40th Annual Cornea Society Meeting

Emporium Hotel Southbank, Brisbane 6-7th March 2025

ANZCS Australian & New Zealand Cornea Society

RANZCO The Royal Australian and New Zealand College of Ophthalmologists
THE LEADERS IN COLLABORATIVE EYE CARE

WELCOME

Dear Friends & Colleagues,

Welcome to the 40th ANZCS Meeting, held in Brisbane, Australia, on March 6–7, 2025.

Building on the success of the 39th meeting in Melbourne, we are delighted to bring together eye bank professionals, scientists, and ophthalmologists from across Australia and New Zealand to share expertise, explore new discoveries, and strengthen both professional and personal connections.

This year's meeting takes place at the Emporium Hotel Brisbane, a luxury venue set in the heart of the vibrant South Bank precinct. Delegates will have the opportunity to immerse themselves in Brisbane's renowned arts, cultural, and dining scene, all while enjoying stunning views of the riverfront.

The Scientific Program Committee has curated an exciting and diverse program that will highlight the latest advancements in our field. We are particularly honored to welcome Dr. Sheraz Daya as an invited speaker. Dr. Daya is a world-renowned ophthalmologist and medical director of the UK's Centre for Sight, celebrated for his pioneering contributions to corneal and refractive surgery, including stem cell transplantation and complex corneal reconstruction.

We are also privileged to host Professor Stuart MacGregor, a leading statistical geneticist and Head of the QIMR Berghofer Statistical Genetics Group. His work in genome-wide association studies (GWAS) and statistical genetic methods has led to major advances published in top journals such as Nature and Nature Genetics. As a co-founder of Seonix Bio, he is actively advancing risk prediction tools to improve the treatment and prevention of blinding eye disease.

The 40th ANZCS Meeting promises to be an outstanding opportunity for learning, collaboration, and connection within the corneal medical and research community. We look forward to an inspiring and memorable meeting in Brisbane.

Yours sincerely,

ANZCS Organising Committee
Dr. Peter Beckingsale, Dr. Cameron McLintock, Dr. David Gunn & Dr. Nick Toalster

CONFERENCE PROGRAM

Registration is open from 8:00am

Thursday 6th & Friday 7th March (9:00am - 5:00pm)

Venue: Frangipani Ballroom, Emporium Hotel,
267 Grey Street, South Brisbane 4101

SOCIAL PROGRAM

Welcome Conference Drinks
Thursday 6th March

Time: 6:00pm
Venue: Terrace Rooftop Bar, Emporium Hotel

Post Conference Drinks
Friday 7th March

Time: 5:30pm
Venue: The Reserve Wine Bar,
Ground Floor, Emporium Hotel.

THE DOUGLAS J COSTER LECTURE

Sheraz Daya MD FACP FACS FRCS(Ed) FRCOphth

Sheraz Daya is the Medical Director of Centre for Sight, UK. Recruited from New York, USA in 1993, Mr Daya was Director and Consultant at the Corneoplastic Unit and Eye Bank, Queen Victoria Hospital. Mr Daya transformed the Corneoplastic Unit and Eye Bank, acquiring an international reputation for excellence in Corneal surgery and resigned from the NHS in 2011. Mr. Daya is a key opinion leader for the ophthalmic industry and is highly regarded nationally and internationally and voted on the Ophthalmologist Power List of top 100 surgeons in the world 2018, 2019 and 2020. He serves on numerous boards and committees and is also the founding Chief Medical Editor of Cataract and Refractive Surgery Today. He has authored over 100 peer-reviewed publications and many book chapters. He is regularly invited to speak at international conventions and meetings and is known for many innovations in ophthalmology, specifically stem cell transplantation, lamellar techniques and refractive surgery. He has delivered several medal lectures in the US (Whitney Sampson), Greece (Fyodorov Award), Canada W Bruce Jackson Award), and UK (Choyce Medal). Mr. Daya was recognised for his leadership by winning the NHS award "Leadership in Improvement" of the Best of Health Awards 2009, South East England. For his contribution to Ophthalmology, he has received the Senior Achievement Award and is a Lifetime Fellow of the American Academy of Ophthalmology. He is also recipient of the Lifetime Achievement award from the International Society of Refractive Surgery (ISRS). and is currently President of the American European Congress of Ophthalmic Surgery.

