CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0026

Gap Junctional Intercellular Communication Protects Human Retinal Pigment Epithelial Cells from Oxidative Stress-Induced Injury

Tiiu Hess, Dale Laird, Hong Liu, Alex Mao, Cady Pocrnich, Qing Shao

Abstract:

Purpose: To determine the roles of connexin 43 (Cx43) and gap junctional intercellular communication (GJIC) in oxidant-stressed cultured human retinal pigment epithelial (hRPE) cells.

Methods: Cultured hRPE cells were treated with the chemical oxidant tert-butyl hydroperoxide (t-BOOH). Cell viability was assessed by the MTT assay. GJIC was evaluated by scrape loading/dye transfer and microinjection assays. Cx43 expression was detected by Western blot and immunofluorescent staining combined with confocal microscopy analysis. Retroviral infection of hRPE cells with disease-linked dominant negative Cx43(G21R), and dominant active mutants of both Cx43 and Cx26 was performed and the effect on cell viability was assessed.

Results: t-BOOH induced hRPE cell death by necrosis. GJIC was hindered by t-BOOH. Phosphorylation of Cx43 and a decrease in overall expression of Cx43 was observed following t-BOOH treatment. Retroviral infection with disease-linked dominant negative Cx43 increased t-BOOH-induced cell death, as did treatment with gap junction blockers 18b-glycyrrhetinic acid (GZA) and flufenamic acid (FFA). Conversely, over-expression of Cx26 and Cx43 increased the viability of oxidant-treated hRPE cells from 45.2% to 74.8% ($p<0.01$) and to 83.2% ($p<0.01$), respectively.

Conclusions: Connexin-mediated protection of hRPE cells from oxidative injury is GJIC-dependent.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0027

Classification and sizing of choroidal neovascular membranes using stereoscopic digital viewing software: Intra-observer and inter-observer agreement.

Dawn Hay, Brad Hinz, Patrick Ma, David Maberley, Matthew Tennant

Abstract:

Purpose: To determine the inter and intra-observer agreement amongst four reading center trained retinal specialists utilizing stereoscopic digital viewing software to classify and size CNV lesions.

Methods: Fourty-four angiograms from clinical trial subjects with age-related macular degeneration were uploaded to the Secure Diagnostic Imaging website. Each angiogram was reviewed in a standard fashion by two independant retinal specialists at different centers. Images were graded on photographic quality, location, activity and size of classic and occult components. A subset of images was re-read at an interval of six months to determine intra-observer agreement.

Results: The results of inter-observer variability were reviewed among four graders. Of the fourty-four images reviewed, 66% were classified as predominantly classic. A mean difference of 0.17 mm2 was found between graders when measuring the classic component ration of each membrane. Variations between graders in ratio of classic to non-classic components resulted in 10 of 44 lesions with conflicting classiciations (predominantly versus minimally classic.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0028

Assessment of Macular Edema Using a Retinal Thickness Analyzer versus Intravenous Fluorescein Angiography

Tiiu Hess, Cindy Hutnik, Alex Mao, Lee Siebert

Abstract:

Purpose: This pilot study sought to determine the technical comparability of the Retinal Thickness Analyzer (RTA; Talia Technologies) with Intravenous Fluorescein Angiography (IVFA) in the clinical assessment of Macular Edema (ME).

Methods: Five patients with ME underwent IVFA and RTA. On IVFA photographs, pathological areas were marked by a vitreoretinal specialist (LS) and areas were calculated using WinStation software (Ophthalmic Imaging Systems). As the current version of RTA Software 4.2.10 SP2 did not have comparable functions, a new software command was created allowing the importation and analysis of RTA images within WinStation software. RTA images were analyzed with the PDT function of WinStation, as for IVFA photographs. To compare lesion localization, the investigators printed a composite image of IVFA and re-scaled RTA images. A grid (referenced to the intersection of vertical and horizontal tangents to the optic disk) was overlain on both images. The grid squares were numbered and individually compared for presence or absence of a marked lesion.

Results: In collaboration with Talia Technologies Canada and Ophthalmic Imaging Systems USA, new software was developed that permitted the assessment of fundus images obtained by IVFA and RTA. The mean size of lesion marked on the IVFA images was 5.46 µm2 compared to 0.77 µm2 on RTA. Localization of lesions using manual grid overlay showed 93 total squares containing lesions on IVFA photographs, of which 39 corresponding squares were compatible on RTA (41.9 % agreement). RTA images indicated an additional 78 squares containing lesions, whose corresponding squares on IVFA showed no pathology.

Conclusions: This head-to-head comparison between fluorescein angiography and a retinal thickness analyzer demonstrated that the two technologies are best regarded as complementary, rather than competing. The tools of analysis created by the investigators demonstrated the relative abilities of each technology in terms of localization of the site of leakage and subsequent extent of edematous macular lesions.

Paper #0036
Cytomegalovirus Retinitis Mimicking Intraocular Lymphoma

James Farmer, Patrick Gooi, Bernard Hurley

Abstract:

Purpose: To discuss an unusual retinal infiltrate in an immunocompromised patient with follicular lymphoma which required retinal biopsy for definitive diagnosis.

Methods: A 62-year-old man was referred to the retinal service for decreased vision in the right eye associated with a white retinal lesion. Past medical history included follicular lymphoma, diagnosed 6 years previously and treated with chemotherapy. In the last 2 years his disease progressed, requiring additional chemotherapy and resulting in numerous admissions for opportunistic infections. On examination, the right eye had slightly decreased visual acuity. Fundoscopy revealed a whitish retinal infiltrate extending inferonasally from the disc with associated disk edema. Fluorescein angiography showed a pattern of early hypofluoresece followed by late hyperfluorescence consistent with an inflammatory lesion. Intraocular lymphoma was considered as a diagnosis; thus, the patient was managed with vitrectomy and retinal biopsy.

Results: Cytological analysis of the vitreous aspirate could not rule out a lymphoproliferative disorder. The microbial analysis was negative. Histology of the lesion showed extensive necrosis and large cells with prominent nucleoli. To rule out lymphoma, a battery of immunostains was performed and all were negative. The limited amount of tissue was exhausted in the process. Some of the atypical cells appeared to contain large intranuclear inclusions, which raised the suspicion of a cytomegalovirus (CMV) infection. The specimen was reviewed with neuropathology and lymphoma specialists who felt the findings were not entirely characteristic for CMV. Since the tissue was exhausted, a hematoxylin and eosin (H/E) slide was destained, on which a CMV immunostain was performed. This revealed positivity in the nuclei and intranuclear inclusions within the large atypical cells. A diagnosis of CMV retinitis was rendered. At 3 months post-vitrectomy, the patient showed improvement in vision and regression of the retinal lesion.

Conclusion: This case illustrates how retinal biopsy may provide a definitive diagnosis and direct patient care. Retinal lesions large enough for retinal biopsy are rarely encountered and often furnish very little tissue. When faced with a limited amount of tissue, destaining regular H/E slides is a possible avenue to performing additional immunohistochemical studies. Alternatively, if no tissue is available, PCR studies on the vitreous aspirate can show the presence of CMV.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0044
Intravitreal Bevacizumab in the Management of Central Retinal Vein Occlusions

Lesley Latham, Arif Samad, Roman Windisch

Abstract:

Purpose: To determine the safety and efficacy of intravitreal Bevacizumab (Avastin®, Genentech) to treat patients with macular edema and/or retinal ischemia secondary to central retinal vein occlusions (CRVO) and associated macular edema and retinal ischemia.

Methods: Retrospective case series of 6 eyes of 6 patients diagnosed with macular edema and/or severe retinal hypoperfusion secondary to CRVO. Patients underwent intravitreal injections of 1.25mg Bevacizumab at 6 week intervals over a period of 18 weeks. Patients were examined at baseline and at follow-up with assessment of visual acuity (VA), fundus photographs, fluorescein angiography and optical coherence tomography (OCT). Treatment outcomes including VA, macular thickness (MT) and vascular leakage were assessed at 18 weeks.

Results: Subjects included 2 women and 4 men with a mean age of 78.2 years (range: 54 – 89). Patients had been diagnosed for a median duration of 7 months (range: 3-11). No previous treatment had been administered to these patients including laser therapy and intravitreal triamcinolone acetonide. No adverse events were observed in any patient.
All patients experienced an improvement in vision. VA improved from a mean of 1.35LogMAR (range: 0.7 – 1.6) at baseline to a mean of 0.8LogMAR (range: 0.3-1.3) at 18 weeks (p=0.028). MT was reduced in all patients at 18 weeks. MT decreased from a mean of 550.3µ (range: 175-799) at baseline to a mean of 339.5µ (range: 122-559) at 18 weeks (p=0.007). Total macular volume had decreased in all patients at 18 weeks. It decreased from a mean of 12.2mm3 (range: 7.9-15.6) at baseline to a mean of 8.6mm3 (range: 5.97-12.7) at 18 weeks (p=0.007). Fluorescein angiography revealed a marked decrease in retinal hemorrhages and vascular leakage.

Conclusion: Intravitreal Bevacizumab appears to be safe and well tolerated in patients with CRVO.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0053

A Rare Case of Intraocular Lymphoma in a Patient with Oral and Oropharyngeal Squamous Cell Carcinoma

Jerrod Kent, Ravi Nrusimhadevara

Abstract:

Purpose: Few cases have been described of two different types of neoplastic processes occurring simultaneously and involving the eye. We report a rare case of intraocular lymphoma seen in a patient with a concurrent diagnosis of squamous cell carcinoma of the oral cavity and oropharynx.

Methods: A case report describing the ophthalmic and histopathological findings in a patient with clinically diagnosed intraocular lymphoma and concurrent squamous cell carcinoma of the oral cavity and oropharynx.

Results: An 88-year old female, recently diagnosed with oral and oropharyngeal squamous cell carcinoma, presented for routine follow up of dry Age Related Macular Degeneration. An incidental suspicious retinal lesion of the right eye was noted at the time. Following this, the patient underwent 20 fractions of 4500cGy palliative radiation therapy over 28 days for her oropharyngeal carcinoma. On follow-up examination, her vision had decreased from 20/60 to 20/400 in the right eye and 20/50 to light perception in the left eye. Fundus examination revealed significant amounts of white sheets of vitreous infiltrates obscuring the right fundus, while on the left, vitreous and retinal infiltrates were seen nasally and a collar of white subretinal infiltrates surrounding the fovea was visualized. No neurological deficits were noted on exam and an MRI scan was negative for CNS involvement. A diagnostic vitrectomy was performed, showing vitritis and cells suggestive of large cell lymphoma.

