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EYE PHYSICIANS AND SURGEONS OF CANADA | MÉDECINS ET CHIRURGIENS OPHTALMOLOGISTES DU CANADA

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Abstract Booklet | Livre des résumés
Paper (Oral) Presentations | Présentations orales

By subspecialty | Par surspécialité

CATARACT SURGERY | CHIRURGIE DE LA CATARACTE

Title: Surgical outcomes of iris-sutured intraocular lenses with the McCannel suture technique

Authors: Rami Abo-Shasha, Phil Hooper, John Gonder

Abstract Body:

Purpose: To determine surgical outcomes of Iris-Sutured Intraocular Lenses with the McCannel Suture Technique.
Study Design: Three year retrospective chart review of all patients with discloated intraocular lenses that underwent repair with McCannel suture technique by Dr. Gonder and Dr. Hooper.
Methods: Three year(2014-2017) retrospective chart review of all patients with intraocular lens dislocation that underwent repair by the McCannel suture technique by Dr. Gonder and Dr. Hooper at the Ivey Eye Institute - St. Joseph's Hospital.Visual acuity was converted to logMAR equivalents. P-Value was analyzed with the Wilcox Signed Rank Test. Inclusion Criteria included 1.) dislocated 3 piece IOLs or dislocated single piece-in the bag-IOLs. 2.) Follow up period of at least four months.
Exclusion Criteria included 1.) baseline anterior chamber inflammation, 2.) dislocated-out of the bag-one piece IOL, 3.) co-morbid, advanced ocular disease prior to surgery or the development of advanced ocular disease after surgery (ie: AMD) Pre-operative variables included age, gender, visual acuity, intraocular pressure, refraction, risk factors for dislocation, iknterval time between cataract surgery and IOL-repositioning surgery, and type of IOL. Post-operative variables included post-operative visual acuity, post-operative intraocular pressure,post-operative Complications, post-operative refraction
Results: 67 participants were enrolled in the study. Average age was 77, and 51% were male. Baseline visual acuity was 1.17 logmar. Baseline intraocular pressure was 18.4, with a range of 0-40. Leading risk factors for discloation included pseudoexfolation (29%), trauma (11%), and cataract surgery related complications (3%). Interval time between cataract surgery and time of dislocation was 11 years. Follow up data ranged from 4 months to 3 years, with average follow up period of 11 months. Final visual acuity was 0.41 logmar (P-value < 0.00005). Final IOP was 14.29(P Value <0.02). There was limited pre-operative refractions prior to dislocation and post-operative refractions post-operative to investigate induced astigmatism. Data available to make this comparison was only available for 12 patients, and there was no induced astigmatism in this small sub-population. Complications were observed and included retinal detachment (1.5%), hemorrhagic choroidal detachment (1.5%), persistent anterior uveitis (3%), lens dislocation (6%), cystoid macular edema (3%), pupillary block (4.5%), and iridodialysis (1.5%). The rate of endophthalmitis was 0%.
Conclusions: This study demonstrates statistically significant improvement in visual acuity and IOP with the McCannel suture technique for dislocated IOLs. Surgically induced astigmatism was not observed in this study and consistent with findings in the literature. Re-dislocation of the intraocular lens was the #1 complication associated with this procedure, followed by pupillary block. Head-to-head studies comparing the McCannel suture with alternative IOL-repositioning surgery is key.

Title: Evaluating pre-operative anesthesia screening tool and key patient care quality markers at HREI

Authors: Tiandra Ceyhan, Prima Moinul, Tin Enoch, Jenny Qian, Tania Ligori, Varun Chaudhary

Abstract Body:

Purpose: To assess the degree of preoperative patient preparedness/optimization for cataract surgery using the Hamilton Regional Eye Institute (HREI) Cataract Screening Pre-procedural Questionnaire (CPSQ).
Study Design: Single-centre, prospective cohort study.
Methods: Ethics approval was obtained from the Hamilton Integrated Research Ethics Board. 151 adult patients undergoing elective cataract surgery at HREI were recruited with informed consent. CPSQ questionnaire screened patients for those at a higher risk of perioperative complications, who were then sent to the pre-operative clinic for consultation. All patients received a reminder phone call the night before surgery, to review preparedness for the day of surgery. Patient demographics and CPSQ survey responses were collected at the time of enrolment. A 5-item satisfaction survey was administered to assess patient satisfaction with the quality of pre-operative instructions provided. Outcomes (delays or cancellations secondary to a lack of patient preparedness, intraoperative systemic complications) and patient satisfaction were compared between patients who attended the anesthesia pre-operative clinic for consultation versus those who did not.
Results: In total, 151 patients completed the study. There were 87 females (57.6%). The mean age was 72.0 ± 10.5 years. There was a moderate level of anxiety preoperatively (5.17 ± 2.98 on a 1-10 scale). Prior to surgery, 129 patients (85.4%) received a phone call about their surgery. The majority of patients, 141 (94%), also received information about cataract surgery via a handout, 59.33% verbally (in combination with handouts) and 1.33% were unable to recall. 146 patients felt they were given adequate information regarding pre-operative medications to take (96.69%), eye drops (99.34%), preoperative fasting guidelines (98.68%), arrival time (99.34%), and instructions for accompaniment/drivers postoperatively (100%). Only 7.43% of patients needed a preoperative anesthesia consultation and all 151 patients (100%) were compliant with fasting guidelines. There were no cancellations or delays. Patient satisfaction with the information received regarding cataract surgery and anesthesia was 4.39 ± 0.88 and 3.80 ± 0.95 (on a 1-5 scale), respectively.
Conclusions: The CPSQ system is an effective tool that can be used to optimize patient care by increasing patient preparedness for cataract surgery and patient satisfaction with the perioperative experience.

🌶 HOT TOPIC | SUJET PIQUANT 🌶

Title: Development and evaluation of self-, peer-, and expert-assessments in video-recorded simulated cataract surgery by ophthalmology residents for competency by design (CBD) training

Authors: Stephanie Cheon, Cornelis de Jager, Rylan Egan, Mark Bona, Christine Law

Abstract Body:

Purpose: The shift of medical education in Canada to CBD has created a need to develop more structured simulation-based surgical training curricula and evaluation tools for ophthalmology trainees. The currently available validated ophthalmology surgical assessment tools are predominantly for intraoperative cases, and do not have competency targets nor utilize self-/peer-assessment. In our pilot study, we sought to develop a valid evaluation tool and identify competency targets for cataract surgery in a simulated environment for trainees.
Study Design: Creation of an assessment tool by conventional Delphi method and prospective validation study of the tool by self, peers, and experts.
Methods: The study was carried out in two phases. Phase 1: An assessment tool comprising of: a) four procedural items scored from 0 (not performed) to 7 (competent), and b) a global rating scale (GRS) requiring yes/no answers to four performance-related questions, was established by conventional Delphi method. The procedural items were incision and paracentesis (formation and technique), viscoelastic (appropriate use and safe insertion), capsulorrhexis (commencement of flap and follow-through), and capsulorrhexis (formation and circular completion). Nine cataract surgery experts provided feedback and modifications in two rounds. Phase 2: Eight ophthalmology residents novice to cataract surgery completed ten simulated surgeries. Two staff ophthalmologists graded the masked videos using the assessment tool. The eight residents graded their own ten videos and ten of their peers' videos in sequential order.
Results: Phase 1: The first round of the Delphi method involved yes/no answers to questions related to the tool; agreement ranged from 55.56% to 100%. The second round used a Likert-type scale to look for conformity between answers. Agreement was 80% or greater (strongly agree or agree) for all answers and improved from the first round. Phase 2: The mean expert score ranged from 3.17±0.86 to 4.67±1.23 for all procedural items across attempts and improved between the first and tenth attempt for each of the four items. There was a general trend towards improved GRS competency and faster surgery completion times by the tenth attempt, but skill proficiency was not necessarily attained. The difference between mean expert and self scores, and between mean expert and peer scores for all procedural items across attempts ranged from -0.48±0.78 to 0.56±0.23 and -0.30±0.17 to 1.11±1.26, respectively. Overall expert scores were higher than overall self and peer scores in three of the four items. Overall incision and paracentesis and viscoelastic scores were consistently higher than overall capsulorrhexis (commencement of flap and follow-through) and capsulorrhexis (formation and circular completion) scores for the expert-, self-, and peer-assessments.
Conclusions: Our study helps provide expectations of the pre-surgical learner and guide objective competency-based assessment. The development of a refined assessment tool and the potential for residents to self-assess and provide peer feedback as an adjunct to expert feedback should be further investigated as not only a method to improve trainee performance, but also lifelong learning skills.

Title: Declining cataract surgery rates affect seniors across Ontario

Authors: Shicheng Jin, Sze Wah Samuel Chan, Neeru Gupta

Abstract Body:

Purpose: To assess recent cataract service delivery in Ontario municipalities and population centres using cataract surgery rate (CSR) as recommended by the WHO Universal Eye Health: Global Action Plan 2014-2019.
Study Design: Retrospective population-level study.
Methods: Population-level data from April 1st 2009 to March 31st 2014 was accessed from the Ontario Ministry of Health and Long-Term Care (MOHLTC) IntelliHealth database by fiscal year. Cataract surgery and demographic data was extracted for Ontario's municipalities using Ontario Health Insurance Plan billings codes. Municipalities were sorted as large urban (≥100,000 persons), medium (30,000 - 99,999 persons), and small (1,000 - 29,999 persons) population centres. Wait times were extracted from the MOHLTC wait times database. Cataract surgery rate (CSR) was defined as the number of cataract surgeries performed per million. Ethics approval was not required for this population based study.
Results: Ontario's total cataract surgery volumes were 145,302 (2010), 147,550 (2011), 143,617 (2012), 144,341 (2013), and 145,239 (2014). The female:male ratio of 1.3:1.0 and mean patient age of 71.6±10 years were consistent from 2010-2014. By age, mean cataract volumes for 45-64 yrs was 21%, for 65-74 yrs was 36%, and for 75+ yrs was 42%. Approximately 98% of cataract surgeries were performed as a single procedure. Glaucoma procedures accounted for 44% of surgeries performed in combination with cataract surgery. Over 5 years, Ontario's CSR decreased by 4% from 11,062 to 10,619, impacting females more than males (5% vs 2%) and those 75 years and older the most (-16%). CSRs by municipality varied significantly with large percent changes during the 5-year period ranging from 1,030 to 254,114. 50 Ontario municipalities had billings for cataract surgery, 22 were large urban, 19 medium, and 9 small population centres. Over the 5-year period, mean CSR declined across all population centres: large urban (-3.6%), medium (-2.3%), and small (-0.7%). Regardless of centre size, the 75+ yr age group showed the largest absolute reduction in CSR, with seniors in small population centres most affected (-29%). Mean wait times increased by 28.0% during the 5 years. CSR is projected to decrease by 35% for the 75+ yr age group by 2025 with current unchanged cataract volumes.
Conclusions: Declining cataract surgical rates have increased the burden of vision loss among our most vulnerable seniors, in rural and urban communities across Ontario. Further research and evidence-based advocacy is needed to prevent avoidable sight loss due to cataracts in Ontario.

Title: A systematic review and meta-analysis of intravenous sedation in modern cataract surgery

Authors: William Hodge, **Effie Kiatos**, Monali Malvankar-Mehta, Cindy Hutnik

Abstract Body:

Purpose: The purpose of this systematic review and meta-analysis is to assess the effectiveness of phacoemulsification with intravenous sedation versus non-intravenous sedation techniques.
Study Design: A Systematic Review and Meta-Analysis.
Methods: The search strategy was performed with the help of an information specialist. A two level screening process was undertaken. Results were done in duplicate with the help of Covedence software. Only RCTs were used in the final analysis. Ten studies made all inclusion criteria and screening sequences.
Results: Results of the meta-analysis found that intravenous sedation was significantly associated with a decrease in pain (SMD = -0.86 with 95% CI of -1.49 to -0.23, p=0.0008) (WMD = -1.01 with 95% CI of -1.66 to -0.36, p=0.002). The weighted mean difference can be interpreted as a 10.1% decrease in pain. The subgroup analysis found patients did not have a statistically significant reduction in pain when using intravenous sedation over oral sedation (SMD =0.02, 95% CI -0.23 to 0.27, p=0.871). The meta-analysis of adverse events found that intravenous sedation did not have a statistically significant increase in adverse events when compared to non-intravenous anesthesia techniques (RR=0.99, 95% CI 0.97 to 1.02, p=0.704).
Conclusions: Although IV sedation reduces patient's perception of pain compared to no IV sedation, the subgroup analysis showed that oral sedation was equally effective. This has implications for manpower needed for cataract surgery and may save significant dollars for the health care system.

🌶 HOT TOPIC | SUJET PIQUANT 🌶

Title: Refractive laser-assisted cataract surgery vs. standard manual surgery: Comparing efficacy and safety in 2844 eyes in the early transition period

Authors: Harrish Nithianandan, Vibeeshan Jegatheeswaran, Logan Germain, Tobi Ajayi, Steve A. Arshinoff, Eric Tam, Sohel Somani

Abstract Body:

Purpose: The evidence supporting the use of either femtosecond refractive laser assisted cataract surgery (ReLACS) versus manual cataract surgery (MCS) is conflicting. This study adds to this body of evidence by reporting on the largest Canadian series of patients undergoing either modality of cataract extraction in the early transition period.
Study Design: This was an IRB-approved retrospective consecutive case series.
Methods: Patients who underwent either ReLACS or MCS at an outpatient cataract surgery suite in Toronto, Canada were included. Patients were excluded from the analysis if the procedure was not completed or if an accompanying procedure was performed. All data was collected via electronic medical records. Preoperative variables of interest included patient gender, age, mean keratometry, axial length, anterior chamber depth and intraocular pressure (IOP). Eyes were numerically graded on their surgical degree of difficulty (DoD) based upon pre-defined characteristics of complex cataracts. Intraoperative outcomes were surgical time, effective phacoemulsification time (EPT) and complications. One-week postoperative refractive deviation from target was also collected.
Results: This study included 1568 ReLACS (55% Female) eyes and 1276 MCS (55% Female) eyes. The mean±SD differences in preoperative age [ReLACS: 68.6±9.5 vs. MCS: 70.7±9.7 years] and surgical time [ReLACS: 6.6±2.9 vs. MCS: 6.0±2.6 minutes] were statistically significant between the groups ($p<0.001$). Mean preoperative keratometry [ReLACS: 43.8±1.7 vs. MCS: 43.8±2.8], axial length [ReLACS: 23.4±3.9 vs. MCS: 23.6±2.1 mm], anterior chamber depth [ReLACS: 3.1±0.6 vs. MCS: 3.1±0.9 mm], and IOP [ReLACS: 15.0±4.6 vs. MCS: 14.8±3.5 mmHg] did not differ between the groups ($p>0.05$). Mean surgical DoD [ReLACS: 0.36±0.6 vs. MCS: 0.28±0.5] was significantly greater in the ReLACS eyes ($p<0.001$). Rates of posterior capsular rupture [ReLACS: 0.77% vs. MCS: 0.24%] were similar ($p>0.05$). The overall postoperative refractive deviation from target [ReLACS: 0.7±2.9 vs. MCS: 0.7±3.4] did not differ between the groups ($p>0.05$). Two-Factor ANOVA revealed significantly less EPT in ReLACS eyes when the DoD>0 [ReLACS: 33.5±28.6 vs. MCS: 39.9±24.5 seconds, $p=0.004$). Refractive deviation from target was less in the ReLACS eyes when the DoD>0 [ReLACS: 0.61±0.7 vs. MCS: 0.73±0.9] and when the DoD>1 [ReLACS: 0.65±0.6 vs. MCS: 0.95±1.3], however these differences were not statistically significant ($p>0.05$).
Conclusions: Despite ReLACS treating slightly more difficult eyes in our series, overall safety and efficacy were comparable between both groups. In difficult eyes, ReLACS is superior in reducing EPT. Trends indicated that ReLACS may be beneficial for refractive accuracy in more difficult eyes.

Title: Investigation of a toxic anterior segment syndrome outbreak (TASS) in British Columbia, Canada, 2017

Authors: Simon P. Holland, **Chanut Nithithanaphat**, Karrie Hammond-Collins, Marcus Lem, Douglas Walter Mock

Abstract Body:

Purpose: An increase in the number of voluntarily reported TASS cases to the Canadian Ophthalmic Society (COS) TASS Task Force from a total of 14 clinics occurred between September 2016 and March 2017. In British Columbia in early 2017, a cluster of TASS cases prompted the need for an investigation to identify any common sources among the cases.
Study Design: A case-control study to identify risk factors associated with TASS was conducted by the Canadian Field Epidemiology Program (CFEP) in conjunction with the BCCDC and COS TASS Task Force.
Methods: Ten incident cases of TASS from three separate facilities were summarized using descriptive epidemiology. A chart review of 3:1 controls to cases was conducted to examine a variety of intra-operative exposures. Odds ratios for exposure variables, along with corresponding 95% confidence intervals and two-tailed Fisher Exact p-values, were calculated. Site observations of the three implicated facilities were conducted.
Results: All clinics reported at least one case in the same week with one clinic reporting all 6 cases on the same day. None of the exposures studied significantly influenced the risk of developing TASS at the 5% level of significance. These results are consistent with the small sample size. Observational epidemiology showed that endotoxins detected from an automated flushing device (QuickRinse,QR) were a possible cause for one of the three clinics. All clinics made improvements to their standard operating procedures for re-processing instruments, specifically elimination of enzymatics and detergents, following the recommendations of this investigation.
Conclusions: TASS outbreaks are often multifactorial, primarily related to issues with ophthalmic instrument re-processing. Because of the multiple steps and products involved in the re-processing of instruments, and the typically small sample sizes, TASS outbreaks are difficult to investigate. This research presents one of few case-control studies conducted during TASS outbreaks, though it did not provide evidence of a unifying etiology. Additionally, reporting of TASS cases and outbreaks is voluntary and inconsistent in Canada. The presence of endotoxins detected in a widely used automated flushing device is of concern as this device is a Level 1 healthcare product and is exempt from federal regulation. There is also concern regarding variability in the use of enzymatics and detergents which have been linked to previous outbreaks. Cataract surgery remains vulnerable to unpredictable outbreaks of TASS and the recent increases in Canada merits investigation and renewed vigilance for early detection and correction of potential risk factors.

Title: Practice patterns of the Canadian Ophthalmological Society members in cataract surgery – Survey 2018

Author: Lindsay Ong-Tone

Abstract Body:

Purpose: This will be the tenth annual survey on the practice patterns of the Canadian Ophthalmological Society (COS) members in cataract surgery.
Study Design: Web based
Methods: This survey will be conducted in January 2018 when an e-mail with a link to Fluid Surveys will be sent to all the COS members who have indicated that their practice focus is on Cataract and IOL. A reminder e-mail will be sent about 3 weeks later.
Results: There was a moderate increase in the number of respondents who were using femtosecond laser assisted cataract surgery (FLACS) between 2014 (8%) and 2015 (18.9%). There was a moderate drop in the 2017 survey to 11.8%. The cataract wound size has been getting smaller over the years. In 2017, the most popular one was 2.2 mm (40.5%) followed by 2.4 mm (22.6%) and 2.75 mm (20.2%). Nearly 65 percent of the respondents were correcting astigmatism at the time of cataract surgery. The majority (79.2 percent) were using a toric intraocular lens to do so. The number of respondents using intracameral antibiotics has increased from 23.1 percent in 2009 to 44 percent in 2017. In this latest survey, the most popular intracameral antibiotic was moxifloxacin (54.4 percent) followed by cefuroxime (18.9 percent) and vancomycin (16.2 percent).
Conclusions: Certain trends in the practice patterns of the COS members in cataract surgery have been observed and maintained over the years. The uptake of FLACS was quite impressive in its first year, but has since waned.

Title: Analyzing the effective lens position and refractive outcomes of complex IOL fixation techniques

Authors: Yogesh Patodia, Jithin Yohannan, Ayda Shahidi, Alexander Kaplan, Iqbal (Ike) Ahmed

Abstract Body:

Purpose: To evaluate the effective lens position (ELP) and refractive outcomes for anterior chamber intraocular lenses (ACIOL), posterior chamber IOLs (PCIOL) in-the-bag, in the sulcus, in the sulcus with optic capture (OC), in the bag with reverse optic capture (ROC), and scleral sutured lenses (SS).
Study Design: Single-centre, retrospective, investigational cohort study.
Methods: 213 eyes, 194 patients that underwent cataract from Jan. 2005 to Oct. 2017. 51 eyes had ACIOLs, 61 eyes with in-the-bag, 30 eyes with sulcus, 43 eyes with OC, 19 eyes with ROC, and 9 eyes with SS PCIOLs. The primary outcome was ELP (measured by anterior-segment OCT from the anterior corneal vertex to the anterior surface of the IOL) and the secondary outcome was mean arithmetic error (MArE); measured as the difference between post-operative refraction and pre-operative targeted refraction for in-the-bag placement (with the exception of the ACIOL group). ELP and MArE were reported as mean, in millimeters (mm) and diopters (D) ± standard deviation, respectively.
Results: In the following groups, ELP was determined to be: 3.41±0.45 mm in the ACIOL group, 4.44±0.31 mm for in-the-bag, 4.31±0.37 mm in sulcus, 4.54±0.41 mm in OC, 4.16±0.37 mm in ROC, and 3.92±0.67 mm in SS. The MArE of each group was determined to be: -0.38±0.69 D for ACIOL, -0.28±0.76 D for in-the-bag, -0.84±1.00 D in sulcus, -0.30±0.97 D in OC, -0.67±0.77 D in ROC, and -0.73±1.10 D in SS.
Conclusions: This study suggests that there can be variability in post-operative refractive outcomes in complex IOL fixation strategies. This variability should be taken into account pre-operatively when calculating the lens power to ensure optimized visual outcomes.

Title: A retrospective analysis on the visual outcomes of an extended range of vision intraocular lens

Authors: Anmol Lamba, **Austin Pereira**, Devesh Varma, Dean Smith, Iqbal (Ike) Ahmed

Abstract Body:

Purpose: To evaluate the visual acuity outcomes and the presence of photic phenomena related to the Tecnis Symfony Extended Depth of Focus (EDF) Intraocular Lens (IOL).
Study Design: Retrospective Chart Review
Methods: All consecutive cases performed by 3 surgeons in a single center were retrospectively evaluated within one month of surgery. Unilateral cases (EDF-IOL in one eye, monofocal aspheric IOL in the other eye), and bilateral cases (EDF-IOL in both eyes) were analyzed separately. Cases with confounding medical history or lack of follow-up data were excluded. Outcomes included Uncorrected Distance Visual Acuity (UCDVA), Corrected Distance Visual Acuity (CDVA), Uncorrected Near Visual Acuity (UCNVA), mean absolute error (MAE), photic phenomena (glare, haloes, dysphotopsia), and complications or re-operations.
Results: 254 cases were evaluated. 139 (54.7%) were unilateral, 99 (39.0%) were bilateral, and 16 (6.3%) were excluded. Median pre-operative Spherical Equivalent (SE) was +0.50 (IQR: -2.00 to +1.75). Median pre-operative CDVA was 0.18 (IQR: 0.1 to 0.3). Unilateral cases had a median UCDVA of 0.3 logMAR (IQR: 0.18 to 0.4). Bilateral cases had a median UCDVA of 0.18 logMAR (IQR: 0.1 to 0.3). For both unilateral and bilateral cases, median CDVA was 0.1 logMAR (IQR: 0 to 0.18) and median UCNVA was 0.18 (IQR: 0.1 to 0.2). Across all eyes, the MAE was 0.33 ± 0.29 diopters. 64.5% of eyes were within 0.25 diopters of the target refraction. Overall, 32 (13.4%) cases reported moderate to severe photic phenomena (non-directed), the most common being haloes (10.5%). There were no intra-operative complications. 7 (2.9%) patients underwent post-operative photorefractive keratectomy, 2 (0.8%) had an IOL explanation, and 1 (0.4%) needed IOL repositioning.
Conclusions: Overall, the extended depth of focus intraocular lens provided a reasonable range of vision for uncorrected distance and near vision. Patients with bilateral EDF IOL implantation had better UCDVA compared to unilateral implantation, while uncorrected near vision was similar. Approximately one in ten patients self-reported significant post-operative photic phenomena in the early postoperative period.

Title: Systematic review and meta-analysis regarding impact of cataract surgery on biometric iris recognition

Authors: Daniel Stojanovic, Amit Sharma, Tony Lin

Abstract Body:

Purpose: Biometrics has been increasingly used in security technologies to verify identities. Iris recognition in particular has become more popular around the globe, and has recently been integrated into the Canadian Nexus card program. This project aims to explore the impact of intra-ocular interventions, particularly cataract surgery, on the reliability of iris recognition.
Study Design: A systematic review and meta-analysis were conducted to determine the impact of cataract surgery on the rate of false-negatives when analyzed through iris recognition software. An electronic literature search of MEDLINE, EMBASE, and CINAHL was performed. Inclusion criteria consisted of pre- and post-surgical comparison of iris recognition.
Methods: In total, 462 articles were retrieved for primary analysis. For study inclusion, the exposure of interest was cataract surgery, and the primary outcome of interest was the false negative rate of iris recognition software when comparing pre-surgical to post-surgical eyes. In total, 4 studies were identified for inclusion.
Results: 235 eyes were analyzed. Each included study was a single armed trial comparing pre- and post-cataract surgery. A meta-analysis of proportions was used to aggregate the data. 6.723% (CI: 3.896 to 10.678) of participants received a false negative reading.
Conclusions: There is a risk of increased rates of false-negatives post cataract surgery. Consistently, this has been attributed to peri-operative damage to the iris. Under slit-lamp exam irises are successfully graded to indicate an increased risk of false-negative scans. It is unlikely that the existence of an intra-ocular lens within the eye has any intrinsic effect on biometric iris matching. However, patients may need documentation following cataract surgery to update their registered biometric data should any surgical complications occur.

Title: Reducing the incidence of clinically significant residual astigmatism with a low-cylinder IOL using the Barrett toric calculator

Authors: David B. Yan, Monica lau

Abstract Body:

Purpose: Determine the effect of the targeted amount of residual astigmatism on the incidence of clinically significant post-operative astigmatism when implanting a low-cylinder IOL using the Barrett toric calculator.
Study Design: Retrospective Study
Methods: A low-cylinder toric IOL (SN6AT2, ~0.68D at corneal plane) was implanted in 44 eyes of 36 patients using the Barrett toric calculator to plan residual astigmatism <0.5D, or <0.1D if the axis flips 90°. Patients were divided by amount of targeted residual astigmatism into two groups: 1) < 0.1D (n=24) and 2) 0.1D-0.5D (n=20). The residual astigmatism with a non-toric IOL was calculated using a novel vector analysis with an online tool to combine the refracted residual astigmatism with a cross-cylinder 90° from the measured axis of the toric IOL at 1-month postop.
Results: Refracted postop astigmatism with the toric IOL (0.37±0.34D) was significantly lower ($p<0.001$) than the astigmatism with a non-toric IOL calculated by vector analysis (0.83 ± 0.33D). Targeting <0.1D residual astigmatism on Barrett toric calculator resulted in significantly less postoperative astigmatism compared to targeting 0.1-0.5D (0.26±0.22D vs. 0.50±0.42D; $p=0.02$). There was also a significantly lower incidence of clinically significant postoperative astigmatism (≥0.75D) in the <0.1D targeted astigmatism group compared to the 0.1-0.5D targeted astigmatism group (4% vs. 25%, $p=0.05$). The refractive benefit of the toric IOL was 0.46±0.31D. Frequency analysis showed that 91% of patients had a positive refractive benefit from the toric IOL, with 80% ≥ 0.25D benefit and 61% ≥ 0.5D benefit.
Conclusions: Vector analysis is an effective tool to demonstrate the refractive benefit of a toric IOL when implanting low-cylinder toric IOLs using the Barrett Toric Calculator. Greater targeting accuracy of astigmatism management with a low-cylinder toric IOL resulted in a lower incidence of clinically significant post-operative astigmatism.