THE JOHN BLANDFORD LECTURE

Prof Stuart MacGregor, PhD AAHMS

Prof MacGregor is a statistical geneticist and Head of the QIMR Berghofer Statistical Genetics Group. Stuart has made seminal contributions to our understanding of complex trait genetics for a wide range of diseases. He plays a leading role in consortium science, particularly in the area of genome-wide association studies (GWAS). His work developing and applying statistical genetic methods has led to publications in top journals such as Nature and Nature Genetics. Stuart's awards include the QIMRB Breakthrough Award and the Australian Academy of Science Human Genetics Medal. He is a co-founder of Seonix Bio, a start-up company that is now delivering advanced risk prediction tools to improve the treatment and prevention of blinding eye disease. Stuart was recently awarded a prestigious NHMRC Investigator grant and inducted as Fellow of AAHMS.

GUEST SPEAKER

Shannon Schweitzer

Shannon Schweitzer, CEBT, is the Executive Director for Lions Eye Bank of West Central Ohio. She was previously the Technical Director and has over 20 years of experience in Eye Banking. Shannon has a BS in Biology and a Master's degree in Business Administration with an emphasis in Healthcare Administration.

Shannon is a Medical Advisory Board Member for Lifeline of Ohio and has previously served in other capacities on nonprofit boards. Shannon has taken on roles in several committees for the Eye Bank Association of America over the years and is currently serving as Speaker of the House. She has been in this role on the Board of Directors for the last 3 years. Shannon enjoys serving the members and the association to help propel the profession forward. Shannon is a collaborator and a huge proponent of the notion that together, we are better.

PROGRAM
Thursday 6th March

Registration from 8:00am Frangipani Ballroom Foyer, Emporium Hotel		
Session 1: Crosslinking, Keratoconus, Grafts **Chair:** David Gunn		
Welcome 9:00		
9:05	Corneal haze formation after collagen cross-linking for keratoconus: a 5-year real-world data in quaternary hospital in Australia	Nina Asrini Noor
9:14	Development of a Polygenic Risk Score for Keratoconus: A Multi-Site Analysis	Jasmin Branford
9:24	Efficacy and safety of standard corneal cross-linking procedures performed with short Versus standard riboflavin induction: two-year outcomes using the Save Sight Keratoconus Registry	Himal Kandel
9:33	What do we know about keratoconus progression?	Stephanie Watson
9:43	Infectious Keratitis after Accelerated Corneal Collagen Cross-Linking	Hemant Jhajharia
10:00	Aaargh K – dealing with the legacy of Radial Keratotomy	Sheraz Daya
Morning Tea 10:20		

PROGRAM
Thursday 6th March

Session 2: CAIRS across Australia **Chair:** Ravi Singh		
11:00	Australian Experience with CAIRS: Techniques and Clinical Outcomes	Brendan Cronin, Aanchal Gupta, Nathan Wong, Andrea Ang, David Gunn
11:30	Who CAIRS	Andrew Pomfret & Lisa Buckland
11:38	Discussion	
11:45	**The Douglas J Coster Lecture:** Clear and in Shape – Principles and Techniques	**Sheraz Daya**
Lunch 12:30		
Session 3: Controversies & Debates **Chair:** Nathan Wong		
13:30	Geographic differences in rates of grafts	Elaine Chong (Data), Elsie Chan, Peter Beckingsale
13:50	Laser assisted surgery eg. ptery	
14:10	Lack of uptake of DALK	
14:30	**Cornea Society AGM**	**Peter Beckingsale**
Afternoon Tea 14:40		

PROGRAM
Thursday 6th March

Session 4: EBAANZ **Chair:** Pierre Georges		
15:10	Empowering Organizational Growth Through Professional Collaborations	Shannon Schweitzer
15:35	EBAANZ up-date	Lisa Buckland
15:45	GAEBA up-date	Elese Draheim
15:53	What eye bankers want surgeons and researchers to know	Heather Machin
16:00	Discussion Time	
BIENCO		
16:10	BIENCO Update	Damien Harkin & Gerard Sutton
16:30	A bioengineered biomimetic collagen cornea model promoting nerve regeneration	Clare Maher
Welcome Drinks 18:00 Emporium Terrace (Rooftop)		