Conclusion: Intraocular Lymphoma is a very rare form of ocular pathology. The characteristic findings of decreased vision and subretinal infiltrates surrounding the fovea lead us to the diagnosis of intraocular lymphoma in our patient. To our knowledge this is the first reported case to date of intraocular lymphoma, without any detectable CNS lymphoma, occurring concurrently in a patient with squamous cell carcinoma.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0069

Prevalence of partial vitreomacular separation in untreated diabetic patients with clinically significant macular edema

Kenneth Eng, Jeff Gale, Sanjay Sharma, Todd Urton

Abstract:

Purpose: To determine the prevalence of partial vitreomacular separation (PVMS) on optical coherence tomography (OCT) study in patients with untreated clinically significant diabetic macular edema (CSDME), and to compare the prevalence to a control group of diabetics with no macular edema.

Methods: In a prospective fashion, all diabetic patients presenting to the Retina Service at Queen's University were considered for inclusion in the study. Demographic data including gender, age, duration of diabetes, and insulin dependence was noted. Eyes with prior retinal laser treatment, intraocular surgery, active retinal or anterior segment neovascularization, uveitis, or any cause of macular edema other than diabetes were excluded. All study eyes underwent a standard ophthalmic examination to determine the presence or absence of CSDME and severity of diabetic retinopathy. All eyes then received an OCT study to determine the presence or absence of PVMS. Patients requiring treatment for macular edema received the current standard of care therapy.

Results: A total of 149 eyes of 81 patients were included. The mean age was 58.5 years (range: 21-83). Seventy-one eyes had CSDME and 78 had no CSDME. The mean duration of diabetes was 12.8 years in patients with CSDME and 9.6 years in those with no CSDME. A total of 5 eyes (7.0%)of 4 patients in the 'CSDME' group and 4 eyes (5.1%) of 4 patients in the 'no CSDME' group had OCT evidence of PVMS. There was no significant difference in the prevalence of PVMS between the 'CSDME' and 'no CSDME' groups (2-tailed Fisher Exact Test: p-value = 0.74). The relative risk of PVMS in patients with CSDME versus those without CSDME was 1.178 (95%C.I. = 0.64-2.17).

Conclusion: Partial vitreomacular separation is an uncommon finding in diabetics with and without CSDME. PVMS is not associated with the degree of diabetic retinopathy or the duration of diabetes. The presence of PVMS on OCT may be a benign finding, unrelated to a significant tractional effect on the retina or to diabetic macular edema. Therefore, the presence of PVMS alone does not help to identify diabetics who would show increased benefit from surgical treatment (pars plana vitrectomy +/- peeling of the internal limiting membrane) for macular edema.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0070
Selection of Appropriate IOL in Combined Procedures (Phacoemulsification and Vitrectomy) With and Without Gas Tamponade

Raúl García, Kelly Schweitzer

Abstract:

Purpose: To determine if a difference in postoperative refraction exists between patients undergoing combined surgeries with and without gas tamponade.

Methods: The study compares 26 subjects undergoing combined procedures without gas tamponade and 28 subjects undergoing the same combined procedure with gas tamponade. The preoperative anticipated refraction is compared with the postoperative measured refraction.

Results: The difference (Ä) between the predicted preoperative refraction and the resulting refractive status 2 months postoperatively was significantly different ($t = 2.66$, $df = 48$, $p < 0.01$) in eyes undergoing combined procedure with gas tamponade (mean Ä = -.30, SD = .66) compared to those eyes not receiving gas tamponade (mean Ä = .16, SD = .55).

Conclusion: Patients undergoing combined procedures with gas tamponade experience a statistically significant myopic shift compared with those patients not receiving gas tamponade. Ophthalmologists performing combined procedures with gas tamponade should be aware of this shift in order to select the appropriate IOL and to help ensure the best visual outcome postoperatively.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0071

Combination Therapy in AMD: A review of visual outcomes following combination therapy reduced fluence Visudyne (rPDT) and an anti-VEGF agent (Avastin) administered as same day therapy. A retrospective, clinical practice review.

Philip L Hooper, Thomas Sheidow

Abstract:.

Objective: To evaluate the visual acuity outcomes of combination therapy with an angio-occlusive agent (Visudyne, reduced fluence - rPDT) and an anti-VEGF agent (Avastin) administered as same day therapy in patients with neovascular AMD.

Methods: Retrospective, single centre, case series. A consecutive series of 105 patients were available for review as of December 2006. All visual acuities were measured on a lighted LCD projector ETDRS-like chart.

Results: A total of 105 patients were reviewed who received combination therapy with same day rPDT and Avastin, either as baseline therapy (PDT Naïve – 67%) or as part of continuing therapy (Prior PDT – 33%). Mean follow up was 105 days with 61 patients having greater than 4 months follow-up.

Overall, visual acuity rose from baseline by 5.2 letters by 2 months and further increased to a 7.7 letter gain by 4 months. In the prior PDT group, the vision improvement was 9.6 letters while in the PDT naïve group, vision improved by 6.6 letters. 86.3% of patients avoided moderate visual loss (lost <15 letters) while 38% of patients gained 15 or more letters and 48% of patients gained 5 or more letters.

Conclusions: Preliminary results suggest that combination therapy with rPDT and Avastin offers a greater likelihood of visual stabilization in patients with exudative AMD than current standard PDT and results in a significant chance of visual improvement not previously seen with single agent therapy. Ongoing follow-up and patient enrollment from a single Canadian academic site will be presented.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0073
Phase I Study of Ranibizumab for Stage 1 or 2 RAP Lesions Secondary to AMD

Thomas Mark Johnson

Abstract:

Purpose: Retinal angiomatous proliferations (RAP) are a form of primary intraretinal neovascularization that may occur in 10-15 % of patients with exudative macular degeneration. Patients present with cystoid retinal edema, intraretinal hemorrhages and a focal hot spot on static ICG imaging. Vascular endothelial growth factor is hypothesized to be a stimulate for the growth of RAP lesions. This study was designed to evaluate the safety and efficacy of ranibizumab in patients with stage I or II retinal angiomatous proliferation (RAP) lesions secondary to age-related macular degeneration (AMD).

Methods: A prospective interventional case series of patients with RAP was conducted. Patients were treated with monthly intravitreal injections of ranibizumab (0.5 mg) per the MARINA protocol. The primary outcome measure was ETDRS visual acuity. Secondary outcomes included exudation on clinical examination, development of retinal choroidal anastamoses and subretinal fibrosis, fluorescein and high speed ICG imaging and OCT 3 retinal thickness and volume.

Results: 8 patients (mean age 29 years) with a minimum of 6 month follow up have been treated. At baseline average VA was 20/63. All patients had clinical features of RAP that was confirmed on imaging to be stage I or II. Average OCT central retinal thickness at baseline was 296 µm. Visual acuity at 3 and 6 month averaged 20/32 ($p<0.05$ compared to baseline). At 3 and 6 months average OCT retinal thickness was 186 and 144 µm ($p<0.008$ compared to baseline). By 3 months all RAP lesions were closed on angiography. Thus far, no serious ocular or systemic adverse events have been reported in this study.

Conclusion: Ranibizumab appears to be efficacious in the treatment of stage I and II RAP lesions. No complications to therapy have been observed.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0077

The outcomes and complications of intravitreal triamcinilone injection for macular edema.

Pankaj Puri, Arvind Venkataraman

Abstract:

Purpose: Evaluate the outcomes and complications of intravitreal triamcinilone injection for macular edema.

Methods: This retrospective study includes 35 eyes of 31 patients who have undergone intravitreal triamcinolone injection and a follow-up of 6 months or more. Intravitreal triamcinolone 4 mg in 0.1 ml was given and were seen on day 1, 1 week, once in 2 months or as needed up to 6 months and every 3 months up to 1 year.

Results: Fifty seven percent (20 patients) showed a gain of 1 line or more of best-corrected visual acuity. If macular degeneration patients were excluded 68% showed a visual gain of 1 line or more. Three patients lost 1 line or more. Six patients (17%) had a significant raise in intraocular pressure, which needed anti-glaucoma medications. Eight eyes showed recurrence of edema, six were given a repeat injection and two patients had their second injection.

Conclusion: Intravitreal triamcinolone injection is effective in macular edema of vascular occlusions and diabetic maculopathy especially when the injection is given early and the effect is sustained in some patients with minimal risks

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0080
Iodine-125 Plaque Brachytherapy in Management of Ciliary Body Melanoma

Hatem Krema

Abstract:

Purpose: Since the management of ciliary body melanoma is controversial, we report our experience with the management and the incidence of postoperative complications, for uveal melanoma involving the ciliary body, treated by Iodine-125 plaque brachytherapy.

Methods: The Electronic charts for all uveal melanoma cases treated with Iodine-125 plaque brachytherapy at Princess Margaret Hospital, in Toronto, since 1998 were reviewed. Inclusion criteria included those uveal melanomas involving the ciliary body whether these melanomas were extending anteriorly to involve the iris or posteriorly to involve choroid. The extent of ciliary body involvement was confirmed by ultrasound biomicroscopy.
Patients demographic data, tumors data, management data and follow-up data including tumor thickness measurements, visual acuity, eye pressure, and brachytherapy- related complications were all reviewed along their subsequent six monthly evaluation visits, following brachytherapy.

Results: We included 42 patients, 13 males and 29 females, median age at presentation was 58 years (range: 30-78 years), median follow-up period of 43 months (range: 12-96 months).
Ciliary body melanomas were asymptomatic in about 55% of cases, while floaters or flashes were the main symptom in about 33 % of patients.
Melanoma pretreatment median thickness was 5.2 mm (range: 1.5 to 10 mm).
Anterior tumor border involved pars plana in 17 cases, par plicata in 10 and iris in 15.
Radiation-induced cataract was the main complication affected 55% of patients; its highest incidence was between 12-18 months of brachytherapy.
Radiation retinopathy affected 24% of patients. Neovascular glaucoma affected 15 % of patients that was controlled by topical treatment, cycloablation, or anti-VGEF injections, but required enucleation as a final treatment in two patients.
The average tumor thickness at the last visit was 3.3 mm representing 40% reduction from the average pretreatment thickness.
One case required enucleation for recurrence. No cases developed metastases.

Conclusion: Iodine-125 plaque brachytherapy provides primary tumor control for ciliary body melanomas. This treatment is associated with radiation-related complications to other ocular structures. However, most of these complications are manageable to permit retention of the treated eye, with preservation of vision, in the majority of cases.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0081
Iodine-125 plaque brachytherapy in the treatment of Large Uveal Melanoma.