CORNEA, EXTERNAL DISEASE AND REFRACTIVE SURGERY
CORNÉE, MALADIES EXTERNES ET CHIRURGIE RÉFRACTIVE

Title: Topical ganciclovir for prophylaxis of cytomegalovirus endotheliitis in endothelial keratoplasty

Authors: Alfred Basilious, Hall Chew

Abstract Body:

Purpose: To describe the presentation and management of two cases of DSEK with subsequent failure secondary to CMV infection and prophylaxis with topical ganciclovir to prevent repeat DMEK failure.
Study Design: Retrospective case series
Methods: A chart review was conducted for 2 patients (2 eyes) with DSEK failure secondary to CMV ocular infection confirmed by PCR of anterior chamber (AC) paracentesis sample.
Results: A 53 year old male (patient 1) and a 70 year old male (patient 2) received DSEK for decompensated cornea secondary to iritis and pseudophakic bullous keratopathy, respectively. Patient 1 was immunocompromised (on prednisone, etanercept, and methotrexate for psoriatic arthritis) while patient 2 was immunocompetent. Patient 1 had first graft failure at 21 months and patient 2 at 10 months. Initial clinical signs included inferior edema, keratic precipitates (KPs) and minimal anterior cellular reaction. Both failed to respond to topical steroid drops, and patient 2 had 3 subsequent failed DSEKs. AC paracentesis confirmed CMV DNA. They received oral valganciclovir for six weeks but both continued to have signs of inflammation and edema with repeat AC samples positive for CMV. They were then started on topical ganciclovir (0.15% ophthalmic gel). Repeat endothelial transplant (Descemet's Membrane Endothelial Keratoplasty [DMEK]) was performed for both patients. They were restarted on topical ganciclovir 4 times a day after surgery as aqueous samples collected during transplant were positive for CMV. Both patients remain free of inflammation or failure on topical ganciclovir for 27 months (patient 1) and 20 months (patient 2) with uncorrected visual acuities of 20/25 and 20/40 respectively.
Conclusions: In cases of DSEK failure with multiple recurrences or history of ocular inflammation, CMV should be considered as a possible causative agent. For the first time in the literature, we demonstrate that long-term topical ganciclovir can be used to prevent recurrence of inflammation and subsequent graft failure in repeat keratoplasty — without the systemic side effects of systemic valganciclovir / foscarnet.

Title: Descemet membrane endothelial keratoplasty in patients with previous trabeculectomy or tube shunt

Authors: Tanguy Boutin, Nir Sorkin, Adi Einan Lifshitz, Zale Mednick, Mahmood Showail, Armand Borovik, Clara C. Chan, David Rootman

Abstract Body:

Purpose: To present the outcome of Descemet Membrane Endothelial Keratoplasty (DMEK) in eyes that have a previous trabeculectomy or a glaucoma drainage device (GDD).
Study Design: retrospective case series
Methods: A retrospective medical chart review of patients that had previously undergone trabeculectomy or GDD implantation, who later underwent DMEK between 2013 and 2017 at the Toronto Western Hospital was done. Twenty-seven eyes of 27 patients with a minimal postoperative follow-up of 6 months were included in the analysis. The indications for DMEK were: Fuchs endothelial dystrophy (2), Pseudophakic bullous keratopathy (12), Iridocorneal endothelial syndrome (2), failed grafts: penetrating (4), DSAEK (5), DMEK (2). All eyes included had previous glaucoma surgeries: GDD (12 patients), trabeculectomy (9 patients), trabeculectomy and GDD (4 patients), trabeculectomy and Minimally Invasive Glaucoma Surgeries (MIGS) (2 patients).
Results: Mean best-corrected visual acuity (BCVA) improved significantly from 1.58 ± 0.62 logMAR (20/760 Snellen) preoperatively to 0.88 ± 0.55 logMAR (20/150 Snellen) at 6 months ($p<0.0001$). At 6 months of follow up, the percentage of eyes that reached 20/50 or better was 41 % and 20/200 or better was 78%. Mean donor endothelial cell density (ECD) was 2776 ± 202 cells/mm2 preoperatively and 1875 ± 451 cells/mm2 at 6 months postoperatively ($p<0,001$). This corresponds to a mean percentage cell loss of 32.4%. Post-operatively, 7 cases out of the 27 (26%) had a graft detachment of which 5 required rebubbling (19%). All were attached following rebubbling. We had one case of primary failure and two of failure in the first year. Of the 27 grafts, one had a rejection after 2 months and another one after 7 months. Of the 27 patients, 16 had a previous GDD implantation. Of those, only 30% reached 20/50 or better BCVA and 48% 20/200 or better at 6 months showing more limited visual improvement in advanced glaucoma patients with DMEK.
Conclusions: While more challenging to do, DMEK may be successfully performed in eyes with a GDD or previous trabeculectomy.

Title: Lymphatic vessels identified in failed human corneal transplants

Authors: Sze Wah Samuel Chan, Michael Diamond, Xun Zhou, Yeni Yucel, Neeru Gupta

Abstract Body:

Purpose: Failed corneal transplant is the most common indication for full-thickness corneal transplants (1). Abnormal corneal blood vessels contribute to graft failure and understanding the nature of these vessels may help monitor and prevent failing grafts. In mouse models, there are reports of lymphatic vessels in the corneas of failed corneal transplants. Here we systematically investigated the presence of abnormal lymphatic vessels in patients with failed corneal grafts.
Study Design: Experimental pathological study.
Methods: After institutional REB approval, 9 failed corneal transplants with neovascularization were selected from the University of Toronto Ophthalmic Pathology database. Paraffin-embedded sections of 8 µm thickness were stained with hematoxylin and eosin (H & E) and re-examined for the presence of neovascularization. This was followed by immunofluorescence staining to identify lymphatics with antibodies to podoplanin (D2-40, monoclonal mouse, Cedarlane Laboratories (CL3730)) and to identify blood vessels with antibodies to CD31 (polyclonal rabbit, Abcam (ab28364)). Immunofluorescence stained sections were analyzed by confocal scanning laser microscopy for the presence of lymphatics and blood vessels and compared to negative controls obtained by omitting the primary antibody. Additionally, these findings were compared to age-matched normal corneas.
Results: In all 9 cases showing neovascularization of the cornea and blood vessels by H & E, immunostaining for CD31 showed clear positivity for blood vessels distributed in varying stromal layers. Most cases (7/9) showed numerous podoplanin immune-positive profiles, either in the form of a lumen (4) or as elongated-stained profiles (7). This was different from CD31-positive blood vessels most often in the form of lumen.
Conclusions: This is the first study to systematically evaluate lymphatic vessels in failed human corneal grafts with neovascularization. The presence of abnormal lymphatic vessels in these failed corneal grafts suggests a role for lymphatics in the graft rejection process, with implications as a new treatment target for failing grafts.

(1) Le R, Yucel N, Khattak S, Yucel YH, Prud'homme GJ, Gupta N. Current indications and surgical approaches to corneal transplants at the University of Toronto: A clinical-pathological study. Can J Ophthalmol 2015:1-6. doi:10.1016/j.jcjo.2016.07.005.

Title: Adverse events in corneal collagen crosslinking (CXL) alone, CXL with intrastromal corneal ring segments, and CXL with topo-guided PRK

Authors: Wendy Hatch, Stephan Ong Tone, Matthew Bujak, Clara Chan, Hall Chew, Sherif El Defrawy, Christoph Kranneman, Raymond Stein, Theodore Rabinovitch, David Rootman, Allan Slomovic, Lacey Haines, Kostadinka Bizheva, Neera Singal

Abstract Body:

Purpose: To describe the adverse events (AEs) from collagen crosslinking (CXL) alone, CXL with simultaneous intrastromal corneal ring segments (CXL-ICR) and with topography-guided photorefractive keratectomy (CXL-TG-PRK) in subjects with progressive keratoconus, pellucid marginal degeneration (PMD) or laser in-situ keratomileusis (LASIK)-induced ectasia.
Study Design: Prospective single- centre non-randomized observational study
Methods: AEs were defined as a change from preoperative to postoperative as follows: intraocular pressure (IOP) increase of 10 mm Hg or more at 1, 3, 6 or 12 months, central corneal thinning (CCT) measured by ultrasound of 100 μm or more at 1 year, a decrease in minimum corneal thickness (MCT) measured by corneal topography and tomography of 100 μm or more at 6 or 12 months, loss of best corrected visual acuity (BCVA) of 3 or more lines at 1, 3, 6 or 12 months, significant haze at 3, 6 or 12 months, 10% or more reduction in endothelial density, infection, scarring or other unanticipated events.
Results: Subjects: 924 eyes of 532 subjects. 676 eyes, 126 eyes, and 122 eyes underwent CXL alone, CXL-ICR and CXL-TG-PRK respectively. AEs: 9, 0, 4 and 6 cases of IOP rise at 1, 3, 6 and 12 months respectively;10 cases of CCT thinning at 12 months; 15 and 17 cases of MCT decrease at 6 and 12 months respectively; 45, 20, 11 and 6 cases of BCVA loss at 1, 3, 6 and 12 months respectively; 11, 16 and 6 cases of significant haze at 3, 6 and 12 months; 1 infection, 1 ulcer, 8 scarring, 3 ICR removed and 1 ICR adjusted, 1 flap edge lift requiring a suture.
Conclusions: Significant loss in BCVA and haze at 1 year were found in very small proportions of the cohort. The haze did not result in significant visual impairment in most cases. Considerable variability was found in the measurements of CCT, and limitations in the measurement of MCT. The AE rate was low in all three procedures.

Title: Outcomes of phototherapeutic keratectomy (PTK) versus topography-guided photorefractive keratectomy (TG-PRK), both with corneal cross-linking

Authors: Simon P. Holland, David T.C. Lin, Murad Al Obthani, Samuel Arba Mosquera

Abstract Body:

Purpose: To compare result of 2 groups of keratoconus (KC) eyes undergoing combined topographic guided photorefractive keratectomy (TG-PRK) and phototherapeutic keratectomy (PTK) both in combination with corneal collagen cross-linking (CXL).
Study Design: Retrospective series
Methods: Schwind Amaris 1050 used with simultaneous CXL, UV-X 9 mW/cm2 x 10 min. for both groups. TG-PRK with CXL, n = 305 eyes and 31 treated with trans-epithelial PTK evaluated at 6 months. Data analyzed: manifest refraction, spherical equivalent (SE), uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), average K, and central corneal thickness. Safety and efficacy evaluated.
Results: Astigmatism reduction was greater in the TG-PRK group 1.56D compared to PTK group 1.16D (P=0.1). TG-PRK group had better UDVA, 61% achieved 20/40 vs 40% in PTK group. 78% of the TG-PRK maintained or had improvement in CDVA versus 58% of PTK group. The Spherical equivalent for TG-PRK group dropped from -2.79+/-3.33D to -0.62+/-2.29D while it is -2.19+/-2.83D to -1.72+/-3.16D for the PTK group. PTK group shows slight corneal flattened, with pre-operatively 48.76+/-4.45D to post-operatively 46.32+/-3.91D.
Conclusions: TG-PRK CXL for keratoconus is superior to PTK CXL in refractive outcomes, including reduction in both spherical equivalent and astigmatism, UDVA and CDVA. While TE-PTK may be less likely to cause progression, this advantage is offset by no useful improvement in astigmatism or vision compared to significant gain in TG-PRK with CXL

Title: Descemet membrane endothelial keratoplasty (DMEK) for management of rare and complex anterior segment disease

Authors: Samir Jabbour, Julia Talajic, Michèle Mabon, Johanna Choremis

Abstract Body:

Purpose: Very few reports have been published on the feasibility of DMEK in complex anterior segment disease. The scientific literature remains very scarce on the safety an efficacy of DMEK in rare anterior segment disease. In this case series, we report our experience and lesson learned from DMEK surgery of rare and complex anterior segment disease
Study Design: Retrospective, non-comparative, case series
Methods: Two eyes in 2 patients diagnosed with unilateral ICE syndrome (Cases 1 & 2), one eye with epithelial downgrowth following cataract surgery (Case 3) and one eye with Axenfeld-Rieger syndrome (Case 4) were treated with DMEK by 1 surgeon (J.C.) at a tertiary center (Maisonneuve-Rosemont Hospital, Montreal, QC) between December 2015 and June 2017. Patient demographics, past medical and ocular history, pre-operative assessment, surgical protocol and post-operative follow-ups were collected from chart review.
Results: All patients underwent DMEK surgery following standard protocolCase 1: BCVA improved to 20/25 from post-op 1 month. Graft was clear and there was no recurrence at last follow-up of 4 months. Case 2: BCVA improved to 20/100 on post-op day 1 and continued to improve to 20/30 at 1 year follow-up. There was no evidence of recurrence or graft failure at 1 year follow-up. Case 3: The patient underwent intra-operative Argon laser and 5-FU anterior chamber lavage before DMEK implantation. The wound was closed with cyanoacrylate glue. Post-operatively at day 2, rebubbling was required for partial graft detachment. BCVA improved to 20/60, graft was clear, the wound was Siedel negative and IOP normalized up to last follow-up at post-op 5 months.
Case 4: BCVA improved from 20/400 to 20/60 at 1 month post-operatively. Graft remained clear and attached. However patient had IOP rise due to steroid response that warranted a trabeculectomy at one month post-operatively.
Conclusions: DMEK seems to be a safe and efficacious surgery in some eyes with rare and complex anterior disease. Careful selection of patient and proper post-operative care are crucial in guaranteeing the success of the surgery. In cases of anterior segment abnormalities, anterior chamber reconstruction should be planned through cataract extraction and/or GSL in order to make unfolding of the graft easier. In cases where anterior segment abnormalities are advanced, DSAEK and standard PKP remain very reasonable options for best visual outcomes. More reports are needed from different centers on their experience with DMEK surgery and rare anterior segment disease.

Title: Rapid sequential corneal topography evaluation of selective suture removal in the management of post-keratoplasty astigmatism

Authors: Milad Modabber, Annie Ho, Jehan Bista, Samir Melki, Mona Harissi-Dagher

Abstract Body:

Purpose: Both penetrating keratoplasty (PK) and deep anterior lamellar keratoplasty (DALK) can result in high levels of postoperative astigmatism. The use of interrupted sutures to secure the graft-host junction allows for the selective removal of sutures at the steep meridian to reduce post-operative astigmatism. There is limited evidence that the same day following suture removal, corneal topography can accurately identify the next pair of sutures requiring removal (Sarhan 2010). However, this remains controversial. Hence, we seek to evaluate the same-day astigmatic effect of corneal topography-guided selective suture removal as compared with repeat topography 4-6 weeks later in PK and DALK patients.
Study Design: Prospective, multi-centre, non-randomized study.
Methods: A total of 30 consecutive PK or DALK patients undergoing selective suture removal for management of high post-keratoplasty astigmatism (> 3D of Cylinder) were included in this study. Following a set time period after PK or DALK procedures, topography-guided selective suture removal in the steep meridian was carried out. Topography was repeated after 30-40 min and again 4-6 weeks later. The tight sutures requiring removal were identified at each session and compared, and the sutures were removed at the 4-6 week mark. The primary outcome measures were the topographic (via Pentacam) and refractive astigmatism (using automated and manifest refraction) measured at both visits. The difference was considered insignificant if the axis of sutures requiring removal was < 22.5° (given 16 interrupted sutures). The secondary outcome measure was best corrected visual acuity (BCVA). Complication rates and deleterious side effects were also documented.
Results: There was a reduction of astigmatism after suture removal, resulting in improvement of BCVA ($p < 0.05$). The difference in remaining topographic astigmatism between 30-40 min and 4-6 weeks after suture removal was not statistically significant ($p > 0.05$) in PK and DALK patients.
Conclusions: Same-day topography following suture removal can define the next set of sutures to be removed with considerable accuracy to reduce the remaining astigmatism. This can reduce the number of follow-up visits necessary to achieve minimal achievable astigmatism and can shorten the post-keratoplasty visual rehabilitation period.

RON JANS CLINICAL CORNEA RESEARCH AWARD

Title: Besifloxacin ophthalmic suspension in patients with bacterial keratitis: A prospective, randomized clinical study

Author: Fatma Zaguia, Michael Ross, Mahshad Darvish, Jean Deschênes

Abstract Body:

Purpose: Bacterial keratitis is a serious ocular problem that can, if not appropriately treated, lead to corneal scarring, perforation, endophthalmitis, and ultimately blindness. Current accepted treatment by most ophthalmologists for corneal ulcers involves aggressive therapy with fortified antibiotics typically every hour, around the clock dosing for at least the 48 hours, causing significant distress to patients, as well as compliance issues. Finally, delayed epithelial healing rate and conjunctival/corneal toxicity are known side effects of fortified antibiotics. Besifloxacin ophthalmic suspension is a novel topical fluoroquinolone, specifically developed as an ocular topical preparation. Several in vitro studies have shown a higher potency when compared with earlier fluoroquinolones, however there is limited data about its safety and efficacy in the treatment of bacterial keratitis.
Study Design: Our study is a multi-site prospective, randomised trial to determine if besifloxacin when compared to fortified tobramycin/vancomycin drops results in non-inferior clinical resolution of bacterial keratitis. Primary outcome was clinical resolution at day 28: no evidence of active bacterial infection, complete reepithelialization/wound healing and resolved inflammation.
Methods: Patients with bacterial ulcers larger than 1 mm were randomised to receive besifloxacin at initially Q4H dosing vs fortified tobramycin + vancomycin at initial Q1H dosing. Complete exams were recorded at initial visit, and at predetermined subsequent visits.
Results: Overall, there were no treatment failures in the besifloxacin group. There was no statistical difference between groups when controlled for initial infiltrate size, with average infiltrate size of 1.2mm in besifloxacin group vs 2mm in fortified group (p=0.11). Median number of days taken for the ulcer to heal between the besifloxacin group (12 days) and fortified group (19 days) showed no statistical difference (p=0.4). The group treated with besifloxacin showed a statistically significant more rapid epithelialization rate, at a mean of 4 days vs 11 (p=0.01). Improvement of visual acuity from baseline at presentation showed no statistical difference (p=0.49) with approximately 1.2 lines gained on Snellen chart for besifloxacin group vs 2 lines of improvement in fortified group.
Conclusions: Our preliminary results failed to find a difference in efficacy of besifloxacin, a novel fluoroquinolone in the treatment of bacterial keratitis when compared to traditional combination therapy of fortified antibiotics.

GLAUCOMA | GLAUCOME

🎖 Second Prize, COS Awards for Excellence in Ophthalmic Research 🎖

Title: Acetylsalicylic acid reduces collagen contraction, remodelling and myofibroblast proliferation in Tenon's capsule tissue mimetic

Authors: James J. Armstrong, Cindy Hutnik

Title: Assessing the effects of indomethacin and dexamethasone on wound healing using a 3D bioartificial tissue of human Tenon's capsule fibroblasts

Authors: Jim T. Denstedt, James Armstrong, Charles Trelford, Cindy Hutnik

Abstract Body:

Purpose: To compare the effects of indomethacin, a non-steroidal anti-inflammatory drug (NSAID), and dexamethasone, on scarring outcomes in a 3D-bioartifical tissue (BAT) model of Tenon's capsule. Secondly, better understand the underlying mechanisms behind the antifibrotic effects of these drugs.
Study Design: An in vitro experiment comparing fibrotic outcomes of steroid and NSAID treatment on human Tenon's capsule fibroblasts.
Methods: Human Tenon's capsule fibroblasts (HTCFs) were cultured within collagen based tissue mimetics and treated with varying concentrations of indomethacin or dexamethacin for 7 days. Contraction of the collagen construct was measured over a 7-day period after which either total RNA was collected or the construct was fixed for histological staining. Real time quantitative PCR (qPCR) was performed to measure relative expression levels of 10 genes involved in the fibroproliferative response.
Results: Both drugs significantly reduced the contractile activity of HTCFs. The expression of ACTA2, the gene encoding alpha smooth muscle actin (aSMA), was significantly reduced in a dose dependent manner in the indomethacin group, compared to dexamethasone and control. RNA expression of the collagen encoding genes Col3A1 and Col2A1and of TBGFB1 were each reduced by the highest concentration of indomethacin. Fluorescent microscopy comparing relative expression of aSMA showed significantly reduced protein expression following indomethacin treatment, and significantly increased expression with dexamethasone treatment, compared to no treatment control ($P<0.05$).
Conclusions: The results of this study demonstrate the antifibrotic effects of NSAIDs in vitro on Tenon's capsule fibroblasts. These results support a possible role of NSAIDs for antifibrotic therapy in glaucoma filtration surgery.

Title: SLT repeatability, the Canadian multicenter RCT

Authors: Cindy Hutnik, Andy Crichton, Bryce Ford, Marcelo Nicolela, Lesya Shuba, Catherine Birt, Enitan Sogbesan, Karim Damji, Michael Dorey, Hady Saheb, Hui Guo, Neil Klar, Darek Gozdzik, William Hodge

Abstract Body:

Purpose: To compare the 1 year IOP lowering effect between selective laser trabeculoplasty (SLT) and argon laser trabeculoplasty (ALT) on patients who were already treated with 360-degree SLT previously.
Study Design: This is the first multicenter, patient-masked, RCT looking at SLT repeatability.
Methods: Patients were recruited from seven Canadian academic centers. We randomly assigned eligible patients, who had previous 360-degree SLT, to receive either 180-degree SLT or 180-degree ALT. The primary outcome was IOP change from baseline to 12 months. The analysis was performed for the complete cases and repeated for the per protocol patients. This trial was registered on ClinicalTrials.gov, number NCT01687465 and was funded by CIHR.
Results: We enrolled 137 participants between February 14, 2013 to October 24, 2016. Randomization was balanced. Diagnosis included primary open angle glaucoma (POAG), pigmentary dispersion syndrome (PDS), pseudoexfoliation syndrome (PXF), and ocular hypertension (OHT). Baseline IOP was 21.67 mmHg (SD 3.15) in the SLT group and 21.77 mmHg (SD 3.35) in the ALT group. At 12-month follow-up, mean IOP reduction was 3.35 mmHg (SD 4.96) for the SLT arm and 3.36 (SD 5.06) for the ALT arm. The difference was -0.01 mmHg (95% CI, -1.86 to 1.84; p = 0.99) for the complete cases and 0.86 mmHg (95% CI, -0.68 to 2.41; p = 0.27) for the patients without protocol deviation. One patient (2%) in the SLT group and 4 (7%) in the ALT group progressed to surgery (RR 0.25 p = 0.22). No IOP spike (IOP elevation > 5 mmHg at 1 hour) was detected in either group.
Conclusions: There are two main conclusions from this study: (1) 180-degree SLT is effective when done after previous complete SLT but ALT can also be used with equal effectiveness in this setting. (2) Although both lasers were effective, IOP reduction was only about 50% of what is typically obtained from laser angle surgery in virgin eyes. An ongoing open label study of these patients is in progress to determine the IOP lowering effects of even further SLT treatments.

Title: Optical coherence tomography for glaucoma diagnosis: An evidence based meta-analysis

Authors: Vinay Kansal, James J. Armstrong, Robert Pintwala, Cindy Hutnik

Abstract Body:

Purpose: Early detection, monitoring and understanding of changes in the retina are central to the diagnosis of glaucomatous optic neuropathy, and vital to reduce visual loss from this progressive condition. The main objective of this investigation was to compare glaucoma diagnostic accuracy of commercially available optical coherence tomography (OCT) devices (Zeiss Stratus, Zeiss Cirrus, Heidelberg Spectralis and Optovue RTVue, and Topcon 3D-OCT).
Study Design: Systematic Review and Meta-Analysis
Methods: Between Jan. 2017 and Feb 2017, MEDLINE®, EMBASE®, CINAHL®, Cochrane Library®, Web of Science®, and BIOSIS® were searched for studies assessing glaucoma diagnostic accuracy of the aforementioned OCT devices. Meta-analysis was performed pooling area under the receiver operating characteristic curve (AUROC) estimates for all devices, stratified by OCT type (RNFL, macula), and area imaged.
Results: 150 studies with 16,104 glaucomatous and 11,543 normal control eyes were included. Key findings: AUROC of glaucoma diagnosis for RNFL average for all glaucoma patients was 0.897 (0.887-0.906, n=16,782 patient eyes), for macula ganglion cell complex (GCC) was 0.885 (0.869-0.901, n=4841 eyes), for macula ganglion cell inner plexiform layer (GCIPL) was 0.858 (0.835-0.880, n=4211 eyes), and for total macular thickness was 0.795 (0.754-0.834, n=1063 eyes).
Conclusions: The classification capability was similar across all 5 OCT devices. More diagnostically favorable AUROCs were demonstrated in patients with increased glaucoma severity. Diagnostic accuracy of RNFL and segmented macular regions (GCIPL, GCC) scans were similar and higher than total macular thickness. This study provides a synthesis of contemporary evidence with features of robust inclusion criteria and large sample size. These findings may provide guidance to clinicians when navigating this rapidly evolving diagnostic area characterized by numerous options.

Title: Gonioscopy assisted transluminal trabeculotomy (GATT): A hemispheric approach

Authors: Anish Arora, **Samir Nazarali**, Stephanie Cote, Adrienne Duimering, Matt Schlenker, Bryce Ford, Patrick Gooi

Abstract Body:

Purpose: To report surgical outcomes of a novel hemispheric approach to gonioscopy assisted transluminal trabeculotomy (GATT).
Study Design: Retrospective Cohort Study
Methods: GATT is a recent minimally invasive glaucoma surgery (MIGS) technique, originally described with a 360-degrees trabeculotomy to successfully reduce intraocular pressure (IOP). We elected to perform a hemispheric rendition such that only 180-degrees of Schlemm's canal is treated rather than the full 360-degrees. The study adhered to the Declaration of Helsinki and Health Research Ethics Board was processed. The primary outcome of interest was the number of patients achieving IOP lower than 21 mmHg or reduced by least 20% by 6 months, not requiring further surgery. IOP lowering and medications were secondary outcomes studied at 1,3, and 6 months.
Results: 132 patients were included in this study, including 57 receiving GATT and 77 receiving hemi-GATT. Of these patients, diagnoses included primary open angle (53), primary closed angle (15), pseudoexfoliation (12), pigmentary (7), uveitic (22), mixed mechanism (6), trauma/angle recession (6), neovascular (3), steroid induced (3), post-penetrating keratoplasty (1), hemolytic (1), and Posner Syndrome (1) glaucoma. The mean age for patients studied was 62 years (15-88) with 56 males and 76 females. 50 patients had underwent previous glaucoma surgery. At the time of surgery, 60 patients had a cataract extraction concurrently and 6 had intraocular lens exchanges. The mean visual field deviation was -14.93 dB with a mean baseline logMAR best corrected visual acuity of 0.43. For GATT, the mean IOP decreased from 22.8±9.3mmHg to 13.0±4.4mmHg ($p<0.001$) at 1 month, 13.0±9.3mmHg ($p<0.001$) at 3 months, and 13.2±4.9mmHg ($p<0.001$) at 6 months post-operatively. The mean number of glaucoma medications decreased from 2.1±1.5 to 1.4±1.2 at 6 months post-operatively. For hemi-GATT, the mean IOP decreased from 31±10.3mmHg to 15.7±6.8mmHg ($p<0.0001$) at 1 month, 14.9±4.6mmHg ($p<0.001$) at 3 months, and 14.4±4.4mmHg ($p<0.001$) at 6 months post-operatively. The mean number of medications decreased from 3.6±1.2 to 1.7±1.4 at 6 months post-operatively. The most prominent complications were hyphema (9%) and presence of cells (21%). The success rate for GATT was 74% and 70% for hemi-GATT. There were no significant differences in outcomes between techniques.
Conclusions: Within the present cohort, IOP and number of glaucoma medications were reduced significantly at 6 months from baseline in both GATT and hemi-GATT and did not significantly differ between groups. The hemi-GATT procedure is a novel technique that preserves 180-degrees of Schlemm's canal, allowing for future GATT or angle surgery to be performed.

