

Melbourne Ophthalmic Alumni 31st Meeting Saturday 11th May 2024

The Martin Family Auditorium
Royal Victorian Eye & Ear Hospital
Level 4





MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Welcome



A warm welcome to the 31st Melbourne Ophthalmic Alumni Annual Scientific Meeting. We are delighted to finally be back 'home' at 32 Gisborne Street, in the beautiful Martin Family Auditorium.

We are confident you will enjoy the strong scientific program and yet another evening of fine food, lively social interaction, bonhomie and culture.

We are delighted to welcome our invited guest speakers and are proud to showcase a multitude of specialist clinics at the Royal Victorian Eye and Ear Hospital, including the Education Vision Assessment Clinic (EVAC), Ocular Diagnostic Clinic (ODC) and Ocular Genetics Clinic (OGC).

Our invited speakers are Assoc Prof Susan Carden (EVAC), Dr Marc Sarossy (ODC), Dr Jonathan Ruddle and Dr Thomas Edwards (OGC). We are very grateful also to all our presenters who will update us on their areas of research and special interest.

The Alumni Committee would also like to present to you a night of dining and entertainment in the architecturally renowned dining room at the Hotel Intercontinental.

Our Guest of Honour this year is Associate Professor Justin O'Day. We look forward to hearing from Justin and honouring him at this year's meeting.

We also look forward to celebrating the registrar group that commenced their training 20 years ago and hearing of their news.

Dr Thomas Hardy

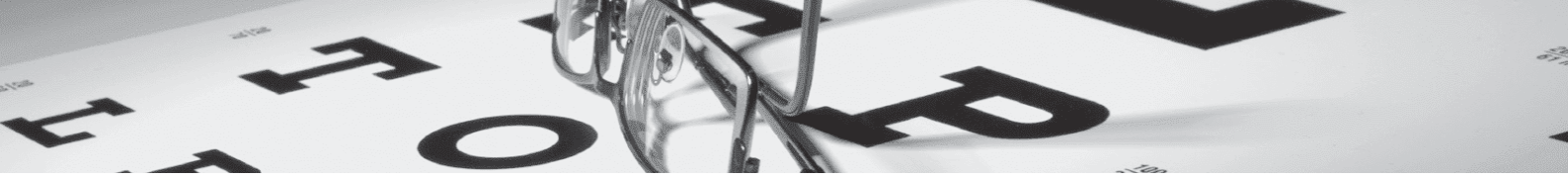
Chair
Melbourne Ophthalmic Alumni

Committee

Dr Dermot Cassidy – Secretary /Treasurer
A/Prof Anne Brooks, Prof Mark Daniell , A/Prof Susan Carden, Dr Jonathan Yeoh,
Dr Robyn Troutbeck, Dr Tom Gin

2nd Year Registrar Group

Zelia Chiu, Lewis Fry, Roshan Karri, Brendon Lee, Dominiclan Maher, Rukaiya Malik, Matthew McMahon,
Michael Short, Matthew Wilson



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Guest Speakers



A/Prof Susan Carden

Susan M. Carden, MBBS FRANZCO FRACS PhD

Susan Carden is an Associate Professor at the University of Melbourne. Her ophthalmology training was done at RVEEH. After a fellowship in paediatric ophthalmology at RCH, she moved to Cincinnati, Ohio, USA, where she completed an accredited AAPOS fellowship at the Children's Hospital Medical Centre and the University of Cincinnati. As a visiting scientist, she attended Smith-Kettlewell Eye Research Institute in San Francisco, while studying Biostatistics and attending Neuro-ophthalmology clinics at UCSF. Her doctorate, 'Retinopathy of prematurity in a transitional economy: comparisons and contrasts with developed countries', examined the development and management of a screening program for ROP in Hanoi, Vietnam. It documented the high prevalence of ROP in babies (including the near-term) exposed to unregulated oxygen therapy. Building on experience from Vietnam, she has advised UNICEF in efforts to establish ROP screening in Papua New Guinea. She has contributed to international ophthalmology textbook chapters and was a clinical investigator for the oxygen safety trial in preterm babies – the STOP-ROP study. As head of the Education Vision Assessment Clinic at RVEEH, she works in a team to ensure that children with low vision and blindness have access to the curriculum at their chosen school.

Dr Thomas Edwards

Thomas Edwards is a consultant vitreoretinal surgeon at the Royal Victorian Eye and Ear Hospital (RVEEH) and Principal Investigator at the Centre for Eye Research Australia (CERA). He holds a dual appointment in the Vitreoretinal Unit and the Ocular Genetics Clinic at the RVEEH. He completed his PhD at the University of Cambridge and was the recipient of a Nuffield Fellowship to the University of Oxford. As head of CERA's Retinal Gene Therapy Unit, he leads a research group working on translational projects involving retinal gene therapy, including clinical trials.



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Guest Speakers



Dr Jonathan Ruddle

Dr Jonathan Ruddle completed his ophthalmology training through the Victorian program and Eye and Ear Hospital fellowship in ocular genetics alongside David Mackey in 2006. Further fellowship time followed in glaucoma both in Melbourne and London with a large amount of time devoted to paediatric / developmental side of glaucoma.

He now undertakes public work in Anterior segment / Glaucoma at Royal Childrens Hospital and the Glaucoma unit of RVEEH. Additionally he leads the ocular genetics clinic at RVEEH and RCH. His private consults in Parkville at Melbourne Childrens Eye Clinic and Parkville Eye Specialists.