Luz Maria Vasquez

Abstract:

Purpose: To determine the success and complication rates of Iodine-125 plaque brachytherapy in the treatment of large uveal melanomas as defined by Collaborative Ocular Melanoma Study Group (COMS).

Methods: A retrospective consecutive cases series of uveal melanoma treated with Iodine-125 plaque brachytherapy at Princess Margaret Hospital since 1998 were included if the largest basal diameter was greater than 16 mm and thickness greater than 2 mm. Tumour characteristics, visual outcomes, radiation related complications, recurrences, and, metastatic rates were documented.

Results: 22 patients with large uveal melanoma were enrolled with a median follow-up of 28 months. All patients were treated with a 20 mm Iodine-125 plaque using standard protocol. Median tumour diameter was 16 mm radially and 14 mm circumferentially. The mean tumour thickness was 6.6 mm at the time of plaque insertion. 86% of tumours were melanotic, 9% presented lipofuscin and 90% were dome shaped. 63.7% were associated with retinal detachment. The mean distance to the optic nerve and fovea was 6.4 mm, and 7.7 mm, respectively.
40% of patients achieved a final visual acuity of 20/40 or better one year post treatment and 27% at the last follow up. The incidence of radiation retinopathy, radiation-induced cataract, and radiation optic neuropathy was 41%, 18% and 4.5%, respectively with a peak incidence at 1 year, 30 months, at 2 years. 22.7% developed neovascular glaucoma. The total incidence of recurrence was 13.6%, all of them treated with enucleation. 18% of the patients developed metastasis.

Conclusions: Iodine-125 plaque brachytherapy is a viable treatment option for large uveal melanomas. However, radiation related complications were significant, with a relatively conservative rate of globe-retention.

CANADIAN RETINA
& VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0089

Monitoring central electroretinal function in patients on long-term hydroxychloroquine therapy :the Ottawa Experience

Laura Smith

Abstract:

Purpose: Plaquenil (hydroxychloroquine) is a medication whose primary clinical indications are collagen vascular diseases including systemic lupus erythematosus and rheumatoid arthritis. Multifocal electroretinography (mERG) has been developed for clinical monitoring of central electroretinal function in patients on these therapeutic compounds. We have investigated mERG correlates in patients on long-term Plaquenil therapy to determine the potential clinical utility of mERG in detecting early changes in retinal function.

Methods: 140 eyes of 70 consecutive patients (61 females, 9 males) on long-term treatment (duration 3 to 15 years (mean = 8.1 years) Plaquenil had serial multifocal ERG recordings performed annually for 2 to 6 years while on treatment. Multifocal ERGS were recorded with DTL fiber electrodes and dilated pupils. The 61 hexagon stimulus subtended 45 degrees centered on the fovea. Timing and response amplitude of the foveal, parafoveal, and paracental rings was measured.

Results: 69% of patients showed no significant changes in mERG during 2 to 6 years of monitored treatment. 23% of patients did show significant changes in mERG during 2 to 4 years of monitored treatment. 7%) of patients did show significant changes in mERG after 4 years of monitored treatment. In those affected patients there was generally good correlation with changes in clinical findings such as 10-2 perimetry and color vision. In several patents taken off Plaquenil there was improvement in mERG noted within 12 months.

Conclusions. Multifocal ERG is an objective, non-invasive method to accurately assess central electroretinal function in patients on long-term Plaquenil therapy.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0094
Modified 20 Gauge Trans-Conjunctival Pars Plana Vitrectomy

Mikael Sebag, Dinu Stanescu

Abstract:

Purpose: To describe a new type of 20-gauge trans-conjunctival pars plana sclerotomy : sclerotomy

Design
The study design was a retrospective study, including 181 patients who underwent pars plana vitrectomy at the Dept of Ophthalmology, University Medical Hopital NotreDame, Montreal, between X and Y

Methods: Chart review of 181 consecutive patients (181 eyes and 543 sclerotomies) who underwent trans-conjunctival sclerotomy (TCS) by one surgeon (M.S.) for various vitreo-retinal conditions : idiopathic epiretinal membrane, idiopathic macular hole,tractional retinal detachment, rhematogen retinal detachment,nonclearing vitreous hemorrhage, proliferative vitreous retinopathy, retained lens fragment, dropped nucleus, silicone oil removal and endophtalmitis. Main outcome measures included time of setting, number of sutures and counter-incision required per eye and per sclerotomy, patient demographics, diagnoses, and types of procedures, postoperative intraocular pressure and both intraoperative and postoperative complications.

Results: There were 71 women and 110 men. The mean age was 59.63 years (range from 19 to 89 years).Mean opening time was 68 seconds. The suture rate per eye was 20% (38 eyes out of 181) The suture rate per sclerotomy was 9%.(49/543) Thirty four eyes did not require counter incision techniques.The counter-incision rate per sclertomy was 48%(266/543).Mean IOP was 17.7 mmHg. In total indications for surgery were rhematogen retinal detachment (106),mixed retinal detachment (2), tractional retinal detachment (3), endophthalmitis (2), dyalisis (1), removal of silicone oil (18), vitreous hemorrhage (14), epiretinal membrane (15), subluxated lens (3), luxated lens (6), macular hole (7) and one combined retinal detachment and phakoemulsification (3).Two subgroups were analyzed. Group 1 includes procedures with injection or removal of silicone oil and fragmatome. Group 2 encompass all other procedures except the one with silicone oil or fragmatome.We found divergent results according to subgroup classification and these results are showed and discussed below.

Conslusion: This novel technique of 20G trans-conjunctival pars-plana vitrectomy allow watertight sutureless sclerotomies. It is safe, reproductible, easy to learn and perform and brings all the advantages of suturless surgery

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0097

Comparison of the potential acuity meter and the visometers in patients with epiretinal membrane

Jean Chuo, Darren Lee, David Maberley, David Puddimore

Abstract:

Purpose: To compare the Guyton–Minkowski Potential Acuity Meter (PAM), the Haag-Streit Lotmar Visometer (Lotmar), and the Heine Visometer (Heine) in their ability to predict postoperative best corrected visual acuity (BCVA) in epiretinal membrane surgery.

Methods: In total, 36 eyes of 36 consecutive patients with epiretinal membrane and no known macular or optic nerve pathology were recruited from a single referral-based retinal practice. Preoperative predictions of postoperative BCVA were compared with actual postoperative BCVA. The usefulness of these instruments as a 'diagnostic test' for predicting true surgical success (defined as postoperative BCVA of 20/50 or better) from predicted surgical success (PAM, Lotmar, or Heine predicted acuity 20/50 or better) was analysed.

Results: There was a rough correlation between postoperative BCVA and PAM predictions (Pearson Correlation, p=0.398, P=0.016) and between postoperative BCVA and Heine predictions (Pearson Correlation, p=0.529, P=0.003). No statistically significant correlation was found for the postoperative BCVA and Lotmar predictions.

Conclusion: We found some clinical benefit to support using the Heine visometer, and no clinical benefit to support using the PAM and Lotmar visometers, in the preoperative assessment of epiretinal membrane patients with no other known retinal or optic nerve pathology.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0098
RNA Interference Against HIF-1α Attenuates Production of Angiogenic Factors from Human RPE Cells

Hans-Michael Dosch, Farzin Forooghian, Rozita Razavi

Abstract:

Background: Vascular endothelial factor (VEGF) and erythropoietin (EPO) have emerged as important angiogenic factors in the pathogenesis of retinal neovascularization in diseases like diabetic retinopathy. Retinal pigment epithelial (RPE) cells have been demonstrated to be an important source of angiogenic proteins in the retina. Recently, RNA interference using small interfering RNA (siRNA) has emerged as a powerful tool for knocking down expression of specific proteins. Hypoxia-inducible factor 1α (HIF-1α) is the common transcription factor for many angiogenic proteins, including VEGF and EPO, and may represent a novel therapeutic target for pathogenic retinal neovascularization.

Methods: Human RPE (ARPE-19) cells were grown to confluence and then transfected with siRNA specific for HIF-1α. As a negative control, cells were transfected with random non-specific siRNA. Cells were then cultured for various times (12, 24, and 36 hours) under hypoxic conditions (3% O2, 5% CO2, 37 °C). Following purification, intracellular protein was analyzed and quantified using Western blot and densitometry, respectively. Protein secreted into the media was assayed using enzyme-linked immunosorbent assay (ELISA). Messenger RNA (mRNA) was quantified using reverse-transcriptase polymerase chain reaction (RT-PCR).

Results: siRNA was successful in knocking down expression of HIF-1α. For a minimum of 72 hours after transfection, HIF-1α protein expression was almost undetectable in RPE cells grown in hypoxic conditions. No cellular toxicity was observed after transfection. VEGF concentration in the media was significantly reduced at all time points (55% decrease, $p<0.001$). Although EPO production by RPE cells was much lower than VEGF, preliminary results also indicated a significant reduction in the amount of EPO secreted into the media. RT-PCR data was consistent with these observations.

Conclusions: RNA interference against HIF-1α can attenuate the production of angiogenic factors by human RPE cells. Antagonism of HIF-1α by this method may have therapeutic potential for diseases like diabetic retinopathy. Potential advantages compared to current anti-VEGF therapies include longer duration of effect with attenuation of multiple angiogenic factors including VEGF and EPO. Future work in this lab will involve examination of other HIF isoforms (HIF-2α), as well as *in vitro* angiogenesis assays (HUVEC tube-forming assays) to compare anti-HIF-1α siRNA to anti-VEGF siRNA.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0100

A Randomized Trial of Topical versus Subconjunctival Anesthesia for Intravitreal Injections

Kenneth Eng, Jeffrey Gale, Kenneth Williams, David Wong

Abstract:

Purpose: To compare the effectiveness of topical versus subconjunctival anesthesia for intravitreal injections.

Methods: Patients requiring intravitreal injections were randomized to topical pledgette anesthesia (n=61) or subconjunctival anesthesia (n=60). Subjects completed a modified version of the McGill Pain Questionnaire post-anesthetic and post-intravitreal injection.

Results: Subconjunctival anesthesia was more painful than topical anesthesia ($p<0.001$). The topical anesthesia group experienced more pain with intravitreal injection than the subconjunctival anesthesia group($p<0.001$).

Conclusion: Both topical and subconjunctival anesthetic provide excellent pain control for intravitreal injections. However, subconjunctival anesthesia may provide more effective pain control, thereby minimizing the risk of complications from patient movement and improving compliance with future injections.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0104

Effect of combination therapy on the retinal and choriocapillaris vascular system. A fluorescein and indocyanine green study of combination therapy with reduced fluence PDT and Avastin.