PROGRAM
Friday 7th March

Registration	8:00	
Session 5: Rapid Fire, Case Studies **Chair:** Cameron McLintock		
9:00	Xerophthalmia in an adult-female patient with vitamin A deficiency	Allister Lee
9:07	Surgery Coaching Pilot for Corneal Surgery	Nigel Morlet
9:14	Post-LASIK corneas show altered immune cell densities, morphologies and dynamics	Laura Downie
9:21	Exploring the immunopathogenesis of Herpes simplex keratitis using high dimensional flow cytometry and imaging and explant models	Sana Arshad
9:28	The Clinical Outcomes of Minor Salivary Gland Transplantation for Severe Dry Eye Disease Secondary to Chronic Stevens-Johnson Syndrome	Hemant Jhajharia
9:35	Causes for Explantation of Small-Aperture IC-8 Intraocular Lens: A Multicentre Case Series	Layla Bunjo
9:42	A Role for Losartan in Epidemic Keratoconjunctivitis	Meiding Wang
9:49	The effect of donor age on the rebubble rate in DMEK surgery	Andrew Apel & Liam Kalas
9:56	Agreement in Corneal Astigmatism Measurements Between Scheimpflug-Placido and Swept-Source Optical Coherence Tomography-Based Optical Biometers	Samir Uprety
10:03	DMEK from then to now: advances in surgical outcomes over a decade	Liam Kalas
10:10	Refractive outcomes of triple surgery: DMEK combined with cataract extraction and MF IOL	Andrew Apel
10:17	Necrotising scleritis, conjunctival masses and neurotrophic keratopathy in a Quantiferon Gold positive patient	Prakshi Chopra
10:24	Patient reported outcomes in infectious keratitis: a systematic review	James Smith
Morning Tea	10:30	

Session 6: Graft registry and Ocular oncology
Chair: James McKelvie

11:00	ACGR Update	Miriam Keane
11:15	ACGR changes & discussion	Keryn Williams
11:23	ACGR audit session	Peter Beckingsale
11:30	Ocular oncology update!	Lindsay McGrath
11:50	A comparison of incisional vs excisional biopsy for treatment of ocular surface squamous neoplasia	Amy Wang
12:00	**Cataract Surgery in Abnormal Corneas**	**Sheraz Daya**
Lunch	12:20	

Session 7: Keratitis/Medical Treatment
Chair: Brett Drury

13:15	**Keratitis Symposium**	
Queensland Microbial Keratitis Database 2005-2024 – 20 Years of Data		Matthew Green
Atypical Keratitis		Stephanie Watson
Update on Microbial keratitis treatment		Andrew Apel
Antimicrobial resistance in bacterial keratitis & BOSS report		Maria Cabrera-Aguas
13:45	Acanthamoeba impacts	Nicole Carnt, Con Petsoglou, Aishah Aldhanhini
14:00	Acanthamoeba Keratitis at RVEEH and beyond	Arthur Okonkwo
14:10	Losartan, does it really work?? An update on emerging therapies for corneal scarring	Gink Yang & Mark Daniell
14:20	Thick or thin-a 12 year retrospective analysis of keratitis on corneal grafts	Natalie Allen
14:30	**The John Blandford Lecture:** Genetic risk polling for eye disease	**Stuart MacGregor**
Afternoon Tea 15:10		
15:40	Keratoprosthesis: What we do and what you can do	Luke Northey
15:50	Ocular trauma at Sydney Eye Hospital – what's next?	Nathan Gunasekaran

PROGRAM
Friday 7th March

Session 8: Video Session, Case Studies, Biggest Failures
Chair: Cameron McLintock

16:10	Bubbling under pressure	Judy Ku
16:17	Lasik flaps with traps	Rob Paul
16:14	No 7 treph for DSAEK	Chameen Samarawickrama
16:21	PK in fungal keratitis	Murie Sundravel
16:28	The Curse of the Purse	Peter Beckingsale

Finish 17:00
Poll Voting

Post conference Drinks 17:30

Venue: The Reserve Wine Bar,
Ground Floor, Emporium Hotel

9:05

Corneal haze formation after collagen cross-linking for keratoconus: a 5-year real-world data in quarternary hospital in Australia

Authors:
Nina Asrini Noor[1,3], Himal Kandel[2], Stephanie Watson[1,2]

Institutions:
1. Sydney/Sydney Eye Hospital, Sydney, Australia
2. Save Sight Institute, Sydney, Australia
3. JEC Eye Hospital, Jakarta, Indonesia

Conflicts of interest:
All authors have no conflict of interest to disclose.