Dr Marc Sarossy

Marc Sarossy runs the electrophysiology service of the Royal Victorian Eye and Ear Hospital. He has delighted and tormented generations of registrars with obscure questions about mathematics, physics and the geometry of the Earth. And taught them a bit of electrophysiology too. He has research interests in visual function and machine learning

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Program



Session 1

Chairs: A/Prof Anne Brooks & Dr Mark Walland

09.00 – 09.05	Dr Thomas Hardy – Chair	Introduction & Welcome
09.05 – 09.15	Dr Sophia Moshegov	Comparison of keratoconus patients who rub their eyes with those who don't; demographics, disease severity, and vision related quality of life
09.15 – 09.25	Dr Antony Boynes	Transcriptomic analysis of TGF β 1-mediated fibrosis in primary human Tenon's fibroblasts
09.25 – 09.35	Dr Adam Moktar	Routine placement of an intraluminal suture should be considered for PreserFlo MicroShunt to prevent early hypotony
09.35 – 09.45	Dr Mark Walland	The Chicken; the Egg; or just Garnish?: Optic Disc Pits, Macular Schisis and Glaucoma
09.45 – 10.40	Invited Speaker Session Ocular Genetics Sometimes they Scream, Sometimes they Lean <i>Dr Jonathon Ruddle</i> Genetic therapy at RVEEH <i>Dr Thomas Edwards</i>	
10.40 - 11.10	Morning Tea	

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Program



Session 2

Chairs: Dr Robyn Troutbeck & Dr Tom Gin

11.10 – 11.20	Mr Ashwin Madhavan	Prevalence and significance of anti-drug antibodies against adalimumab in the treatment of non-infectious uveitis
11.20 – 11.30	Dr Cameron Greenhalgh	Sore knee, can't see: a clinical audit assessing the ocular screening process for Juvenile Idiopathic Arthritis patients
11.30 – 11.40	Mr Zachary Angus	Fluorescein Angiogram causing venous staining: A rare self-resolving phenomenon
11.40 – 11.50	Dr Donald Tran	Faricimab's treatment interval in non-treatment naive neovascular age-related macular degeneration: a medical record review
11.50 – 12.00	Dr Thomas Desmond	Hyperreflective foci on OCT: A scoping review on its definitions, origins and clinical utility in eyes with AMD
12.00 – 12.10	Dr Jason Ha	Inflammation and immune dysfunction: novel therapeutic targets in DR?
12.10 – 12.35	AGM	
12.35 – 13.30	Lunch	

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Program



Session 3

Chairs: Dr Dermot Cassidy & Dr Jonathon Yeoh

13.30 - 14.25	Invited Speaker Session Education Vision Assessment Clinic (EVAC) 'EVAC' – What's in a name? <i>A/Prof Susan Carden</i> Ocular Diagnostic Clinic (ODC) The past present and future of multifocal electrophysiology <i>Dr Marc Sarossy</i>	
14.25 – 14.35	Dr Kristyna Stepnicka	Developing and validating a novel Colour Saturation Threshold Test
14.35 – 14.45	Mr Alexander Sarossy	Correlations between parameters influencing skill acquisition in cataract surgery simulation
14.45 – 14.55	Dr Nicholas Dewhurst	Ocular trauma in badminton and the emerging trend of pickleball – A 5-year review of badminton related eye injury emergency department presentations
14.55 – 15.05	Dr Brendon Lee	Epidemiology, outcomes, and socioeconomic cost of eye injuries
15.05 – 15.25	Afternoon Tea	

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Program



Session 4

Chairs: Dr Thomas Hardy and A/Prof Alan McNab

15.25 – 15.35	Dr Amal Dameer	Tightening Precision of OSA screening with Floppy Eyelid Syndrome
15.35 – 15.45	Dr Sachin Phakey	Surgical service utilisation for thyroid eye disease in Australia
15.45 – 15.55	Dr Zixin Hong	Australian Experience with Dysthyroid Optic Neuropathy: A Retrospective Multi-Centre Analysis, Preliminary Data at Three Ophthalmic Centres
15.55– 16.05	Dr Domagoj Vodanovich	Osseointegrated implant treatment outcomes following orbital exenteration in a large multi centre cohort
16.05 – 16.15	Mr Zachary Angus	Epibulbar Complex Choristoma Containing Bone: A Case Report and Closer Look at Classifications
16.15 – 16.20	Dr Thomas Hardy	Close and Thanks
4:30 – 5:30pm	Post-conference Drinks Cerulea – CERA's newly opened Centre for Clinical Trials 7th Floor via the blue lift	

Dinner

Intercontinental Melbourne, The Rialto
495 Collins Street Melbourne

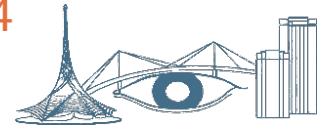
6:00pm for 6:30pm

Guest of Honor – A/Prof Justin O'Day

20-year reunion of 1st year Registrars from 2004

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 1



09:05

Comparison of keratoconus patients who rub their eyes with those who don't; demographics, disease severity, and vision related quality of life

Sophia Moshegov MD¹, Stephanie Watson PhD¹, Himel Kandel PhD¹

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No competing/conflicts of interest, or funding sources to declare.

Purpose

Keratoconus is a progressive corneal ectasia that presents a significant challenge to clinicians and patients alike. Amongst the diverse risk factors implicated in its development, eye rubbing has been proposed as the most significant contributor. Those who engage in eye rubbing may have more severe disease on initial presentation, and poorer vision related quality of life than their non-eye rubbing counterparts.

Methods

Save Sight Keratoconus Registry data was utilised to analyse the demographic factors, clinical data and vision related quality of life data in keratoconus patients according to frequency of eye rubbing. Clinical data collected at each visit for each participant included visual acuity, maximum anterior sagittal curvature (Kmax), steep meridian of anterior corneal surface (K2) and pachymetry. Vision related quality of life data was collected via the Keratoconus Outcomes Research Questionnaire (KORQ).