Thomas Sheidow

Abstract:

Objective: To evaluate the effects of combination therapy with reduced fluence PDT (rPDT) and intravitreal Avastin on the retinal and choroidal vascular perfusion.

Methods: Three patients were evaluated on Day 1, Week 1, Month 1 and Month 3 following combined rPDT and Avastin utilizing OCT, IVFA and ICG. Evaluations of the PDT-induced choroidal perfusion changes were performed using the grading scheme developed by Michels et al IOVS 2006.

Results: Two patients with Predominantly classic (PC) and one with Minimally classic (MC) CNV were evaluated with OCT, IVFA and ICG at baseline, post treatment day1, week 1 and month 1. All patients had complete closure of the CNV by week 1, with both PC lesions being completely closed by day 1 and with restoration of the normal retinal architecture on OCT. OCT remained stable through 1 month follow-up. No patients displayed any evidence of retinal non-perfusion on IVFA at any time post treatment.

On ICG, 1 patient with no initial changes on day 1 developed grade 2 choriocapillaris closure by week 1 which persisted until 1month follow-up. No progression of this effect was seen on the subsequent testing. Both of the other patients experienced either Grade 0 or 1 changes, suggestive of no significant impact on the normal choriocapillaris.

Conclusion: These three patients compare favourably with the low fluence patients in the study by Michels et al suggesting that the addition of the anti-VEGF agent Avastin does not appear to have a significant deleterious effect on the retinal or choriocapillaris perfusion on IVFA or ICG. This suggests that there are no additional safety concerns with the use of same day combination therapy.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0107

Intravitreal Injection of Bevacizumab (Avastin) for the Treatment of Rubeosis Iridis and Neovascular Glaucoma

Sonia A. Callejo, John Chen, John Galic, Pierre Labelle, Mila Oh, Elham Rastikerdar, Patrick Saurel

Abstract:

Purpose: To evaluate short-term efficacy and safety of intravitreal injection of bevacizumab for treatment of iris neovascularization (INV) and angle neovascularization (ANV)

Methods: Retrospective chart review of patients with INV and/or ANV secondary to proliferative diabetic retinopathy (PDR) or vascular occlusion (VO) was performed. Visual acuity, intraocular pressure (IOP), and the extent of INV/ANV before and after bevacizumab injection were obtained. The number of injections needed, time-period between injections, use of adjunctive treatments or surgeries following the injections as well as complications were reviewed.

Results: Twelve eyes of 11 patients (6 PDR, 5 VO) were identified, 9 males and 2 females with a mean age of 77.8 years. The mean follow-up period was 22.5 weeks. VA remained stable in all eyes during the follow-up period. Mean IOP at baseline was 23 mmHg (range 12 to 50). Mean post-treatment IOP was 21.2 mmHg at 1 week, 23.4 mmHg at 1 month, and 22.4 mmHg (range 11-42) at the last follow-up. Complete regression of INV was noted in 9 of 10 eyes within 3 weeks following bevacizumab treatment (range 1 day to 8 weeks). Complete regression of ANV was noted in 10 of 11 eyes within 4 weeks after treatment (range 4 days to 8 weeks). Recurrence of neovascularization was reported in 4 eyes, requiring an additional injection 26 to 36 weeks later following the first injection. Complete regression within 2 weeks of the second injection was noted in all 4 cases. Six eyes required further treatments/surgeries following injection. 4 eyes required pan-retinal photocoagulation (PRP), 1 eye underwent vitrectomy with endolaser, and 1 eye required Ahmed tube placement. Two of these eyes had active INV/ANV at the time of the additional procedure. No local or systemic complications of the injections were reported.

Conclusion: Intravitreal injection of bevacizumab was associated with a rapid and profound regression of INV/ANV, with a minority of patients requiring additional injections. Intravitreal bevacizumab may be considered as an adjuvant measure for the treatment of anterior neovascularization prior to PRP taking its full effect. Bevacizumab can also be used as a useful alternative treatment for patients with INV/ANV in whom media opacity precludes the use of PRP or in whom maximum PRP treatment has already been performed. Additional studies are needed to evaluate the optimal dosing, long-term safety, and the duration of its effect.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0108

Assessment of the Accuracy of Clinical Exam and Diagnostic Vitrectomy for Intraocular Lymphoma

Harpreet Gill, Patrick Ma, David Maberley, Nk Wade, Valerie White, Leah Wittenberg

Abstract:

Purpose: To determine the accuracy of clinical and cytological diagnosis of intraocular lymphoma.

Methods: Retrospective review of Anatomical Pathology Laboratory Database at Vancouver Hospital for all patients who had vitreous cytology specimens between October 1990 and October 2005. We reviewed patient charts to obtain follow up information.

Results: We reviewed vitreous cytology results from diagnostic vitrectomies in 278 eyes of 255 patients. One patient had 3 diagnostic vitrectomies, 21 patients had 2 procedures and 233 patients had a single procedure. We categorized our samples into six major categories: granulomatous inflammation, acute inflammation consistent with endophthalmitis, large cell lymphoma, mixed non-specific inflammation, hypocellular specimens and other. Clinically suspected lymphoma was the most common reason for diagnostic vitrectomy in 71 of 278 (26%) eyes. Of the 71 clinically suspected cases, 10 were cytologically proven to have intraocular lymphoma. Diagnostic vitrectomies in the remaining 207 cases were not done for suspected lymphoma, however four of these cases were diagnosed as lymphoma by cytology. This gives a sensitivity of clinical exam of 71%, specificity of 77% and positive predictive value of 14%. Two cases with negative cytology were subsequently found on follow-up to have lymphoma for a sensitivity of cytology of 88%, specificity of 100% and negative predictive value of 99%.There were no false positive cytological exams. Fourteen cytology specimens in 11 patients were positive for lymphoma.

Conclusion: Clinical exam for intraocular lymphoma did not have a high positive predictive value, but was moderately sensitive and specific. Cytological exam was 100% predictive for lymphoma, but had a small number of false negative exams. This suggests that in patients where there is a high suspicion for lymphoma, further diagnostic investigation should be pursued.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0109

North Carolina Macular Dystrophy in a Canadian Family

Sana Al-Zuhaibi, Ashjan Bahmafouz, Michael Kapusta, Pierre Lachapelle, John Little, Julie Racine, Lauren Segal, Kent Small

Abstract:

Background: North Carolina Macular Dystrophy (NCMD) was first described in a family of 3 brothers who emigrated from Ireland in the 1830ï¿½s. Unrelated affected families have been found in Texas, Central America, and France. All have been mapped to the MCDR1 locus on chromosome 6q.

Purpose: To describe the clinical features of a Canadian family with autosomal dominant North Carolina Macular Dystrophy. To determine if the disease locus maps to MCDR1 on 6q.

Methods: More than 30 family members have been reviewed or examined by an ophthalmologist. Fundus photography, standard and multifocal electroretinography, color vision have been performed on 6 members including the proband.

Results: The family emigrated from England to Eastern Canada in 1927; all still reside in this region. At least 8 of more than 35 family members have the condition. All but one (the proband) have relatively good vision (20/40 or better). The proband has good vision in one eye and 20/200 in the other.

Conclusion: This is the first known Canadian family which has North Carolina Macular Dystrophy. Linkage studies are in progress. On the long term, central vision remains quite good in most family members; only a couple have developed a macular scar. Further family members are being sought to determine if they also may have the condition.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0133

Time dependent labelling of rat retinal ganglion cells by fluorogold via retrograde transport from the superior colliculi

Michele Archibald, Vanessa Avellaneda Chevrier, Balwantray Chauhan, Terry LeVatte, Xu Wang

Abstract:

Purpose: To determine the time course of the tracer fluorogold (FG) to label retinal ganglion cells (RGC) when applied to the superior colliculus (SC).
METHODS: Gel foam soaked in 2% FG was placed over the surface of both SC of adult Long Evans rats. Rats were euthanized and perfused at 1, 2, and 3 days following application. Retinas were removed and whole-mounted. Digital fluorescent photomicrographs were taken centered at 1, 2, and 3 mm from the optic disc in each quadrant. Labelled RGCs were manually counted and averaged over all quadrants.

Results: The mean density of RGCs demonstrating FG fluorescence in rat retinas 1 day after application of 2% FG gel foam to the SC was found to be 2178 cells/mm2. At 2 and 3 days, the RGC densities were 2221 and 2229 cells/ mm2 respectively. Our previous work showed that 7 days after application of 2% FG, a mean density of 2002 cells/mm2 in the retina are labelled (Chauhan et al., 2004).

Conclusion: These results suggest that near complete RGC labelling is achievable with FG application to the superior colliculus as early as 1 day post application.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0136

Treatment of choroidal neovascularization in choroideremia with intravitreal bevacizumab (Avastin)

Amin Kherani, Ian Macdonald, Azien Safarpour, Riz Somani

Abstract:

Purpose: Therapies targeting vascular endothelial growth factor (VEGF) are effective in the treatment of choroidal neovascular membranes associated with age-related macular degeneration. We report a case of choroidal neovascularization in a male patient with X-linked choroideremia treated with intravitreal bevacizumab (Avastin).

Methods: Intravitreal Avastin (1.25 mg) was injected in a 19 year old male patient with choroideremia and a choroidal neovascular membrane. The patient presented with a paracentral scotoma in the left eye. Optical coherence tomography (OCT) and fluroescein angiogram (FA) findings were consistent with choroidal neovascularization. FA and OCT findings were compared before and after treatment with Avastin. A mutation in the REP-1 gene was revealed by mutation analysis, confirming the clinical diagnosis of choroideremia.

Results: No signs of toxicity were observed.

Conclusions: To our knowledge, this is the first case of choroidal neovascularization associated with choroideremia treated with intravitreal Avastin. Choroidal neovascularization is a rare complication of choroideremia which may respond to anti-VEGF therapy.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0141

Electrophysiological effects of intravitreal Avastin (bevacizumab) used for the treatment of exudative age-related macular degeneration (AMD).

Ken Eng, Jeffrey Gale, Rustum Karanjia, Sanjay Sharma, Martin W.ten Hove

Abstract:

Purpose: To assess the effects on retinal electrical activity of intravitreal bevacizumab (Avastin) in patients with exudative AMD by multifocal electroretinogram (mf-ERG).