Introduction: Our aim was to determine the incidence of clinically significant corneal haze formation after collagen cross-linking (CXL) for keratoconus.

Study design: Retrospective study

Method: Retrospective analysis was performed in patients with keratoconus who underwent CXL between 2019 and 2023 in Sydney/Sydney Eye Hospital collected from the Save Sight Registries. Seventy-two CXL procedures were retrieved. Excluded from the analysis were 19 eyes (15 eyes lost to follow up, 4 eyes developed secondary infection). Subjective corneal haze measures were evaluated in various visits after CXL using slit-lamp biomicroscopy. Corneal haze was considered significant based on clinical judgement.

Results: Total of 53 eyes from 47 patients with 26 males (55.3%) and mean age 22.5 ± 7.7 years (range 12 to 45 years) were included. The incidence of clinically significant corneal haze after CXL was 5.7% (3 eyes). All patients with significant haze underwent epithelium-off CXL with either conventional (1 eye) or accelerated protocol (2 eyes). All cases were treated with topical steroid (flurometholone 0.1%, dexamethasone 0.1%, or prednisolone 1%) ranging from 6 weeks to 6 months. Corneal haze remained until the last follow up in all patients although the destiny was reported to be less.

conclusion: Clinically significant haze is not uncommon follow CXL for keratoconus and may persist over months.

9:14
Development of a Polygenic Risk Score for Keratoconus: A Multi-Site Analysis

Authors:
Jasmin Branford, Bobak Bahrami, Richard Mills, Jamie Craig

Background: Keratoconus is a progressive ectatic corneal disease that can cause significant visual impairment and long term treatment and follow-up burden. While genetic predisposition plays a critical role, current clinical markers inadequately predict disease progression and severity. Developing a polygenic risk score (PRS) could enhance early identification of at-risk individuals, allowing timely intervention with treatments to prevent progression such as corneal crosslinking. It may also improve counselling of patients seeking refractive corneal surgery.

Setting: This retrospective study includes data from multiple Australian sites, with blood samples collected between 1 October 2007 and 8 October 2024.

Methods: A total of 914 eyes with keratoconus were analysed, including 273 eyes that underwent corneal grafting. Eighty-one of the 273 eyes had a first- or second-degree relative with keratoconus (30%) compared with 19% of those who were not grafted (122 eyes). Clinical data, including central corneal thickness (CCT), steepest keratometry (Kmax), age of diagnosis and age at grafting, were examined to evaluate disease severity and its predictors. Genotypic data will be used to construct a PRS, and its associations with clinical features and disease progression will be analysed.

Results: The mean age at grafting was 30.3 ± 12.1 years. Associations between CCT, Kmax, and grafting age are under investigation to quantify the predictive value of these parameters for disease severity. The PRS aims to stratify patients by genetic risk, offering insights into those requiring early intervention, optimal follow-up strategies for suspect cases, and counselling for laser refractive surgery. We anticipate presenting the PRS results at the meeting.

Conclusion: This study seeks to establish a PRS for keratoconus to improve early detection and management of high-risk individuals. Such a tool could refine clinical decision-making, enhance personalised care, and reduce the burden of advanced disease requiring surgical intervention.

9:24

Efficacy and safety of standard corneal cross-linking procedures performed with short Versus standard riboflavin induction: two-year outcomes using the Save Sight Keratoconus Registry

Authors:
Himal Kandel, PhD[1]; Marco Abbondanza, MD[2]; Aanchal Gupta MBBS, MMed, FRANZCO[3,4]; Jern Yee Chen, FRANZCO[5]; Adam S Watson MBChB, FRANZCO[6]; Stephanie L Watson OAM, MBBS, PhD, FARVO, FRANZCO[1]

Institutions:
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2. Abbondanza Eye Centres, Rome and Milan, Italy
3. Adelaide Eye & Laser Centre, Adelaide, SA, Australia
4. South Australian Institute of Ophthalmology, Adelaide, SA, Australia
5. Flinders Medical Centre, Flinders University, Adelaide, Australia
6. Eye Institute, Auckland, New Zealand

Purpose: The objective of this study was to compare the effectiveness and safety of short versus standard riboflavin induction times in cross-linking (CXL) for keratoconus.