Results

There was no significant association between eye rubbing frequency and sex, ethnicity, smoking status, age at first visit, or family history of keratoconus. Participants with allergic eye disease were significantly more likely to always/often rub their eyes ($p = 0.05$). Those with clinician reported dry eye disease had significantly less frequent eye rubbing ($p = 0.03$). Index visual acuity and measurements of corneal topography including Kmax, K2, pachymetry were not associated with eye rubbing frequency. There was a strong correlation between KORQ score and eye rubbing frequency. Participants with higher activity limitation score ($p < 0.001$) or symptom score ($p < 0.001$) were significantly more likely to report more frequent eye rubbing.

Conclusion

Frequent eye rubbing in patients with keratoconus is associated with greater rates of allergic eye disease, and poorer vision related quality of life compared to patients who infrequently rubbed their eyes.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 1



09:15

Transcriptomic analysis of TGF β 1-mediated fibrosis in primary human Tenon's fibroblasts.

Antony Boynes^{1,2*}, Zoe Pasvanis^{1,2}, Roy C.K Kong³, Elsa C. Chan^{1,2,3}, Raymond C.B. Wong^{1,2}, Jennifer Fan Gaskin^{1,2}

1. Centre for Eye Research Australia, Royal Victorian Eye and Ear Hospital, Australia
2. Ophthalmology, Department of Surgery, University of Melbourne, Australia
3. Department of Medicine, University of Melbourne, Australia

*Correspondences

Dr Antony Boynes, Royal Victorian Eye and Ear Hospital, 32, Gisborne Street, East Melbourne, VIC 3002, Australia,

Email: antonyboynes@gmail.com

Short title

Gene signature identification of myofibroblast activation by TGF β

Purpose

To further understand the molecular mechanisms of ocular fibrosis following glaucoma filtration surgery (GFS) by identifying genes involved in myofibroblast differentiation in human Tenon's fibroblasts (HTFs).

Methods

HTFs were isolated and propagated from explanted subconjunctival Tenon's capsules collected during GFS performed in 3 patients. RNA extraction was performed after 5 days post-treatment, and RNA sequencing was performed. Bioinformatic analysis was performed to analyse differential gene expression in the two sample groups. We carried out detailed gene ontology, gene set enrichment analysis, and KEGG pathway analysis.

Results

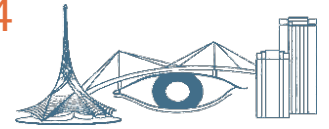
Following quality control, 3,362 differentially expressed genes were identified, of which 1,532 were upregulated and 1,820 were downregulated following TGF β 1 treatment. We detected significant enrichment in genes associated with the gene ontology terms TGF-beta-signaling, Wnt signaling pathway, extracellular matrix organization, and regulation of cell cycle process. There was significant upregulation of 14 genes associated with myofibroblast activation.

Conclusions

This work provides an important reference with unprecedented insights into the transcriptional landscape of HTFs myofibroblast differentiation. This is fundamental to advance our understanding of ocular fibrosis and identify novel therapeutic targets to limit formation of scar tissue following GFS.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 1



09:25

Routine placement of an intraluminal suture should be considered for PreserFlo MicroShunt to prevent early hypotony

Adam A. Moktar^{1,2}, Jason Ha^{1,2}, Yu Xiang George Kong^{1,2,3}

1. Department of Ophthalmology, Centre for Eye Research Australia
2. Department of Ophthalmology, Royal Victorian Eye and Ear Hospital
3. Department of Surgery (Ophthalmology), University of Melbourne

Background

The novel microinvasive glaucoma surgery device, Preserflo MicroShunt (PMS), facilitates aqueous drainage and intraocular pressure reduction, while providing an internal resistance that reduces risk of postoperative hypotony. Nonetheless, postoperative hypotony remains an encountered complication with a potential sequela of complications as well as financial and resource burdens.

Aim

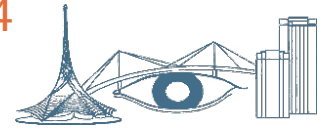
To address the importance of considering intraluminal suture use during PMS insertion to prevent early hypotony.

Methods and Results

Theoretical analysis using Hagen-Poiseuille Law was employed to assess the flow through PMS tubes with and without an intraluminal suture. The pressure differential (amount of pressure required to overcome the tube's internal resistance to cope with aqueous production) calculated for PMS tube is 3.6 mmHg. Hence PMS is reliant on tissue resistance downstream to provide resistance to prevent numerical hypotony (<5 mmHg). With the use of Hagen-Poiseuille Law, the addition of a 9-0 or 10-0 monofilament suture provides a differential pressure of 19.1 or 10.7 mmHg respectively, thereby preventing post operative hypotony. Conclusion: Routine stenting during PMS implantation should be considered for prevention of early postoperative hypotony while still achieving sustained IOP reduction.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 1



09:35

The Chicken; the Egg; or just Garnish?:
Optic Disc Pits, Macular Schisis and Glaucoma

Dr Mark J Walland, Glaucoma Investigation and Research Unit, Royal Victorian Eye and Ear Hospital, Melbourne

Aim

Macular Schisis is classically associated with a congenital optic disc pit. This paper aims to clarify whether so-called acquired pits – typically seen in advanced glaucoma – are similarly associated with schisis.

Methods

Case series and literature review

Results

Macula schisis can occur in the presence of congenital or acquired optic disc pits; in the absence of a pit but the presence of glaucoma; or without glaucoma.