HOT TOPIC | SUJET PIQUANT

Title: Visual field testing in a portable virtual reality environment

Authors: Runjie B. Shi, Yvonne M. Buys, Teresa LY Fee, Yousaf J. Mahsood, Graham E. Trope, Moshe Eizenman

Abstract Body:

Purpose: Standard automated perimetry is widely used for detection and monitoring of visual field (VF) defects such as in glaucoma. Current devices like the Humphrey Field Analyzer (HFA) are expensive, have limited portability and require a testing facility with technical support. Using a standard smartphone (Huawei Nexus 6P Google 32GB Model H1511 android smartphone), virtual reality viewer (VR, google cardboard second generation) and Bluetooth controller (clicker) we have created a head-mounted mobile perimeter (MP). In this study we compared the performance of the MP to the HFA.
Study Design: Prospective cross-over study.
Methods: 19 consenting subjects from the Toronto Western Hospital glaucoma unit, with varying degrees of glaucomatous VF loss were enrolled. Each subject underwent a HFA 24-2 SITA standard followed by the MP. In addition seven subjects underwent a second MP to test for inter-test variability. For each subject one eye was tested.
Results: The mean age of the subjects was 64.9±9.1 years. Test duration was longer with MP (8.6±1.0 mins) compared to HFA (5.7±1.1 mins, $p<0.001$). The reliability indices were similar for false positives and negatives however there were significantly more fixation losses with the MP (22% versus 7.2%, $p=0.01$). We found a good correlation between the HFA and MP for threshold ($R2=0.64$), and excellent agreement for MD ($R2=0.87$), PSD ($R2=0.89$) and VFI ($R2=0.92$). Overall there was a lower sensitivity with MP and higher variance at the lower thresholds. In the 7 subjects who repeated the MP there was no significant difference in test duration or reliability indices. There was a good agreement between the tests for threshold ($R2=0.61$) and excellent agreement for MD ($R2=0.98$), PSD ($R2=0.96$) and VFI ($R2=0.97$).
Due to the limited dynamic range of the cell-phone's display, we used larger Goldmann size targets to test VF thresholds that were below 10dB. This resulted in larger variations between the HFA and MP for such thresholds. The performance of the MP could be improved by using smartphone displays with larger dynamic range and reducing the scattering from the optical lenses of the virtual reality system.
Conclusions: MP shows promise as a complimentary device to HFA. The portability and affordability of this device could make this a valuable tool for home monitoring and screening purposes. Further development of smartphone based mobile perimeters could lead to highly cost efficient VF tests especially for subjects who are unable to visit a VF lab.

Title: Intermediate term outcomes of SIBS microshunt alone or in combination with phacoemulsification

Authors: Jithin Yohannan, Husayn Gulamhusein, Matthew B. Schlenker, Iqbal (Ike) Ahmed

Abstract Body:

Purpose: Evaluate intermediate term outcomes of SIBS microshunt with mitomycin C alone or in combination with phacoemulsification in glaucoma patients.
Study Design: Retrospective longitudinal case series.
Methods: 159 consecutive eyes in 143 patients with a diagnosis of glaucoma received the SIBS microshunt with mitomycin C at a single institution. Of these, 125 eyes had a standalone microshunt implantation (solo group) and 34 eyes had microshunt implantation with concurrent phacoemulsification (combo group). Primary outcome was median IOP at the last follow-up visit. Secondary outcome was the median number of glaucoma medications at the last follow up. Complications and re-operations were recorded.
Results: Median follow-up time was 12 mos (IQR 9-16 mos). Overall, median pre-operative IOP was 22 mmHg (IQR 18-28) and median number of medications was 4 (IQR 3-4). Median IOP and number of medications decreased to 13mmHg (IQR 11-17) and 0 (IQR 0-1) respectively at last follow up.
In the 125 solo eyes, median pre-operative IOP and medications were were 21 (IQR 18-28) and 4 (IQR 3-4) respectively. This decreased to 13 (IQR 11-16) and 0 (IQR 0-2) at last follow-up.
In the 34 combo eyes, median pre-operate IOP and medications were 24 (IQR 20-29) and 4 (IQR 3-4) respectively. This decreased to 14 (IQR 11-17) and 0 (IQR 0-0) at last follow-up.
Complications were transient. 2 eyes required surgical revision and 1 required tube shunt surgery.
Conclusions: These data suggest that SIBS microshunt can effectively lower IOP and reduce number of medications in patients with glaucoma. The efficacy of the device appears to be similar when used stand-alone or in combination with phacoemulsification. There were minimal complications and a low rate of repeat surgery.

INTERNATIONAL AND PUBLIC HEALTH OPHTHALMOLOGY
L'OPHTALMOLOGIE INTERNATIONALE ET SANTÉ PUBLIQUE

Title: The prevalence and determinants of visual impairment in Canada: Cross sectional data from the Canadian longitudinal study on aging

Authors: Ellen E. Freeman, Rumaisa Aljied, **Marie-Josée Aubin**, Saama Sabeti, Ralf Buhrmann

Abstract Body:

Purpose: Determine the prevalence and determinants of visual impairment in Canada.
Study Design: Population based cross sectional study
Methods: Data from 30,097 adults who took part in the Canadian Longitudinal Study on Aging Comprehensive Study were included. Inclusion criteria included being between the ages of 45 and 85 years old, community-dwelling, and living near one of the 11 data collection sites across 7 Canadian provinces. People were excluded if they were in an institution, living on a First Nations reserve, were a full-time member of the Canadian Armed Forces, did not speak French or English, or had cognitive impairment. Visual acuity was measured using the Early Treatment of Diabetic Retinopathy Study chart at two meters while participants wore their usual prescription for distance, if any, and also with pinhole correction. Visual impairment was defined as binocular presenting acuity worse than 20/40. Logistic regression was used accounting for the complex survey design.
Results: 5.7% (95% Confidence Interval (CI) 5.4-6.0) of Canadian adults had visual impairment. A wide variation in the provincial prevalence of visual impairment was observed ranging from a low of 2.4% (95% CI 2.0-3.0) in Manitoba to a high of 10.9% (95% CI 9.6-12.2) in Newfoundland and Labrador. Uncorrected refractive error was the major cause of visual impairment. Factors associated with a higher odds of visual impairment included older age (odds ratio (OR)=1.07, 95% CI 1.06-1.08), lower income (OR=2.07 for those earning less than $20,000 per year, 95% CI 1.65-2.59), current smoking (OR=1.52, 95% CI 1.25-1.85), Type 2 diabetes (OR=1.20, 95% CI 1.03-1.41), and memory problems (OR=1.44, 95% CI 1.04-2.01).
Conclusions: Efforts are needed to reduce uncorrected refractive errors, increase access to smoking cessation programs, and ensure that diabetics are getting appropriate eye care.

Title: Macular optical coherence tomography improves cost-effectiveness of screening for diabetic macular edema

Authors: Ian Wong, Raymond Wong, Rita Gangwani, **Jonathan Chan**, Ryo Kawasaki, Victor Chong

Abstract Body:

Purpose: To compare the cost-effectiveness of four different screening strategies to detect diabetic macular edema
Study Design: Subjects are recruited from a local screening program during February 2014 to January 2016. The current screening protocol, Strategy A, was compared with three other alternative screening strategies using a simulation model. In Strategy B, retinal hemorrhage involving the macula is no longer considered a surrogate marker for DME; Strategy C utilizes best corrected visual acuity instead of presenting visual acuity and macular optical coherence tomography (OCT) for suspected DME cases; and Strategy D adds macular OCT for all cases to the current screening protocol.
Methods: In addition to the current screening protocols, best-corrected visual acuity assessment (BCVA) and a macular volume scan using optical coherence tomography (OCT) (Cirrus HD OCT 4000, Carl Zeiss Meditec, Dublin, California, USA) were added to the screening routine for all study subjects.The 4 strategies were compared in terms of the sensitivity indexes, health benefits, i.e. quality-adjusted-life-years (QALYs) gained, and the cost-effectiveness. Reference for comparison was taken from the gross domestic product per capita (GDP) of Hong Kong, as well as USD$50,000/QALY gained. When using Hong Kong's GDP as reference, strategies costing: 1) less than 1 GDP are considered ‘very cost-effective’;2) between 1 to 3 times the GDP are considered ‘cost-effective’;3) more than 3 times the GDP are considered ‘not cost-effective’.The GPD of Hong Kong from 2014 was used (HKD$310,113, or USD$39,963) as the reference.
Results: A total of 2,277 subjects (mean age 62.80±11.75 years, 43.7% male) were recruited. With OCT used as a standard for identifying DME, the false-positive rate of DME using Strategy A and B was 87.1% and 79.8%, respectively. The cost of Strategies A, B, C, and D, in terms of USD$/QALY gained, was 7447.5, 8428.7, 5992.3 and 4113.5, respectively. All 4 strategies were considered ‘very cost-effective’ when using both Hong Kong’s gross domestic product per capita (GDP) and <USD$50,000 per QALY gained as references.
Conclusions: Although the current screening protocol can still be considered as cost-effective, the high false-positive rate of DME would lead to an excessive amount of unnecessary specialist referrals. In contrast, Strategy D, by incorporating OCT for all subjects into the current protocol, was found to be the most cost-effective screening strategy.

Title: Generational differences in practice patterns of ophthalmologists in Ontario: Implications for workforce planning

Authors: Yvonne M. Buys, **Tina Felfeli**, Mayilee Canizares, Yaping Jin

Abstract Body:

Purpose: To investigate the effect of generational and gender differences on practice patterns of Ontario ophthalmologists over the past two decades.
Study Design: Age-Period-Cohort (APC) analysis
Methods: The Ontario Health Insurance Plan (OHIP) physician billings database for fiscal years 1992 to 2013 was used to calculate number of ophthalmologists, yearly median billings, number of patients and number of patient visits. Age, gender, fiscal year, and year of birth were also extracted. Cohorts were defined based on birth year into 10-year categories (i.e. 1915-1924) and fiscal year was used as an indicator of period. Age groups were defined by 5-year increments (i.e. <35 to 75-79). Yearly median OHIP billing dollars were converted to 2013 dollars. Hierarchical age-period-cohort (APC) models were used to disentangle the unique effects of age, period, and cohort on changes in total payments and the number of visits per ophthalmologist over time.
Results: 388 (11.3% female) ophthalmologists were practicing in Ontario in 1992 and 457 (19.9% female) in 2013. Results from the unadjusted APC model indicated significant age affects ($p<0.0001$) with the overall age-trajectory of payments peaking in middle age and a decline in older ages. There was also a general trend of increasing yearly OHIP billing dollars in both men and women ($p< 0.001$). In addition to the age and period effects, cohort effects were significant for both men and women ($p< 0.001$) with a general trend of higher total payments in each succeeding recent cohort. To note, there were significant interactions between gender and birth cohort ($p=0.048$) and gender and age ($p=0.015$) suggesting that the gender gap in payments widens in recent cohorts (e.g. 1975-1984 to 1945-1954). However, after adjusting for the volume of visits and patients in practice, gender differences were largely reduced although remained significant ($p < 0.001$).
Conclusions: The practice patterns of ophthalmologists differ significantly among various generations. Recent cohorts of ophthalmologists have a greater yearly OHIP dollars billed compared to the older cohorts at the same age group. The widening gender gap of OHIP billing dollars in more recent cohorts was partially explained by differences in the number of visits per patients among female and male ophthalmologists in each cohort. As recent cohorts with an increasing number of females enter the workforce, generational differences in practice patterns of ophthalmologists will likely shift the effective healthcare supply and demand, and thus have important implications for ophthalmology workforce planning.

Title: Accuracy of a popular online symptom checker for ophthalmic diagnoses

Authors: Carl Shen, Michael Nguyen, **Alexander Gregor**, Gloria Isaza, Anne Beattie

Abstract Body:

Purpose: To evaluate the diagnostic accuracy, triage urgency, and interuser variability of a popular online symptom checker for common ophthalmic presentations
Study Design: Cross-sectional descriptive study
Methods: Forty-two validated clinical vignettes of ophthalmic complaints were generated and distilled to their core presenting symptoms. Cases were entered into WebMD® symptom checker by both medically trained and non-medically trained personnel. Output from the symptom checker including number of symptoms, ranking and list of diagnoses, and triage urgency was recorded.
Results: The mean number of symptoms entered was 3.6±1.6 (range 1-8), of which a mean of 0.5±0.8 (range 0-3) were extra-ocular. The median number of diagnoses generated by the symptom checker was 26.8±21.8 (range 1-99). The primary diagnosis by the symptom checker was correct in 10/42 (24%) of cases. The correct diagnosis was included in the symptom checker's top 3 diagnoses in 16/42 (38%) of cases. The correct diagnosis was not included in the symptom checker's list at all in 19/42 (45%) of cases. The average position on the differential list generated by the symptom checker when the correct diagnosis was appropriately listed was 4.8±8.2 (range 1-39). The most common primary diagnosis made by the symptom checker was, "nearsightedness". Fourteen of 17 cases where the primary diagnosis' triage urgency was incorrect would have led to an urgent case being triaged as non-urgent. The symptom checker performed better in diagnostic accuracy of non-urgent conditions. Interuser variability for the correct diagnosis being in the top 3 listed was strong (cohen's kappa = 0.84).
Conclusions: As more patients present with self-guided research of their medical symptoms, it is important for ophthalmologists to be familiar with the features and limitations of online symptom checkers as popular tools. While online symptom checkers can arrive at the correct clinical diagnosis, a significant proportion of diagnoses are not captured. As a particularly visual specialty, with similar common symptomatic presentations of distinct diseases, ophthalmology may represent a particularly challenging field for internet based symptom checkers to excel in. More research to reflect the real-life application of internet diagnostic resources is required.

Title: The effect of government delisting of routine eye exams on the diagnosis of eye diseases in Ontario

Authors: Yaping Jin, William Jeon, Michael Brent, Rick Glazier, Yvonne Buys, Graham Trope

Abstract Body:

Purpose: In 2004, Ontario delisted routine eye exams for residents aged 20-64. We investigated if delisting reduced the incidence of eye disease diagnoses in the Ontario Health Insurance Plan (OHIP) among affected Ontarians post-2004 in relation to pre-2004.
Study Design: A time-series analysis.
Methods: We analyzed yearly Ontario health administrative billing data from 2000 to 2014. Included in analyses were Ontarians without diabetes and/or without a visit to OHIP-insured ophthalmologist/optometrist one year prior to the study year. This was because Ontarians aged 20-64 in these categories were affected by de-listing. Eye disease diagnoses submitted by all OHIP-insured healthcare providers were identified utilizing ICD-9 diagnostic codes. All eye diseases were grouped together in the analyses. Cases of newly billed eye disease diagnoses per 100 person-years were compared post- versus pre-delisting among subgroups of Ontarians affected (aged 20-64) and unaffected (aged 0-19 or 65+) by delisting. Newly occurred diabetes was excluded and then included as a part of eye disease diagnoses as a diabetes diagnosis may or may not relate to an eye disease diagnosis.
Results: When diabetes was excluded as a part of eye disease diagnoses, a significantly reduced incident cases (per 100 person-years) of OHIP-insured eye disease diagnoses was observed immediately following the delisting among affected age groups: from 25.8 in 2003 to 6.2 in 2005 in the 20-39 age group and from 46.0 in 2003 to 10.9 in 2005 in the 40-64 age group. The reduced incidence remained at a similar low level from 2005 to 2014. The average reduction was -20.5% for the 20-39 age group ($p<0.0001$) and -37.0% for the 40-64 age group ($p<0.0001$). For those ages unaffected by delisting, the incidence of OHIP-insured eye disease diagnoses was stable throughout the study years: around 25-30 cases per 100 person-years for the 0-19 age group ($p=0.30$) and about 50 cases per 100 person-years for the 65+ age group ($p=0.18$). A similar trend was documented when diabetes was included as a part of eye disease diagnoses.
Conclusions: A significantly reduced incidence of OHIP-insured eye disease diagnoses was observed soon after delisting came into effect. This large and persistent reduction in diagnoses of eye disease raises concerns about undetected eye disease and consequences for visual health that should be further investigated.

Title: Cataract surgery and traffic crashes: Population-based exposure-crossover design

Authors: Matthew B. Schlenker, Deva Thiruchelvam, Don Redelmeier

Abstract Body:

Purpose: Cataracts are the most common cause of visual impairment worldwide and may increase the risk of a serious traffic crash. The potential benefits of cataract surgery on reducing a patient's subsequent risk of a traffic crash are uncertain. We conducted a comprehensive longitudinal analysis testing whether cataract surgery is associated with a reduction in serious traffic crashes where the patient was the driver.
Study Design: Population-based individual-patient self-matching exposure-crossover design.
Methods: Setting: Ontario, Canada, between April 1st, 2006 and March 31st, 2016. Participants: Consecutive patients 65 and older undergoing cataract surgery (n = 559,546). Intervention: First eye cataract extraction surgery (most received second eye soon after). Main Outcome: Emergency department visit for a traffic crash as a driver.
Results: A total of 4,680 traffic crashes (2.36 per 1,000 patients annually) accrued during the three and half-year baseline interval and 1,200 traffic crashes (2.14 per 1,000 patients annually) during the one-year subsequent interval, representing 0.22 fewer crashes per 1,000 patients annually after cataract surgery (odds ratio 0.91; 95% confidence interval 0.84 - 0.97; p = 0.0037). The relative reduction included patients with diverse demographic, ophthalmologic, and medical characteristics. No significant reduction was observed in other outcomes such as traffic crashes where the patient was a passenger or a pedestrian nor in other unrelated serious medical emergencies. Patients with younger age, male gender, a history of crash, more emergency visits, and frequent outpatient physician visits had the highest risk of subsequent traffic crashes.
Conclusions: Cataract surgery is associated with a modest decrease in a patient's subsequent risk of serious traffic crashes as a driver.

Title: Defunding the pre-operative history and physical exam: Putting the cart before the evidence?

Authors: Kiersten Schock, Alex Ragan, John T. Huang

Abstract Body:

Purpose: Several health authorities within Canada have recently decided to defund the routine pre-operative history and physical exam traditionally performed prior to cataract surgery. While these authorities suggest that their decisions are evidence based, the authors are not aware of any comprehensive review of the literature addressing this topic, nor have the relevant health authorities been forthcoming with the evidence used in their decision processes. Accordingly, the objective of the instant study is to fill this evidentiary deficiency and perform a comprehensive review of the literature as it pertains to the value of the pre-operative history and physical examination in the context of cataract surgery.
Study Design: Systematic review.
Methods: The following databases were searched with search strings prepared in consultation with a staff librarian at the local university health sciences library: PubMed, MEDLINE, Cochrane Library, Google Scholar, Web of Science, EMBASE, CINAHL, BIOSIS Previews. Only higher-level forms of evidence were assessed, including randomized controlled trials, cohort, and case-control studies. Two reviewers independently assessed title and abstracts per inclusion criteria. Disagreements between the authors were resolved by discussion.
Results: We identified three articles that met our inclusion criteria: two prospective cohort studies and one retrospective cohort study. These articles suggest that traditional pre-operative histories and physical examinations could be replaced by a health questionnaire (Jastrzebski et al. and Reeves et al.) or eliminated altogether (Alboim et al.). However, various methodological weaknesses, and the very data derived from these studies, appear to undercut these conclusions. Examples of these weaknesses include: (1) the insensitivity of questionnaires for medical conditions predisposing patients to perioperative morbidity and mortality; (2) cohort populations that were strongly biased for “un-assessed” patients to be relatively healthier than “assessed” patients; and (3) lower quality methodologies such as cohort studies rather than randomized controlled trials.
Conclusions: The scientific literature presently contains three studies suggesting that the pre-operative history and physical exam could be modified, restricted, or eliminated altogether. However, the evidence supporting these suggestions remains tenuous due to methodological weaknesses and poor supporting data. While finding efficiencies in providing medical care is an admirable goal, physicians should be cautious in accepting recommendations that reduce the checks and balances that ensure perioperative safety. Further studies of better methodological quality should be completed to clarify the present evidence regarding pre-operative assessments prior to cataract surgery.

HOT TOPIC | SUJET PIQUANT

Title: Unmet eye care needs among a Syrian adult refugee population

Authors: Tarek A. Bin Yameen, Myrna Lichter

Abstract Body:

Purpose: There is a lack of data on vision problems in an adult refugee population in Canada. Given the recent arrival of 40, 000 Syrian refugees, we performed a cross-sectional, descriptive study to assess the prevalence of visual impairment and unmet eye care needs of adult Syrian refugees in Toronto.
Study Design: Five single-day clinics were organized. Enrolment was offered to Syrian refugees registered with resettlement agencies, not for profit organizations, and/or private sponsorship groups.
Methods: Through a structured interview, socio-demographics, medical history, subjective visual acuity, and access to eye care information was collected. Comprehensive visual screening, slit-lamp, dilated direct funduscopy, and refractions were performed. Visual acuity data was compared to Canadian prevalence data. $\chi 2$ tests were used for statistical analysis.
Results: 526 (65.8%) out of the 800 adults and children offered enrollment participated in the study. 248 adult patients were examined. The median age was 36 years (interquartile range (IQR)= 30-35) and 53% were females. Most patients lived outside Syria as refugees for 1 to 5 years (69.4%) and earn less than $1000 monthly (49.6%).
The prevalence of reported uncorrected vision problems was 22.2% for distance vision, 6.5% for near vision, and 5.6% for distance and near vision, including loss of vision. When compared to the general Canadian population, Syrian adult refugees were 19 times more likely to report uncorrected vision problems (34.4% v. 1.8%, $p < 0.01$). A majority had not visited an eye specialist in the past year (95.2%) and 60.5% were dissatisfied with their vision.
The presenting visual acuity in the better-seeing eye was 20/50 or worse in 19.4% (95% CI, 14.6%-24.8%). By using pin-hole correction, this improved to 12.5% (95% CI, 8.7%-17.3%). Compared to the Canadian population (0.95%), Syrian adult refugees were 13 times more likely to have 20/50 vision or worse ($p < 0.01$).
The most common finding was refractive error in 46.0% (95% CI, 39.6%-52.4%) followed by non-refractive error in 15.3% (95% CI, 11.1%-20.4%). The most frequent non-refractive errors were cataracts (4.0%), glaucoma (2.8%), traumatic injuries (2.4%), dry age related macular degeneration (2.0%), diabetic retinopathy (2.0%), and retinitis pigmentosa (1.6%).
Conclusions: This is the first study to assess ocular health in a refugee population in Canada. Syrian adult refugees have a high prevalence of visual impairment, even when living within a system of universal healthcare. Ongoing vision-screening programs and accessible eye clinics may address this need.

Title: Community & home eye screening service (CHESS)

Authors: Chee-Chew Yip, Nigel Kendrick Tan, Sweet Fun Wong

Abstract Body:

Purpose: Regular mass eye screenings do not reach out to all in the community especially the elderly, uneducated and frail. Community and Home Screening Service (CHESS) aims to provide First-level Community Eye Screening (FiLCES) and Second-level Eye Consultation (SeLEC) for early detection and management of treatable eye conditions within the accessibility of northern Singapore residents.
Study Design: A trans-disciplinary collaboration involving nurses, optometrist and ophthalmologists to provide community eye care (screening and management) in the Northern part of Singapore.
Methods: CHESS was started in January 2017. It leveraged on and optimised the usage of existing resources:1. FiLCES by trained & accredited nurses from "Ageing-in-Place" program to do patient home visits and Population Health Office to do regular community health screeningsThe nurses conduct visual acuity testing and torch light eye examination test for screening. 2. SeLEC by trained & accredited optometrists at Wellness Centres (used for elderly social engagement and health programs, re-designed to create clinical consult rooms). The optometrist manages referrals from FiLCES via tele-consultation with and supervision by the hospital Ophthalmologist to reduce unnecessary hospital referrals.
Results: To date (September 2017), 1,231 residents underwent FilCES: of which 47.9% (590/1231) were detected to have one/ more eye conditions. Of these, 41.5% (245/590) could be managed at SeLEC. Already 237 out of the 245 patients have been seen at SeLEC. 44.7% (106/237) of them needed specialist referral. The detected abnormalities from SeLEC involved the lens (38.0%), conjunctiva (19.7%), anterior chamber (6.7%), eyelid (15.9%), cornea (7.2%), eye position (1.7%), uncorrected refractive error (7.0%), others (3.8%). This translates to only 8.6% (106/1,231) of the total screened requiring specialist referral. The manpower savings is about $75,000. Financial assessment deem CHESS viable based on a projected screening of 10,000 residents at nominal fees of SGD$2 (FiLCES, 84.1% savings) and SGD$8 (SeLEC, 78.4% savings). KPTH collaborated with NHG Polyclinics (NHGP) to facilitate the follow up of SeLEC patients in the polyclinics for hospital specialist referral. A hassle-free, coordinated workflow and referral process has been set up between the Wellness Centre and Polyclinic.
Conclusions: CHESS is a feasible & cost-effective eye care model to screen and manage some eye conditions in the Northern Singapore community. A significant number of asymptomatic eye conditions were detected.

NEURO-OPHTHALMOLOGY | NEURO-OPHTALMOLOGIE

Title: Suicidal ideation and psychological symptoms in bilateral vision loss

Authors: Ismail Abdulle, Henry Liu, Jesse Gale, Matin Khoshenvis, Lissa Poincenot, David Baron, Rustum Karanjia, Alfredo Sadun, Isabelle Gauthier, Shireen Hussein, Alexander Pearson, Starleen Frousiakis

Abstract Body:

Purpose: Bilateral vision loss is a major traumatic event that often results in numerouspsychological symptoms in patients. Most concerning of these symptoms is suicidal ideation. Leber's Hereditary Optic Neuropathy (LHON) is a debilitating disease due to mutations in mitochondrial DNA causing rapid onset vision loss. Here we investigate the unique pattern of psychological symptoms experienced by patients diagnosed with LHON resulting in bilateral vision loss who have reported a high degree of suicidal ideation. In doing so, physicians may be better able to screen for suicidal ideation in visually impaired patients with LHON who present with unique patterns of psychological symptoms. This is the first study evaluating suicidal ideation and associated psychological symptoms in LHON patients with bilateral vision loss.
Study Design: Cross sectional survey.
Methods: An online survey of patient with LHON was conducted. Data collected was non-identifiable and patients symptoms and finding were self reported. Questions were asked in accordance to the criteria for Major Depressive Disorder outlined in the Diagnostic and Statistical Manual for Mental Disorders-V. Participants self reported suicidal ideation along with psychological well-being before and after experiencing vision loss. This study was approved by the IRB at USC Keck School of Medicine.
Results: 103 participants completed the surveys in its entirety. Participants reported a mean premorbid suicidality score of (4.6 +/- SEM 0.5), whereas the mean postmorbid suicidality score was (26.6 +/- SEM 2.6). Participants who reported postmorbid suicidality scores of >50 were considered to have suicidal ideation. Of the 103 participants, 23 had reported suicidal ideation (22%) after having experienced bilateral vision loss. Those with postmorbid suicidal ideation (suicidality score >50) reported higher mean psychomotor agitation (41.8 +/- SEM 3.8), lower mean sleep disturbance (13 +/- SEM 2.6), and lower mean fatigue (15.2 +/- SEM 1.8) when compared to those who reported suicidality scores of <50 (mean psychomotor agitation 26.4 +/-SEM 2.7, mean sleep disturbance 31.25 +/- SEM 3.9, mean fatigue 27.8 +/- SEM 3.1).
Conclusions: These finding may assist physicians in the screening for suicidal ideation in patients who present with bilateral vision loss from LHON and potentially other diseases. By understanding the unique constellation of psychological symptoms in patients with bilateral vision loss, physicians may be better equipped to help these patients.

HOT TOPIC | SUJET PIQUANT

Title: The predictive value of high sensitivity C-reactive protein for suspected giant cell arteritis

Authors: Alison K. Banwell, Isabella Irrcher, Wilma Hopman, Martin ten Hove, John Thomas Gonder

Abstract Body:

Purpose: Visual loss is a significant concern in Giant Cell Arteritis (GCA), a vasculitis common in older adults. GCA is an ophthalmic emergency. In Kingston, Ontario, high sensitivity C-Reactive Protein (hsCRP), erythrocyte sedimentation rate (ESR), and platelet count are used to risk stratify patients with suspected GCA. The relationship between standard CRP and GCA is well established. HsCRP is determined via a quantitative immunoturbidimetric method to detect CRP in serum and plasma with variable assay ranges and at lower limits than standard CRP. The use of hsCRP and CRP in other conditions is established. The purpose of this study is to ascertain hsCRP's predictive reliability and validity for GCA, as it is yet unquantified.
Study Design: This retrospective review of charts from September 2011 to September 2016 formed a database of all patients that underwent temporal artery biopsy (TAB) at Kingston General Hospital or Hotel Dieu Hospital. Statistical analysis of hsCRP levels was performed.
Ethics approval was granted by the local Research Ethics Board.
Methods: Age at biopsy, gender, hsCRP, ESR, platelet count, and other confounders such as past medical history and corticosteroid use were abstracted from patient charts. The primary outcome was to establish the predictive value of various hsCRP cutoffs in order to determine the most significant cutoff value for positive TAB.
The sensitivity and specificity of hsCRP was evaluated by 2x2 table. Odds ratios were computed for hsCRP, ESR, and platelet counts. Cutoff values were selected based on current laboratory cutoffs, literature surrounding standard CRP, and a receiver operator curve.
Results: Thirty-seven (19%) of 197 patients (127 male, 70 female) with a mean age at biopsy of 71 (range 36-92; SD 9.4) years had a positive TAB. Four cutoff values were established: >3.0mg/L, >8.0mg/L, >15 mg/L, and >35 mg/L. The most statistically significant odds of a positive TAB were found at hsCRP values >35 mg/L (OR 5.86, 95%CI 2.675-12.826; $p<0.001$). Twenty-six of 72 patients (36%) with hsCRP values >35 mg/L had a positive TAB. At hsCRP values >35mg/L, negative predictive value was 91% and positive predictive value was 36%. Sensitivity and specificity were 70% and 71%, respectively.
Conclusions: HsCRP is useful for risk stratifying patients with suspected GCA, with higher suspicion for values over 35 mg/L, and lower suspicion for values under 3.0 mg/L. The sensitivity and specificity of these values impact clinical decisions around temporal artery biopsies and treatment of GCA in high risk patients.