Methods: Fifteen subjects with exudative AMD have been recruited over a four month period at a tertiary care centre as part of this ongoing study. The subjects selected are naïve to bevacizumab in the investigated eye and underwent pretreatment testing with mf-ERG and intravenous fluorescein angiography (IVFA). A second mf-ERG test was conducted seven to fourteen days post-treatment. The location and size of the lesion was assed on the IVFA and plotted against the mf-ERG responses using a custom overlay. This allowed the localized physiological visual responses to be correlated with the underlying pathology. The P1 and N1 response amplitudes were examined pre and post bevacizumab for both central degrees of vision and quadrants with and without pathology. Areas without pathology were utilized to assess for inter-test variability.

Results: Initial assessments indicate that bevacizumab conferred a significant improvement in amplitude of the P1 response from lesion associated recordings in 60% of those who showed a clinical improvement in visual acuity. In four subjects the response corresponding to the area of highest fluid accumulation demonstrated a significant increase in the P1 amplitude post-treatment, irrespective of clinical outcome (43%±13 increase; $p<0.008$). In addition, in three patients where the visual acuity showed improvement, the amplitude of P1 in areas where fluid was identified on the initial IVFA was significantly increased relative to baseline (17%±5 increase; $p<0.03$). These subjects had no significant inter-test variability ($p>0.22$). There was no significant difference in the amplitude of the aggregate P1 or N1 response one week post injection in the central 5, 12, 20 and 40 degree's of vision.

Conclusion: This study represents a novel method for assessing an improvement of mf-ERG responses. We were able to detect an electrophysiological change which correlates with improvements in visual acuity post-bevacizumab treatment. This study demonstrates that mf-ERG is a useful modality for identification of localized electrical disturbances in the retina caused by AMD. Furthermore, mf-ERG provides a potential method for assessing treatment outcome over time. The ability of mf-ERG responses to predict changes in visual acuity and the potential for improvement with bevacizumab treatment warrants further investigation.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0142

Intravitreal Bevacizumab (Avastin) for the Treatment of Pigment Epithelial Detachment associated with Neovascular Age-Related Macular Degeneration

Alexander Banashkevich, Jean Chuo, Patrick Ma, David Maberley, Michael Potter, Matthew Russell, Peter Zakrzewski

Abstract:

Purpose: Various treatments have been attempted in the management of pigment epithelial detachment (PED) associated with neovascular age-related macular degeneration (AMD), but none have demonstrated significant therapeutic benefit. The risk of severe vision loss has been reported with the use of photodynamic therapy (PDT) with verteporfin. The Purpose of this study was to investigate the use of intravitreal bevacizumab (Avastin) for the treatment of PED associated with neovascular AMD.

Methods: Consecutive patients presenting with PED associated with subfoveal neovascular AMD who received at least one intravitreal bevacizumab (1.25 mg) injection were analyzed as a retrospective case series. Subsequent bevacizumab injections and/or other treatment modalities were employed based on treatment response. Primary outcome measures were best-corrected visual acuity (BCVA) and OCT-derived central macular thickness measurements.

Results: Analysis of preliminary study data shows 43 eyes of 42 patients with a mean age of 78.9 years. There were 35 eyes of 35 patients with BCVA data both at baseline and one month post-injection. The mean baseline BCVA (calculated by conversion to logMAR) improved from 20/239 to 20/183 at one month post-injection (P=0.11). Among these 35 eyes, 13 (37.1%) showed visual improvement (halving or better of the visual angle), and 16 (45.7%) had no significant change. Six (17.1%) eyes demonstrated significant visual loss (doubling or worse of the visual angle), of which 4 (11.4%) had severe vision loss to the counting fingers level. OCT data was available for 29 eyes of 29 patients at both baseline and one month post-injection. The mean central macular thickness decreased from 302 µm at baseline to 244 µm at one month post-treatment (P=0.001). No short-term systemic safety concerns were identified in the study. One patient developed anterior uveitis post-injection, which resolved with topical corticosteroids.

Conclusions: Preliminary study results reveal the promising nature of intravitreal bevacizumab (Avastin) for the treatment of PED associated with neovascular AMD. A non-statistically significant improvement in mean BCVA was found at one month post-injection, with 83% of eyes showing either significant improvement or stability in visual acuity. A statistically significant decrease in macular thickness was demonstrated at one month, likely representing resorption of intra- and subretinal fluid. Despite the markedly improved visual outcomes compared with PDT/verteporfin, there may be a similar risk of severe vision loss with the use of intravitreal bevacizumab. Follow-up at this point is too short to make firm conclusions; data collection is ongoing and updated results will be presented.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0146

Pneumatic retinopexy as first line intervention for primary rhegmatogenous retinal detachments

Feisal Adatia, Howard Chen, Jaime Claramunt, Stephen Conti, Robert Devenyi, Peter Kertes, Wai-Ching Lam

Abstract:

Introduction: The Purpose of this study was to prospectively evaluate the overall utility of pneumatic retinopexy on all patients with a primary rhegmatogenous retinal detachment in whom it is reasonable that pneumatic retinopexy may work, to evaluate extended criteria, and to determine if the success of pseudophakic patients is higher in the era of phacoemulsification.

Methods: Prospective, consecutive, interventional series of patients who presented with a primary rhegmatogenous retinal detachment where the ora serrata could be examined for 360 degrees and it was reasonable that pneumatic retinopexy could tamponade or sequentially tamponade the causative retinal breaks. Extended criteria in this study was defined as a single break spanning > 1 clock hour, multiple breaks spanning greater than 1 clock hour, an inferior break(s), having a retinal break(s) in attached retina requiring pre-treatment with laser or cryotherapy, or extensive lattice (> 3 clock hours).

Results: There were 165 primary rhegmatogenous retinal detachments that were consecutively screened over a one-year period. 115 patients were candidates for the study and 113 were enrolled. The overall success rate for PR alone was 70.7 % (80/113) and 72.8 % (51/70) for eyes that fit the clinical trial guidelines (CTG) as defined by the Pneumatic Retinopexy Trial. There were 76 phakic eyes and 37 pseudophakic eyes. In the phakic group, 46 eyes fit the clinical trial guidelines and 80.4% (37/46) were successful compared to 30 eyes with extended criteria of which 73.3% (22/30) were successful. In the pseudophakic group, 24 eyes fit the clinical trial guidelines criteria of which 58.3% (14/24) were successful, and 13 were extended criteria of which 53.8% (7/13) were successful. All failures were reattached with further vitrectomy and or scleral buckling surgery. In the CTG phakic group 22.2% (2/9) required more than one further surgical intervention compared to 60% (6/10) of the pseudophakic CTG failures. In the extended criteria groups, 25 % (2/8) of phakic eyes and 33.3% (2/6) of pseudophakic eyes with unsuccessful PR required more than one further surgical intervention.

Conclusions: Pneumatic retinopexy alone can treat over half of all phakic rhegmatogenous retinal detachments, phakic patients consistently respond more favorably than pseudophakic patients despite improvements in cataract surgery that allow for better visualization of the peripheral retina. Extended criteria results were more favorable in the phakic group than in the pseudophakic group. Extended criteria failures do not require more surgical intervention to reattach the retina than CTG failures.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0147
Intravitreal Bevacizumab in the Managment of Age Related Macular Degeneration

Arif Samad, Roman Windisch

Abstract:

Purpose: To investigate the safety and efficacy of intravitreal bevacizumab (Avastin®, Genentech) in the treatment of exudative age related macular degeneration (AMD).

Methods: This retrospective case series reports the effects of intravitreal bevacizumab in 61 eyes of 58 patients with exudative age related macular degeneration. Patients were treated with 1.25mg bevacizumab at 6 week intervals and were examined at baseline and followup visits with visual assessment, optical coherence tomography (OCT) imaging, and fluorescein angiography. Outcome measures including visual acuity, foveal thickness, total macular volume and vascular leakage were assessed at 12 weeks.

Results: No complications, including inflammation, endophthalmitis, and increased intraocular pressure were observed in any patient. 78% of patients experienced stabilization or improvement in vision from baseline. The mean logMAR visual acuity increased from 0.765 at baseline (range: 0.18-0.78) to 0.674 (range: 0.1-1.6) at 12 weeks. The mean fovel thickness decreased from 309.5µ (range: 143-837) at baseline to 245.4µ (range: 106-609) at 12 weeks. The mean total macular volume decreased from 7.96mm3 (range: 4.66-15.3) at baseline to 6.90mm3 (range: 5.26-14.42) at 12 weeks. Fluorescein angiography revealed a marked decrease in retinal hemorrhages and vascular leakage.

Conclusions: Intravitreal bevacizumab appears to be a safe and well tolerated treatment for exudative AMD. Treatment results in a reduction in macular thickening with a corresponding stabilization or improvement of vision in 78% of patients. Long-term studies are needed to fully elucidate the role of intravitreal bevacizumab in the treatment of AMD.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0149

Comparison of retinal function after indocyanine green and trypan blue assisted internal limiting membrane peeling during macular hole surgery

Benoit Cinq-Mars, Kathy Francis, Marcelle Giasson, Marc Hebert, Melissa Louis, Yvon Tardif

Abstract:

Purpose: To compare visual outcome and functional results after successful macular hole surgeries performed with indocyanine green (ICG) or trypan blue (TB).

Methods: Prospective analysis of 22 eyes of 22 patients diagnosed with stage 2, 3 or 4 idiopathic macular holes. All patients underwent pars plana vitrectomy, but different dyes were used for internal limiting membrane peeling. In 11 eyes, ICG was used and in 11 eyes TB was used. Choice of stain was assigned in a random fashion at time of study entry. Pre- and post operative examinations (6 weeks, 3 months, 6 months and 1 year) included anatomic results, best corrected visual acuity (VA) (ETDRS), multifocal electroretinography (mfERG-103 hexagons), and optical coherence tomography (OCT).

Results: Results are presented for the 6 weeks post-Tx. OCT revealed that the macular hole was closed in all. VA was not significantly different between groups. After 6 weeks post-tx, VA was improved significantly in both groups with a mean of 12.3 letters in TB group (P=0.0004) and 10.3 letters in ICG group (P=0.001). In TB group, 8\11 eyes improved by at least 5 letters compared to 6\11 eyes in the ICG group. Comparing both groups in terms of mfERG-103 hexagons, central 10 degrees, P1 amplitude was marginally improved in both groups after 6 weeks post-Tx. (P=0.06). P1 latency was significantly prolonged in both groups, with a mean of 1.5 ms in the TB group (P=0.02) and 0.98 ms in the ICG group (P=0.006). Prior to treatment, both groups were identical in terms of age (66 Vs 67 y.o), VA (36.7 letters Vs 40.9 letters), mfERG-P1 central 10 degrees amplitude (8.3nV Vs 7.6 nV) and latencies (34.5ms Vs 34.6ms) for the TB and ICG group respectively.