Conclusions

A strict demarcation between the functional and anatomical significance of congenital versus acquired optic disc pits may not be justified.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



11:10

Prevalence and significance of anti-drug antibodies against adalimumab in the treatment of non-infectious uveitis

Ashwin Madhavan, Sophie Rogers, Priya Samalia, Anthony Hall, Lyndell Lim

Aim

Anti-drug antibodies (ADA) may develop against adalimumab. We performed an observational cross-sectional cohort study to determine the prevalence of ADA in patients with non-infectious uveitis.

Methods

Patients receiving adalimumab for non-infectious uveitis at either the Royal Victorian Eye and Ear Hospital, or Eye Surgery Associates were recruited from March 2023 to August 2023. All patients were tested for serum trough adalimumab level, and adalimumab ADA.

Results

We recruited 80 patients (45 females) with median age 45 years (range 18, 87). Median duration of uveitis was 5.2 years (range 0.4-25.3). Median duration of adalimumab therapy was 2.3 years (range 0.2-13.1). The most common diagnoses were idiopathic uveitis (N=27) and sarcoidosis (N=13).

ADA was present in 5 of 80 patients (6.3%). Compared to patients without ADA, patients with ADA had lower serum adalimumab levels [median 0.0 $\mu\text{g}/\text{mL}$ (IQR 0.0, 0.0) vs 5.1 $\mu\text{g}/\text{mL}$ (IQR 2.8, 7.8), $p=0.002$] and higher C-reactive protein [median 7.4 mg/L (IQR 5.5, 7.9) vs 2.0 mg/L (IQR 0.0, 6.0), $p=0.030$]. We found no differences in duration of therapy, use of conventional immunosuppression, uveitis activity or visual acuity.

Conclusions

We found a low prevalence of ADA against adalimumab. Presence of ADA was associated with reduced serum drug levels and higher C-reactive protein.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



11:20

Sore knee, can't see:

a clinical audit assessing the eye screening process of Juvenile Idiopathic Arthritis patients

Dr Cameron Greenhalgh

MBChB (University of Aberdeen, Scotland, United Kingdom)
HMO3, Western Health, Melbourne, Victoria, Australia

Background

Juvenile Idiopathic Arthritis is the most common rheumatological condition of childhood. One of the most common extra-articular manifestations of the disease is Anterior Uveitis. AU can be sight threatening therefore regular eye screening is required for JIA patients.

Aims

To assess the number of screening appointments JIA patients attend at Aberdeen Royal Infirmary (ARI) in Scotland and compare to a previous audit cycle in 2018. To assess the communication between the ophthalmology and rheumatology departments along with the documentation of patient's drug use.

Methods

A clinical audit was undertaken on the number of ophthalmology screening appointments JIA patients in ARI had between January 2020– January 2021. Analysis was undertaken on a data set provided by the ARI rheumatology department. Factors related to the screening appointments were assessed. Results: Improvements have been made in the eye screening of JIA patients however the extra monitoring recommended for patients started and stopped on specific systemic treatments was not fully adhered to.

Conclusion

Annual screening appointments attended by JIA patients has increased and the majority of patients are seen three monthly. Patients stopping methotrexate and starting etanercept are not being monitored as recommended therefore higher monitoring standards are necessary. Dr Cameron Greenhalgh MBChB (University of Aberdeen, Scotland, United Kingdom) HMO3, Western Health, Melbourne, Victoria, Australia

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



11:30

Fluorescein Angiogram Causing Venous Staining: A Rare Self-Resolving Phenomenon

Zachary George Angus^{1,2}, Daini Ong¹, Sanjeewa S Wickremasinghe¹

1. Department of Ophthalmology, Royal Victorian Eye and Ear Hospital, Melbourne, VIC, Australia
2. Department of Medicine, Nursing and Health Sciences, Monash University, Clayton, VIC, Australia

Introduction

Fluorescein angiography (FA) is a useful investigation in the diagnosis and treatment of retinal and choroidal disease. FA has well-reported adverse effects, most being mild. Very few cases have reported venous staining following FA.

Case Presentation

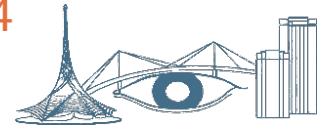
Two cases are reported. Case 1 was a 90-year-old female with bilateral neovascular age-related macular degeneration. In the few minutes following her routine FA, she developed cutaneous fluorescein staining ascending along the superficial forearm veins proximal to the cannula in situ at the dorsal wrist. (Fig. 1a, b) Case 2 was a 50-year-old male with diabetic macular oedema. In the minutes following his FA, he developed cutaneous fluorescein staining descending along the dorsal forearm veins distal to the cannula in situ at the cubital fossa. (Fig. 2) Both patients were managed conservatively with the stain resolving in the next few days. Both cases were distinct to typical dye extravasation following FA. We propose multiple vascular and dermal factors that could explain the observed phenomena.

Conclusion

Cutaneous fluorescein staining around superficial vasculature is a rare phenomenon. We write this case to reassure clinicians that this phenomenon seems to be self-limiting and does not require any treatment.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



11:40

Faricimab's treatment interval in non-treatment naive neovascular age-related macular degeneration: a medical record review

Donald Tran¹, Trung Dang¹, Jonathan Moodie¹, Alan Luckie¹, Myra McGuinness^{2,3}

1. EyeClinic Albury Wodonga, Albury, NSW, Australia
2. Centre for Epidemiology and Biostatistics, The University of Melbourne, Melbourne School of Population and Global Health, Melbourne, Australia
3. Centre for Eye Research Australia, Melbourne, Australia

Background

Among patients with treatment-naive neovascular age-related macular degeneration (nAMD), faricimab has comparable visual outcomes to aflibercept with the potential to reduce treatment burden. We aimed to investigate the treatment interval among non-treatment naive nAMD patients.