Title: A prospective analysis of Ottawa's neuro-ophthalmology referral patterns

Authors: Isabelle D. Gauthier, Shireen Hussein, Henry Liu, Ismail Abdulle, Alexander Pearson, David H. Zackon, Daniel Lelli, Rustum Karanjia

Abstract Body:

Purpose: Subspecialty eye care clinics are responsible for providing quaternary care for patients with complex eye and often rare eye diseases. To ensure high quality patient care, it is often necessary to triage patients based on the information provided in the referral from the refereeing physician or optometrists. Neuro-ophthalmology is a subspecialty which deals with disease of the optic nerve, visual processing and efferent visual system. The purpose of this Quality Improvement Project was to better understand the current effectiveness of Neuro-ophthalmology triage process, consultation wait times, and to evaluate diagnostic discordance between the primary reason for referral and final diagnosis.
Study Design: The study was a prospective chart review.
Methods: The study included all neuro-ophthalmological consults seen in the Ottawa area over a 6 month period from February to July, 2017. As a quality improvement project, it was certified OHNS-REB exempt. The collected data included referral information such as referral source (e.g. ophthalmologist, optometrist, emergency department, primary care physician or other medical specialists), referral diagnosis, referral date and if the referral was marked as urgent. It also included the date seen at the clinic, the impression from the attending neuro-ophthalmologist and final diagnosis.
Results: Of the approximately 800 patients assessed by the three neuro-ophthalmologists in the study, almost 50% had been referred by other ophthalmologists in the region. Referrals from optometrists, external physicians and family physician accounted for about 20%, 15% and 10% respectively. The most common reason for referred was diplopia, accounting for 10% of all referrals, this was followed by unexplained vision loss and visual field defects. The average wait time between the referral and the appointment with an ophthalmologist was 75 days. About 10% of all referrals were marked urgent and the average wait times were lower at 30 days. Almost 20% of patients had a normal examination or resolved symptoms when assessed by the neuro-ophthalmologists. The final impression by neuro-ophthalmologists was in accordance with the referring diagnosis for almost 60% of the cases. There was significant diagnostic discordance in approximately a quarter of cases.
Conclusions: The results from this study will help better understand referral patterns and how it affects patient management, wait times and access to care. Appropriate and efficient consultation requests were assessed and will help address appropriate triaging of patients and potential knowledge gaps in referring professionals.

Title: Multivariate prediction model for suspected giant cell arteritis

Authors: Edsel Ing, Gabreiela Lahaie Luna, Andrew Toren, Royce Ing, John J. Chen, Nitika Arora, J. Alexander Fraser, Felix Tyndel, Arun Sundaram, Cindy Lam, Vivek Patel, Ezekiel Weis, Steven Gilberg, Christian Pagnoux, Martin ten Hove

Abstract Body:

Purpose: To develop and validate a diagnostic prediction model for patients with suspected giant cell arteritis (GCA).
Study Design: A retrospective review of consecutive adult patients undergoing temporal artery biopsy (TABx) for suspected GCA was conducted at seven university centers.
Methods: The pathologic diagnosis was considered the final diagnosis. The predictor variables were age, gender, new onset headache, clinical temporal artery abnormality, jaw claudication, ischemic vision loss (VL), diplopia, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and platelet level. Multiple imputation was performed for missing data. Logistic regression was used to compare our models with the non-histologic American College of Rheumatology GCA classification criteria (ACR). Internal validation was done with 10-fold cross validation and bootstrap. External validation was performed by geographic site.
Results: There were 530 complete TABx records; 397 were negative and 133 positive. Age, jaw claudication, VL, platelets and log CRP were statistically significant predictors for positive TABx, but ESR, gender, headache and temporal artery abnormality were not. The parsimonious model had a cross-validated bootstrap AUROC 0.810 (95%CI .766, .854), geographic external validation AUROC's 0.75-0.85, calibration p H-L=.812, sensitivity 43.6% and specificity 95.2%, and outperformed the ACR criteria. Online calculator: https://docs.google.com/spreadsheets/d/1wlRFGleW2Vf-LlylmY76KSTzIAf1TrX5U_1770HhD1Y/edit#gid=0
Conclusions: Our prediction rule with calculator and nomogram aids in the triage of patients with suspected GCA, and may decrease the need for TABx in select low score risk subjects. However, misclassification remains a concern.

Title: Neuro-ophthalmologic manifestations of syphilis in a Canadian cohort of patients

Authors: Zainab Khan, Julie Vadboncoeur, Yasmine Rabia, Bouchra Serhir, Claude Fortin, Annie-Claude Labbé, Kinda Najem, Laurence Jaworski, Marie-Josée Aubin

Abstract Body:

Purpose: Rates of syphilis are increasing both globally and in Canada. This is accompanied with an increase in ocular syphilia. The purpose of this study was to describe the neuro-ophthalmic clinical presentations found in a cohort of patients diagnosed with ocular syphilis.
Study Design: Retrospective, descriptive and non-comparative observational study.
Methods: All patients with positive syphilis serology (including at least one positive treponemic serology test result) from two tertiary eye-care centers in Montreal, Quebec (Hôpital Maisonneuve-Rosemont and CHUM-Notre-Dame) between 2000 and 2015 were included in this study. Patient demographics and clinical presentations were analyzed. A concurrent review of the existing literature on syphilitic optic neuropathy was carried out.
Results: There were 115 patients (169 eyes) with ocular syphilis. The diagnosis and treatment were done at 2 tertiary-care centers in Montreal between 2000 and 2015. The mean follow-up period was 19 months. Overall, 19% (22) had neuro-ophthalmologic involvement. The most common neuro-ophthalmic manifestation was optic neuropathy (19 patients or 86%) followed by oculomotor involvement (3 patients or 14%).
The mean age at presentation of optic neuropathy was 52 years. All 22 patients (100%) with optic neuropathy were male. HIV status was available (previously know to be positive or requested at the time of syphilis diagnosis) in 68% (13); of these, 62% (8) were co-infected with HIV. Bilateral disease was found in 53% (12). The clinical manifestations of syphilitic optic neuropathy were: 42% (9) with optic atrophy, 11% (2) with posterior optic neuritis and 47% (10) with anterior optic neuropathy or disc edema. The latter group may have represented anterior optic neuropathy, perineuritis or neuroretinitis cases (distinguishing between these is often difficult due to the overlap in subjective and objective clinical presentation). 37% (8) had concurrent anterior and/or intermediate uveitis. The mean initial vision was 20/80 in all optic neuropathy patients and final vision after follow-up and treatment was 20/40. Visual outcome was good when treated as neurosyphilis. 55% (12) were treated with IV penicillin, 18% (4) with IM pencillin, and 5% (1) with IV ceftriaxone. 9% (2) patient were lost to follow-up and it is unknown whether they completed their course of treatment.
Conclusions: Optic neuropathy is a common presentation of ocular syphilis. HIV co-infection with ocular syphilis is frequent. It is therefore important to assess for both when considering either diagnosis. With the rates of syphilis on the rise globally, it is imperative to consider this diagnosis and to treat ocular syphilis as neurosyphilis.

Title: Evaluating the variability of neuro-ophthalmic emergency management by practicing ophthalmologists in Canada

Authors: Harrish Nithianandan, **Irfan N. Kherani**, Danah H. Albreiki

Abstract Body:

Purpose: The purpose of this prospective survey study was to identify variability in the management of neuro-ophthalmic emergencies by practicing ophthalmologists in Canada.
Study Design: This was a prospective survey study.
Methods: This study received ethics approval from the Ottawa Health Science Network Research Ethics Board. A web-based survey consisting of 6 neuro-ophthalmic patient case descriptions followed by multiple choice questions was developed by a practicing neuro-ophthalmologist (DA). The survey did not indicate that the patient scenarios depicted neuro-ophthalmic emergencies. The questions of the survey either asked participants to select the next best step in the management of the patient or asked participants to diagnose the patient. One point was awarded for each correct answer on the survey, with a maximum possible score of 6. The survey was distributed in English by the office of the COS Executive Director on behalf of the study team to the physician members of the COS. Two months following the dissemination of the survey, the responses were analyzed using Microsoft Excel®. Responses from neuro-ophthalmologists pertaining to case management were excluded from the analysis to evaluate ophthalmologists without neuro-ophthalmic subspecialty fellowship training.
Results: One hundred sixty-one ophthalmologists from across Canada completed the survey. Comprehensive ophthalmologists, retina specialists and pediatric ophthalmologists comprised 56%, 13% and 10% of the study sample respectively, and the remaining 21% of respondents were other subspecialists. 70% of respondents had a private-office based practice while 30% were primarily hospital-based. The vast majority of respondents (78%) indicated that 0-10% of their patients have neuro-ophthalmic disease. Case management responses by 7 neuro-ophthalmologists were excluded. The mean±SD score achieved on the survey was 5.0±0.92 points with a range of 2-6 points out of 6. 31.6% of respondents scored 6/6 points. 77% of respondents correctly identified urgent CT Head as their management of choice to rule out a case of papilledema. 84% of respondents correctly identified urgent CT to manage a case of pituitary apoplexy. The vast majority of participants (91%) correctly selected ESR/CRP/PLT to rule out GCA. Similarly, most participants (96%) selected urgent CTA to rule out a PCOM aneurysm in a case of third nerve palsy and 95% correctly diagnosed a patient with Mucormycosis. The area of greatest variability was in a case of carotid artery dissection causing Horner's syndrome where 53% correctly selected CTA neck, however CT Chest and MRI Head was selected by 38% and 9% of respondents respectively.
Conclusions: Areas of variable neuro-ophthalmic emergency management by ophthalmologists have been identified. These results suggest that future continuing professional development modules pertaining to neuro-ophthalmology should focus on the emergent management of Horner's syndrome.

Title: Characterization of inter-eye onset in Leber's hereditary optic neuropathy (LHON) mutation subtypes

Authors: Henry Liu, Chiara La Morgia, Lidia Di Vito, Samir Nazarali, Isabelle Gauthier, Maleeha Syed, Alexander Pearson, Jasdeep Chahal, Mike Ammar, Michelle Carbonelli, Piero Barboni, Anna Maria De Negri, Frederico Sadun, Valerio Carelli, Alfredo Sadun, Rustum Karanjia

Abstract Body:

Purpose: Leber's hereditary optic neuropathy (LHON) is an inherited mitochondrial disease characterized by a painless, subacute loss of central vision with over 95% of affected patients harbouring one of three mitochondrial DNA (mtDNA) classical point mutations (G11778A, G3460A and T14484C). The purpose of this study was to compare the age of disease onset and time interval between affected eyes by mutation.
Study Design: Retrospective chart review
Methods: Age of onset, unilateral versus bilateral presentation, interval between the first and second eye, and the mtDNA mutation were retrieved from two separate database registries consisting of 268 Italian and 71 U.S. patients.
Results: Clinical data from 339 patients with LHON mutations were evaluated (G11778A, n = 216; G3460A, n = 40; T14484C, n = 44; non-dominant mutations, n = 39). Bilateral eye involvement was clinically documented in 99.4% of cases with 50.3% of all patients demonstrating sequential onset. In these latter cases the median inter-eye delay was 12.8 weeks. Comparing the age of onset across mutation subtypes, the T14484C mutation resulted in the lowest age at onset (19.2 ± 10.6 years) compared to G11778A (25.8 ± 15.3 years), G3460A (20.9 ± 14.5 years) and non-dominant mutations (22.9 ± 12.1 years) ($p < 0.05$). The M:F ratio for G11778A, G3460A, T14484C and non-dominant mutations were 3.5:1, 1.7:1, 4.5:1 and 3.8:1 respectively. Interestingly, the T14484C mutation exhibited more simultaneous than sequential onsets compared with the other mutation subtypes ($p < 0.001$). Moreover, T14484C showed a shorter and more reproducible interval between eyes (inter-eye onset range = 1-44 weeks) versus G11778A (range = 1-2016 weeks), G3460A (range = 2-816 weeks), non-dominant mutations (range = 1-108 weeks) for sequential presentations.
Conclusions: The T14484C mutation, though least penetrant, manifested at an earlier age and resulted in a smaller inter-eye delay interval range and higher incidence of simultaneous involvement compared to the other classical and non-dominant mutations in LHON.

Title: The diagnostic value of optical coherence tomography in idiopathic infantile nystagmus

Authors: Anu Maudgil, Rui Hua, Agnes Wong

Abstract Body:

Purpose: Infantile nystagmus presents with horizontal oscillations of the eyes within the first 6 months of life, and has a variety of causes. Traditional work up includes examination under anaesthesia or sedation to exclude anterior or posterior segment pathology, electrodiagnostics to investigate pathway function and MRI brain to exclude neuropathology. If all these examinations are found to be normal, infantile nystagmus has been considered idiopathic. Optical coherence tomography (OCT) is a newer technology, applicable in young children, which can identify subtle macular pathologies. The aim of this project is to quantify what percentage of a cohort of patients with previous diagnoses of infantile idiopathic nystagmus may have abnormalities on OCT that could lead to a revised diagnosis.
Study Design: Retrospective observational study
Methods: Review of cases notes was performed, as well as review of OCT scans by 2 independent examiners. Data was analyzed to ascertain what percentage of patients with a previous diagnosis of infantile idiopathic nystagmus had revised diagnoses on the basis of OCT findings. A secondary analysis included the percentage that had diagnoses of certain conditions including albinism, PAX6 gene mutations and achromatopsia.
Results: A demonstrable number of patients with previous diagnoses of idiopathic infantile nystagmus were found to have abnormalities on OCT imaging, not previously suspected on macular examination.
Conclusions: Given the number of cases identified with abnormalities on OCT imaging, we would recommend that handheld OCT is a routine part of work up in new cases of infantile nystagmus.

Title: The role of optical coherence tomography in patients with sellar masses: Are the 2016 guidelines on the neuro-ophthalmic evaluation of pituitary adenomas already obsolete?

Authors: Jonathan A. Micieli, Richard J. Blanch, Eman Hawy, Jason H. Peragallo, Kannan Narayana, Nancy J. Newman, Valérie Biousse

Abstract Body:

Purpose: The 2016 Congress of Neurological Surgeons guidelines on pre-treatment ophthalmology evaluation in patients with pituitary adenomas recommend pre-operative, "Optical Coherence Tomography (OCT) to measure both retinal nerve fiber layer (RNFL) thickness and the presence of damage to the ganglion cell layer (GCL) on algorithms that segment the macular cube," to assess prognosis for visual recovery. Although RNFL and GCL thickness are routinely used to predict recovery of visual function after treatment, the importance of OCT for compressive optic neuropathy or chiasmopathy diagnosis is less well recognized. We report a patient series with sellar masses causing mass effect on the anterior visual pathways who had normal visual fields but binasal decreased GCL thickness, suggesting preclinical evidence of compression.
Study Design: Retrospective case series
Methods: 12 patients seen for assessment and monitoring of sellar lesions without a definite visual field defect, but abnormal macular GCL were included. Visual fields were classified as suspicious or not for chiasmal compression. GCL/RNFL analyses using Cirrus-OCT were classified into percentiles based on the manufacturer's reference range. Chiasmal compression was determined by review of coronal images from MRIs with dedicated views of the pituitary and sellar region.
Results: Visual fields were completely normal in 6 of 12 (50%) cases, but GCL analysis showed a macular nasal sextant with a thickness less than 1% of that seen in the normal population in all cases. RNFL thickness was within the reference range in 2 of 6 of these cases, less than 5% in 2 of 6 of these cases and less than 1% in 2 of 6 of these cases.
Visual fields were suspicious for chiasmal compression in that there was a subtle bitemporal visual field defect not easily recognized in 6 of 12 (50%) cases. All of these cases had a macular GCL thickness less than 1% of the normal population in a nasal sextant or clear binasal loss of the macular GCL. RNFL analysis was in the reference range in 2 of 6 of these cases, less than 5% in 2 of 6 of these cases and less than 1% in 2 of 6 of these cases.
Conclusions: In our patients, macular GCL analysis was more sensitive than visual fields in detecting chronic chiasmal compression, suggesting that GCL analysis is an essential test in the diagnosis of compressive optic neuropathy, even before visual fields become abnormal. Macular GCL analysis should be obtained in all patients with radiologic evidence of anterior visual pathway compression even when visual fields appear normal.

Title: Does optic nerve appearance predict visual outcome in patients with idiopathic intracranial hypertension?

Authors: Jonathan A. Micieli, Beau B. Bruce, Caroline Vasseneix, Richard J. Blanch, Damian E. Berezovsky, Jason H. Peragallo, Nancy J. Newman, Valérie Biousse

Abstract Body:

Purpose: Stratification of idiopathic intracranial hypertension (IIH) patients allows aggressive treatment to prevent vision loss in high-risk patients. We assessed whether Frisén grade, optic disc hemorrhages (ODH) and cotton wool spots (CWS) predict outcome in IIH.
Study Design: Retrospective cohort study of consecutive IIH patients.
Methods: 389/1244 consecutive IIH patients (773 eyes) were seen before or within 30 days of diagnostic lumbar puncture/medical treatment, with fundus photographs at presentation. Patients' characteristics, visual acuity (VA), visual field (VF) grade, and Humphrey VF mean deviation were recorded. Fundus photographs graded by 3 independent reviewers used a standardized protocol for presence, type, and severity of ODH and CWS, and severity of papilledema by the modified Frisén scale. Multivariable linear and logistic mixed models evaluated the association between Frisén grade, ODH, CWS and visual outcomes controlling for confounding variables.
Results: 205/773 (26.5%) eyes had >1 ODH, 99/773 (12.8%) eyes had >1 CWS, 86/773 (11.1%) had >1 ODH and CWS. Controlling for Frisén grade, BMI, black race, and gender, the presence of ODH/CWS was associated with worse VA and VF grade at initial presentation ($p<0.03$), but not at final follow-up. Results were the same when limiting the analysis to the 223 patients (352 eyes) who would have qualified for the IIHTT by VF criteria (VF-MD, -2 to -7dB). More patients with ≥1 ODH (21.5% vs 6.7%) or CWS (31.3% vs 4.7%) underwent surgical treatment compared to those without ODH/CWS, but the presence of ODH/CWS was not an independent predictor of surgery. The presence of ODH/CWS was associated with higher Frisén grade ($p<0.001$) and Frisén grade correlated with worse mean deviation and VF grade at final follow-up ($p<0.001$).
Conclusions: While the IIHTT associated ODH with both worse Frisén grade and treatment failures, they did not examine whether ODH was a risk factor independent of papilledema severity (likely due to the low frequency of treatment failures in a population with mild disease). In our study, neither ODH nor CWS were independently associated with poorer visual function at last follow-up.

Title: The epidemiology and clinical characteristics of Leber hereditary optic neuropathy (LHON) in British Columbia

Authors: Colten Wendel, Jiyoung Hwang, Andre Mattman, Hilary Vallance, Claire A. Sheldon

Abstract Body:

Purpose: With promising clinical trials, there is a need for an accurate understanding of the epidemiology of LHON. This study aims to estimate the prevalence and describe the clinical presentation of LHON in British Columbia, Canada.
Study Design: In British Columbia, all clinical genetic analyses are co-ordinated and documented through the Provincial Genetics Laboratory. In a retrospective study, all subjects diagnosed with LHON between 1996 - 2016 were collated and clinical information was gathered.
Methods: Chart review of all patients with a mitochondrial sequencing diagnosis consistent with LHON were reviewed and their clinical data were gathered.
Results: We identified 44 subjects with genetically-confirmed LHON. In the mid-year point of the study, there were 3,444,285 people <65 years old. The minimum point prevalence for LHON within this population was 1.28 per 100,000 (95% CI 1.12-1.73 per 100,000). This is lower than seen in England and comparable to prevalence rates in Finland and Denmark. Heteroplasmy was present in 9% of cases. Of the 44 cases, 41 were LHON primary mutations (11778G>A, 14484T>C, and 3460G>A). Overall, subjects were 55% male, with an average age of symptom onset at 27.4 +/- 4.8 years. For those with symptomatic vision loss, the average time between fellow eye involvement was 2.7 +/- 0.9 months. The average wait time from initial onset of visual loss to diagnostic testing was 1.3 +/- 0.7 years. One patient was treated with idebenone. Clinical phenotype varied: there were 3 patients with MS-like illness with symptomatic white matter lesions, 2 with dystonia and 1 with a cardiac conduction abnormality. Finally, seven subjects experienced partial recovery of visual loss.
Conclusions: Epidemiologic information can help inform the patient population that may benefit from new treatments. In British Columbia, nearly 2 in 50000 people possess LHON mt DNA mutations, although there is a significant delay in diagnosis. Mechanisms to improve the availability of mitochondrial sequencing is an important consideration in future healthcare policies.

Title: A novel psychophysical assessment for light-induced discomfort: A potential clinical tool for photophobia

Authors: Marija Zivcevska, Shaobo Lei, Al Blakeman, Herb Goltz, Agnes M. Wong

Abstract Body:

Purpose: A key perceptual symptom in several neuro-ophthalmic disorders is photophobia - a phenomenon broadly defined by light-driven painful sensations, and subsequent tearing and squinting. Currently however, photophobia is mostly descriptive, with poorly understood mechanisms and no available objective assessment. Recently, studies have suggested that photophobia is likely mediated by the melanopsin-containing intrinsically photosensitive retinal ganglion cell (ipRCG) pathway. ipRGCs are a subset of retinal photoreceptors with a peak spectral sensitivity of ~480 nm (blue light) and a unique sustained firing response that is dependent on the ambient illumination levels and the retinal area stimulated. We aimed to: (1) design a novel psychophysical assessment that considers the spectral properties of melanopsin and (2) establish a normative dataset for previously tested photophobia characteristics that play a role in the degree of discomfort experienced: wavelength and viewing condition. We hypothesized that visually normal participants would experience greatest light discomfort under blue light stimuli and binocular viewing conditions.
Study Design: Prospective study
Methods: Eleven participants underwent pharmacological mydriasis (2.5% phenylephrine) prior to the experiment. A Ganzfeld system presented 7 randomized light intensities (1 s each) of either red (1.5, 19.1, 38.2, 57.3, 76.3, 152.7, 305.3 cd/m2) or blue (1.4, 7.1, 14.3, 28.6, 42.9, 57.1, 71.4 cd/m2) light, 20 times per intensity, in four 70 trial blocks (using the method of constant stimuli). White-light stimuli (3 cd/m2, 4 s duration) were interleaved with the chromatic trials. Participants rated each stimulus as either “uncomfortably bright” or “not uncomfortably bright”. The experiment was done binocularly and monocularly in separate sessions, and the color/viewing condition order was randomized across participants. The proportions of “uncomfortable” responses per testing session were used to generate psychometric functions from which 50% discomfort thresholds were calculated individually.
Results: Light-induced discomfort was higher under blue light stimulation compared to red light stimulation, both during binocular ($t(10)= 3.58$, $p < 0.01$) and monocular viewing ($t(10)= 3.15$, $p=0.01$). There was also a significant difference in discomfort between viewing conditions, with binocular viewing inducing more discomfort for blue light ($p < 0.001$), but not for red light stimulation.
Conclusions: Photophobia characteristics are consistent with the features of the melanopsin system. This is the first visual discomfort assessment designed around the melanopsin spectral properties which can be customized to assess photophobia in different clinical populations. In visually-normal participants, the results support the hypothesis that photophobia is predominantly an ipRGC-mediated phenomenon.

OCULAR REGENERATIVE MEDICINE | MÉDECINE OCULAIRE RÉGÉNÉRATIVE

Title: Simple limbal epithelial transplantation (S.L.E.T.) for recurrent double-headed pterygium

Authors: Tanguy Boutin, Zale Mednick, Allan Slomovic

Abstract Body:

Purpose: To show a novel surgical procedure to treat recurrent pterygium
Study Design: Case study
Methods: We present a novel case of a simple limbal epithelial transplant (SLET) performed for an aggressive recurrent kissing pterygium in a patient with history of severe atopy and chronic blepharitis. He had a previous pterygium excision done five years ago with conjunctival autograft and Mitomycin C. A healthy area of the limbus (2 clock hours) was identified and harvested in the affected eye. The double-headed kissing pterygium was excised and a superficial keratectomy was performed, followed by a 360 degree peritomy and tenotomy. Amniotic membrane was secured with fibrin glue and sutured into place with 8-0 Vicryl. The harvested limbal tissue was cut into 12 small pieces and glued onto the mid peripheral aspect of the amniotic membrane. A bandage contact lens was put into place and the patient started on a regimen of tobradex four times per day.
Results: The visual acuity improved from counting fingers at one foot to 20/60 uncorrected (pinhole 20/40) at six months. The cornea fully epithelialized and remained avascular without any signs of pterygium recurrence.
Conclusions: SLET was shown to be an effective therapeutic option for this patient with an extensive recurrent kissing pterygium. This provides promise that SLET may be a successful novel approach to other complex pterygiums, including recurrent pterygiums that have been resistant to traditional surgical techniques.

OCULOPLASTICS AND RECONSTRUCTIVE SURGERY
OCULOPLASTIE ET CHIRURGIE RECONSTRUCTIVE

Title: Bilateral invasive HPV-16 positive ocular surface squamous cell carcinoma in an immunocompetent patient

Authors: Sara AlShaker, Martin Chang, Curtis Archibald, Godfrey Heathcote, Dan DeAngelis

Abstract Body:

Purpose: Ocular surface squamous neoplasia (OSSN) is rare; incidence is reported to be 0.02 to 3.5 per 100,000. Human papilloma virus (HPV) has long been implicated in OSSNs. While the finding of an HPV-driven disease in squamous carcinomas of the oropharynx indicates a potentially favourable prognosis, current ophthalmic literature is currently conflicted on the role of HPV in OSSN due to many factors including the rarity of the condition, geographic variations, and differences in sample testing.
Study Design: Case report
Methods: Retrospective review of clinical charts
Results: An otherwise-healthy 52-year old female presented to our centre with bilateral protuberant eyelid masses with crusting and discharge at the eyelid margins. She had originally seen an ophthalmologist 7 years prior to presentation with the finding of a small left followed by a right palpebral conjunctival papillomas. She was prescribed topical chemotherapy but had not been compliant with treatment which led to progression of the disease bilaterally. She had also declined early surgery and was lost to follow up for years. She once again sought medical attention as the masses had accelerated in growth resulting in vision loss in both eyes. On examination, the eyelid masses appeared to contiguously involve the palpebral and bulbar conjunctiva resulting in distortion of the ocular surface. A CT scan of the orbits confirmed anterior segment invasion as well as anterior orbital invasion. An examination under anesthesia and biopsy of the lesions bilaterally revealed an invasive squamous cell carcinoma that was P16 positive. Formalin-fixed paraffin-embedded tissue from both sites was later typed for HPV via the Roche Cobas 4800 Assay for HPV PCR and showed bilateral HPV-16 positivity. There was no distant metastasis and no lymphadenopathy (Stage T4N0M0). She was also evaluated for immunodeficiency and was found to be HIV-negative and hosting a normal level of immunoglobulins deeming her immunocompetent. The patient was counselled on the need for bilateral exenterations, which she initially refused but eventually had underwent. She declined post-surgical radiation.
Conclusions: This is a unique case of bilateral locally invasive OSSN in an immunocompetent host that resulted in bilateral vision loss necessitating the need for bilateral exenteration. The lack of compliance with therapy had led to observation of the natural history of OSSN, which demonstrated slow yet locally destructive progression. The finding of HPV-16 positivity in both sites poses the question whether this is the driving etiology behind the disease.