Methods: Data for this longitudinal observational study were captured through the web-based Save Sight Keratoconus Registry system from the routine clinical practice (15 sites). The outcomes were compared using mixed-effects regression models adjusted for age, sex, visual acuity, keratometry, pachymetry, practice, and eye laterality.

Results: The riboflavin induction time was short in 123 eyes (94 patients; mean age 27.1 ±10.2 years; 73.4% male) and standard in 191 eyes (160 patients; mean age 25.8 ± 8.6; 73.8% male). The baseline characteristics (sex, mean age, BCVA, keratometry, and pachymetry [TCT]) were similar between the groups (all $p > 0.05$). At the 2-year follow-up visit, no statistically significant differences were observed in outcomes between the groups with short and standard riboflavin induction [visual acuity 3.9 (0.4 to 7.4) vs 4.1 (1.4 to 6.9) logMAR letters, respectively; Kmax -1.0 (-2.3 to 0.4) D vs -0.8 (-1.7 to 0.1) D, respectively; K2 (-0.3 (-1.7 to 0.7)D vs -0.7 (-1.4 to -0.01) D, respectively; MCT (-10.6 (-25.3 to 4.2) vs -7.4 (-17.8 to 3.0) µm respectively; all $p > 0.05$]. At a 2-year follow-up, no serious adverse events were recorded.

Conclusions: Short and standard riboflavin induction times achieved similar degrees of flattening in K2 and improvement in vision.

9:33
What do we know about keratoconus progression?

Authors:
Professor Stephanie Watson OAM FARVO[1,2], Himal Kandel[1,2], and the Fight Corneal Blindness Project group

Institutions:
1. Corneal Unit, Sydney Eye Hospital, Sydney NSW
2. Corneal Research Group, Sydney Medical School,

Introduction: Knowledge of keratoconus natural history is fundamental in making informed treatment decisions. Yet clinicians face challenges in predicting keratoconus progression.

Study design: Systematic review with meta-analysis and real-world data from the Save Sight Keratoconus Registry, a global database.

Methods: Prospective or retrospective studies of keratoconic patients with visual acuity, corneal parameters were included. Databases analyzed included Medline, Embase, CENTRAL and CINAHL. Data from 3994 untreated eyes from 2283 patients with keratoconus on the Save Sight Keratoconus Registry were included. Patients were divided into 'progressors' and 'stable' patients for each clinical (visual corneal) parameters. Primary outcomes were the proportion of eyes with sustained progression in a parameter. Secondary outcomes included predictors of progression.

Results: The review found that progression was greater for younger patients and those with greater Kmax (>55D). Real-world registry data found the proportion of eyes progressing by a clinical parameter at 1 year was up to 7%. Every 1D steeper K-max was associated with 7% worsening of VA and for every 1 year younger a 4% greater risk of K-max steepening.

Conclusion: Published data and real-world evidence can provide clinicians and researchers with guides to calculate progression risk in everyday practice.

9:42

Infectious Keratitis after Accelerated Corneal Collagen Cross-Linking

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Purpose: To analyse the risk factors, clinical features, visual outcomes and in-vivo imaging characteristics in cases of keratoconus developing keratitis following accelerated collagen cross linking (CXL).

Methods: A retrospective observational case series at a tertiary eye centre in India evaluating eyes that underwent accelerated CXL from January 2021 to July 2024.

Results: Of 723 eyes undergoing CXL, 13 eyes developed infectious keratitis (1.79%). Majority belonged to upper middle socio-economic class and presented in summer and rainy season. The use of bandage contact lens was common in all cases. The mean duration from onset of symptoms to presentation was 2.7 ± 1.5 days (range 1 to 5 days). The most common clinical presentation was multifocal stromal infiltrates observed in 85.7% cases. The median area of epithelial defect was 12 mm2 and average resolution time was 18.4 ± 12.9 days. The most common organism that was isolated was CoNS, while others included Staphylococcus aureus, Escherichia coli, Candida sp. and Acanthameba sp. The resistance to fourth generation fluoroquinolones (moxifloxacin) was observed in three of five cases (60%). Anterior segment optical coherence tomography (AS-OCT) showed variable depth of involvement. Majority cases had involvement anterior to the demarcation line. Scheimpflug imaging showed greater flattening and thinning with scar formation. In the early post-operative phase, transient steepening was observed in one case. Small ulcers had minimal effect on keratometry.