Methods

Retrospective case series of nAMD patients, treated for ≥ 6 months before and after switch to faricimab. Demographic and injection visit data was collected from a single regional ophthalmic practice (2023).

Results

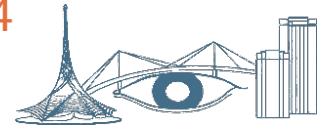
Seventy-eight eyes (41 left, 53%) of 61 patients (43 females, 70%) with mean age 80.2 years (SD 7.3) were included. Median visual acuity was 6/9 (IQR 6/6-6/18) at switch and 6 months later. Mean injection interval was 5.8 weeks (SD 1.6) at switch and 8.1 weeks (SD 1.8) 6 months post-switch (mean difference 2.3 weeks, 95% CI: 2.0-2.6). At switch, 47 eyes (60%) were active on OCT and 31 (40%) eyes were inactive. At 6 months post-switch, exactly half (39 eyes) was active and the other half was inactive.

Conclusion

Faricimab may extend injection interval at 6 months post-switch in a subset of non-treatment naive nAMD patients whose disease activity is inadequately controlled on other intravitreal agents.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



11:50

Hyperreflective foci on OCT:

A scoping review on its definitions, origins, and clinical utility in eyes with AMD

Authors

Thomas Desmond^{1,2} Svetlana Cherepanoff^{2,3}

Save Sight Institute, University of Sydney, Sydney, Australia

Ocular Pathology Research Group, St Vincent's Hospital, Sydney, Australia

School of Clinical Medicine, UNSW Sydney, Sydney, Australia

Background

Hyperreflective foci (HRF) are potential OCT biomarkers in retinal diseases, including Age-related Macular Degeneration (AMD). However, there is a lack of consistent definitions, and their histological origins remains unclear. This scoping review maps current HRF terminology, reviews evidence for histological correlates, and investigates their clinical utility in AMD.

Methods

Comprehensive database searches identified 416 papers mentioning HRF, which were reviewed for definitions used. 13 papers with clinicopathological evidence were analysed to determine histological correlates. 45 papers were assessed for evidence on clinical utility.

Results

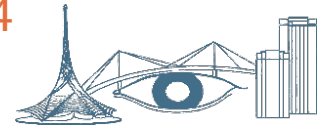
HRF are inconsistently defined across AMD and diabetic retinopathy studies. Leading theories suggest HRF in AMD originate from migrating RPE cells or RPE-containing macrophages. Increased HRF predict progression to late AMD (geographic atrophy, neovascular AMD), enlargement of existing atrophy, and improved fluid reduction after anti-VEGF treatment, but show mixed results for visual acuity prediction.

Conclusions

Standardized HRF definitions are needed to facilitate further research. Histological origins remain uncertain between RPE and macrophages. HRF demonstrate potential as biomarkers in AMD for disease progression and treatment response. Improved criteria will enable additional investigations into their clinical utility and predictive power.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 2



12:00

Inflammation and immune dysfunction: novel therapeutic targets in DR?

Jason Ha^{1,2,3}, Devy Deliyanti², Peter van Wijngaarden^{1,4}, Jenny Wilkinson-Berka^{2,3}

1. Centre for Eye Research Australia, East Melbourne, VIC, Australia
2. Department of Anatomy and Physiology, School of Biomedical Sciences, University of Melbourne, Parkville, VIC, Australia
3. Royal Victorian Eye and Ear Hospital, East Melbourne, VIC, Australia
4. Ophthalmology, Department of Surgery, University of Melbourne, Parkville, VIC, Australia

Background

The traditional view of diabetic retinopathy (DR) as a solely microvascular disease has been replaced by mounting evidence of inflammation and immune dysregulation potentiating retinal injury.

Supporting a role for T cells in DR pathogenesis is our laboratory's discovery that CD8+ T cells are recruited to and release injurious pro-inflammatory and cytotoxic factors in the retina¹, and that powerful anti-inflammatory Foxp3+ regulatory T cells (Tregs) can mitigate these effects².

Discussion

In an oxygen-induced retinopathy model of proliferative retinopathy, neovascularisation is associated with increased CD4+ and CD8+ T cells in blood, lymphoid organs, and retina, while Tregs were markedly decreased, as identified by flow cytometry. The adoptive transfer of CD8+ T cells deficient in TNF, interferon gamma, perforin, or granzymes A/B into immunocompetent Rag1^{-/-} mice reduced neovascularisation and VEGF levels. Furthermore, the decline in Tregs can be prevented with an IL-2/anti-IL-2 mAb complex or the adoptive transfer of Tregs. Early pilot studies in our laboratory have demonstrated that Vitamin A supplementation may be beneficial in increasing Treg levels.

Conclusion

This emerging area of fundamental DR research—the contribution of CD8+ T cells and Tregs in DR pathogenesis—can herald novel immunotherapies for retinal vascular disease.