Conclusions: This is an ongoing study and more patients are undergoing the protocol. At the moment, the only variable that seems to distinguish the TB versus the ICG group is the number of patients for whom visual acuity was improved by at least 5 letters, with the TB group doing slightly better than the ICG group.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0151

Spontaneous suprachoroidal hemorrhage of unknown etiology in the immediate post-operative period following uneventful scleral buckle surgery: a case study of a 63-year-old male.

Peter Jelfimow, Ravi K. Nrusimhadevara

Abstract:

Purpose: Suprachoroidal hemorrhage is a recognized complication of scleral buckle surgery. Numerous etiologies including hypotony, valsalva, and direct trauma in the form of cryopexy have been implicated. We present a case of total monocular vision loss as a result of a spontaneous choroidal hemorrhage in a 63 year old caucasian male who underwent scleral buckle surgery for a rhegmatogenous retinal detachment.

Method: Case report.

Results: Extensive investigations failed to reveal an etiology for the spontaneous choroidal hemorrhage.

Conclusions: Suprachoroidal hemorrhage is a recognized complication of ocular surgery with potentially devastating consequences. We present a case of a suprachoroidal hemorrhage following scleral buckle surgery despite any intraoperative or postoperative hypotonous event. To the best of our knowledge, this is the first reported case of spontaneous choroidal hemorrhage in the immediate postoperative period following uneventful scleral buckle surgery.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0154

Symptomatic Polypoidal Choroidal Vasculopathy as a Subgroup in AMD with Choroidal Neovascularization with Better Visual Outcome

Alan F Cruess, Roman Windisch

Abstract:

Purpose: To examine the high speed fluorescein ICG angiograms of a cohort of Visudyne® PDT treated AMD patients in order to determine lesion characteristics associated with a better visual outcome as measured by best corrected visual acuity (VA) compared to historical controls with age related macular degeneration (AMD) and choroidal neovascularization (CNV) from the verteporfin in photodynamic therapy (VIP) study.

Methods: This is a retrospective observational study of a consecutive series of 32 patients with VA of 0.6 logMAR or better, of whom 17 had symptomatic, sub- or juxtafoveal, polypoidal choroidal vasculopathy (PCV), diagnosed over the last 2.5 years.. Patients were examined at baseline and at follow-up with, VA, optical coherence tomography (OCT) and high speed simultaneous intravenous angiography with fluorescein (IVF) and indocyanine green (ICG) with the Heidelberg Retina Angiograph 2 (HRA 2) from Heidelberg Engineering. Patients underwent photodynamic therapy (PDT) with verteporfin every 3 months as long as there were signs of activity.

Results: From the 17 eyes of the 17 patients identified with PCV, 7 women and 10 men with a mean age of 70.8 years (range: 58 – 88), were followed over an average time of 15.3 months (range: 4-28). These eyes represented 10.1% of all consecutive AMD eyes submitted for HRA 2 examination over a period of 2.5 years. No previous treatment had been administered to these patients. 11 (64.7%) patients experienced an improvement in VA, 3 (17.6%) remained stable and 3 (17.6%) lost an average of 5 letters. In comparison, 84% of the VIP patients lost at least 15 letters after 2 years of therapy. VA improved overall from a mean of 0.34 logMAR (range; 0.6 – 0.1) at baseline to a mean of 0.275 logMAR (range: 0.5 – 0.1), (p=0.15). Patients needed an average of 3.4 PDTs (range: 1-5), VIP-Patients needed an average of 5 PDTs over 2 years.

Conclusions: PCV manifesting as recurrent hemorrhagic and exudative detachment of the retinal pigment epithelium and neurosensory retina has been known for almost 2 decades. PDT has been shown to be effective for treating PCV in eyes with subfoveal involvment. VA improvement and absence of signs of activity were achieved in 65% of the eyes in our series. Four patients needed only 1 PDT treatment; four patients needed 2 PDTs to obtain occlusion of the leaking vessels. The abnormal vessels in PCV seems to be more sensitive to PDT than other CNV due to AMD.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0155

Severe ocular traumas - Retrospective analysis of patients treated by a combined surgery of the anterior and posterior segments.

Benoît Cinq-Mars, René N.V.Dinh, Alain F.Laplante

Abstract:

Purpose : Severe eye traumas were associated in the past to a poor visual prognosis. We reviewed the evolution of patients with severe ocular trauma involving both the anterior and posterior segments of the globe. These patients underwent a combined surgery by a team of two sub-specialized surgeons.

Methods : We conducted a retrospective analysis of cases occurring from 2001 to 2005, studied their visual acuity up to 18 months, their post-trauma complications and the factors affecting their visual prognosis. Statistical analysis were conducted to ensure the significance of the results

Results : We reviewed 44 combined surgeries. The patients experienced a plethora of damages and post-operative complications, especially retinal detachments and low vision. Their visual acuities were statistically improved in the follow up period up to 18 months. Some regained functional vision. The surgical time and the presence of retinal detachments at the time or after the combined surgeries were identified as statistically significant visual prognosis factors. We noted a tendency for open-globe injuries to be associated with poor visions and retinal detachments.

Conclusions : Compared to the literature, we are showing an improvement in the visual prognosis of these severely damaged eyes. We are reporting that retinal detachments remain an issue and should be treated aggressively.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0158
Foveoschisis Without Macular Hole in Non-Highly Myopic Eyes

Marc-André Rhéaume, Mikaël Sebag

Abstract:

Purpose: To describe the clinical features and treatment of two cases of foveoschisis without macular hole in non-highly myopic eyes.

Methods: Two women presented with decreased vision in one eye. None of them were highly myopic (mean refractive error = -2.75 D, mean axial length = 23.83mm) nor presented features of high myopia like posterior staphyloma. After an initial optical coherence tomography (OCT) examination, both patients underwent pars plana vitrectomy without internal limiting membrane peeling.

Results: Preoperative OCT examination revealed a foveoschisis without any macular hole or epiretinal membrane. The photoreceptor layer seemed to be intact and in place in both eyes. In one patient, postoperative OCT examination revealed complete flattening of the schisis cavity with visual acuity (VA) going from 6/12 preoperatively to 6/15 postoperatively. The other patient showed an improvement in VA from 6/15 preoperatively to 6/6 postoperatively, with an almost normal macular appearance on last clinical examination.

Conclusion: To our knowledge, these are the first two cases reported of pure foveoschisis in non-highly myopic eyes. Although the exact mechanism of foveoschisis formation in these patients remains to be found, tangential and/or anteroposterior vitreous traction may play a major role. Moreover, individual retinal susceptibility to such traction could also be a key factor.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0160

Intravitreal Bevacizumab versus Combined Therapy with Verteporfin and Intravitreal Bevacizumab for Choroidal Neovascularization

Michael Brent, Luis Riveros

Abstract:

Purpose: To compare the 6 month results for patients treated with combination therapy of photodynamic therapy (PDT) with Verteporfin and Intravitreal Bevacizumab versus Intravitreal Bevacizumab monotherapy, for Choroidal Neovascularization (CNV) secondary to Age-related macular degeneration (AMD).

Methods: This is a retrospective observational study. 65 eyes were treated with either combination therapy of PDT with Visudyne plus Intravitreal Bevacizumab 1.25mg, or Intravitreal Bevacizumab 1.25mg monotherapy. . 32 patients were treated with PDT, and subsequent Bevacizumab given either the same day or one week later. A further injection of Intravitreal Bevacizumab was administered 5- 6 weeks later. At 13 weeks, patients were re-evaluated with clinical examination, fluorescein angiography and Stratus3 Optical Coherence Tomography (OCT) to determine if re-treatment was necessary. In the Bevacizumab monotherapy group, 33 eyes were treated with Intravitreal Bevacizumab at 5 - 6 weeks intervals. Patients were re-evaluated with clinical examination, fluorescein angiography (FA) and OCT after 3 injections. Primary outcome measures included change from baseline visual acuity (VA), change in central retinal thickness (CRT) measured by OCT, and number of treatments necessary for lesion stabilization.

Results: Preliminary results showed that 84.37% of eyes that received combination therapy required only one session of PDT and either 2 or 3 injections of Intravitreal Bevacizumab to achieve an inactive lesion on FA, stable or improved VA, and stable or decreased CRT measured by OCT, at 3 and 6 months. One eye (3.12%) required a second PDT at the 6th month of his initial treatment.
In contrast 39.4% of eyes treated with Intravitreal Bevacizumab monotherapy required 3 injections to achieve an inactive lesion on FA, stable or improved VA, and stable or decreased CRA measured by OCT at 3 months. 60.6% of eyes treated with Bevaccizumab monotherapy had stable or improved VA and stable or decreased CRA measured by OCT at 6 months, but required a mean of 5 injections to reach stabilization. 12.9 % of eyes developed recurrent CNV and required additional Intravitreal Bevacizumab or combination therapy.

Conclusion: Results suggest that both combination therapy of PDT with Verteporfin and Intravitreal Bevacizumab and Intravitreal Bevacizumab monotherapy, showed comparable stabilization and even improvement of visual acuity rates, and decreased CRT on OCT, for CNV secondary to AMD at 6 months. Combination therapy required fewer treatments sessions than Intravitreal Bevacizumab monotherapy to achieve stability. Further investigation is warranted with large prospective randomized clinical trials.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0161

Tired, Using the Wrong Hand, Coffee or a Drink and What Did You Think: Lessons Learned from the EYSI Virtual Reality Surgical Simulator, a Potential Tool in Resident/ Fellow Surgical Teaching

COS Award for Excellence in Ophthalmic Research WINNER

Feisal Adatia, David Assaad, Alan Berger, David Chow, Rajeev Muni

Abstract:

Purpose: To determine whether real life surgical experience correlates with baseline scores on the EYESI VR simulator. To document if improvement occurs with repeated use. To measure the effects of various challenges to surgical performance. Finally, to determine the subjective satisfaction of using the EYESI simulator

Methods: The study was performed using the EYESI simulator (VR Magic, Germany), a virtual reality system that includes a computer model of microsurgical instruments and intraocular anatomy. Residents, fellows and surgical retina staff were assessed on surgical simulations to determine their manual dexterity, degree of tremor and their ability to peel the ILM. Participants were assigned scores based on speed, efficiency of movement and their ability to avoid retinal damage. After completing two baseline training sessions participants were challenged using their dominant and non-dominant hands, pre- and post- prolonged sleep deprivation (up 17.5 hours), pre- and post-caffeine intake (391 mg) and pre- and post-alcohol intake (2 shots of tequila). To determine subjective satisfaction with the simulator, an anonymous questionnaire was administered to residents from various ophthalmology programs that had tested the simulator.