Title: Efficacy of Endoscopic dacryocystorhinostomy for the treatment of nasolacrimal duct obstruction secondary to high dose radioactive iodine ablation

Authors: Rafic Antonios, François Codère

Abstract Body:

Purpose: To evaluates the efficacy of endoscopic dacryocystorhinostomy (eDCR) for nasolacrimal duct obstruction (NLDO) in patients exposed to radioactive iodine (RAI) for treatment of thyroid carcinoma.
Study Design: Retrospective consecutive chart review.
Methods: A consecutive chart review of all patients who had received RAI for the treatment of thyroid carcinoma and had undergone eDCR as the primary procedure for the treatment of NLDO, from January 2007 to December 2016 at, was conducted. All patients had surgery performed by the same surgeon F.C, had undergone probing and irrigation to assess NLDO preoperatively and at 1 week, 1 month, and 3 months postoperatively. All patients had silicone tubes removed after 4-6 weeks postoperatively. Mitomycin C (MMC) was only used in redo DCR surgeries. At baseline no patient had any concomitant obstruction arising from sites other than the nasolacrimal duct, any eyelid or eyelash abnormalities, or any prior interventions to the lacrimal system, and none had a history of facial trauma or fractures of the nose and orbital walls.
Results: A total of 18 of 354 patients (5%) were treated with high dose RAI therapy for thyroid carcinoma prior to onset of NLDO and intervention with eDCR. All of the patients were females with a mean age of 50 ± 15 years (range: 20-72 years). The mean RAI dose was 239 ± 105 mCi. DCR was performed bilaterally in 10 patients and unilaterally in 8 patients. After one surgery, complete recovery was obtained in 10 (56%) patients, and partial relief was obtained in 8 (44%) patients. Among the 8 patients that had persistent epiphora, 3 patients refused additional surgery, 1 patient successfully underwent external DCR with MMC, and 2 of 4 (50%) had successful revision eDCR with MMC. At the time of revision surgery, all patients had scarring and epithelialization either at the level of the ostium, or around the internal punctum. Among patients who were found to fail initial eDCR in our study, patients that had previously received high dose RAI for the treatment of thyroid carcinoma constituted 8 of 23 (35%). Overall success rate of primary eDCR increased from 93% to 96% when patients who had previously received high dose RAI for thyroid carcinoma are excluded.
Conclusions: RAI-associated NLDO is associated with a higher incididence of eDCR surgery failure. Use of MMC in revision eDCR might be associated with an increased chance of success.

Title: Review of clinical features, practice patterns, and treatment outcomes of idiopathic dacryoadenitis at major oculoplastic referral clinics in Toronto, Canada

Authors: Harleen Bedi, Harmeet Gill, Navdeep Nijhawan, Dan DeAngelis, James Oestreicher, Nancy Tucker

Abstract Body:

Purpose: Current management of idiopathic dacryoadenitis is perplexed by marked variability in clinical approaches that are practioner-dependent, and range from initial conservative medial management with corticosteroids to an aggressive primary debulking of the affected lacrimal gland. The primary aims of this study were to determine the rate of treatment response, treatment recalcitrance and disease recurrence, and to formulate an approach toward management of idiopathic dacryoadenitis. Secondary aims of this study were to review the histopathologic features of lacrimal gland biopsies to assess the distribution of pathology.
Study Design: This prospective, multi-centre observational clinical chart review identified all patients with the diagnosis of idiopathic dacryoadenitis from various Oculoplastic practices in Toronto, Canada.
Methods: Each patient's initial presentation, management and treatment outcomes were collected. The rate of treatment response, recalcitrance and disease recurrence was measured and histopathologic features of lacrimal gland biopsies were evaluated for distribution of pathology. Patients were followed over 6 months post completion of therapy to measure recurrent attacks, dry eye symptoms, and/or use of anti-inflammatory medications. Data was analyzed using Fisher exact test (2-tailer) and Student t-test (2-tailed) with statistical significance defined at $p<0.05$.
Results: Forty-two cases of idiopathic dacryoadenitis have been included. Our study population showed a female preponderance (81% women, 19% men) and a mean age of 50 (+SD 11.9) years. Bilateral lacrimal gland involvement was seen in 40% cases. An even distribution of "classic" dacryoadenitis with moderate inflammation (52.3%) and painless orbital mass effect (47.7%) was seen clinically. Concomitant autoimmune or allergic disease was observed in 52.3% patients. Radiologically, 42.9% patients presented with isolated enlargement of the lacrimal gland. Of those who showed concurrent orbital involvement, inflammation was commonly seen extending to extraocular muscles (66.7%), orbital fat (77.8%) and optic nerve (11.1%). A total of 90% of patients were initiated on prednisone therapy, approximately half (47%) of who relapsed. Most patients required a mean treatment period of 4.8 months (95% CI 3 to 6.6 months). Of these patients, complete resolution seen in 50%, 33.3% became recalcitrant and 16.7% showed incomplete response.
Conclusions: Half of the patients with idiopathic dacryoadenitis showed a complete resolution on oral prednisone therapy. Clinical remission was achieved in 83.3% of the population on oral therapy alone, thereby necessitating debulking surgical or radiation therapy for a minority of patients diagnosed with this entity. Our findings provide an approach to management of idiopathic dacryoadenitis, which will help inform practice decisions in the primary care setting.

Title: The three clinical presentations of tarsal cysts

Author: Michel Belliveau

Abstract Body:

Purpose: To improve recognition of the tarsal cyst by describing three clinical presentations
Study Design: Retrospective case series
Methods: Data from three representative cases were included
Results: Tarsal cysts may present as: 1. Protruding lesion on the conjunctival surface of the eyelid, 2. Dome-shaped subcutaneous eyelid lesion, 3. Recurrent eyelid lesion. Full-thickness tarsal erosion is typical and may require reconstruction. The cyst contains fluid and keratinous debris. Extrusion of this coconut water-like content can be an intraoperative clue in unsuspected cases. Eradication of the cyst wall is required to prevent recurrence.
Conclusions: Pre-operative awareness of this lesion can prepare the surgeon for a possible reconstructive procedure when an incision and drainage may otherwise be anticipated. Awareness of the need to eradicate the lesion may prevent subsequent procedures.

Title: Hard palate mucosa graft height in the correction of lower eyelid retraction

Authors: Michel Belliveau, Sonul Mehta, Rahul Sharma, James Oestreicher

Abstract Body:

Purpose: To evaluate the relationship between graft height and lower eyelid elevation
Study Design: Retrospective interventional case series
Methods: Institutional research ethics board approval was obtained. Charts were identified over a 4-year period using billing records. The relationship between the change in the amount of inferior scleral show following hard palate grafting and graft height was assessed. Minimum of 6 months post-operative follow-up was required. Grafts were categorized into 3 groups; small [less than 5 mm, n=14, mean (SD) 3.9 (0.3) mm, median 4 mm], medium [5mm to less than 7 mm, n=21, mean (SD) 5.6 (0.5) mm, median 6 mm], large [7 mm or greater, n=12, mean (SD) 7.9 (0.7) mm, median 8mm].
Results: Forty-seven lower eyelids in 25 patients were included (13 thyroid eye disease, 7 post-blepharoplasty, 5 other). Mean (SD) follow up was 10.7 (5.2) months. The mean (SD) pre-operative scleral show was 1.4 (0.7) mm. The mean (SD) post-operative scleral show was 0.2 (0.3) mm. The mean (SD) amount of scleral show treated by the 3 sizes of grafts were; small 0.9 (0.6) mm, medium 1.4 (0.5) mm, and large 2.0 (0.7) mm. With a mean graft size of 5.7 mm, the overall ratio of graft size per mm improvement in scleral show was 4.6 (or 0.22 mm scleral show improvement per mm graft). This relationship held within each of the graft size groups; small and medium, 4.6 mm graft per mm improvement in scleral show (or 0.22 mm scleral show improvement per mm graft); large, 4.7 mm graft per mm improvement in scleral show (or 0.21 mm scleral show improvement per mm graft). Correlation was moderately positive (Spearman's rho =0.464, p=0.001).
Conclusions: Graft height requirements for effective elevation are approximately double than what is commonly recommended (4.6:1 compared with 2-3:1).

Title: Fat is our friend: The use of adipose tissue in oculoplastic surgery

Author: Patrick R. Boulos

Abstract Body:

Purpose: The purpose of this study is to evaluate the use of fat for a variety of functional and cosmetic oculoplastic indications and more specifically the role of fat injections to replace periocular fillers causing chronic periocular edema.
Study Design: Retrospective case series.
Methods: Review of 29 cases over a period of 7 years, using clinical data and photograph review. Study parameters included: patient satisfaction, follow-up, fat longevity, complications and disappearance of pre-operative chronic edema secondary to hyaluronic acid (HA). We describe the use of hyaluronidase and fat injections or grafting for a variety of functional and cosmetic oculoplastic indications.
Results: - 7 patients were treated with fat transpositions - Fat injections were used for periorbital hollows, perioral hollows, treatment of deep superior sulci, lower eyelid retraction and scar treatment in 20 patients - Fat pearl grafts were used to treat deep superior sulci in 2 patients.
The fat injection patient satisfaction rate was: Fully satisfied 85% (17/20) Satisfied 15% (3/20) Dissatisfied 0% (0/20)
Pre-operative chronic edema from hyaluronic acid fillers resolved in all patients.
Range of follow-up was 3-24 months.
The main complication of fat injections was partial fat atrophy in 4 patients, which occurred more frequently in functional patients (3/4) and in the early post-operative period.
Conclusions: Autologous fat is a safe and reliable natural filler. It provides great long-term esthetic and functional results in the treatment of volume loss and is an excellent solution for patients suffering from chronic periorbital edema secondary to hyaluronic acid.

Title: Novel posterior lamellar spacer consisting of bovine collagen graft

Authors: Nicolas Cadet, Yasser Khan

Abstract Body:

Purpose: We describe a novel surgical technique using a commercially available bovine collagen graft as a posterior lamellar spacer of the lower eyelid.
Study Design: Case series
Methods: Nineteen patients were included in the study and followed for 6 months.
Results: Success was defined as quantitative improvement of the lower eyelid retraction with asymmetry of 2 mm or less between the lower eyelids. We obtained a success rate of 87%.
Conclusions: Utilisation of a collagen graft instead of other types of grafts (eg hard palate graft) could potentially save intraoperative time and decrease postoperative pain.

Title: Novel surgical technique of canalicular marsupialization

Authors: Nicolas Cadet, Hamza Sami, Yasser Khan

Abstract Body:

Purpose: We describe a novel surgical technique of canalicular reconstruction that involves a punctoplasty and canalicular marsupialization using sutures.
Study Design: Case series
Methods: Twenty-six patients were included in the study and followed for 6 months
Results: Success was defined as patent punctum and absence of clinically significant epiphora. We obtained a success rate of 82%.
Conclusions: This procedure could be useful in cases of inflammatory and recurrent punctal stenosis.

Title: Modified evisceration technique: Posterior sclerectomy for phthisis bulbi and microphthalmos

Author: Gunay Ibrahimzade

Abstract Body:

Purpose: To describe and evaluate the efficacy of primary larged-sized orbital implant placement with evisceration in patients with phthisis bulbi and microphthalmos.
Study Design: interventional study
Methods: Modified technique of evisceration with posterior sclerotomy and autogenous scleral patching with primary placement of silicone orbital implant was performed in 32 consecutive patients who presented with phthisis bulbi and microphthalmos. The postoperative performance of the implant was assessed in terms of volume replacement and motility.
Results: Out of 32 patients, 19 (59,4%) were males and 13 (40,6%) were females. Age ranged from 15 to 47 years with an average of 29.5 years. We reviewed the files and analyzed the data of 23 patients (eyes) with phthisis and 9 patients with microphtalmos who underwent this technique from June 2013 to September 2015. The diameters of the silicone implants were 18 and 20 mm. which was depended on the size of the paired eye.The mean follow up period was 2 years. None of the patients had implant extrusion, exposure or migration. Degree of volume replacement was found to be good in 29 patients and fair in 3 patients. 27 patients had a good motility of prosthesis and 5 patients had fair movement of prosthesis.
Conclusions: Technique of evisceration with posterior sclerectomy was found safe and useful for implantation of larger implants for phthisis bulbi and microphthalmos. Evisceration with modified technique followed in the present study minimized the extrusion rates of silicone orbital implants with successful retention of the implant.

Title: Closure of a large sino-orbital fistula with bioengineered collagen matrix

Authors: Imran Jivraj, Ahsen Hussain, Navdeep Nijhawan

Abstract Body:

Purpose: Orbital exenteration surgery may be complicated by sino-orbital fistula formation. We describe the successful use of the Integra® acellular bovine matrix in repairing a persistent sino-orbital fistula following exenteration.
Study Design: Case Report
Methods: Case Description and Review of Literature
Results: A 55 year old man with an extensive smoking history was evaluated for ocular surface squamous neoplasia after proliferation and orbital extension following brachytherapy and noncompliance with topical Mitomycin. He had previously undergone a right dacryocystorhinostomy with Jones tube insertion. A subtotal exenteration was performed with frozen section control of the margins and the socket was left to epithelialize secondarily. There was a persistent sino-orbital fistula measuring approximately 3cm in the region of the previous DCR. Closure with a paramedian forehead flap was unsuccessful. The patient refused a free flap but consented to the experimental use of an Integra® bilayer matrix over a Vicryl mesh with revision of the forehead flap. This enabled successful closure of the fistula after five months of follow-up.
Conclusions: Integra® is an acellular dressing that consists of a matrix of cross-linked bovine collagen and glycosaminoglycans covered by a semi-permeable layer of silicone. Use of dermal substitutes enables rapid re-epithelialization without incurring the risk of additional donor site morbidity and flap failure. Integra® has been widely used in reconstructive surgery; in ophthalmology there are reports of its use in repairing traumatic eyelid skin defects, lower lid retraction, and reconstruction of exenterated sockets. To the best of our knowledge, closure of a sino-orbital fistula with bioengineered dermal matrix has not been described.

Title: An inflammatory reaction to stored fascia lata 37 years post-implantation

Authors: David R. Jordan, Kaisra Esmail, Seymour Brownsteion, Tina Tang, Bruce Burns

Abstract Body:

Purpose: To describe a reaction to stored fascia lata 37 years post implantation
Study Design: Case report.
Methods: review of single patient history and treatment record.
Results: Methotrexate was required for several years to keep the inflammatory reaction quiet
Conclusions: Stored fascia lata has been used in several surgical specialties including ophthalmology, neurosurgery, urogynecology, oral surgery as well as cosmetic surgery. Within ophthalmology, it has been utilized as a suspensory material in frontalis sling surgery, as an orbital floor implant and as a patch graft during glaucoma filtering surgery.1,2,3 Complications are uncommon but may include early localized inflammatory reactions, infection, and granuloma formation.4,5,6 The authors report a suspected inflammatory reaction to stored fascia lata 37 years' post-placement. The authors suspect there may have been a delayed inflammatory reaction to a component of the autologous fascia graft that was not completely inactivated by the original sterilization technique. To our knowledge, this type of delayed inflammatory reaction has not been previously reported. It raises a concern about the use of autologous donor tissue and accepted sterilization techniques that may not be 100% effective in deactivating all components of the donor graft causing a subsequent latent reaction.

Title: Spontaneous orbital emphysema in a pediatric patient

Authors: **Georges B. Nassrallah**, Vincent Sun, Ayesha Khan

Abstract Body:

Purpose: Spontaneous orbital emphysema in the absence of recent trauma is exceedingly rare, with less than 5 cases reported in the literature. It has been hypothesized that a congenitally thinner lamina papyracea, chronic sinusitis, previous minor trauma or previous nasal surgery may predispose to this condition. In rare cases, orbital emphysema may lead to ischemic optic neuropathy or central retinal artery occlusion. We report the first case in the literature of spontaneous orbital emphysema in a pediatric patient.
Study Design: Case report.
Methods: The patient's medical chart was reviewed and a comprehensive literature review was conducted.
Results: An 11-year-old female presented to ophthalmology clinic with a 3-day history of right periorbital swelling that started spontaneously when she blew her nose and heard a pop. She had no known previous medical or surgical history and there was no recent history of infection or significant trauma. On exam, her vision was 20/20 in both eyes and her pupils were equal and reactive to light with no relative afferent defect. She had mild restriction in right supraduction. Exophthalmometry measurements were 23 OD, 21 OS and a base of 100. Her upper lid was swollen with crepitus on palpation, but anterior and fundus exams were unremarkable. Computed Tomography of her orbits and facial bones revealed loculated air superiorly and laterally within the right bony orbit communicating with the ethmoid sinus as well as medial deviation of the lateral ethmoid sinus wall. These findings were suggestive of remote trauma or a developmental anomaly. The patient was followed closely and the emphysema resolved with abstinence from nose blowing and a short prophylactic course of antibiotics.
Conclusions: This is the first report of spontaneous orbital emphysema in the pediatric population. A history of increased pressure in the nasal cavity immediately preceding symptoms either by nose blowing or sneezing is vital in making the correct diagnosis and arranging prompt referral to ophthalmology in order to rule out unlikely, but possibly devastating complications.

Title: Optic neuropathy from pseudomonas osteomyelitis of the skull base

Authors: Amrit S. Rai, Yelin Yang, Victoria Leung, Imran Jivraj, Harmeet Gill

Abstract Body:

Purpose: Skull-base osteomyelitis (SBO) is a potentially life-threatening entity, most commonly caused by Pseudomonas aeruginosa in patients with immune compromise. While SBO may be associated with multiple cranial neuropathies, optic neuropathy is a rare complication. We describe the presentation and management of optic neuropathy from Pseudomonas SBO in the context of chronic lymphocytic leukemia (CLL).
Study Design: Case report
Methods: Case report and literature review
Results: A 53-year-old diabetic woman on Ibrutinib for relapsed CLL presented with left-sided headache, left periorbital pain and decreased visual acuity. Her oncology team started oral antibiotics for presumed sinusitis, and held chemotherapy. When ophthalmology was consulted one week later, she was noted to have limited supraduction, ptosis, and proptosis of the left eye. Visual acuity was 20/60 and colour vision was reduced. There was a relative afferent pupillary defect and a temporal field deficit suggestive of an optic neuropathy. Examination of the contralateral eye was normal. Gadolinium enhanced MRI of the brain demonstrated bony dehiscence and inflammation within the maxillary, sphenoid and cavernous sinuses diagnostic of a SBO. There was also soft tissue enhancement of the left superomedial orbit, involving the superior oblique, superior rectus, medial rectus and optic nerve. Urgent endoscopic sinus biopsy and debridement was performed and cultures revealed Pseudomonas aeruginosa with no fungal elements. The patient was treated with a six week course of intravenous Ceftazidime and her Ibrutinib was subsequently restarted. While her repeat MRI showed interval improvement, there remained an ill-defined infiltration within the orbital apex and cavernous sinus. On follow-up, her ptosis, proptosis and extraocular motility had improved, and there was no further worsening of her optic neuropathy.
Conclusions: The differential diagnosis of painful vision loss is broad, including arteritic, demyelinating, inflammatory, and infiltrative optic neuropathies. Among immunocompromised patients, the clinician must maintain a heightened suspicion for infectious optic neuropathy, particularly when there is evidence of orbital disease. Previous reports of optic neuropathy from SBO describe an aggressive clinical course resulting in severe vision loss. Presumptive treatment with corticosteroids for arteritic ischemic optic neuropathy, as well as unrevealing surgical cultures, may create diagnostic confusion and delay appropriate management. Our patient's preserved visual function resulted from early neuro-imaging, successful surgical biopsy of accessible tissue with culture and sensitivity data, and targeted antibiotic therapy.

Title: Periocular cutaneous sarcoid: Case series

Authors: Rehan Rajput, Soupramanien Sandramouli, Hardeep Mudhar, Rina Bhatt

Abstract Body:

Purpose: Periocular sarcoidosis is an uncommon cutaneous manifestation. We aim to highlight the importance of such a rare presentation along with our experience in the management of such lesions in a cohort of four interesting patients.
Study Design: Retrospective case series review of all patients diagnosed with periocular cutaneous sarcoidosis following incisional biopsy and systemic investigation presenting to our adnexal service in the UK, over a 12 month period.
Methods: Four patients presented to our oculoplastic service with periocular cutaneous lesions and underwent incisional biopsy. Following an established diagnosis of cutaneous sarcoidosis, two patients underwent treatment with intralesional triamcinolone, one patient was started on methotrexate therapy and the remaining two patients were observed
Results: The cohort comprised of 3 males and 1 female. Patient 1 was a 57-year-old Afro-Caribbean gentleman with right upper lid spindle shaped fullness of purple hue and a dough like consistency on palpation. Patient 2 was a 61-year-old Caucasian gentleman with a localized area of scaly dermatitis with a subsequent diagnosis of pulmonary sarcoidosis. Patient 3 was a 47-year-old Caucasian female referred as suspected basal cell carcinoma with a right inner canthal nodular lesion, with a subsequent diagnosis of pulmonary sarcoidosis. Patient 4 was a 56-year-old Caucasian male with bilateral swelling of the medial aspect of his upper lids with subsequent pulmonary involvement on chest CT. Systemic work up in patient 1 did not reveal any extracutaneous sarcoidosis. All patients underwent diagnostic incisional biopsy demonstrating features consistent with cutaneous sarcoidosis. Patients 1 and 3 were treated with intralesional triamcinolone. Patient 1 required further treatment with immunosuppressive therapy under dermatology to avoid side effects of hypopigmentation and ptosis from further triamcinolone. Patients 2 and 4 were observed.
Conclusions: To the best of our knowledge this is the first reported case series of periocular cutaneous sarcoidosis demonstrating the varying morphology of these lesions. The authors highlight both the difficulty in recognising these lesions that show considerable clinical heterogeneity and can mimic other cutaneous pathology. In summary, we have found that over 12 months, sarcoid lesions of the eyelid may remain stable without therapy, can be observed and may respond to intralesional triamcinolone with risk of recurrence. Given the anatomical nature of the eyelids some patients may require systemic immunosuppression and in our experience oral methotrexate at 15 mg/week shows good efficacy with resolution of lesion at 6 months.

Title: Enucleation and evisceration: An analysis of indications, histopathological findings and surgical trends over 23 years

Authors: Kelsey A. Roelofs, Helya Aghazadeh, Marvi Cheema, Ezekiel Weis, Jaime Badilla

Abstract Body:

Purpose: To report indications for eye removal, histopathological diagnosis and surgical trends in enucleation versus evisceration over a 23-year period.
Study Design: Retrospective consecutive case series of patients undergoing enucleation or evisceration at our institution.
Methods: Ethics approval was obtained from the University of Alberta Health Research Ethics board. An electronic database containing all operative slates for all ophthalmic surgeries performed at the Royal Alexandra Hospital in Edmonton, Canada, was searched for records of all enucleations or eviscerations performed between January 1994 and December 2016. A total of 786 cases were identified. Basic demographic information, including gender, date of birth, operative date and laterality were recorded. Archived hospital charts were accessed and reviewed for clinical and histopathological diagnoses as well as the type of implant used. Univariate and multivariate logistic regression analysis was performed to determine which variables were associated with enucleation vs evisceration and to calculate corresponding odds ratios. The study cohort was divided into two time periods by separating the first 10 years of the study period (1994- 2004 inclusive) from the rest of the study time period (2005-2016 inclusive).
Results: A total of 786 patients with a mean age (±SD) of 52 years ± 23 years were included. The most common clinical diagnosis was blind painful eye (56%) followed by intraocular tumor (23%). Corresponding pathological examination of specimens revealed chronic inflammatory change (46%) and intraocular tumor (25%). Eyes with active infection were more likely to be eviscerated (OR: 4.67; $p<0.001$) when compared to other diagnostic groups, and all eyes diagnosed with intraocular tumors were enucleated. While most eyes in the study were enucleated, the proportion of eyes eviscerated increased over the study period ($p=0.010$) from 8% between 1994-2004 to 14% between 2005-2016.
Conclusions: While enucleation was performed more commonly overall, the incidence of evisceration increased throughout the study period. The proportion of patients that underwent evisceration was the highest in cases of infection and in older patients. In our series, there were no instances of occult intraocular tumor in patients who were eviscerated, suggesting that in cases where careful pre-operative ultrasonography is performed by a skilled physician, evisceration may be a safe option for eye removal.

Title: Increased dacryocystorhinostomy (DCR) failure in patients with gastro-esophageal reflux disease (GERD) and primary acquired nasolacrimal duct obstruction (PANDO).

Authors: Nirojini Sivachandran, Ahsen Hussain, John Harvey

Abstract Body:

Purpose: To determine whether patients with primary acquired nasolacrimal duct obstruction (PANDO) undergoing repeat dacryocystorhinostomy (DCR) are more likely to have co-morbid gastroesophageal reflux disease (GERD).
Study Design: Retrospective chart review and phone interview. Patients who had failed primary DCR surgery (defined as continued symptoms, a blocked tear duct on syringing in clinic postoperatively and repeat surgery).
Methods: A list of patients who had DCR surgery over a 10-year period from 2006 to 2016 was acquired. Charts were reviewed to identify patients who had failed DCR surgery and for any past medical history of treated or untreated GERD. Patients were contacted by telephone to identify whether patients had undiagnosed/unreported GERD by use of the validated Reflux Disease Questionnaire (RDQ). Anyone with a past medical history of GERD or on medications for acid repression or RDQ score >15 were considered to have GERD.
Results: There were 58 of the 509 patients who underwent repeat DCR surgeries. Of these 58 only 46 met the study criteria. Of these 46 our phone response rate was only 63.0%, and the remainder of the patients had retrospective chart review. Though not statistically significant more patients with GERD failed DCR compared to those without GERD, 34.7% and 26.7% respectively. However, patients with PANDO and GERD were 2.3x more likely to fail DCR surgery than patients without PANDO and GERD, 24.0% vs. 10.7%, $p < 0.05$.
Conclusions: The pathogenesis of PANDO is poorly understood and GERD has been postulated to play a role. Patients with PANDO and GERD are 2.3x more likely to fail DCR surgery.

Title: Non-loading surgical techniques for the treatment of paralytic lagophthalmos

Authors: Ran Stein, Patrick R. Boulos

Abstract Body:

Purpose: Facial nerve paralysis leads to dysfunction of the orbicularis oculi muscle, which interferes with eyelid closure, and cause retraction of both upper and lower eyelids. These lead to exposure keratitis with risk of corneal infection and ulceration. When supportive lubricating treatment fails to maintain an adequate moisture status, the most acceptable surgical methods for the upper eyelid are through lid loading techniques with either gold or platinum implants. However, these carry substantial complication rates, and sometimes also disturbing eyelid appearance. Treatment of upper eyelid retraction with mullerectomy or blepharotomy and raising of the lower eyelid with procedures such as a hard palate graft can reduce lagophthalmos sufficiently to obviate the need for an upper eyelid load. The purpose of this study is to evaluate non-loading techniques for the treatment of paralytic lagophthalmos.
Study Design: Retrospective case series
Methods: Data extraction of all the cases of paralytic lagopthalmos where treatment included either mullerectomy or blepharotomy at Hôpital Maisonneuve-Rosemont performed by a single surgeon (P.B.) between the years 2013-2016. Parameters obtained were patients age, affected side, etiology for nerve paralysis, upper eyelid position and lagophthalmos, and signs of corneal exposure. Also noted were other surgical procedures performed, complications, and the need for consecutive surgeries.
Results: Total of 6 cases of paralytic lagophthalmos, either primary (congenital or acquired, one case each) or secondary (2 cases of schwannoma, 1 following parotidectomy, 1 following trauma) were treated surgically by blepharotomy (1 case) or mullerectomy (5 cases). All patients were noted to exhibit good Bell's phenomenon. All patients went through surgical procedures addressing the lower eyelid position in order to further reduce lagophthalmos (lateral tarsal strip, palate graft, tarsorrhaphy, medial spindle). Mean lagophthalmos before the surgery measured 7.5 mm (range 4-11 mm). Follow-up ranged between two weeks and fourteen months. Improvement in lagophthalmos was seen in all patients (mean 4 mm, range 0-7.5). One patient required further interventions to both upper and lower eyelid. The upper eyelid position and contour was good in all patients. In the blepharotomy case, an intra-operative ptosis was observed and repaired. No other complications were seen.
Conclusions: The treatment of paralytic lagophthalmos should be tailored to each patient and may include several surgical procedures. Treating the upper eyelid using non-loading surgical techniques should be considered in paralytic lagophthalmos patients, as they provide good esthetic and functional outcomes, without the disadvantages of gold or platinum weights.