1. Deliyanti D, Figgitt WA, Gebhardt T, Trapani JA, Mackay F, Wilkinson-Berka JL. CD8+ T Cells Promote Pathological Angiogenesis in Ocular Neovascular Disease. *Arterioscler Thromb Vasc Biol.* 2023 Apr;43(4):522–36.
2. Deliyanti D, Talia DM, Zhu T, Maxwell MJ, Agrotis A, Jerome JR, et al. Foxp3+ Tregs are recruited to the retina to repair pathological angiogenesis. *Nat Commun.* 2017 Sep 29;8(1):748.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 3



14:25

Developing and Validating a Novel Colour Saturation Threshold Test

Kristyna Stepnicka^{1,2}, M. Sarossy³, A. Sarossy¹

1. Monash University, Clayton, Victoria,
2. Monash Health, Victoria,
3. Melbourne University, Parkville,

Color vision testing forms an important part of the diagnosis and monitoring of retinal and optic nerve diseases. Further, subjective colour desaturation is a well described feature of optic neuritis. Most of the readily available color vision tests are targeted at congenital color vision loss, assess hue rather than saturation discrimination and are not well graded. In this study, we demonstrate a novel test – the LSS 4 – measuring the colour saturation threshold of perception across multiple hues. Thirty subjects were recruited with a mix of normal and abnormal ocular health. Testing was conducted with the LSS-4 test comprising a simple detection task within 11 progressively more desaturated pseudoisochromatic plates. Four hues were tested: mauve, red, green and blue (median wavelengths: 570, 616, 555 and 527nm). Each participant was tested twice using the same equipment on different days. Intraclass correlation coefficient (ICC_{2,1}) was used to assess test-retest reliability. Mean test time was 5.18 minutes. ICC_{2,1} showed high reliability for all hues (mauve 0.93, red 0.95, green 0.87, blue 0.91) and total score (0.96). There was no significant difference in the reliability between hues. Ultimately, the LSS-4 is a reliable and easy to perform test that may have utility in clinical neuro-ophthalmological practice.

MELBOURNE OPHTHALMIC ALUMNI MEETING 2024

Abstracts - Session 3



14:35

Correlations between Parameters Influencing Skill Acquisition in Cataract Surgery Simulation.

Alexander Sarossy¹, Callum Gin², Jorge Reyna³, Santosh Khanal³, Rahul Chakrabarti^{1,4,5}

1. Monash University, Faculty of Medicine, Nursing and Health Sciences
2. Royal Adelaide Hospital
3. Royal Australian and New Zealand College of Ophthalmologists
4. The University of Melbourne, Department of Ophthalmology
5. The Royal Victorian Eye and Ear Hospital, East Melbourne

Introduction

The EyeSi cataract surgery simulator consists of a Cataract Challenge Course, a virtual reality simulation of cataract surgery. In this study, we aimed to determine any correlation between the parameters measured on this simulator.

Methods

Data on the performance of 56 Ophthalmology trainees at the Royal Victorian Eye and Ear Hospital were analysed. The trainees ranged from 1st to 4th year of training. Analysed parameters included Initial Task Performance, Time-to-Gate (the time to reach a threshold score), and Peak Performance. Relationships between the parameters were analysed with Pearson r .

Results

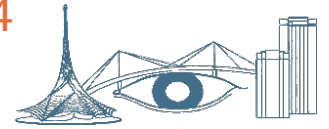
The strongest correlation was found between initial and peak performance ($r=0.810$), which was greater than the correlation between Initial Performance and Time-to-Gate ($r=0.553$). Time-to-Gate was weakly correlated with Peak Performance ($r=0.475$).

Conclusions

Time-to-Gate, Initial Performance and Peak Performance are interlinked, indicating trainees with the highest initial performance remain ahead in ability. Participants who spend longer on "perfecting" each stage of the simulator are not granted more points than those who rush through. The authors believe that virtual reality systems play a crucial role in training surgical registrars. However, their scoring systems should focus more on skill mastery to facilitate maximal skill acquisition.

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Abstracts - Session 3



14:45

Ocular trauma in badminton and the emerging trend of pickleball:
A 5-year review of badminton related eye injury emergency department presentations.

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Aim

To examine the nature and severity of badminton-related ocular injuries in Melbourne, Australia and review the parallels to the fast-emerging racquet sport, pickleball.

Design

Retrospective chart review.

Methods

A search of the medical records was conducted for patients presenting to the emergency department at The Royal Victorian Eye and Ear Hospital with badminton related eye injuries from June 2018 to May 2023. Data was extracted, focusing on injury mechanism, patient demographics, and treatment outcomes.

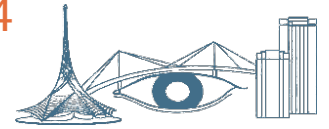
Results

In total, 88 patients were included in the study, comprising 64 (72.73%) males and 24 (27.27%) females. The mean patient age was 36.13 years. The most common age groups were 30–39-year-olds, comprising 27.27% of presentations, followed by 20–29-year-olds with 21.59% of cases. There were 10 (11.36%) paediatric presentations. Injuries occurred in 46 (52.27%) right eyes and 42 (47.73%) left eyes. The mechanism of injury was either due to a projectile injury from a shuttlecock in 76 (86.36%) cases or direct strikes from a teammate's racquet for 12 (13.64%) cases. The most common injury was hyphaema (72.73%), followed by commotio retinae (45.45%). One patient sustained a penetrating eye injury from a shuttlecock shattering spectacle worn during play. Medical intervention was required for 89.8% of patients and 6.82% required surgery. 76.81% of patients had a final BCVA of 6/6 or greater. There are currently no eye-safety guidelines for badminton in Australia.

Pickleball is a rapidly growing racquet sport played on a badminton-sized court using paddles and a plastic wiffle ball. the USA's fastest growing sport for the previous three consecutive years and is seeing a similar rise in Australia. Similarly to badminton, it involves firm projectiles with players in close proximity and there are no eye-safety guidelines. Emerging evidence has highlighted eye injuries sustained in pickleball play.

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Epidemiology, outcomes, and socioeconomic cost of eye injuries

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4. Translational Ocular Research and Immunology Consortium (TORIC), Sydney, Australia

Purpose

To report the epidemiology, visual outcomes, surgical interventions, and costs of open globe (OGI), closed globe (CGI) and adnexal eye injuries (AEI).