Results: At baseline, junior residents had an average score of 943 (n=8), while senior residents scored 1045 (n=4), fellows 1151 (n=7) and surgical retina staff 1143 (n=3). All residents vs fellows (p=0.027). All residents vs staff (p=0.04). Comparing baseline 1 to baseline 2 there was a 12.5% increase in overall scores (p = 0.029), (n=15). Residents improved 14.8%, while fellows and staff improved 9.97%. A decrease in performance using the non-dominant hand with an average drop of 15.7% in performance (p= 0.043), (n=16) was seen. Average performance under moderate sleep deprived conditions decreased 3.36%, this was not statistically significant (p=0.6), (n=8). There was a trend towards increased performance with caffeine of 6.1% with 11/13 participants improving (p=0.2), (n=13). After alcohol there was a non-significant drop of 5.2% in performance (p=0.5), (n=8).
From the subjective questionnaire, 80% felt that the EYESI reflects surgical performance and 93% felt that the EYESI system mimics intraocular surgery (n=16).

Conclusion: A Correlation of Scores with Surgical Experience was seen. Learning takes place as with continued use, scores improved. A significant drop was seen in use of the non-dominant hand while no drop was seen with moderate sleep deprivation. A trend to improvement was seen with caffeine use and no drop was seen with alcohol. Residents felt that the EYESI mimics intraocular surgery.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0163

The risk for splash injury during periocular and intraocular injections: a study of retina specialists and fellows

Dan Bourla, Dinu Stanescu

Abstract:

Objective: To evaluate the use of eye protection, risk of conjunctival splash, and infection risk awareness among retina specialists and fellows in training.

Design: Prospective study with a questioner pole.
Participants: Retina specialists and fellows working in the United States, France and Israel.
Main outcome measures: Frequency of use and type of eye protection employed during periocular and intraocular injections, incidence of eye splash, number of procedures performed, and awareness of transconjunctival infection risk were studied.

Results: Sixty-four ophthalmologists responded to the questionnaire: 40 retina fellows and 24 retina specialists. The fellows and specialists reported using eye protection during intraocular and periocular injections in 22.5% and 33.3% respectively. Retina fellows had an average of 2.1 years experience and the specialists had an average of 10.4 years experience in performing intraocular or periocular injections. The average number of injections performed by the fellows and specialists was 23 and 35 per week respectively. There were a total of twelve conjuctival splash occurrences reported by six fellows and two retina specialists. Splash events were significantly more likely to occur during procedures performed by fellows (p

Conclusion: Eye protection is seldom used during intraocular or periocular injections. Although the risk for conjunctival splash during intraocular and periocular injections is relatively small, protective measurements may be considered when treating high-risk patients.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0166
Avastin Treatment of Cnv Secondary to Optic Nerve Drusen

Dinu Stanescu

Abstract:

Purpose: To report the use of intravitreal bevacizumab (Avastin) in the treatment of juxtafoveaal choroidal neovascular (CNV) membrane associated with optic nerve drusen

Design:
Retrospective case review.

Methods: A 45-year-old woman was seen for decrease of vision in her right eye. She had a past medical history of bilateral optic nerve drusen and former subfoveal CNV OS surgically removed. Juxtafoveal CNV was diagnosed and she underwent three intravitreal injection of bevacizumab. She was monitored for visual acuity, fluorescein angiography and optical coherence tomography

Results: The patient showed complete regression of subfoveal choroidal neovascularisation after three bevacizumab intravitreal injection.

Conclusions: Intravitreal Bevacizuamb is an effective treatement for subfoveal choroidal neovascularisation associated with optic nerve drusen.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0167
Avastin as an adjunctive treament of macular oedema in BRVO

Danny Gauthier, Dinu Stanescu

Abstract:

Purpose: To report the use of intravitreal bevacizumab (Avastin) in the treatment of macular oedema secondary to branch retina occlusion (BRVO)

Design: Retrospective case review.

Methods: 39-year-old man was seen in our department for decrease of vision and metarmrophopsia in the right eye since three months. His past medical history was remarkable for new onset of high blood pressure. BRVO was diagnosed and related to high blood pressure. Fundoscopy showed massive retinal haemorrhages and some macular oedema that was immediately treated by grid laser. Three months later his vision did not improve and was still complaining of metamorphopsia. He was given two intravitreal injection of bevacizumab.(1.25mg/0.1ml) He was monitored for visual acuity, fluorescein angiography and optical coherence tomography

Results: The patient showed complete regression of macular oedema after two bevacizumab intravitreal injection. Final vision was 6/7.5 with resolution of ocular complains. OCT and FA both demonstrate a dramatic improvement in measure of macular thickness and late leakage respectively

Conclusions: Intravitreal Bevacizuamb is an effective treatment in adjunction to macular grid for macular oedema secondary to BRVO

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0170

Retinal Pigment Epithelial Tears with Intravitreal Bevacizumab Treatment of Neovascular Age-Related Macular Degeneration

Gabriel Chu, John Gonder, Phil Hooper, Tom Sheidow

Abstract:

Background: Retinal pigment epithelial (RPE) tears can be a consequence of the natural course of age-related macular degeneration (AMD), or the result of its treatment through photodynamic therapy or thermal laser. With the advent of vascular endothelial growth factor (VEGF) inhibitors, case reports of RPE tears have recently been reported to be a possible complication of intravitreal pegaptanib (Macugen) in the treatment of AMD. A literature search has found been no published cases of RPE tears associated with intravitreal bevacizumab (Avastin) treatment of wet AMD.

Method: Chart review of patients in 3 retinal practices at the Ivey Eye Institute, a tertiary care centre, and identification of AMD patients who have sustained RPE tears as a result of treatment with intravitreal bevacizumab.

Results: This is a non-comparative case series of 4 patients who developed RPE tears after a single bevacizumab injection for the treatment of neovascular AMD associated with pigment epithelial detachments (PED). All these patients had a history of progressive visual decline and associated hemorrhage and/or subretinal fluid. The RPE tears occurred within 6 weeks of intravitreal bevacizumab treatment. Visual acuities have remained stable or improved.

Conclusion: Physicians should be wary of this potential complication when treating PED in wet AMD with intravitreal bevacizumab.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0173

Intravitreal bevacizumab for the treatment of choroidal neovacularization secondary to pathologic myopia.

Amin Kherani, Andrew W. Kirker, Arif Samad

Abstract:

Purpose: To determine the safety and efficacy of intravitreal bevacizumab in the treatment of subfoveal choroidal neovascularization secondary to pathologic myopia.

Methods: A retrospective review of five consecutive patients diagnosed with choroidal neovascular membrane (CNVM) associated with pathologic myopia and treated with intravitreal injection of bevacizumab. All patients were examined prior to commencement of treatment and at 6-8 week intervals with best corrected vision, optical coherence tomography (OCT) and fluorescein angiography (IVF). Endpoints for treatment were cessation of leakage by fluorescein angiography and absence of edema on OCT imaging.

Results: An average of three injections (range 2-4) of bevacizumab were required to induce cessation of leakage from the CNVM on IVF. Vision improved from a pre-treatment level of logMAR equivalent 1.1 ± 0.5 to an average of 0.4 ± 0.3 (Snellen equivalent 20/40). All patients were followed for 4-8 months (mean 5.8). The final vision was 20/40 or better in 4/5 patients. The average foveal thickness as measured by OCT was 295 ± 21 before treatment and was 229 ± 61 at the last appointment. There was no evidence of inflammation, bleeding, cataract, or retinal damage following the intravitreal injections.

Conclusions: In this limited series, intravitreal bevacizumab was found to be safe and effective in the treatment of choroidal neovascularization associated with pathologic myopia. Cessation of leakage is frequently associated with an improvement in visual acuity. Controlled clinical trials with long-term follow-up are recommended.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0174
The Feasibility of Travel in Commercial Aircraft for Patients with Scleral Buckles and Intraocular Gas

Robert G. Devenyi, Navapol Kanchanaranya, Wai-Ching Lam, Jason Noble

Abstract:

Purpose: To determine the feasibility of aircraft flight for patients with small volumes of postoperative intraocular gas and scleral buckles.

Methods: Patients with small intraocular gas bubbles (10-20%) who had undergone scleral buckling, pars plana vitrectomy with air fluid exchange, and C3F8 injection were invited to participate in this prospective, nonrandomized study. Patients were tested in the hypobaric chamber at the Defense Research and Development Canada test site located in Downsview, Ontario. Simulation of flight was performed in the hypobaric chamber with an ascent rate of 300 feet/minute to an altitude of 8000 feet. This altitude was maintained for 30 minutes before beginning descent at a rate of 300 feet/minute. Intraocular pressure (IOP) measurements were done at baseline and then every 5 minutes during simulated flight, using a Goldman applanation tonometer.

Results: Five patients were included in the study. The average gas bubble size was 16% (range, 10%-20%). During ascent, IOP steadily rose from an average of 13.0 ± 5 mmHg at baseline to a peak of 26.6 ± 13 mmHg at 8000 feet (a rise of 104%). At the end of 30 minutes of cruising, IOP fell to an average of 20 ± 8 mmHg (54% above baseline, 25% below the peak pressure). IOP continued to fall throughout the descent phase, achieving an average IOP of 6 ± 1 mmHg at the end of descent, representing a reduction of 50% below baseline. All patients tolerated the experiment well.

Conclusions: Our results indicate that although patients with intraocular gas demonstrate significant changes in IOP during simulated flight, it is possible for patients with scleral buckles, a low baseline IOP and a gas bubble size of less than 20% to tolerate air travel in a commercial aircrafts.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0176

Effects of early intravitreal Bevacizumab (Avastin) application on management and visual outcome of patient with central retinal vein occlusion.

Kam Kassiri, Matthew Tennant

Abstract:

Introduction: Eyes with central retinal vein occlusion (CRVO) have been shown to have an increased level of expression of vascular endothelial growth factor (VEGF) both at mRNA and protein levels. Inhibition of VEGF in animal models at either mRNA or protein level has shown prevention of iris neovascularisation. Bevacizumab(Avastin)is a recombinant humanized monoclonal antibody directed against VEGF. Recent studies have shown that ocular applications of Bevacizumab in ischemic paradigms have demonstrated visual improvement.