PEDIATRIC OPHTHALMOLOGY AND STRABISMUS
L'OPHTALMOLOGIE PÉDIATRIQUE ET STRABISME

Title: Surgical management in the treatment of heavy eye syndrome: Success of myopexia alone without surgery for the medial rectus

Authors: Helya Aghazadeh, Gina Naranjo, Bradley Wakeman, Carlos Solarte

Abstract Body:

Purpose: Esotropia and Hypotropia associated with high myopia is called Heavy eye syndrome (HES), also known as myopic strabismus fixus. In recent years, myopexy and its variations (loop myopexia, lateral rectus repositioning) have become excellent of choice in the surgical management of Heavy eye syndrome. Given the increasing use of these techniques in the treatment of HES, our study aims to evaluate the efficacy of myopexy alone with no intervention with regards to extraocular muscle insertion in the treatment of HES.
Study Design: This study is a retrospective cohort series following patients diagnosed and treated for Heavy eye syndrome at a major tertiary pediatric ophthalmology practice in Edmonton, Alberta, Canada, between 2009 and 2017. REB Approval was obtained prior to evaluation of charts.
Methods: Patient charts with clinical features of high myopia associated with esotropia and hypotropia, as well as MRI or CT findings characteristic of Heavy eye syndrome were identified and extracted. This process yielded nine patients and 15 eyes that met inclusion criteria. Data collected in this study includes age, sex, pre-operative and post-operative eye alignment, pre-operative refraction, limitation of abduction and elevation pre and post-operatively. Means and 95% confidence intervals were calculated for each variable. Statistical analyses of patient data were conducted using paired T-test analysis for comparison of groups.
Results: The majority of HES eyes which underwent surgical correction were treated with myopexy (64%), followed by loop myopexy (21%), and repositioning of the lateral rectus (14%). These procedures corrected a mean of 27.6 prism diopters in the horizontal plane (2.62 SD, 20.29 -30.90 CI) and 5.6 prism diopters of hypotropia in the vertical plane (6.11 SD, -7.98 -1.21 CI). Of these cases, post-operative surgical correction in the vertical (p-value 0.0113) and horizontal (p-value <0.0001) plane were found to be statistically significant comparing pre and post-operative measurements. There is also improvement in the limitation of elevation (p-value 0.0263). A minority of patients (26%) were found to be over-corrected following surgery. Post-operative complications associated with overcorrection occurred primarily in the vertical direction.
Conclusions: Myopexy was found to be the most commonly used surgical method for correction of strabismus associated with HES. Myopexia is shown to be effective in decreasing the degree of deviation in both the horizontal and vertical directions. Post-surgical overcorrection was the primary complication of surgical management and occurred mostly in the vertical direction with limitation in depression following the procedure.

Title: Diagnostic occlusion test for acquired esotropia

Authors: Alaa AlAli, Sadik T. Sherief, Katelyn MacNeill, Kim Quann, Michael J. Wan, David R. Smith

Abstract Body:

Purpose: To measure the primary strabismic deviation accurately, fixation and accommodation must be controlled and all fusional divergence must be eliminated. The 45- minutes diagnostic occlusion test (DOT) is one of the key test that is used to assess the full degree of deviation in intermittent exotropia. This test is not considered as part of the work-up for patients with acquired esotropia. About 20% of children with acquired esotropia have unstable ocular alignment over time. In this study we aim to assess the change in measured esodeviation after a 45- minutes DOT in patients with acquired esodeviations.
Study Design: Prospective interventional study
Methods: We conducted a prospective interventional study with a total of 67 participants with acquired esotropia. Two orthoptists (KN and KQ) measured the angle of deviation with prism and alternating cover test at far and near target before and after 45 minutes. 37 participants where assigned to patch group (one eye patched for 45 minutes) and 30 participants where assigned to the control group (participants waited for 45 minutes with no patch, and then one eye is patched just before the patient was assessed by one of the blinded orthoptist; KN or KQ). Independent T-test was used to determine the strabismus angle difference between the 2 groups.
Results: Out of the 67 patients enrolled, 42% were males and 58% were females. The average age of the participants was 9 years of age (range 3-17 years old). 37.3% had a diagnosis of accommodative esotropia compared to 62.7% who were diagnosed with partially accommodative esotropia. 33% of patients in the patching group showed a significant change in the amount of measured esotropia after the DOT. On the other hand, none of participants assigned to the control showed a significant change in the amount of measured esotropia.
Conclusions: This study demonstrated that DOT can be applied clinically for acquired esotopia for accurate measurement of angle of deviation. Performing DOT in acquired esodeviations may help to reveal the full deviation and ultimately decrease the risk of surgical undercorrection. On average there may be 0.5-1.0 mm change in the amount of recti muscle recesssion or resection if a surgical plan is initiated.

Title: Infantile exotropia: Clinical effect of surgical timing

Authors: Mansoureh Bagheri, Majid Farvardin

Abstract Body:

Purpose: Controversy exists about the proper time of surgery for infantile exotropia (XT). The aim of this study was to review the degree of postoperative ocular alignment, sensory outcomes, and need for re-operation after surgical managements of infantile XT.
Study Design: Observational retrospective case series
Methods: We reviewed clinical records of 49 patients with constant infantile XT> 25 Δ, who underwent strabismus surgery in a tertiary referral university center between 2004 and 2014. The study was approved by the local Ethics Committee and was compliant with the principles of the Declaration of Helsinki revised in October 2008. Minimum follow up duration after surgery was 2 years. Post-operative binocular sensory status was assessed using Worth 4-dot and Titmus stereoacuity tests. Corrective surgery was offered to patients with more than 10 Δ XT or 5 Δ esotropia (ET) after first operation.
Results: Performing surgery at a younger age led to more need for corrective surgery (P= 0.005). Patients who developed consecutive ET had lower age at the time of initial surgery (P= 0.039). Among 20 patients who were testable for sensory outcome assessment, only 4 patients developed stereopsis while 15 patients achieved bifixation in Worth 4-dot test. All of the 4 patients who had post-operative measurable stereoacuity had initial surgery after the age of one.
Conclusions: Our results suggest that earlier surgery does not necessarily lead to better sensory outcomes and it may also result in more need for corrective surgery.

Title: Neurodevelopmental outcomes in infants with retinopathy of prematurity treated with bevacizumab versus laser

Authors: Maram Isaac, Kamini Raghuram, Alaa AlAli, Kamiar Mireskandari, Prakesh S. Shah, Nasrin Tehrani

Abstract Body:

Purpose: To compare neurodevelopmental outcomes at 18-24 months corrected age (CA) in preterm infants treated with intravitreal bevacizumab injection (IVB) to those treated with conventional laser ablation.
Study Design: Retrospective cohort study.
Methods: We included all infants treated for retinopathy of prematurity (ROP) between April 2009 and June 2015. Infants who died before neurodevelopmental assessment, infants with major congenital or chromosomal anomalies, and those with no follow-up data available were excluded. We also excluded infants who were treated for compassionate reasons and who received both IVB and laser. Baseline characteristics were extracted by directly reviewing patients' charts and from both the Canadian Neonatal Network (CNN) and the Canadian Neonatal Follow-up Network (CNFUN) databases. Maternal and neonatal characteristics and neonatal comorbidities were collected. The primary outcome is moderate-severe neurodevelopmental impairment (NDI), evaluated at 18-24 months corrected age. Bayley Scales of Infant Development, Third Edition (BSID III), were used for the assessment of NDI. Baseline ROP parameters, treatment modality and postmenstrual age at treatment were collected. Secondary neurodevelopmental outcomes included the presence or absence of cerebral palsy, bilateral visual loss and hearing loss requiring amplification. Secondary ROP outcomes included structural, visual and refraction outcomes as defined by the ETROP at 24±6 months CA. Descriptive statistics, Pearson Chi-square or Fisher exact test were used for categorical variables and Student t-test and ANOVA F-test were used for continuous variables. Odds ratio for moderate to severe NDI was calculated for both groups.
Results: Eighty-eight infants were treated for ROP during the study period. Fifty-six infants met inclusion criteria (29 IVB and 27 laser-treated). Neurodevelopmental assessment at this time was available for 21 and 16 infants treated with IVB and laser, respectively. 72.4% and 59.3% of all treated IVB and laser infants, respectively, had moderate to severe NDI (OR 1.8, 95% CI 0.59, 5.53, p=0.3). Mean visual acuity was 0.41±0.26 and 0.45±0.44 for the IVB and laser groups respectively (p=0.65). Mean spherical equivalent was -3.23±5.15 and -4.62±5.76 for the IVB and laser groups, respectively (p=0.23). All treated infants in both groups had favorable structural outcomes.
Conclusions: Preliminary results from this study show similar neurodevelopmental outcomes in patients treated with IVB and laser. The results of our study are particularly relevant in light of increasing use of anti-VEGF agents in the treatment of severe ROP.

Title: Safety of intracameral moxifloxacin prophylaxis in pediatric lens related surgeries

Authors: Sina Khalili, Ahed Imtirat, Sara Williams, Asim Ali, Nasrin Tehrani, Kamiar Mireskandari

Abstract Body:

Purpose: The general safety of intracameral (IC) moxifloxacin (Vigamox™) prophylaxis for endophthalmitis after cataract surgeries in adults has been shown in several studies. Herein, we aim to investigate the safety of IC moxifloxacin prophylaxis in pediatric lens related surgeries.
Study Design: Retrospective study
Methods: All consecutive patients undergoing lens related surgery between January 2014 and December 2016 were reviewed. Patients with pre-existing diagnosis of uveitis, glaucoma or other ocular comorbidity other than cataract were excluded. The intraocular pressure (IOP), central corneal thickness (CCT), endothelial cell density (ECD), corneal edema, anterior chamber (A/C) cell/flare activity, and best corrected visual acuity (BCVA) before and after surgery were collected.
Results: We included 181 eyes undergoing lens related surgeries in 122 patients. In 141 surgeries IC moxifloxacin was used (IC-Mox), while subconjunctival antibiotics were used in 40 eyes (Subconj-AB). The average age at the time of surgery was 59.3 and 82.2 months respectively in IC-Mox and Subconj-AB groups. The pre-operative CCT, ECD, and BCVA were not statistically different between groups (p=0.35, 0.34, and 0.8 respectively). The pre-op IOP was notably higher in group 2 (15.6 vs. 13.1mmHg; p=0.0005). Mean follow-up was 21 months in both groups. No post-operative complications such as endophthalmitis, retinal detachment, anterior uveitis or glaucoma were noted in either group. Comparison of post-operative IOP, CCT, ECD, corneal edema, A/C flare activity and BCVA was not statistically significant (p=0.07, 0.6, 0.07, 0.06, 0.3 and 0.7, respectively). The A/C cell activity at its highest value in the first 6 weeks after surgery was significantly higher in the Subconj-AB group compared to that of the IC-Mox group (p=0.007).
Conclusions: The use of IC Moxifloxacin prophylaxis in pediatric patients did not show any post-operative adverse event on IOP, CCT, ECD, corneal edema, A/C flare when compared to subconjunctival antibiotics. No adverse outcomes were recorded at 21 months follow up. We believe that IC moxifloxacin is safe in pediatric population.

Title: Electroretinographic and optical coherence tomographic characteristics of mucopolysaccharidosis type I Hurler and I Hurler-Scheie

Authors: Stephanie N. Kletke, Ajoy Vincent, Tom Wright, Eoghan Millar, Asim Ali

Abstract Body:

Purpose: To describe the clinical, full-field electroretinography (ERG) and spectral-domain optical coherence tomography (SD-OCT) findings in mucopolysaccharidosis (MPS) type I.
Study Design: Retrospective cohort study.
Methods: This study was approved by the SickKids Research Ethics Board. Fourteen children (50% female) with MPS I Hurler (I-H, n=11) and Hurler-Scheie (I-H/S, n=3) who had ERG and SD-OCT were identified. Clinical features, genetic analysis, ERG and fundus photography were retrospectively reviewed. Segmentation analysis was performed using Iowa reference algorithms on both macular cube scans and high definition 5-line raster scans of Cirrus SD-OCT. The external limiting membrane (ELM) thickness at the foveal centre was measured manually by drawing a line perpendicular to the retinal pigment epithelium (RPE) that passed through the central fovea.
Results: Diagnosis was confirmed by IDUA mutational analysis (n=9) or alpha-L-iduronidase deficiency (n=5). Children with MPS I-H had hematopoietic stem cell transplant (mean age 1.22 years) and I-H/S received enzyme replacement (mean age 4.69 years). All children had diffuse ground glass stromal opacities, 9 requiring deep anterior lamellar keratoplasty. At the initial ERG (mean 10.10 years, range: 1.58 - 17.92), mean visual acuity was 0.70 logMAR (range: 0.3 - 1.6) and mean cycloplegic spherical equivalent was +1.79 D (range: -25.00 to +8.75). Mean initial standard flash b/a ratio was 1.13 (range: 0.37-3.58). Eleven cases (79%) had at least one electronegative ERG. Four children had maculopathy, but none showed peripheral pigmentary retinopathy. SD-OCT demonstrated central macular ELM thickening in all cases. Mean foveal ELM thickness was 34.41 μm (range: 14.20-53.11).
Conclusions: Despite systemic therapy, micro-structural and functional retinal changes are uniformly seen in MPS I prior to clinically apparent retinal changes. Central macular ELM thickening may reflect glycosaminoglycan deposition detected histopathologically or be due to secondary changes in Müller cells in MPS. The presence of an electronegative ERG represents a post-transductional abnormality, which could be explained by ELM thickening.

Title: A randomized clustered clinical trial to assess the efficacy of vision screening in children aged 3-6 years

Authors: Mayu Nishimura, Daphne Maurer, Agnes Wong

Abstract Body:

Purpose: To conduct a randomized clustered clinical trial to assess the efficacy of vision screening to detect vision problems in children aged 3-6 years.
Study Design: 24 kindergarten classrooms (mean = 30.1 children per classroom) were randomly assigned to "Early" vs. "Late" screening. The primary measure was the number of children wearing glasses in Early classrooms (i.e. after intervention) versus in Late classrooms (i.e. before intervention). The secondary measure was the presence of vision problems, such as amblyopia, amblyopia risk factors (e.g. strabismus), and clinically significant refractive errors, as determined by gold standard eye examinations, against which the screening results were tested.
Methods: Five screening tools were used: Cambridge Crowded Acuity Cards, Preschool Randot Stereoacuity test, Plusoptix and Spot autorefractors, and the Pediatric Vision Scanner, a new device that assesses binocular fixation. Children in Early classrooms were screened at the beginning of the year. Those failing any one of the screening tools were given a gold standard eye examination and fitted with glasses if needed. Children in the Late group were screened near the end of the year. Glasses counts were compared between classrooms in Early versus Late screening groups. To test the accuracy of the screening tools, all remaining children (i.e. Early group children who passed screening and all Late group children) received gold standard eye examinations. The study protocol was approved by SickKids and McMaster REB and followed the tenets of the Declaration of Helsinki.
Results: The odds of children wearing glasses at the end of the year in Early classrooms was 9.29 (95% CI: 3.7-31.16) times those in the Late group. Comparison of the screening results to the gold standard eye examinations (n= 712) showed that sensitivity was 84% (95% CI: 78-89, based on bootstrapping) and specificity was 48% (95% CI: 44-53). For children in senior kindergarten (mean age = 68.2 months), sensitivity was 91% (95% CI: 81-96) and specificity was 58% (95% CI: 51-65); for children in junior kindergarten (mean age = 55.6 months), sensitivity was 80% (95% CI: 72-87) and specificity was 42% (95% CI: 37-48). Overall, the screening protocol detected 180 children with vision problems (80.2% of amblyopia and risk factors; 90.1% of refractive errors).
Conclusions: Vision screening was more effective than "care as usual" in identifying children in need of glasses; it also detected most cases of amblyopia and amblyopia risk factors.

Title: Pars plana vitrectomy and endoresection for retinoblastoma recalcitrant to focal and systemic therapy in an only remaining eye

Authors: Kelsey A. Roelofs, Sameh Soliman, Brenda Gallie, Junyang Zhao, Oiyan Li, Songyi Wu, Liwen Jin, Kahaki Kimani

Abstract Body:

Purpose: To describe a case of recalcitrant retinoblastoma in an only remaining eye managed with careful pars plana vitrectomy (PPV), endoresection, and silicone oil tamponade.
Study Design: Case report
Methods: The clinical course of child with retinoblastoma from Kenya was reviewed.
Results: In July 2013, a 4-month old female in Nairobi, Kenya, was diagnosed with bilateral retinoblastoma. Her right eye underwent prompt enucleation. Pathological examination identified massive choroidal invasion with optic nerve involvement past the lamina cribosa but not extending to the transected portion of the nerve (pT3a). The child received 6 cycles of systemic chemotherapy following the vincristine - etoposide - carboplatin (VEC) protocol and the remaining left eye was concurrently treated with laser 8 times between August 2013 and December 2014. In June 2015, florid intraocular tumour recurrence was noted and the child was re-started on systemic chemotherapy. She subsequently received 6 additional cycles of VEC between June and September 2015. There was a poor response to chemotherapy, and enucleation of the remaining left eye was the only option left. Because endoresection by PPV was available in China, the child was referred to QuanZhou Children's Hospital for a second opinion, and in January 2016, the team proceeded with PPV, endolaser to reinforce the barrier laser and endoresection of the tumor base. Intraoperatively, melphalan 5μg/ml was used in the irrigation fluid. Silicone oil was injected. Incision ports were closed with 6-0 absorbable sutures and 0.2 ml melphalan (5 μg, 25 μg/ml) was injected subconjunctivally at the three port sites. In April, 2016 the silicone oil was removed and at most recent follow up in November 2017, the eye is stable, and the child is systemically well with 6/6 vision in her only remaining eye.
Conclusions: Retinoblastoma treatment prioritizes first and foremost, saving the child's life, second salvaging the eye and finally, optimizing vision. Following the success and safety of intravitreal chemotherapy, PPV and endoresection for selected eyes with tumor recalcitrant to any conventional therapy, may be useful in only remaining eyes.

Title: The use of telemedicine in the diagnosis of ocular health condition in the paediatric population

Author: Kourosh Sabri

Abstract Body:

Purpose: The research project aims to study the feasibility and accuracy of telemedicine for interpreting eye examinations, diagnosing amblyopia and its causes, as well as helping identify neurosurgical emergencies through the diagnosis of pupil abnormalities and paralytic strabismus in children under the age of 7 years.
Study Design: The first phase of this project involves assessing the inter-observer variability between four eye care professionals when performing eye examinations on 27 children. Phase 2 involves a direct eye examination of 160 children by an ophthalmologist, which is videotaped. The video of the eye examination is then watched by the remaining 3 eye care professionals to assess the level of agreement and accuracy of diagnosis using telemedicine.
Methods: All four eye care professionals in phase 1 examine the same child directly and perform a set of standard eye tests to reach a diagnosis. In phase 2, one eye care professional performs a direct eye examination on a child. This is video-taped and shown to the remaining three eye care professionals.
Results: We assessed the level of agreement of diagnosis between all four eye care professionals in phase 1 as 92%. The level of agreement for phase 2 is tentatively high.
Conclusions: The potential impact of the study results in terms of offering a new and innovative way of timely diagnosis and hence treatment of amblyogenic eye disease as well as diagnosing cranial nerve palsies in children is significant. It can help reduce the prevalence of individuals with unilateral or bilateral chronic visual impairment for life as well as allowing for expedition of urgent neurosurgical referrals requiring neuroimaging. With individuals in rural, remote and isolated areas having increased difficulty accessing secondary and tertiary health care services in larger centres and a lack of physicians working in remote communities, it is important to further research the use of tools such as telemedicine to maximize health care to the public.

Title: Impact of early post natal weight gain on retinopathy of prematurity in very pre-term infants in South-Western Ontario

Authors: Sapna Sharan, Yingxiang Li, Michael Miller, David Lee

Abstract Body:

Purpose: Our aim was to examine the relationship between postnatal weight gain and development of any stage of ROP among preterm infants in South-Western Ontario.
Study Design: Retrospective chart review of medical records of 431 preterm infants born between January 1, 2008 and June 1, 2015 with gestational age (GA) at birth under 31 weeks or birth weight (BW) and under 1250 grams at Victoria Hospital at London Health Sciences Centre, London ON.
Methods: Neonatal characteristics, ROP status, comorbidities, postnatal weight measurements were collected and compared using analysis of variance. Weight was collected at birth; days 7, 14, 21, 28, 42 of life; first day of full enteral feeding (FEF); and discharge/transfer. Multivariable regression analysis was used to compare time durations and weight velocities while controlling confounding variables.
Results: Slow weight gain from day 7 to day 28 ($p<0.001$), higher weight change from birth to full enteral feeding (FEF) ($p<0.001$), a longer duration from birth to FEF ($p<0.001$), and longer duration from FEF to discharge/transfer ($p<0.001$) were associated with severe ROP. In logistic regression analysis adjusting for GA, bronchopulmonary dysplasia, and surgical ligation for patent ductus arteriosus, only duration from FEF to discharge/transfer was an independent risk factor of ROP ($p<0.05$).
Conclusions: Slow weight gain from day 7 to day 28 and long duration from birth to FEF may be useful additional predictors for the development of ROP but is dependent on GA. A delay to reach FEF appears to be a risk factor for ROP that is independent of GA and BW, and may also be associated with other co-morbidities.

Title: Morning glory disc anomaly in children: Optical coherence tomography as a prognostic and management tool

Authors: Stephanie Sobey, Aaron Chan, Kamiar Mireskandari

Abstract Body:

Purpose: To investigate the utility of Optical Coherence Tomography (OCT) as a prognostic screening tool in children with Morning Glory Disc Anomaly (MGDA) through the correlation of macular OCT findings with visual acuity outcomes.
Study Design: A retrospective, observational case series of MGDA patients over a 17-year period (January 1st, 2000 to June 1st, 2017) at the Hospital for Sick Children.
Methods: Approval from our institutional Research Ethics Board was obtained. A database search was performed for all patients diagnosed with MGDA. Inclusion criteria were a) confirmed MGDA diagnosis using fundus photos, b) having a high-quality macular OCT, c) reliable visual acuity measurement, and d) no history of retinal detachment. Visual acuity was then compared to the level of foveal involvement observed on macular OCT.
Results: Five patients (six eyes) met our inclusion criteria. Visual acuities ranged from 20/20 to light perception (LP). Macular OCT revealed a spectrum of foveal involvement correlating with the level of visual acuity (20/20, 20/32, 20/80, 20/160, 20/300, and LP). The fovea was completely unaffected with 20/20 acuity. There was progressively greater involvement of the outer retinal layer by the MGDA excavation for each level of reducing acuity until no fovea could be identified with LP vision.
Conclusions: In congenital ocular abnormalities, it can be difficult to predict visual outcomes, and occlusion therapy is often attempted to optimize visual outcomes in cases of suspected amblyopia. We propose the use of OCT as a prognostic indicator to guide amblyopia treatment since anatomical integrity of the fovea correlates with visual outcomes rather than the diagnosis of MGDA itself.

🎖 Third Prize, COS Awards for Excellence in Ophthalmic Research 🎖

Title: The use of eyemasks for reducing neonatal stress following dilated retinal examination

Authors: Andrei-Alexandru Szigiato, Mathew F. Speckert, Jeanne Zielonka, Kathleen Hollamby, Mary Debono, Filiberto Altomare, Eugene Ng, Rosane Nisenbaum, Michael Sgro

Abstract Body:

Purpose: Dilated retinal examination is routinely performed for low birthweight, preterm infants at risk of developing retinopathy of prematurity (ROP). While these examinations help prevent blindness, they can be physiologically stressful for infants. Changes in oxygen saturation, blood pressure and heart rate occur during the exam and increased apneic episodes have been reported the 24h-48hs afterward. We postulate that photosensitivity during mydriasis contributes to exam stress and that reducing light stimulation with a phototherapy mask can make infants more comfortable.
Study Design: Multi-centre randomized clinical study.
Methods: After informed consent was obtained, infants with a birthweight <1500g or gestational age of ≤32 weeks scheduled for their first ROP screening were randomized to receive either routine care or a phototherapy mask during pupil dilation in addition to routine care, worn for a minimum of 4hrs. Dilated retinal exams were performed by retinal surgeons and fellows. The primary outcome was the frequency of any desaturation, bradycardic event, or apneic event 12 hours following the examination, compared to baseline. Heart rate, respiratory rate and oxygen saturation were also recorded for 4 hours following the examination.
Results: A total of 51 infants were examined; 28 randomized to the masked group and 23 to the control group. 10 and 13 infants were on ventilator support at the time of examination in each group, respectively. There was a 57.7% decrease in all stressful events in the masked group compared to controls in the 12 hour post-exam period (Rate Ratio=0.42, 95% CI 0.2-0.9, P=0.024). There was a 61.3% decrease in bradycardic events in the masked group compared to controls (RR=0.39, 95% CI 0.2-1.0, P=0.042). Heart rate was higher in both groups after the exam (Mean HR: 164.67 bpm post vs 157.3 bpm pre; P=0.04), with no difference in between groups (Effect by group P=0.31). There was no significant difference seen in either group in respiratory rate or oxygen saturation at 2 or 4 hours after the ROP examination. Risk factors associated with increased stress included younger gestational age (RR=1.32 95%CI [1.2-1.5] per week), lower birthweight (RR=1.39 [1.2-1.5] per 100g), ventilator support around the time of exam (RR=2.67 [1.3-5.6]), intraventricular hemorrhage (RR=3.78 [1.9-7.3]), and hyponatremia (RR=3.42 [1.8-6.6]). No adverse events occurred while using eye masks.
Conclusions: Infants who wore a phototherapy mask during pupillary dilation had lower rates of stressful episodes following dilated retinal examination, particularly lower episodes of bradycardia.

RETINA | RÉTINE

Title: Multifocal electroretinographic changes after cessation of Plaquenil therapy for suspected toxicity

Authors: Beatrice Adamptey, Chris Rudnisky, Ian M. MacDonald

Abstract Body:

Purpose: To describe multifocal electroretinogram (mfERG) changes among patients suspected to show hydroxychloroquine (Plaquenil) toxicity and their outcomes after discontinuation of Plaquenil therapy.
Study Design: A retrospective case series of 14 patients followed with mfERG testing as part of a screening program for monitoring Plaquenil therapy.
Methods: Multifocal ERG charts of six hundred patients screened for Plaquenil retinopathy at the Eye Institute of Alberta, Edmonton, were reviewed. Patients with abnormal mfERG test results, defined as elevated ring 1/3 ratio above the upper limit of the 95% confidence interval of age normative range or reduced ring 1, 2, 3 amplitudes below the lower limit of the 95% confidence interval of age normative data with or without delayed implicit time, were identified. Their ERG results were correlated with spectral domain optical coherence tomography and Humphrey 10-2 automated visual field data, when data was available. Patients who discontinued therapy as a result of screening were identified; multifocal ERGs were recorded at 6 month intervals over a period of three years.
Results: Fifty patients were identified as having abnormal mfERGs: 14 of these patients discontinued therapy. Nine of the 14 patients who discontinued therapy experienced reversal of the abnormal mfERG findings (improved ring 1, 2, 3 amplitudes and ring 1/3 ratio to normative data) within six months of cessation. Progression of the abnormal mfERG findings (further reduction in ring amplitudes) was observed in four patients while one patient experienced neither progression nor reversal of the abnormal mfERG result. Patients who experienced progression of the mfERG findings had advanced disease (depressed ring amplitudes with rings 1, 2, 3 amplitudes reduced by 80% of age normative data) and delayed implicit times. Although there were no statistically significant differences ($p>0.05$) between the two groups in terms of their clinical characteristics such as daily drug dose per body weight, duration of therapy, cumulative drug dose and age, the mean of these characteristics was higher for patients with progression than those with reversal of abnormal findings, with a 14.3 ± 4.6 mean years of therapy, 6.3 ± 2 mg daily drug dose per kilogram, and a mean age of 65.5 ± 3.4 years.
Conclusions: Hydroxychloroquine retinopathy, when detected before severe depression by multifocal electroretinography, may be reversed; however, the possibility of reversal is unlikely in advanced disease. Cases that experience reversal of toxicity do so within six months of cessation.

Title: Sequential pneumatic retinopexies for the treatment of primary inferior rhegmatougenous retinal detachments with inferior breaks

Authors: Alaa AlAli, Serge Bourgault, Roxane J. Hillier, Rajeev H. Muni, Peter J. Kertes

Abstract Body:

Purpose: To evaluate a new approach of sequential pneumatic retinopexies for the management of inferior rhegmatogenous retinal detachments with inferior breaks.
Study Design: A multi-centre retrospective non-comparative consecutive case series
Methods: Multicenter consecutive case series of inferior retinal detachments caused by retinal breaks located within the inferior 4 clock hours treated with sequential pneumatic retinopexies, 24 to 48 hours apart. A total of 30 patients with inferior retinal detachments secondary to one or more breaks between the 4 o'clock-8 o'clock meridians were included from September 2007 to February 2012.
Results: The mean follow-up duration was 30.9 weeks. Anatomic success at 8 weeks was achieved in 63.3% of patients. The mean visual acuity improved from 20/225 at baseline to 20/58 at last follow-up (p=0.002).
Conclusions: Sequential pneumatic retinopexy offers a new viable surgical option for the treatment of retinal detachments with inferior breaks.