Method

684 eyes (155 OGI, 529 CGI/AEI) from a 13-year (2008-2020) retrospective tertiary-centre study. Outcome included best-corrected visual acuity (BCVA), operating theatre visits (OT), prognostic models, and costs.

Results

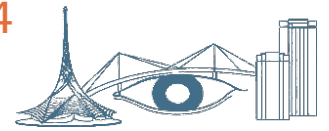
Injuries disproportionately affected young males during work and sport, with poor eye protection adherence (11.9% and 2%, respectively). Falls in older females at home were also prevalent. AEI occurred frequently in CGI (71.5%), particularly in assaults (88.1%) and included eyelid lacerations (20.8%), orbital injuries (12.5%), and facial fractures (10.2%). In OGI, final mean logMAR BCVA improved to 1.4 ± 1.2 [6/150] from 2.0 ± 1.0 [CF]. Only 35.7% of 98 patients who presented with HM/LP/NLP improved to $\geq 6/60$. In CGI, the final median logMAR BCVA improved to 0.2 [6/9] from 0.5 [6/18] ($p < 0.001$). In OGI, the Ocular Trauma Score and Classification and Regression Tree prognosticated visual outcomes ($p < 0.001$). In total, 583 procedures were required in 417 theatre visits. The hospital and direct societal cost for Australia approaches AUD92.6–137.5 million per year.

Conclusions

OGI/CGI/AEI represent a prevalent and preventable burden on patients and the economy. Cost-effective public health strategies should target at-risk populations.

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15:25

Tightening Precision of OSA screening with Floppy Eyelid Syndrome

Amal Dameer, Russell Conduit, David L. Hare, Catherine Itsiopoulos, Charles Su, Thomas Hardy, Alan McNab & Jwu Jin Khong

Background

Floppy eyelid syndrome (FES) is associated with obstructive sleep apnoea (OSA). Previous studies have found patients with OSA have higher risk of FES. This association helps early detection and referral for OSA assessment from the eye clinics. In contrast, in the sleep or respiratory clinics, little is known of the prevalence of FES in OSA. FES can potentially be a good OSA screening tool. This study aimed to determine the performance of FES patients on standard OSA screening questionnaires. In addition, the study examined correlation between screening scores with OSA severity as determined by diagnostic sleep study in FES patients. The study also aimed to provide evidence as to whether FES is a compelling OSA screening marker.

Methods

FES patients from audit tool database at the Royal Victorian Eye and Ear Hospital (RVEEH) and its associated private clinics (JJK,TH,AM,CS) were contacted. Participants were mailed standard OSA screening questionnaires including the STOP-Bang (SBQ) and Epworth Sleepiness Scale (ESS). Diagnostic sleep study results were retrieved for analysis. The severity of OSA was assessed from the 'Apnoea-Hypopnea Index' (AHI), which is the total number of apnoeas and hypopneas in an hour. AHI was correlated with FES diagnosis and OSA screening tool performance. From the patients self-reported history and/or available medical records, cardiovascular co-morbidities were also recorded.

Results

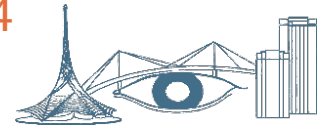
A total of 38 patients participated. The mean age was 60.9 years (SD +/- 14.5 years). Males were in the majority with 32 patients (84.2%) and there were 6 (15.8%) female patients. The mean body mass index (BMI) was 35.7 (SD +/- 7.2). Neck circumference was >40cm in 28 (73.7%) patients. A vast majority of 33 patients (86.8%), were found high risk for OSA with an SBQ score ≥ 4 . A large proportion of patients had high SBQ scores of 5 (8 patients, 21%), 6 (8 patients, 21%) and 7 (6 patients, 15.8%). Abnormal daytime sleepiness, measured by ESS as ≥ 8 , was only present in 13 (34.2%) patients. The median ESS score for FES patients was 6.32, which indicates most FES patients were not positive for daytime sleepiness, contrary to typical OSA patients. All 34 patients who completed a diagnostic sleep study were diagnosed with OSA. This finding demonstrates a 100% sensitivity. It also demonstrated a 100% prediction of OSA with a FES diagnosis. Mild OSA with an AHI < 15 was seen in 2 (5.9%) patients. Moderate OSA with an AHI between 15 - 30 was seen in 4 (11.8%) patients; and severe OSA was seen in 26 (76.5%) patients. The most common cardiac co-morbidity was atrial fibrillation and atrial arrhythmia, recorded in 8 (23.5%) patients.

Conclusion

100% of FES patients were positive for OSA on diagnostic sleep study, where $\geq 75\%$ were diagnosed with severe OSA. Only a third had abnormal daytime sleepiness. This finding correlated well with SBQ screening where 86.8% patients were detected as high risk for OSA, with 57.8% having very high scores. The findings support a compelling case to have FES assessment as an integral part for OSA screening along with SBQ.

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15:35

Surgical service utilisation for thyroid eye disease in Australia

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3. Centre for Eye Research Australia, The Royal Victorian Eye and Ear Hospital, Victoria, Australia

Aim

Surgical treatments for thyroid eye disease (TED) include orbital decompression, strabismus and eyelid surgery. We aimed to characterise the frequency and financial burden of orbital decompression, eyelid recession and lower eyelid blepharoplasty for TED in Australia between 2010 and 2022.

Methods

Retrospective analysis of orbital decompression, upper and lower eyelid recession and lower eyelid reduction surgeries performed in Australia, by year and state/territory, recorded by Medicare. The Medicare Benefit Schedule (MBS) procedural fee was used to estimate annual costs.