Conclusion: Infectious keratitis following accelerated CXL is a rare clinical entity. Early presentation, timely management including use of topical steroids are associated with good visual outcomes.

11:00

Australian Experience with Corneal Allogenic Intrastromal Ring Segments (CAIRS): Techniques and Clinical Outcomes

Overview:
This symposium will present the early clinical experiences and insights from leading Australian surgeons on the use of Corneal Allogenic Intrastromal Ring Segments (CAIRS). Each speaker will focus on a specific surgical technique, offering practical tips, case outcomes, and lessons learned. The symposium aims to provide a well-rounded understanding of CAIRS' role in corneal surgery and its potential for improving patient outcomes across a variety of clinical scenarios.

Presenters and Topics:

Brendan Cronin, MBBS, FRANZCO
Introduction to CAIRS and FS200 Femtosecond Laser Experience
Brendan will introduce the concept of CAIRS, its indications, and share his experience with planning using the CAIRS Plan software. He will also discuss the FS200 femtosecond laser's role in CAIRS procedures, providing an overview of his clinical outcomes.

Aanchal Gupta, MBBS, MMed (Ophth Sci), Grad Dip (Refract Surg), FRANZCO, FWCRS
VisuMax Technique: Tips, Tricks, and Case Result. South Australian Experience
Aanchal will present her expertise with the VisuMax femtosecond laser for CAIRS, highlighting surgical techniques and offering practical tips for achieving optimal outcomes. A case study with follow-up results will be discussed to illustrate the technique's effectiveness.

Nathan Wong, MBBS, FRANZCO
IntraLase Technique: Key Insights and Case Results. Melbourne Experience
Nathan will provide an in-depth look into the IntraLase technique for CAIRS, offering procedural advice and sharing key clinical outcomes from his practice. A case presentation will follow to emphasize the technique's precision and efficacy.

Andrea Ang, MBBS, FRANZCO
Atos/IntraLase Techniques: Perth Experience
Andrea will explore her experience with both Atos and IntraLase techniques, focusing on her early results with CAIRS in Perth. She will discuss the potential for these approaches and share cases with postoperative outcomes.

David Gunn, MBBS, FRANZCO
CAIRS Results in Combination Cases: IC-8, PTK, and Post-Phacoemulsification
David will close the symposium by reviewing CAIRS results in combination with other corneal interventions, including IC-8 lens implants, phototherapeutic keratectomy (PTK), and post-phacoemulsification cases. He will discuss the synergy between CAIRS and these procedures to enhance patient outcomes.

Learning Objectives:
Understand the planning and execution of CAIRS using various femtosecond laser platforms.
Gain insights into the technical variations and tips for optimizing outcomes in CAIRS.
Learn from case studies illustrating the versatility of CAIRS in managing complex corneal cases.
Discuss the integration of CAIRS with other surgical procedures.

11:30
Who CAIRS

Authors:
Andrew J Pomfret, Katrina Elliott, Jelena M Kezic, Lisa Buckland

Institutions:
Lions Eye Bank of Western Australia (LEBWA), Lions Eye Institute, Perth, Western Australia

Financial disclosures: None

Corneal Allogenic Intrastromal Ring Segments (CAIRS) is a new pre-cut cornea option provided by LEBWA for the treatment of Keratoconus. This form of pre-cut tissue is a first for Australia and New Zealand eye banks.

Methods: Using either fresh or thawed corneas, the endothelial and epithelial layers are vigorously removed using an eye spear. The stromal ring is trephined using a Jacobs trephine, and the Bowman's membrane is marked with corneal ink. The stromal ring is then placed back into transport medium and shipped to the surgeon for transplantation.

Results: CAIRS is becoming increasingly popular in Australia as a cost-effective alternative for the treatment of Keratoconus. Unlike its counterpart KeraNatural, CAIRS is provided fresh and is covered by the protected health information, if used in conjunction with a pharmaceutical benefits scheme item.

Conclusion: Surgeons are loving this service, and we expect demand to grow.

9:00

Xerophthalmia in an adult-female patient with vitamin A deficiency.

Authors:
Lee, Allister[1]; Wilson-Pogmore, Ario[1,2]; Maccheron, Luke[1].

Institutions:
1. Department of Ophthalmology, Royal Brisbane and Women's Hospital, Brisbane, QLD, Australia.
2. Department of Ophthalmology, Cairns Base Hospital, Cairns, QLD, Australia.