Title: Ruthenium-106 for Medium size Choroidal Melanoma

Author: Tahra AlMahmoud

Abstract Body:

Purpose: To report on treatment outcomes for medium size choroidal melanoma treated with Ruthenium-106 (Ru-106) plaque brachytherapy.
Study Design: A retrospective case series of twenty-eight patients received Ruthenium-106 brachytherapy treatment for choroidal melanoma.
Methods: The Kaplan-Meier method was used to estimate the proportion of patients who were regression-free from the date of Ru-106 plaque insertion. Cox proportional hazards regression was used to investigate for prognostic factors of time to regression. Logistic regression was used to investigate for factors prognostic of visual acuity at 1 year.
Results: Median follow-up was 31.2 months. At twelve and twenty-four-months post-irradiation, the best corrected visual acuity equal to or greater than ≥ 20/70 (LogMar ≥ -0.54) was 53.8% and 64.2%, respectively. Median time to tumour regression was estimated to be 10 months (95% CI = 9-18 months), with 100% of response rate by 32 months. Radiation-induced side effects were limited and there were no post-radiation enucleations.
Conclusions: The majority of patients maintained good visual acuity, with no enucleations and minimal side effects. In this cohort the Ruthenium-106 plaque brachytherapy proved to be an efficacious and safe treatment option for patients with medium size choroidal melanomas with a maximal tumor height of 5 mm.

Title: Prevalence of obstructive sleep apnea in patients with retinal vein occlusion

Authors: Michael H. Brent, Tina Felfeli, Efrem D. Mandelcorn, Colin Shapiro, Roy Alon

Abstract Body:

Purpose: Retinal Vein Occlusion (RVO) is one of the most common sight threatening retinal vascular disorders. Recent publications have suggested an association between Obstructive Sleep Apnea (OSA) and retinal vein occlusion. It is commonly known that patients with RVO exhibit symptoms of visual loss upon awakening, which alludes to the possibility that nocturnal events contribute to its pathogenesis. The purpose of this study is to investigate the prevalence of OSA in patients with RVO, in the Retina Service at the Donald K Johnson Eye Institute at the University Health Network, Toronto.
Study Design: Prospective cross sectional study.
Methods: Research Ethics Board (REB) approval has been granted. Patients with RVO, diagnosed clinically, and confirmed with intravenous fluorescein angiography, will be recruited. The patients will have to answer two standard questionnaires used to screen for OSA (Berlin questionnaire+ STOP BANG questionnaire), their answers will be scored and recorded, and all patients will be sent for a sleep test at a certified sleep lab. The prevalence of OSA in RVO patients will be calculated, and the ability of each questionnaire to accurately detect OSA will be determined. A sub group analysis will be performed to assess for possible differences between patients with central retinal vein occlusion vs. branch retinal vein occlusion. Patients with positive results for OSA, will be offered the appropriate treatment with a sleep apnea specialist.
Results: 27 patients have been enrolled in the study to date (14 with CRVO/HRVO and 13 with BRVO). All patients enrolled in the study completed the two questionnaires. Of 14 patients that have completed their sleep test, three were found to have severe OSA, eight had moderate OSA, and three patients had mild OSA. According to our current findings, the prevalence of OSA in RVO patients is 100%. Our findings showed that the STOP BANG questionnaire has a sensitivity of 79%, and the Berlin questionnaire has a sensitivity of 43% for detecting OSA. Of the 14 patients who have had a sleep test, eight have subsequently been treated for OSA with Continuous positive air pressure machine (CPAP) and six are scheduled for a sleep specialist assessment.
Conclusions: Based on the results to date, the prevalence of OSA in RVO patients appears to be high.

Title: Changing the paradigm of retinal treatment through drug delivery

Authors: Varun Chaudhary, Ben Muirhead, Heather Sheardown

Abstract Body:

Purpose: To assess three novel drug delivery vehicles for therapeutic retinal injections.
Study Design: Basic science
Methods: Three techniques of delivering retinal therapeutic injections were assessed in vitro and in vivo. All were injectable and gelled in the eye following injection, although different gelation mechanism was used in each. A temperature responsive gel which is a liquid at room temperature, but gels in response to exposure to physiologic temperatures. These systems have been shown to degrade over a period of 9-12 weeks in vivo. Secondly, a poly(ethylene glycol) (PEG) based system has been developed which gels via a chemically mediated mechanism. In these systems, we explored tethering the drug via an enzymatically labile linker. Finally, a Vitamin E and PEG system which has a novel gelation mechanism based on exposure to aqueous solutions was also examined. All systems were designed to degrade following release of the drug payload.
Results: The thermally gelling system demonstrated a prolonged release (3 months or more) of avastin following an initial burst. Degradation times in excess of 9 months were observed with these systems. In the PEG based system a dexamethasone release system was tested using matrix metalloproteinases as a model enzyme. The presence of MMP led to release of the drug, demonstrating that it is possible to create a biochemically responsive system. Degradation of the gel was dependent on the presence of the enzyme. Thirdly, the Vitamin E and PEG combination system was found to release at a relatively constant rate for a period of at least 4 months.
Conclusions: It is believed that these systems of drug delivery treatments to the back of the eye have the potential to enhance treatment regimens, resulting in drug levels within the therapeutic range for extended time periods. Different drugs are appropriate for the different systems and the system must be tailored to ensure appropriate release kinetics.

Title: Ophthalmology resident consultations for intraocular fungemia: A quality assurance project

Authors: Crystal Cheung, Joshua Manusow, Efrem Mandelcorn

Abstract Body:

Purpose: This study sought to prospectively review the quality of ocular candida consultations by other medical services at teaching hospitals at the University of Toronto Hospital Network. Secondary endpoints of this study included: 1) Predictive characteristics of positive ocular exams 2) Incidence of change in clinical management following ophthalmic consultations.
Study Design: A prospective cohort study was performed of consecutive adult patients from 2014-2016.
Methods: Ophthalmology residents at University of Toronto were asked to complete a short survey electronically after completion of inpatient consultations for ocular candida. The survey consisted of 5 main questions: 1) Results of the dilated fundus examination for intraocular fungus, including active chorioretinitis or endophthalmitis, 2) The presence of a positive culture (blood, peripherally inserted central catheter (PICC), urine, sputum, CSF, tissue biopsy), 3) Patient's conscious state, 4) Visual symptoms (present, absent or unable to communicate), and 5) Change in management following ophthalmic consultation. Fischer's exact test was used to analyze ordinal variables. Statistical significance was set at a p-value of <0.05.
Results: Seventy-eight inpatient consultations to rule out intraocular fungus were performed. Seventy-one patients (91.0%) had a positive blood culture. One patient (1.2%) had a positive urine culture, 1 patient (1.2%) had positive aspergillus from tissue biopsy, while 3 patients (3.8%) had a positive fungal culture from a PICC line. A positive blood culture compared to a positive non-blood culture (i.e. urine or tissue biopsy) was not correlated with a positive intraocular fungus examination ($p=0.337$). Six patients (7.69%) were diagnosed with fungal chorioretinitis or endophthalmitis on the initial examination. Of these 6 patients with a positive exam for intraocular funngus, 1 patient had visual symptoms and 5 were asymptomatic. In patients with a negative ocular examination for fungus, 37 patients were asymptomatic and 35 were intubated. In patients who could communicate, the presence of visual symptoms was significantly associated with the presence of fungal chorioretinitis or endophthalmitis ($p=0.026$). Among the 6 patients with intraocular fungus, 1 required intravitreal anti-fungal injections, 2 were changed from an oral to intravenous route for anti-fungal therapy, 2 required an increase in anti-fungal treatment duration, and 1 patient with a positive urine culture was initiated on anti-fungal therapy.
Conclusions: Approximately 91% of inpatient ophthalmology examination for intraocular fungus had a positive blood culture. The incidence of fungal chorioretinitis or endophthalmitis was 7.69% and all patients with intraocular fungus had a change in clinical management. The presence of visual symptoms was significantly associated with presence of fungal chorioretinitis or endophthalmitis ($p=0.026$).

Title: Neurodevelopmental outcomes of infants treated with ranibizumab for severe retinopathy of prematurity - A case matched comparison to laser photocoagulation

Authors: Anna Ells, April Ingram, Alexander Platt, Patrick Mitchell

Abstract Body:

Purpose: Intravitreal anti-VEGF therapy for treatment of severe retinopathy of prematurity (ROP) has demonstrated promising results, however reports of the safety of this treatment, related to neurodevelopmental development are limited. We compared the neurodevelopmental outcomes of two groups of infants treated for severe retinopathy of prematurity with low dose, anti-VEGF, ranibizumab, or laser photocoagulation.
Study Design: Retrospective matched case study
Methods: This was a retrospective matched case study and included two groups of infants treated for Type 1 (ETROP) severe ROP with either laser photocoagulation or intravitreal injection of ranibizumab. Infants included in each group were matched for time of hospital admission, Scores for Neonatal Acute Physiology (SNAP II), gestational age (+/- 1 week), birthweight (+/- 100 grams), highest stage and lowest zone of ROP at time of treatment. Measures of neurodevelopmental outcome included the Cognitive, Language, Motor Bayley Scales of Infant and Toddler Development. The Gross Motor Function Classification System (GMFCS) for cerebral palsy was also included and presence of significant hearing deficits were noted. Neurodevelopmental outcomes for infants were obtained at 21 months chronological age and compared for the two groups.
Results: Forty infants were enrolled, 20 in each treatment group and matched for the defined criteria. Mean birthweight in the group treated with ranibizumab was 613.9g and 623.5g in laser photocoagulation group. Gestational age at birth was 24.65 weeks and 24.8 weeks for ranibizumab and laser groups respectively. At 21 months, neurodevelopmental outcomes were available for 35 of 40 infants, as four infants were lost to follow-up and one was deceased. There was no statistically significant difference in Bayley cognitive, language or motor scores between the two groups. Three patients in each group were diagnosed with cerebral palsy (GMFCS 5, 3, and 2 in ranibizumab group; GMFCS 5, 3 and 1 in laser group), and one patient in the laser treated group has a note hearing deficit, requiring a hearing aid.
Conclusions: Clinical evidence indicates that intravitreal anti-VEGF therapy can be as effective as laser photocoagulation in the treatment of severe ROP. Twenty one months after laser photocoagulation or intravitreal injection of ranibizumab for severe ROP, no significant differences in neurodevelopment were found.

HOT TOPIC | SUJET PIQUANT

Title: Differences in metamorphopsia measurements and optical coherence tomography morphological changes following rhegmatogenous retinal detachment repair: Analysis of a randomized controlled trial comparing pneumatic retinopexy to pars plana vitrectomy

Authors: Tina Felfeli, Roxane J. Hillier, Carolina Francisconi, Verena Juncal, Michael Y. K. Mak, Louis R. Giavedoni, David T. Wong, Alan R. Berger, Filiberto Altomare, Radha P. Kohly, Rajeev H. Muni

Abstract Body:

Purpose: To compare metamorphopsia measurements and optical coherence tomography (OCT) morphological changes in patients randomized to primary pneumatic retinopexy (PnR) vs pars plana vitrectomy (PPV) for rhegmatogenous retinal detachment (RRD) repair.
Study Design: Randomized controlled trial
Methods: Patients with 1-year follow-up from The Pneumatic Retinopexy versus Vitrectomy Outcomes Randomized Controlled Trial (PIVOT) conducted between August 2012 to May 2017 were included in the study. The trial included patients with a single retinal break, or group of breaks no larger than 1 clock hour, above the 8 and 4 o'clock meridians. Stratified randomization by macular status was performed. Severity of metamorphopsia at 1 year was quantified using M-Charts, a diagnostic tool for quantification of vertical (MV) and horizontal (MH) metamorphopsia with scores of 0.2-2.0 degrees of visual angle. Foveal morphological changes on OCT at 1 year were assessed by two masked independent graders with disagreement adjudicated by a third masked grader.
Results: A total of 176 eyes (176 patients) were randomly assigned to primary PnR vs PPV. The PnR group had 49% macula off vs 51% in the PPV group (p=0.763). Mean age was 60.7±10.1 and 60.3±7.8 years in the PnR and PPV groups, respectively (p=0.952). 1-year ETDRS was 79.9±11.5 vs 75.0±14.7 in the PnR and PPV groups, respectively (p=0.024). Mean MV scores (n=126) were 0.14±0.29 in the PnR group and 0.28±0.42 in the PPV group (p=0.026). Mean MH scores (n=126) were 0.15±0.33 in the PnR group and 0.24±0.46 in the PPV group (p=0.247). The 1-year ETDRS was significantly associated with MV and MH scores (p=0.002, p<0.001). OCT assessment at 1 year (n=149) revealed that the proportion of patients with interdigitation zone (IDZ) disruption was lower in PnR group compared to PPV (61% vs 78%, p=0.027). The proportion of patients with external limiting membrane disruption was lower in the PnR compared to the PPV group (8% vs 20%, p=0.034) as was the proportion of patients with cystoid macular edema (12% vs 25%, p=0.035). There was no significant difference between groups in the proportion of patients with epiretinal membrane, foveal contour abnormality, subfoveal fluid, inner and outer retinal folds, ellipsoid zone disruption, and retinal pigment epithelium disruption. IDZ disruption was associated with presence of vertical and horizontal metamorphopsia (p=0.042, p=0.002). MH scores were associated with cystoid macular edema (p=0.034) but no signification association between MV and MH scores with epiretinal membrane was noted (p=0.297, p=0.441).
Conclusions: Primary PnR for RRD repair results in superior visual acuity and reduced vertical metamorphopsia compared to PPV at 1 year. Abnormalities of the interdigitation zone and external limiting membrane were significantly lower in the PnR group. The reduced postoperative vertical metamorphopsia with PnR at 1 year is associated with reduced disruption of the IDZ on OCT.

Title: The association of aqueous cytokines with long-term response to intravitreal ranibizumab in diabetic macular edema

Authors: Tina Felfeli, Roxane J. Hillier, Elvis Ojaimi, David T. Wong, Michael Y. K. Mak, Alan R. Berger, Radha P. Kohly, Peter J. Kertes, Farzin Forooghian, Shelley R. Boyd, Filiberto Altomare, Louis R. Giavedoni, Rosane Nisenbaum, Rajeev H. Muni

Abstract Body:

Purpose: To identify the association of baseline aqueous humor cytokine levels with long-term response to intravitreal ranibizumab in patients with diabetic macular edema (DME).
Study Design: Prospective longitudinal cohort study.
Methods: Treatment-naïve patients with centre-involving DME and central subfield macular thickness (CST) ≥310 µm on spectral domain optical coherence tomography (OCT) were included in the study. All patients received monthly intravitreal ranibizumab for 3 months. Aqueous fluid specimens at baseline and at 2 months were obtained immediately prior to ranibizumab injections. Multiplex immunoassay of aqueous samples was carried out for vascular endothelial growth factor (VEGF), placental growth factor, transforming growth factor beta, intercellular adhesion molecule-1 (ICAM-1), interleukin (IL)-2, IL-3, IL-6, IL-8, IL-10, IL-17, vascular cell adhesion molecule-1, monocyte chemoattractant protein-1, and epidermal growth factor. Following 3 months of follow-up, patients were longitudinally followed as per standard of care. Response to ranibizumab over the study period was assessed by OCT parameters. Patients were classified as, i) responsive if there was resolution of DME with ranibizumab, and ii) unresponsive if persistent and/or recurrent DME was present despite ongoing ranibizumab therapy.
Results: A total of 40 eyes (39 patients) with a mean age of 64.45 ± 10.47 years were followed between December 2011 and November 2017. The mean follow-up period was 3.76 ± 1.9 years. Twenty-eight eyes (70%) were responsive to ranibizumab, while 12 (30%) were unresponsive. The mean change from baseline in macular volume cube (mm3) at last follow-up was significantly higher for the responsive versus the unresponsive group (2.36 ± 2.01 vs 1.3 ± 1.1, p = 0.037). Aqueous VEGF concentration (pg/mL) was significantly associated with long-term treatment response and was lower in the responsive group at baseline (882.2 ± 501.7 vs 1045.9 ± 754.2, p = 0.041) and at 2 months follow-up (108.4 ± 203.3 vs 243.4 ± 534.1, p = 0.024). A greater decline in baseline aqueous concentration of ICAM-1 (pg/mL) at the 2-month follow-up showed a trend for association with long-term response to ranibizumab (489.2 ± 688.1 vs 371.6, p = 0.058).
Conclusions: Lower levels of baseline and post intravitreal ranibizumab aqueous VEGF in patients with DME are associated with favorable long-term response to treatment.

Title: Vision-related functioning in patients undergoing pneumatic retinopexy vs. vitrectomy for primary rhegmatogenous retinal detachment: Sub-analysis of the PIVOT trial

Authors: Carolina L. M. Francisconi, Roxane J. Hillier, Tina Felfeli, Louis R. Giavedoni, David T. Wong, Alan R. Berger, Filiberto Altomare, Rahda P. Kohly, Rajeev H. Muni

Abstract Body:

Purpose: The management of rhegmatogenous retinal detachment (RRD) varies markedly among surgeons largely based on prior experience, local culture, patient age and lens status. PIVOT was a prospective RCT that compared long-term outcomes of RRD repair in patients undergoing pneumatic retinopexy (PnR) vs. pars plana vitrectomy (PPV). Patients undergoing PnR had superior visual acuity and reduced morbidity with fewer patients requiring cataract surgery at 1 year. The PnR group had a lower primary anatomical success rate (81%PnR vs 93% with PPV), however both groups achieved a 99% final retinal reattachment (secondary success). Patients who had PnR demonstrated higher overall vision-related functioning (NEI-VFQ25 Composite Score) at 3 and 6 months, with no significant difference at 1 year. The purpose of this study was to determine which subscales within the NEI-VFQ25 were significantly different between groups.
Study Design: RCT
Methods: Prospective RCT conducted between August 2012 and May 2017. RRDs presenting with a single retinal break, or group of breaks no larger than one clock hour, above the 8 and 4 o'clock meridians were included. Macula-on and -off RRDs were assigned to each group by stratified randomization and treated within 24 and 72 hours respectively. Patient reported visual-related functioning was assessed at 3, 6 and 12 months using the NEI-VFQ25 questionnaire. The NEI-VFQ25 is composed by 12 subscales: General Health, General Vision, Ocular Pain, Near Activities, Distance Activities, Vision Specific:Social Functioning, Vision Specific:Mental Health, Vision Specific:Role Difficulties, Vision Specific:Dependency, Driving, Color Vision and Peripheral Vision.
Results: 157 patients were included in this sub-analysis. PnR was associated with superior vision-related functioning; specifically, significant differences ($p<0.05$) were noted in the Distance Activities (PnR 88±14,PPV 81±19), Mental Health (PnR 82±18,PPV 74±24), Role Difficulties (PnR 85±20,PPV 77±23), Dependency (PnR 94±13,PPV 88±20) and Peripheral Vision (PnR 88±19,PPV 79±24) at 3 months and Distance Activities (PnR 89±13,PPV 83±17), Mental Health (PnR 84±17,PPV 79±21) and Peripheral Vision (PnR 91±16,PPV 81±24) at 6 months. There was no significant difference between the two groups at 1 year.
Conclusions: This is the first RCT that compared PnR vs PPV from the patient's perspective using the NEI-VFQ25. The results of this study demonstrate that patients undergoing PnR have superior vision-related functioning during the first 6 months after retinal detachment repair. PnR was associated with a faster recovery of functioning related to distance vision, peripheral vision, independence and daily activities. The differences between PnR and PPV in the NEI-VFQ25 Composite Score and various subscales scores are likely explained by PnR being a less invasive procedure, with faster recovery, superior visual acuity and less morbidity when compared to PPV for patients enrolled in the PIVOT trial.

Title: Macular buckle without vitrectomy for myopic macular schisis - A Canadian case series

Authors: **Parampal Grewal**, Steven Lapere, Rishi R. Gupta, Mark Greve

Abstract Body:

Purpose: To determine the effectiveness of a macular buckle procedure without vitrectomy for myopic macular schisis.
Study Design: Retrospective case series.
Methods: All patients who underwent macular buckle surgery without vitrectomy for symptomatic myopic macular schisis without macular hole were included. Visual acuity and anatomical outcomes based on optical coherence tomography (OCT) were compared pre- and post-operatively.
Results: Eight consecutive eyes from seven patients were included. Six of the seven patients were female and the mean age was 59 ± 6 years (range 49 - 66 years). The mean follow-up duration was 11 ± 7 months (range 3 - 23 months). Mean pre-operative axial length was 29.5 ± 1.3 mm (range 27.88 - 31.96 mm). Mean pre-operative best-corrected visual acuity (BCVA) was 0.71 ± 0.29 logMAR (Snellen equivalent 20/103) and mean post-operative BCVA was 0.56 ± 0.50 (Snellen equivalent 20/73; $p = 0.45$). Seventy-five percent of patients maintained or improved vision. Pre- and post-operative OCT images are included and discussed within. Pre-operative ellipsoid zone status and post-operative central macular buckle indentation appear to be important in visual outcomes. Two patients required a buckle repositioning for persistent schisis. One patient developed a macular hole post-operatively which resolved with subsequent vitrectomy. There were no other complications.
Conclusions: Myopic macular schisis is an uncommon and challenging complication of high myopia. The macular buckle represents a safe and promising therapeutic option for myopic macular schisis.

Title: Intraoperative dexamethasone intravitreal implant (Ozurdex) in vitrectomy surgery for epiretinal membrane

Authors: Avner Hostovsky, Rajeev H. Muni, Kenneth T. Eng, Drew Drew Mulhall, Christina Leung, Peter J. Kertes

Abstract Body:

Purpose: To study of the effectiveness and safety of the intra-operative intravitreal sustained-release dexamethasone implant 0.7mg (Ozurdex®) in vitrectomy surgery for epiretinal membrane
Study Design: Prospective, multicenter, pilot study
Methods: Inclusion criteria included patients with a visually significant (<20/50) idiopathic epiretinal membrane. Exclusion criteria included secondary epiretinal membrane, other visually significant macular pathology and prior intravitreal triamcinolone acetonide. All patients underwent standard 23-gauge pars plana vitrectomy with membrane peeling. At the conclusion of the surgery an Ozurdex implant was injected into the vitreous cavity through the inferotemporal sclerotomy after the cannula had been removed. Patients were followed for 6 months. The primary outcome measure was best corrected visual acuity change at 3 months. Secondary outcomes included best corrected visual acuity change at 6 months, changes in central retinal thickness (CRT) and macular cube volume at 3 and 6 months. Intraocular (IOP) changes were monitored and cataract progression in phakic patients was documented
Results: 15 patients were enrolled in the study, 2 patients did not meet inclusion criteria and 1 patient was lost to follow up. 12 eyes of 12 patients were included in the analysis. Seven (58%) were phakic and five (42%) were pseudophakic at the time of surgery. Two of the phakic eyes (28%) had worsening of the cataract during the follow-up period and underwent subsequent cataract surgery during the study. Mean preoperative BCVA was 50.67 (SD=8.62) ETDRS letters and improved significantly to 63.67 (+12.91 letters, p=0.008) at three months and to 65.5 (+14.83 letters, p=0.004) at six months. Mean central macular thickness was 548 (SD=97.7) microns at baseline, which improved to 411 microns (-137microns, p=0.002) at 3 months and to 431 microns (-117microns, p=0.001) at 6 months. Mean preoperative macular volume was 12.71 mm3 (SD=1.21) which improved to 10.93 mm3 at 3 months (-1.78mm3, p<0.001) and to 10.99 mm3 at 6 months (-1.72 mm3, p<0.001). There were no complications related to the steroid implant injection procedure in an air filled eye at the end of the surgery. One patient had mild ocular hypertension (IOP<25) at 2 visits that resolved with no treatment. No other complications were documented
Conclusions: Intra-operative injection of intravitreal dexamethasone implant 0.7mg (Ozurdex) at the end of vitrectomy surgery for epiretinal membrane is a safe technique. The visual acuity outcome is comparable to prior studies with intravitreal triamcinolone acetonide injection at the conclusion of epiretinal membrane surgery with a potentially better safety profile. Dexamethasone intravitreal implant 0.7mg (Ozurdex) is a seemingly useful surgical adjunct that warrants further study.

Title: Outcomes of using sutureless, scleral-fixated posterior chamber intraocular lenses

Authors: Oluwadara Onasanya, **Vinay Kansal**, Kevin Colleaux, Nigel Rawlings

Abstract Body:

Purpose: To describe the indications, visual outcomes and complications of sutureless, scleral-fixated posterior chamber intraocular lens (SFIOL) implantation.
Study Design: Retrospective chart review
Methods: This retrospective chart review identified 135 eyes who underwent SFIOL implantation at Saskatoon City Hospital (Saskatoon, Saskatchewan, Canada) from July 2013 to August 2017 by two vitreo-retinal surgeons. Patients were ≥18 years of age. Data was collected on patient demographics, clinical history, ocular history, pre-operative ocular characteristics (visual acuity, manifest refraction, corneal power, lens status, intra-ocular pressure (IOP)), operative details, post-operative visual outcomes, and complications. Visual and refractive outcomes were compared between the pre-operative and latest post-operative visit using repeated measures analysis of variance (ANOVA).
Results: 78 patients were female (57.8%), with the mean patient age of 72.9 ± 15.5 years. The mean follow-up was 10.9 ± 10.5 months. Dislocated IOL due to zonular weakness was the primary indication for SFIOL implantation (88 eyes (65.2%)). Alcon MA60AC lens was implanted in 111 (68.2%) eyes, with the remaining eyes having a pre-existing IOL fixated. Compared to baseline pre-operative assessment, at latest follow-up there was improvement in uncorrected visual acuity (1.4 ± 0.9 to 0.67 ± 0.60 logMAR, $p<0.01$), best corrected visual acuity (BCVA) (0.7 ± 0.5 logMAR to 0.37 ± 0.38 logMAR, $p<0.01$). Changes in absolute spherical and cylindrical refraction were not significant. The most frequent post operative complications were IOP elevation >30mmHg (23.7%), vitreous hemorrhage (VH) (17.8%), cystoid macular edema (CME) (11.9%), hypotony (11.1%), iris capture (10.4%), uveitis-glaucoma-hyphema (UGH) syndrome (10.4%). Operative reinterventions included SFIOL exchange (subluxed SFIOL-0.7%, broken haptic-2.2%), SFIOL repositioning (iris capture-5.2%), SFIOL removal (UGH syndrome-1.5%, broken haptic-0.7%), pars plana vitrectomy (VH-2.2%, cataract remnant-0.7%, hypotony-1.5%)), trabeculectomy (high IOP-1.5%). 11 (8.1%) patients required multiple re-interventions.
Conclusions: SFIOL implantation is a reasonable option for eyes with inadequate capsular support. This technique resulted in a visual improvement in most patients. Many of the surgical complications were related to a floppy iris-lens diaphragm (VH, UGH syndrome, iris capture). Some of the eyes with complex pathology such as high myopia or previous trauma were predisposed to this. Surgical modifications can be made to minimize the iris-related complications.

Title: Canadian treat and extend analysis trial with ranibizumab in patients with neovascular AMD: CANTREAT study one year results

Authors: Peter Kertes, Tom Sheidow, Geoff Williams, Mark Greve, Ivan Galic, Emmanouil Rampakakis, Joanne Gavalakis, Andrea Scarino

Abstract Body:

Purpose: Age-related macular degeneration (AMD) is the leading cause of severe, irreversible vision loss in developed countries and is more common with increasing age. To date, there have been few large prospective randomized clinical studies which have assessed the efficacy of a treat-and-extend (T&E) regimen compared with monthly dosing for the treatment of neovascular AMD. The purpose of this analysis was to compare the effectiveness of ranibizumab using a T&E regimen to once-monthly (OM) dosing in treatment-naïve neovascular AMD patients followed in Canadian routine clinical care.
Study Design: This is a 24-month prospective, randomized (1:1), open-label, multicenter, post-authorization study conducted in Canada.
Methods: Interim analysis describing baseline characteristics, visual acuity, and injection frequency over 24 months. Patients enrolled as of September 5th, 2017 were included. Summary statistics including the mean and standard deviation for continuous variables and counts and percentages for categorical variables were produced for baseline and outcome parameters. Between group differences were assessed with the one-sided independent Samples t-test for change in best corrected visual acuity (BCVA).
Results: A total of 580 patients (T&E=287; OM=293) were included in the analysis; of these, 526 patients (T&E=268; OM=258) and 343 patients (T&E=175; OM=168) had 12-month and 24-month follow-up, respectively. Mean (SD) age was 78.8 (7.8) years, 60.3% were females, 94.3% were Caucasian, and 22.4% had a family history of AMD. No significant between-group differences were observed in baseline characteristics. Mean (SD) baseline BCVA was 58.7 (14.2) and 59.4 (13.5) for T&E and OM, respectively, and was comparable for both groups. At Month 12, after an average of 9.4 (T&E) and 11.8 (OM) injections, mean (SD) BCVA improvement was 8.4 (11.9) and 6.0 (11.9) ($p=0.012$) letters, respectively. At Month 24, after an average of 18.0 (T&E) and 23.6 (OM) injections, mean (SD) BCVA improvement was comparable between groups with 6.4 (14.7) and 7.0 (12.1) letters ($p=0.336$), respectively. In the T&E group, the proportion of patients extended by ≥8 weeks of treatment at 12 and 24 months was 69.3% and 70.9% and those extended to 12 weeks was 29.9% and 40.0%, respectively.
Conclusions: The results of the current analysis showed that a T&E dosing regimen offers comparable BCVA improvement at 12 and 24 months, but with significantly fewer injections when compared to a monthly dosing regimen.