Results

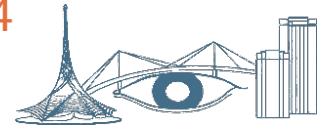
During 2010–2022, there were 1139 orbital decompressions, 10066 eyelid recessions and 3007 lower eyelid reductions in Australia. More surgeries were performed in New South Wales than in Victoria (orbital decompressions, 42% vs 25%; eyelid recessions, 59% vs 16%; and, lower lid reductions, 36% vs 17%, respectively). Annual surgical numbers fluctuated in Australia. Orbital decompressions tended to decrease, falling from 116 (in 2010) to 77 (in 2019), and then to 60 (in 2021). Similarly, lower lid reductions fell from 334 (in 2014) to 217 (in 2019), and then to 190 (in 2021). Conversely, eyelid recession tended to increase, rising from 481 (in 2010) to 936 (in 2022). The mean annual total MBS cost in Australia during the study period was approximately \$123,000 for orbital decompression, \$660,000 for eyelid recession and \$83,000 for lower eyelid reduction.

Conclusion

Orbital decompression and eyelid surgery for TED has fluctuated in frequency during the last ten years. Decreases may reflect natural variation with time, improved control of TED, and the impact of COVID-19. Future studies investigating other peri-operative patient, practitioner and facility costs would be useful to elucidate the financial burden of TED surgery.

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15:45

Australian Experience with Dysthyroid Optic Neuropathy: A Retrospective Multi-Centre Analysis, Preliminary Data at Three Ophthalmic Centres

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3. Orbital, Plastic and Lacrimal Unit. The Royal Victorian Eye and Ear Hospital, East Melbourne, VIC, Australia.

Aims

To examine the clinical features and treatment outcomes of dysthyroid optic neuropathy (DON) and to establish the prevalence of significant visual loss despite treatment at three ophthalmic centres.

Method

Retrospective analysis of patients with DON at Royal Victorian Eye and Ear Hospital, Royal Perth Hospital and Royal Prince Alfred Hospital between January 2016 and December 2022.

Results

45 patients and 73 eyes were examined with mean follow-up of 26 months. The average age at diagnosis was 56 years. Majority of patients were female (62%) with smoking history (60%). The mean presenting vision was 6/12, which improved to 6/9 post treatment. At diagnosis, majority of affected eyes had reduced colour vision (66%), proptosis (77%), apical crowding (59%) and Humphrey visual field defect (73%). 34% responded to corticosteroid alone, 37% required surgical decompression in addition, and 25% requiring management beyond corticosteroid and surgical decompression including orbital radiotherapy and immunomodulators. At the final follow-up visit, 18 affected eyes had worse than 6/12 vision and one had worse than 6/60 vision.

Conclusion

Majority of DON patients required treatment strategies beyond corticosteroid, including surgical decompression, orbital radiation, and immunomodulators. With treatment, majority of DON affected eyes had visual improvement and retained good functional vision.



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Osseointegrated implant treatment outcomes following orbital exenteration in a large multicentre cohort.

Dr Domagoj Vodanovich, A/Prof Ian Hewson, Dr Benjamin Dixon

We sought to evaluate the association between osseointegrated implant failure and the use of postoperative radiotherapy (PORT) and smoking in patients who have undergone orbital exenteration, whilst comparing outcomes in other anatomical head & neck locations.

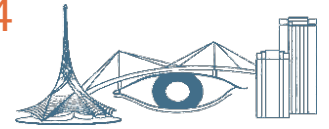
A retrospective analysis was performed for patients receiving orbital and craniofacial implants for prosthetic eyes following resection for head and neck cancer across two Australian tertiary centres.

There were 90 orbital implants inserted following orbital exenteration, among a total of 461 implants inserted across a cohort of 148 patients with orbital, oral, nasal or auricular post-surgical defects. The highest failure rates were seen for orbital implants (10.0%), followed by nasal (7.7%), oral (3.7%) and auricular (0%). Approximately half of the cohort (54.5%) were smokers and most patients (74.3%) received PORT. There was no statistically significant association between the use of postoperative radiotherapy or smoking and implant failure.

Osseointegrated implants remain a promising and reliable intervention for patients following surgical resection of head and neck cancer, including those who have a history of smoking or receive postoperative radiotherapy.

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16:05

Epibulbar Complex Choristoma Containing Bone: A Case Report and Closer Look at Classifications

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Introduction

Epibulbar choristoma is a benign congenital lesion containing histologically normal-appearing tissue in an abnormal ectopic location. An epibulbar choristoma is classified as either epibulbar dermoid, dermolipoma or complex choristoma based on histological examination. The case presented was a presumed epibulbar dermolipoma with no signs of ossification on imaging, examination or intra-operatively until the specimen was examined histologically, clarifying the lesion as an epibulbar complex choristoma containing bone. Reassuringly, the presence of bone in such lesions should not change management.

Case Presentation

A mother noticed a small fleshy mass on her 9-year-old daughter's superotemporal bulbar conjunctiva. The suspected epibulbar dermolipoma was confirmed with MRI (Fig. 1) and initially managed conservatively. Two years later she was referred for apparent growth and cosmetic concerns and she underwent successful surgical debulking. Multiple pathologist opinions (Fig. 2) were required to correctly diagnose the lesion as a complex epibulbar choristoma as the presence of bone caused some diagnostic confusion.

Conclusion

We present this case for its unusual presentation and histological findings. Orbital surgeons should be aware of the possibility of ossification of epibulbar choristomas and avoid confusion with alternative diagnoses. Clarification of the latest classification system for epibulbar choristomas is provided.