Vitamin A plays a crucial role in maintaining ocular health, with deficiency being exceedingly rare in developed countries. Manifestations of vitamin A deficiency can be devastating and range from nyctalopia to corneal xerosis, ulceration and perforation. This case presentation describes a 19 year-old female with Avoidant Restrictive Food Intake Disorder (ARFID) who presents with progressive bilateral corneal opacification, thinning and neovascularization. Investigations revealed multiple nutrient deficiencies including vitamin A (retinol) levels of 0.9 and a retinol binding protein level of 1.2. Management included intensive preservative-free lubricating eye drops, retinol eye ointment (Vita-POS ®) and oral vitamin A supplementation. The patient was referred to a dietician, primary heatlthcare physician and mental health service due to ongoing issues with treatment compliance. Follow-up is ongoing but challenging due to poor patient attendance to appointments.

9:14
Post-LASIK corneas show altered immune cell densities, morphologies and dynamics

Authors:
Laura E Downie[1], Rajni Rajan[1], Mengliang Wu[1], Senuri Karunaratne[1], Ji-hyun Lee[1], Phillip Bedggood[1] Andrew B Metha[1], Holly R Chinnery[1,2,3.]

Institutions:
1. Department of Optometry and Vision Sciences, University of Melbourne, Victoria, Australia
2. Department of Optometry and Vision Science, University of Western Australia, Crawley, WA
3. Lions Eye Institute, Nedlands, Western Australia, Australia

Financial disclosures: LED, MW, PB, ABM and HRC are listed inventors on a patent relating to the Fun-IVCM method, filed by the University of Melbourne.

Introduction: This study compared the in vivo morphodynamic features of corneal immune cells in post-LASIK corneas, relative to controls, using Functional In Vivo Confocal Microscopy (Fun-IVCM).

Study design: Cross-sectional study of controls (n=16; mean±SD age: 28.7±7.2 years) and individuals who had myopic LASIK, 6-24 months prior (n=13; 28.2±4.6 years).

Method: Corneal nerve density (static IVCM, ACCMetrics) and sensitivity (non-contact corneal aesthesiometry) were quantified. Fun-IVCM imaging (Heidelberg HRT-3 with Rostock Corneal Module) was applied to quantify the density, morphology and dynamics of corneal immune cell subsets (T cells, dendritic cells [DCs] and macrophages).

Results: Relative to controls, post-LASIK participants had lower corneal nerve parameters (density, fibre length, branch density) and sensitivity. Corneal epithelial T cell densities were similar; however, DC density was relatively lower in the inferior corneas of post-LASIK participants (p=0.045). At the corneal whorl, stromal macrophage density was relatively lower and T cell speeds were higher in the post-LASIK group. Stromal macrophages had larger cell and field areas, and perimeters, in post-LASIK corneas (p=0.0002).

Conclusion: The shape and dynamic behaviours of corneal immune cells are different in post-LASIK corneas compared to healthy controls. Further work is required to define the functional significance of these differences in cell morphodynamic features.

9:21

Exploring the immunopathogenesis of Herpes simplex keratitis using high dimensional flow cytometry and imaging and explant models

Authors:
Sana Arshad[1,2], Kirstie Bertram[2], Hafsa Rana[2], Holly Chinnery[3], Andrew White[1,2], Constantinos Petsoglou[2,4], Anthony Cunningham[2], Nicole Carnt[1,5,6]

Institutions:
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2. Centre for Virus Research, Westmead Institute for Medical Research, Faculty of Medicine and Health, University of Sydney
3. Department of Optometry and Vision Sciences, The University of Melbourne
4. NSW Tissue Banks, Sydney Eye Hospital
5. School of Optometry and Vision Science/Faculty of Medicine and Health, University of
6. New South Wales
7. Institute of Ophthalmology, University College London

Introduction: Herpes keratitis (HK) is caused primarily by herpes simplex virus type 1 (HSV-1) and can lead to infectious blindness.

Study Design: We designed a tissue study examining human corneas affected by HK, removed before corneal transplant, or from donors with a history of HK, to define the resident and infiltrating immune cells, compared to normal corneas. We also infected pig corneas with HSV-1 to examine the initial events of HSV-1 infection in the cornea.