Hypothesis: Intravitreal application of Bevacizumab in eyes with CRVO will improve visual outcomes as compared to previous interventions.

Methods:Comparison of all consecutive patients with CRVO/NVI examined by the Alberta Retina Consultants in 2005 to all patients with CRVO/NVI treated with Avastin in 2006.

Results: Our results show that early use of Avastin leads to a better visual outcome and decreased possibility of developing neovascular glaucoma.

Conclusion: Our findings suggest that Avastin can decrease morbidity of CRVO.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0178

Evaluating functional change following macular hole surgery with scanning laser ophthalmoscope microperimetry

Stuart G. Coupland, Bernard Hurley, Brian C. Leonard, Laura Smith

Abstract:

Purpose: In the last 15 years there have been significant advances in vitreoretinal surgical repair of macular holes with successful macular hole closure rates ranging from 70 to 90%. Optical coherence tomography provides dramatic visual demonstration of the efficacy of macular hole repair with return of the normal foveal pit appearance in many patients. Functional recovery as demonstrated by visual acuity shows significant improvement with greater than 2 Snellen lines seen in the majority of eyes undergoing macular hole repair. Interestingly, there is sometimes a discrepancy between structural evidence of hole repair and improvement in visual acuity. Microperimetry has recently been shown to have significant effectiveness in the evaluation of focal retinal sensitivity in eyes before and after macular hole repair. This pilot study is designed to compare change in visual function in patients following macular hole repair using scanning laser ophthalmoscope microperimetry ,optical coherence tomography and clinical measures of visual acuity.

Methods: Patients undergoing internal limiting membrane peeling macular hole surgery for a stage 2,3 or 4 hole were recruited. Preoperative OCT measurement of macular hole dimensions was assessed by SLO/OCT . Retinal sensitivity was determined by microperimetry on the Ophthalmic Technologies Inc. OCT/SLO-7 system with a Goldman III size stimulus, and the polar 3 pattern with 24 stimulus locations covering with central 10°, using a 4-2 staircase strategy. SLO microperimetry was performed preoperatively and at periods of at 1, 3, 5 and 8 weeks postoperatively. The change over time of LogMar acuity and mean retinal sensitivity within the central 10° was statistically analyzed using multivariate Repeated Analysis of Variance (ANOVA) and correlational analysis.

Results: The relationship between retinal sensitivity measured by microperimetry and changes in LogMar acuity will be described. In addition, the relationship between preoperative macular hole size and change in retinal sensitivity measured by microperimetry will be reviewed.

Conclusions: Microperimetry can provide useful complementary information about retinal sensitivity in patients undergoing macular hole repair.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0183

Loss of ATR-X gene leads to tumor development during retinogenesis.

Nathalie Berube, Varun Chaudhary, Claudia Seah

Abstract:

Background: The ATRX gene is a transcriptional regulator during development and mutations in this gene have been associated with abnormal neuronal development in the brain leading to several mental retardation syndromes. At the 2006 Canadian Ophthalmological Meeting we presented results of abnormal retinal development in a 24 day old ATRX knock out animal.

Purpose: The objective of the present study was to elucidate the precise role and mode of action of the ATRX protein during the entire retinogenesis process in the embryonic murine model.

Methods: Mice conditionally deficient for ATRX were generated by crossing ATRX(loxP) females to heterozygous Foxg1Cre knock-in male mice. BrdU labeling was performed on time-mated homozygous ATRX(loxP) mice by injecting intraperitoneally with 5-bromo-2-deoxyuridine (BrdU). Animals were sacrificed after 1 hour. Tissue was collected from embryos at embryonic day 13.5 (E13.5), E16.5 and E18.5. Embryonic ocular tissue was fixed and sections were cut at 10um and mounted on slides. Yolk sac DNA from embryos was genotyped by PCR. Immunofluorescence staining was performed. Mitotic markers were used to study cell division. Cell-type specific markers were used to study the different neuronal and glial cell types in the retina and the lens. BrdU labeling was detected by staining with the anti-BrdU antibody to study cells in S phase. TUNNEL assays were carried out to study apoptosis. In-situ hybridization was carried out with key markers including Math3.

Results: We describe the spatial and temporal expression of the ATR-X gene during the entire retinogenesis process in the murine retina. The key stage for ATRX gene in retinal development appears to be at E18.5 days. The loss of the gene leads to a tumor growth in the outer neuroblastic layer of the retina. Majority of cells in this tumor growth express markers for amacrine cells. The knock-out retina also demonstrates increased apoptosis and abnormal mitotic activity.

Conclusions: The ATRX gene is a critical player in retinogenesis in the murine model. We describe the specific expression pattern of this gene during the normal retinogenesis process. Loss of this gene leads to tumor like proliferation of the outer neuroblastic cell layer expressing amacrine cell markers. It appears that the
ATR-X gene controls progenitor cell migration and differentiation during retinal development.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0196

Epiretinal membrane associated neovascularization in a patient with Terson's Syndrome

Mikael Sebag, Dinu Stanescu-Segall, Daniela Toffoli

Abstract:

Purpose: Epiretinal membrane formation occurs in up to 78% of patients with Terson's Syndrome. To our knowledge however, neovascularization of such membranes has never been reported. We report a young patient with Terson's Syndrome OS who presented with vitreous hemorrhage, posterior vitreous detachment and an epiretinal membrane complicated by neovascularization.

Methods: Case report and literature review using the Medline database (1966-2006).

Results: A 38 year old woman known for hypertension and regular cocaine use was brought to the emergency department after losing consciousness following a severe headache. Cerebral CT scan and angiography demonstrated a subarachnoid hemorrhage caused by a 5x3 mm ruptured aneurysm arising from the distal portion of the left middle cerebral artery. Five weeks following craniotomy and aneurysm clipping, the patient complained of decreased vision in her left eye. An ophthalmology consult revealed the following exam: visual acuity 20/30 OD, CF10 cm OS, normal intraocular pressures, normal retinal exam OD and a severe vitreous hemorrhage OS. B-scan confirmed a posterior vitreous detachment and absence of retinal detachment OS. The patient was followed at regular intervals with gradual improvement in visual acuity to 20/40 OS 10 months later. At this time, a neovascularized epiretinal membrane was noted OS and confirmed with retinal angiography and optical coherence tomography (OCT). 2.5 mg (0.2 cc) avastin was injected OS with subsequent angiography demonstrating a decrease in neovascularization OS. Two weeks post avastin injection, vitrectomy, membrane peeling, fluid-gas exchange (15% C3F8) and pneumatic retinopexy were performed OS. The neovascular membrane was sent for histopathological exam. On histology, the superficial portion of the membrane was found to contain dense collagen, glial cells with reactive gliosis and an abundance of neovascular capillaries; whereas the deeper portion consisted of the internal limiting membrane, glial cells and very few neovascular capillaries.

Conclusion: We report a patient with unilateral Terson's syndrome complicated by posterior vitreous detachment and epiretinal membrane formation associated with neovascularization. This was confirmed by retinal angiography and OCT. To our knowledge, no such cases have been reported to date. In this patient, it is possible that retinal vasospasm and hypertensive changes secondary to cocaine use, coupled with decreased retinal perfusion following the subarachnoid hemorrhage, may have created an ischemic environment subject to neovascular membrane formation.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0199

Avastin for the treatment of iatrogenic choroidal neovascularization membrane (CNVM)

Dinu Stanescu

Purpose

To report the clinical, angiographic and optical coherence tomography findings of a patient with CNVM following globe perforation treated by intravitreal bevacizumab

Methods

A 50-year-old patient with a globe perforation secondary to a retrobulbar anesthesia was followed in our department. Three months after the onset he developed a juxtafoveal CNVM that was treated by three intravitreal injections of Bevacizumab (2.5mg/0.2ml)

Results

The patient had a pre-operative visual acuity of 6/30 OS.Two weeks after surgrey BCVA was 6/9 OS with fundoscopy revealing subretinal and preretinal hemorrages in the posterior pole. Three months following the surgery, the patient complained of decrease of vision with metamorphopsia and micropsia. BCVA was 6/24 OS and 6/6 OR. Dilated fundui of the right eye showed subretinal and lipis in the macular region. A fluorescein angiography disclosed an early filling of a choroidal neovascular membrane becoming hyperfluorescent throughout the sequence and leaking on the late phase of the sequence. The corresponding optical coherence tomography confirmed the presence of subretinal fluid and measured a mean foveal thickness of 441µm. A diagnosis of iatrogenic choroidal neovascularization secondary to globe penetration was made. The patient was offered 2.5 mg of intravitreal Bevacizumab. One month later, he was still complaining of metamorphopsia but FA showed a smaller CNV membrane. He was given a second injection of Bevacizumab. One month later, his vision was 6/9 with less metamorphopsia. FA showed mild leakage of the CNV membrane in the late frames of the sequence. O.C.T. measured a mean foveal thickness of 267 microns.The patient was offered a third intravitreal Avastin injection. Eight monthts after the onset VA was 6/9 OS without symptoms. FA disclosed an atrophic CNV membrane without leakage

Conclusion

Intravitreal Bevacizumab could be considered as an effective treatment for iatrogenic CNVM secondary to globe perforation. Further studies are warranted to confirm this hypothesis.

CANADIAN RETINA & VITREOUS SOCIETY

FRIDAY 22 JUNE

Paper #0200
Unusual carcinoma-associated retinopathy of small cell lung carcinoma

Dinu Stanescu

Purpose
To report an unusual case of carcinoma-associated retinopathy (CAR) in a patient with small cell carcinoma of the lung. DESIGN: Case report.

Method
A 41-year-old man with bilateral progressive loss of vision and photopsia was referred to the ophthalmology service. Antiretinal antibodies were determined by Western blot analysis. Electrophysiology and fluorescein angiography were performed.

Results
The patient was found to have small cell carcinoma of the lung. The diagnosis was confirmed by transbronchic biopsy and positive antirecoverin antibodies on western blot analysis of his serum. His visual loss was asymmetrical. Right eye was 20/200 and left eye 20/60. The full field ERG demonstrated mostly normal rod responses but central cone abnormalities The patient was treated with methylprednisolone and chemotherapy without improvent in his vision. A few months later he underwent three plasmapheresis sesssions. Subsequently he developped left macular edema that responded very well to oral diamox. Ten years later the patient was still alive and his final vision was 20/200 RE and 20/40 LE

Conclusion
We present a very unusual carcinoma-associated retinopathy in a small cell lung carcinoma with preservation of vision in one eye and exceptional survival.