Title: Changes in aqueous cytokine levels following treatment with aflibercept in treatment-naïve patients with diabetic macular edema

Authors: Michael Y. Mak, Verena Juncal, Rajeev Muni

Abstract Body:

Purpose: To determine changes in aqueous cytokine levels in treatment-naive DME patients during intravitreal aflibercept treatment.
Study Design: Interventional, prospective clinical study.
Methods: Study approval was provided by St. Michael's Hospital Research Ethics Board. Patients with treatment-naive DME, age greater than 18 years, with non-proliferative diabetic retinopathy (NPDR), and with central macular thickness of 310 µm or more on SD-Optical Coherence Tomography (SD-OCT) were included. Patients received aflibercept injections at baseline, and monthly injections for three months after baseline.
On each visit Snellen BCVA, SD-OCT, and an anterior chamber (AC) tap was performed to collect aqueous fluid before each aflibercept injection. Multiplex immunoassay of aqueous samples were carried out for FGF-2, IL-6, IL-8, IL-10, IP-10, MCP-1, VEGF, PDGF-AA, HGF, PLGF, sICAM-1, sVCAM-1, TGF-β1, TGF-β2, and TGF-β3. Median Percent change in cytokines were determined by the formula (median month 2 cytokine levels - median baseline cytokine levels)/baseline cytokine levels. Percent change in CST and Macular Volume were determined by the formula (month 2 OCT measurement-baseline OCT measurement)/baseline OCT measurement. A Wilcoxon analysis was used to compare change in cytokine levels at baseline and month 2.
Results: A total of 11 patients were included of which 6 were male and 5 females, 9 right eyes, median age 59±9.6 years. Mean LogMAR at baseline and month 3 were 0.34±0.18 and 0.31±0.17 respectively. Median baseline CST and macular volume were 451.0±92.0µm and 12.1±1.3mm3 respectively, and median month 3 CST and macular volume were 345.5±89.8µm and 11.2±1.0mm3 respectively. CST and macular volume percent change between month 3 and baseline was -19.7±15.3% and -9.6±4.6% respectively. There was no significant change in FGF-2, IL-10, IL-8, MCP-1, sICAM-1, sVCAM-1 and TGF-β3 levels.
There were significant increases in TGF-β1 (baseline median=87.44ρg/mL, month 2 median=205.9ρg/mL, median %change=135.5%, p=0.007), IP-10 (baseline median=119.9ρg/mL, month 2 median=217.8ρg/mL, median %change =81.7%, p=0.007), and HGF (baseline median=854.4ρg/mL, month 2 median=1269.7ρg/mL, median %change=48.6%, p=0.047).
There were significant decreases in VEGF (baseline median=97.1ρg/mL, month 2 median=0ρg/mL, median %change=-100%, p=0.005), PLGF (baseline median=4.4ρg/mL, month 2 median=0ρg/mL, median %change=-100%, p=0.028), IL-6 (baseline median=13.6ρg/mL, month 2 median=6.8ρg/mL, median %change =-49.9%, p=0.011) and PDGF-AA (baseline median=68.7ρg/mL, month 2=36.5ρg/mL, median %change=-5.6%, p=0.032).
Conclusions: In treatment naïve patients with DME, aflibercept resulted in reduced OCT CST and macular volume. VEGF, PLGF, IL-6 and PDGF-AA were reduced. However, there were increases in IP-10 and pro-inflammatory cytokines including TGF-β1 and HGF. Larger, longer-term studies should examine if cytokine changes correlate with anatomic findings with aflibercept treatment.

Title: Outcomes of vitrectomy in Terson syndrome: A multicenter Canadian perspective

Authors: Samir Nazarali, Irfan Kherani, Bernard Hurley, Geoff Williams, Michael Fielden, Feisal Adatia, Amin Kherani

Abstract Body:

Purpose: To characterize the presentation of Terson Syndrome (TS) and report on the outcomes of vitrectomy at two major ophthalmic centres in Canada. TS is defined as ocular hemorrhage resulting from intracranial hemorrhage. Literature investigating outcomes of vitrectomy in TS is limited and provides no consensus on the optimal time to perform surgery.
Study Design: Retrospective chart review.
Methods: All consecutive patients presenting with TS who subsequently underwent pars plana vitrectomy by retina specialists at the Calgary Retina Consultants, Southern Alberta Eye Centre and the University of Ottawa Eye Institute over the last 10 years. All patients underwent standard small guage pars plana vitrectomy. Additional procedures including membrane peel, endolaser, vitreous tamponade and cataract extraction were performed as necessary. The primary outcome of interest was the change in best-corrected visual acuity (BCVA) at three months from baseline. Secondary outcomes included the association between baseline BCVA and final BCVA and the association between BCVA and timing of surgery (early vs. later than 90 days).
Results: A total of 14 eyes of 11 patients met the inclusion criteria and underwent pars plana vitrectomy for TS. The mean time between intraocular hemorrhage and vitrectomy was 160 days, ranging from 29 to 859 days. Baseline preoperative BCVA was logMAR 1.57 ± 1.03. BCVA at the final postoperative follow-up was logMAR 0.53 ± 0.82, which was significantly improved compared to baseline (p=0.01). Further analysis demonstrated that baseline BCVA was not significantly correlated with final BCVA, Spearman's rho= 0.016, p= 0.957. Additionally, BCVA did not significantly differ between those who had surgery prior to 90 days compared to after 90 days, p=0.087. The mean final BCVA among the six eyes undergoing vitrectomy prior to 90 days was 0.43 ± 0.78 compared to the eight eyes undergoing vitrectomy after 90 days, 0.61 ± 0.88. One eye required secondary surgery due to a retinal detachment and proliferative vitreoretinopathy.
Conclusions: Vitrectomy is safe, effective and should be considered for non-clearing vitreal bleeding due to TS. Our results would suggest that ocular hemorrhaging in TS can be observed conservatively for a period of time (for spontaneous improvement) without the risk of reduced visual potential. Ophthalmic evaluation should be considered promptly following intracranial hemorrhage especially for patients with concurrent vision loss. Following a period of observational management, vitrectomy surgery should be offered.

Title: Ultrasound biomicroscopic analysis of the sutureless scleral fixated intraocular lens

Authors: David Plemel, Steven Lapere, Jaspreet Rayat, Donna Bong, Deana Breum, Rizwan Somani

Abstract Body:

Purpose: To determine the association between ocular dimensions and sutureless scleral fixated intraocular lens (SFIOL) position with visual acuity outcomes and postoperative complications.
Study Design: Prospective observational case series of eyes with aphakia or subluxated intraocular lenses that had placement of a SFIOL.
Methods: Ultrasound biomicroscopy (UBM) was performed prior to SFIOL surgery to determine ocular dimensions. Repeat UBM was performed at a minimum of two months after surgery to locate SFIOL position.
Results: Nineteen (19) eyes were included. Visual acuity improved from a mean of LogMAR 1.25 ± 0.78 (20/356 Snellen equivalent) at presentation to 0.58 ± 0.49 (20/76 Snellen equivalent) at a mean of 2.63 months postoperatively (P = 0.006). Sixteen haptics (44.4%) were visualized in the ciliary sulcus post-operatively. Optic tilt was associated with increased postoperative complications (P = 0.05). Postoperative complications including cystoid macular edema, vitreous hemorrhage and uveitis-glaucoma-hyphema syndrome were not associated with ciliary sulcus diameter (P = 0.74), haptic placement (P = 0.67), floppy iris (P = 0.95), or iris touch (P = 0.69). There were no cases of subsequent SFIOL dislocation or endophthalmitis. Visual acuity outcome was not associated with axial length (P = 0.65), ciliary sulcus diameter(P=0.35), postoperative haptic location (P = 0.47) or iris touch (P = 0.54).
Conclusions: Optic tilt is associated with an increased risk of postoperative complications. Ocular dimensions and haptic placement are not associated with visual outcomes or postoperative complications in eyes with a SFIOL.

HOT TOPIC | SUJET PIQUANT

Title: Time to treatment - A tele-retinal referral system for wet age-related macular degeneration and diabetic macular edema

Authors: Jenny Qian, Joshua Barbosa, Varun Chaudhary

Abstract Body:

Purpose: Optometrists are responsible for triaging retinal eye diseases in Ontario. However, the limited number of retinal specialists mean long wait times; this can lead to vision loss if the referral is inaccurate in cases where the patient should have received treatment sooner. This study compares the time-to-treatment for patients based on teleophthalmology referral versus a conventional paper referral system for wet age-related macular degeneration (wAMD) and diabetic macular edema (DME).
Study Design: A single-centered, prospective observational study.
Methods: Ethics approval was obtained from the local Research Ethics Board. Optometrist referrals were sent to a Hamilton retinal specialist by fax or tele-referral (secure email). Tele-referrals included fundus and/or optical coherence tomography (OCT) images. The time-to-treatment - time from when the retinal specialist reviewed the referral to when the patient received treatment - was compared between groups.
Results: Out of 50 participants (64 eyes), the majority were wAMD referrals: 23 tele-referrals and 14 from fax. Patients referred by tele-referral lived an average 28.42 ± 26.28 km from the eye clinic, and 16.88 ± 11.02 km for fax referrals ($p < 0.05$). It was 1.9 ± 1.9 days from tele-referral to specialist review and 0.25 ± 0.5 days from fax referral to review ($p < 0.01$). 48.3% of tele-referred patients required treatment compared to 38.1% from fax ($p < 0.05$). Time-to-treatment was 28.8 ± 13.7 days in tele-referred patients and 60.6 ± 15.4 days for fax patients ($p < 0.01$). The time from referral to treatment for tele-referrals was 32.3 ± 15.2 days and 61.9 ± 15.5 days for fax referrals ($p < 0.01$). The number of visits was similar between groups (1.8 ± 0.5 for tele-referrals and 1.9 ± 0.4 for fax) but less tests were ordered for tele-referred patients (1.4 ± 0.7 tests versus 2.0 for fax).
Conclusions: The time from referral to review was longer for tele-referrals, but time-to-treatment and time from referral to treatment was shorter. The tele-referrals provided more detailed information with the inclusion of testing images. As a result, the tele-referral group had improved diagnostic accuracy as a greater proportion of tele-referred patients required treatment and improved efficiency as less testing at the eye clinic was performed. While larger studies are required, these results demonstrate the potential of teleophthalmology referral systems to provide benefits for healthcare providers and their patients.

Title: Efficacy of preoperative intravitreal injection of gas as an adjunct to pars plana vitrectomy for rhegmatogenous retinal detachment repair

Authors: Rachel Trussart, Tina Felfeli, Efrem D. Mandelcorn

Abstract Body:

Purpose: To evaluate the success rate and complications of preoperative intravitreal injection of gas (PIG) with or without laser retinopexy (LR) combined with pars plana vitrectomy (PPV) for rhegmatogenous retinal detachment (RRD) repair.
Study Design: Prospective nonrandomized interventional case series
Methods: Consecutive cases of RRD requiring surgical repair using PPV who were eligible to receive PIG from April to September 2017 at Toronto Western Hospital were included in this case series. All patients were followed for a minimum of 3 months postoperatively. They were excluded in cases of proliferative vitreoretinopathy grade C or D, contraindication to intraocular gas due to travel plans and inability to maintain the required postoperative head position. The primary outcome measure was anatomical retinal reattachment. Secondary outcome measures included postoperative visual acuity (VA), ease of surgical repair and postoperative complications.
Results: A total of 21 eyes were included in this case series. Of the treated eyes, 52% were macula off and 29% had at least one inferior retinal break. Sixty-two percent of cases had multiple retinal breaks with 69% not clustered in the same quadrant. Two patients had a history of recent ocular trauma and seven patients initially presented with moderate vitreous haemorrhage. Seven patients were high myopes (≥6D). Presence of lattice degeneration was observed in 52% of eyes. Three patients had previous RRD repair in the same eye.
All eyes (100%) achieved retinal reattachment. The mean VA improved significantly from 0.77±0.69 LogMAR preoperatively to 0.39±0.31 (p=0.01) at the final follow-up postoperatively. Thirty-eight percent of cases required pneumatic retinopexy only. Sixty-two percent of eyes underwent a PIG with or without LR followed by single PPV and gas tamponade to successfully reattach the retina. Of the PPV patients, none required perfluorocarbon (PFC) heavy liquid or unnecessary posterior retinotomy. In the macula-on group, no patients were observed to develop intraoperative macular detachment. Postoperative complications included transient increased intraocular pressure (14%), cataract formation in 18% of the eleven phakic patients, cystoid macular edema (5%), epiretinal membrane (5%) and persistent subretinal fluid (10%).
Conclusions: PIG is valuable whether eyes reattach with pneumatic retinopexy alone or if PPV is required. This adjunctive intervention to PPV not only showed a high success rate (100%) but also may simplify PPV without the need for PFC or posterior retinotomy, which may ultimately improve final visual outcomes.

Title: The diagnostic utility of multifocal electroretinography in detecting chloroquine and hydroxychloroquine retinal toxicity

Authors: Adrian C. Tsang, Sina Ahmadi, John Hamilton, Jennifer Gao, Gianni Virgili, Stuart Coupland, Chloe Gottlieb

Abstract Body:

Purpose: To evaluate the diagnostic accuracy of the multifocal electroretinogram (mfERG) as a screening test for detecting hydroxychloroquine (HCQ) and chloroquine (CQ) toxicity.
Study Design: A prospective cross-sectional study conducted in accordance to the Standards for Reporting of Diagnostic Accuracy Studies (STARD).
Methods: Consecutive patients referred to the University of Ottawa Eye Institute for HCQ or CQ retinopathy screening from 2011-2014 underwent a 10-2 automated visual field (AVF), spectral domain optical coherence tomography (sdOCT), and mfERG testing. Patients with amblyopia, myopia or hyperopia in excess of 8 diopters, coexisting retinal disease, and prior retinal surgery were excluded. Abnormalities in parafoveal ring amplitudes (R2, R3) or parafoveal ring ratios (R2/R5, R3/R5) were considered a positive index test. mfERG was compared against the reference standard set by the 2016 AAO Recommendations on Screening for CQ and HCQ Retinopathy. Toxicity was defined as presence of a 10-2 AVF defect with localized thinning of the photoreceptor layers in the parafoveal region on sdOCT. Receiver operating characteristic (ROC) analyses was used to determine diagnostic performance of mfERG parameters. Logistic regression was used to model the effect of covariates in ROC analyses. The area under the curve (AUC) for each mfERG parameter, and the sensitivity and specificity of mfERG were calculated.
Results: Sixty-three patients (47 females, 16 males) were included in the final analysis. 8 patients had evidence of retinal toxicity according to the 2016 AAO guidelines and 20 patients had mfERG findings suspicious for CQ/HCQ retinal toxicity. mfERG was found to have a sensitivity of 1.00 (95%CI: 0.79 to 1.00) and a specificity of 0.78 (95%CI: 0.69 to 0.85). Ring 2 amplitude had the best performance among all parameters (AUC: 0.97, 95%CI: 0.94 to 1.00). R2 amplitude decreases linearly with increasing cumulative dose (p=0.015) and daily dose (p=0.009).
Conclusions: The 2016 AAO guidelines focuses primarily on the use of subjective functional testing and objective structural testing through its endorsement of 10-2 AVF and sdOCT respectively. The high sensitivity of parafoveal (R2) amplitude depression on mfERG and its linear relationship to cumulative and daily dose in this study illustrates an important role for objective documentation of visual function. The false positive rate suggests a potential period where physiologic dysfunction maybe detected objectively on mfERG prior to demonstrable structural change on sdOCT. The progressive and irreversible course of the disease warrants further prospective trials to establish criteria to detect dysfunction prior to established retinopathy.

UVEITIS | UVÉITE

Title: Validation of a first-visit questionnaire for the management of uveitis patients

Authors: Andrei F. Dan, Christian El-Hadad, Eric Fortin, Karin Oliver

Abstract Body:

Purpose: First-visit questionnaires for uveitis patients have previously been suggested as tools. These questionnaires are compressive medical histories and reviews of systems that are 5 pages in length and have over 100 questions, making them a challenge to complete. To our knowledge, no studies to date have validated such a questionnaire both in terms of appropriateness nor have they assessed whether or not a patient can accurately complete it. In this study, we aim to validate a first-visit questionnaire for the management of uveitis patients that we have been using at the McGill Academic Eye Center.
Study Design: 2 part study; a survey of Canadian Uveitis specialists asking for their opinions of the questionnaire and a retrospective chart review assessing the accuracy of the completed questionnaires in our clinic.
Methods: The survey of uveitis specialists had 10 total questions regarding the following 3 areas of interest: is the questionnaire appropriate in terms of content and format, would it impact management and how would you administer it. The retrospective chart review assessed at 51 sequential patients who completed the questionnaires on their own without assistance from a medical professional. Questionnaires were cross-referenced with the clinical interview and medical history from the chart for accuracy.
Results: 13 uveitis specialists responded to the initial survey. More than 90% of respondents found the questionnaire to be appropriate in terms of clarity and content and agreed that the answers on this questionnaire would impact work-up and management. 69% of respondents said that the questionnaire covered material that they normally would not in an interview. 85% felt comfortable for a patient to complete the form on their own, and less than 40% would go over the form directly or have an assistant go over the form with a patient. In our retrospective chart review, 50/51 sequential patients successfully completed the questionnaire (1 did not due to a language barrier). When compared with the medical charts, patients had a mean error rate of 1.6 errors (range 0-10). Patients made more errors in the family history and non-medical history section (0.75 mean errors) as opposed to the personal medical history or review of systems sections (0.43 mean errors and 0.45 means errors respectively).
Conclusions: We have demonstrated agreement among uveitis specialists that this is an appropriate screening questionnaire for uveitis patients and evidence that it may complement the interview. Despite the complexity of the questionnaire, most patients were able to complete it accurately without the assistance of a medical professional. We recommend all ophthalmologist assessing uveitis patients to considering using such a questionnaire at the first visit.

🎖 First Prize, COS Awards for Excellence in Ophthalmic Research 🎖

Title: Peptidyl-prolyl cis-trans isomerase A (PPIA) - A novel biomarker of multi-episodic (recurrent) ocular toxoplasmosis

Author: Jordan Isenberg

Abstract Body:

Purpose: Ocular toxoplasmosis (OT) is the most common etiology of posterior uveitis. The high incidence of macular scarring associated with OT is a leading cause of visual morbidity. Serum biomarkers of the disease would aid in its diagnosis. This study sought, for the first time, to elucidate serum biomarkers for OT.
Study Design: Shotgun biomarker discovery
Methods: Blood samples were collected from four groups of nine patients each; toxoplasmosis IgG- with no history of uveitis, non-toxoplasmosis uveitic, first episode OT, and symptomatic recurrent OT. Serum was isolated and subjected to proteomics analysis using 2-dimensional gel electrophoresis (GE) and surface-enhanced laser desorption ionization mass spectrometry (SELDI- MS). Selected proteins were further separated by GE and sequenced using tandem MS. Results were directly cross-validated directly with a T. gondii outbreak biomarker database that occurred in a neighboring Brazilian state.
Results: Fifty markers of OT and 46 markers of recurrent disease were discovered by SELDI-MS; 47% were cross-validated; 14 biomarkers were selected for verification by 1-dimensional gel electrophoresis. 2D-GE analysis yielded 57 bands which were selected based on the intensity of the bands, leading to the identification of 20 proteins. 75% of those identified candidates were also found by SELDI-MS. Four candidates were chosen for immunoblotting. Only one serum protein, peptidyl-prolyl cis-trans isomerase A, was validated to be a biomarker of multi-episodic OT by immunoblotting in patient and control samples.
Conclusions: PPIA is a validated marker for multi-episodic OT with significant potential clinical significance.

Title: Ophthalmic manifestations in patients co-infected with HIV and syphilis: Case series (2000-2015) from 2 tertiary care centers in Montreal

Authors: Zainab Khan, Julie Vadboncoeur, Yasmine Rabia, Bouchra Serhir, Annie-Claude Labbé, Claude Fortin, Kinda Najem, Laurence Jaworski, Marie-Josée Aubin

Abstract Body:

Purpose: In recent years, the rates of syphilis are globally on the rise. Syphilis is one of the most prevalent infections in patients with HIV. The purpose of this study was to describe the demographics, ocular clinical presentations, management and visual outcomes of patients with ocular syphilis who are co-infected with HIV.
Study Design: Retrospective, descriptive and non-comparative observational study.
Methods: All patients with positive syphilis serology (including at least one positive treponemal test result) and co-infection with HIV were included in this study. Patients were recruited from two tertiary eye-care centers in Montreal, Quebec (Hôpital Maisonneuve-Rosemont and CHUM-Notre-Dame) between 2000 and 2015. Ophthalmic manifestations, demographics, management and outcomes were analyzed.
Results: 37 patients were included in this study. All patients had at least one positive treponemal serology test. 10 (27%) had a known diagnosis of HIV at the time of presentation. The remainder were found to be positive upon serology testing in our clinic. The mean age at presentation was 43 years. All patients (100%) were male. 24 (65%) were men who were sexually active with men, 2 (5%) were heterosexual, 1 (3%) was bisexual and the sexual orientation of 10 (27%) was unknown. Of the 37 patients, hepatitis C status was positive in 3 (8%), negative in 26 (70%) and unknown in 8 (22%). All patients were assessed by an infectious disease team. The mean presenting best-corrected visual acuity was 20/50. Ocular presentations included the following: 11 (30%) with anterior segment disease including isolated anterior uveitis (24%) and anterior uveitis combined with intermediate uveitis (6%); 24 (65%) with posterior segment disease including isolated intermediate uveitis (11%), posterior uveitis (22%) and panuveitis (32%); 16 (43%) with neuro-ophthalmic manifestations including 14 (38%) with optic neuropathies and 2 (5%) with cranial neuropathies; and 4 (11%) with other ocular diseases including scleritis and macular edema. Lumbar puncture was performed in 31 patients (84%) and it was abnormal in 27 of these patients (87%). It yielded a positive Veneral Disease Research Laboratory (VDRL) value in 7 patients (23%). 22 (71%) had an elevated white blood cell count and 23 (74%) had elevated protein concentrations. 33 of the 37 patients (89%) were treated. 29 (78%) patients received intravenous penicillin (as monotherapy or in combination with intramuscular), 3 (8%) received intramuscular penicillin and 1 (3%) received other antibiotics (ceftriaxone, azithromycin or doxycycline). The treatment status of 4 (11%) patients was undetermined because 3 (8%) were lost to follow-up and the treatment dosages for 1 (3%) was unclear upon chart review. Mean final best-corrected visual acuity was 20/30. The duration of follow-up was 12.6 months.
Conclusions: All patients presenting with ocular syphilis should be screened for HIV. Given the high rates of cerebrospinal fluid abnormalities, all ocular syphilis patients should be screened by a lumbar puncture regardless of HIV status. Visual outcomes are good when treated with intravenous penicillin as neurosyphilis.

Title: The efficacy and safety of Ozurdex intravitreal implant for the treatment of non-infectious intermediate uveitis

Authors: Solin Saleh, Chris Welsh, Chloe Gottlieb

Abstract Body:

Purpose: Ozurdex (Allergan, Inc, Irvine, California) is a sustained-release intravitreal dexamethasone implant that delivers corticosteroid directly to the posterior segment of the eye, allowing for controlled drug release over approximately 6 months. To date, few studies have been carried out to assess the role of Ozurdex in patients with exclusively non-infectious intermediate uveitis. The purpose of this study is to evaluate the efficacy and safety of the Ozurdex intravitreal implant for the treatment of non-infectious intermediate uveitis in patients on systemic immunosuppressive therapy and those naïve to systemic therapies.
Study Design: Case series.
Methods: Retrospective review of demographic information, clinical data and optical coherence tomography (OCT) scans from patients with non-infectious intermediate uveitis treated with Ozurdex at the University of Ottawa Eye Institute between September 1, 2010 and December 1, 2016. Demographics and clinical information, including pre- and post-treatment best-corrected visual acuity (BCVA), intraocular pressure (IOP), anterior chamber and vitreous inflammation following SUN grading, and central retinal thickness (CRT) and presence of cystoid macular edema (CME) on OCT were analyzed.
Results: The charts of 22 patients and 33 eyes with at least 6 months of follow up after Ozurdex implant were included. Mean age was 45.09 years, and 15 patients were female. Nine out of 22 patients (40.9%) were on systemic immunosuppressive therapy. Mean pre- and 6-month post-treatment BCVA was ~20/35 (0.225 logMAR) and ~20/25 (0.130 logMAR), respectively (p=0.038). Mean pre- and post-treatment CRT was 383.3 microns and 294.8 microns, respectively (p=0.00013). At the last follow-up appointment, there was resolution of CME in 83.3% of patients. At 6 months post-treatment, 88.0% had anterior chamber cell resolution, 84.6% had anterior chamber flare resolution, 78.6% had vitreous cell resolution, and 66.7% had vitreous haze resolution. Complete resolution of all intraocular inflammation was seen in 63.6% of our sample. IOP was not significantly raised post-treatment. Adverse events after Ozurdex injection included blurred vision in 57.6%, floaters in 54.5%, and photophobia in 15.2%. These had resolved at the last follow-up appointment in greater than 80% of the patients.
Conclusions: The Ozurdex intravitreal dexamethasone implant was effective in treating intermediate uveitis in our study group with statistically significant improvements in BCVA and CRT at 6 months follow up. Most patients in this study had complete resolution of their intraocular inflammation. Adverse effects were difficult to attribute to either the treatment or disease process, but most had resolved by the last follow-up appointment. Ozurdex appears to be a safe and effective treatment for non-infectious intermediate uveitis.

VISION REHABILITATION | RÉADAPTATION VISUELLE

Title: The state of low vision care in Ontario between 2009 and 2015

Authors: Amy Basilious, Alfred Basilious, Alex Mao, Cindy Hutnik

Abstract Body:

Purpose: Little is known about how low vision services by ophthalmologists are being accessed and provided. The aim of this study was to analyze the patterns of provision and utilization of vision rehabilitation services in Ontario, Canada from 2009 to 2015.
Study Design: Retrospective population-based study between 2009 and 2015.
Methods: Data associated with vision rehabilitation billing codes was obtained from the Ontario Health Insurance Plan (OHIP) database. All ophthalmologists (N=92) who billed for vision rehabilitation services through OHIP between 2009 and 2015 in Ontario and the patients (N=8949) who received these services were included in this study.
Results: The patient population that received vision rehabilitation services between 2009 and 2015 was comprised mostly of individuals older than 60 years old (79%) and more females (61%) than males. While patient and provider geographic distributions overlapped in the areas with largest patient populations, many regions lacked services. Over the seven-year period analyzed, the majority of these patients (71%) made only one vision rehabilitation visit. A small subset of patients (11%) made more than two visits. In 2010 to 2012, follow-up visits were more common than initial assessments. However, in 2009 and 2013 to 2015, initial assessments were more common. Only nine providers practiced low vision for seven years, while 43 provided services for only one year. In 2015, the most common diagnostic services provided to low vision patients were Optical Coherence Tomography (OCT) of the retina, OCT retina for laser or intravitreal (IV) injection and OCT retina for laser or IV for neovascularization (NV). The most common therapeutic services were IV for wet age-related macular degeneration (AMD), paracentesis, and IV for non-AMD.
Conclusions: Although low vision services increased steadily between 2009 and 2015, it is estimated that in any given year, 5% or less of those living with low vision accessed these services. There were inequities in ability to access these resources based on age, sex, and geographic location. There is a significant need to increase number of providers, service locations, and access for patients.