Methods: Following human cornea tissue collection, 24-colour flow cytometry and complimentary imaging mass cytometry with 31-markers were performed. Pig corneas were topically infected via high-density microneedle-patches (HD-MAPs) dipped in HSV-1 and detected virus infection/spread by RNAscope, adapted for HSV-1 DNA.

Results: Proportions of immune cell subsets between control and HK human tissues were similar, however, CD4+ and CD8+ T cells in the epithelium and stroma of HK corneas were significantly more activated and resident (CD69+ and HLA-DR+) comparatively. Additionally, a heterogenous population of these T cells were spatially located throughout the cornea and limbal regions. Finally, punctures created by HD-MAPs in pig corneas were consistent and extended into the stroma, however, HSV-1 was restricted to the corneal epithelium only.

Conclusion: This study will help improve immunotherapy for HK and vaccine design to prevent it.

9:28

The Clinical Outcomes of Minor Salivary Gland Transplantation for Severe Dry Eye Disease Secondary to Chronic Stevens-Johnson Syndrome

Authors:
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Purpose: To study the outcomes of minor salivary gland transplantation for severe dry eye disease secondary to chronic Steven Johnson Syndrome.

Methods: It was an ambispective, interventional case series conducted at Rajendra Prasad Centre for Ophthalmic Sciences, Delhi, India from 2022 to 2023 evaluating the outcomes of minor salivary gland transplantation with anchorage of the minor salivary glands to superior rectus muscle in twenty cases of severe dry eye disease secondary to chronic Steven-Johnson Syndrome. The pre-operative clinical parameters were compared to those at post-operative 1 year follow-up.

Results: At 1 year follow-up, there was an improvement in median Schirmer-1 value (p=0.0004), hyperemia score (p=0.0004), keratinization score (p=0.04), corneal epithelial defect score (p=0.0004), corneal opacification score (p=0.001), corneal neovascularization score (p=0.001), palisades of Vogt score (p=0.007), corneal keratinization score (p=0.04) and corneal conjunctivalization score (p=0.08).

Conclusion: The minor salivary gland transplantation is a viable management option for cases with severe dry eye disease secondary to chronic Steven Johnson Syndrome with clinical improvement in corneal and conjunctival parameters of the ocular surface.

9:35

Causes for Explantation of Small-Aperture IC-8 Intraocular Lens: A Multicentre Case Series

Authors:
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Financial disclosures: Nil

Introduction: The IC-8 intraocular lens (IOL) is a small-aperture lens designed to improve vision by reducing the impact of higher-order aberrations, particularly in patients with aberrant corneas. While effective in many cases, the pinhole optics may compromise overall vision quality, leading to dissatisfaction or the need for lens exchange. This case series examines the reasons for IC-8 IOL exchange, providing insights into patient selection, visual outcomes, and clinical decision-making.

Study Design: A retrospective case series from January 2018 to November 2024 was conducted at four institutions across Australia.

Method: Participants included were adults aged ≥18 years who had explantation of an IC-8 IOL. Case records were reviewed and data extracted included demographics, ocular history, reason for IC-8 IOL insertion/exchange, pre- and post-operative biometry and corneal tomography, visual acuity (VA) and subjective outcomes.

Results: Nine eyes of eight patients were included. Indications for IC-8 IOL implantation included prior LASIK wishing for depth of focus post-op (n=3), radial keratotomy (n=1) non-ectatic irregular astigmatism (n=3), astigmatism (n=1) and corneal scarring (n=1). Reasons for exchange included poor intermediate/distance vision (n=6), glare and halos (n=4), dull vision (n=2) and poor night vision (n=2). Seven patients reported improvement in symptoms following exchange. Three eyes had exchange with an extended depth of focus (EDOF) lens and one with a trifocal lens, the remainder with monofocal lenses. There was no significant difference in mean uncorrected VA (p=0.75) or best-corrected VA (p=0.72) pre- and post-IC-8 IOL exchange. Lens decentration or pupil size did not appear to influence visual outcomes.

Conclusion: The IC-8 IOL can be associated with dissatisfaction with visual quality, even when used in aberrant corneas. This lens should not be used as an EDOF IOL. Almost all patients reported symptomatic improvement after exchange.

9:42
A Role for Losartan in Epidemic Keratoconjunctivitis

Authors:
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2. Eyesmatter Clinics

Financial Disclosure: The authors declare that they have no conflict of interest

Introduction: Losartan has shown anecdotal promise in reducing corneal scarring associated with corneal cross-linking and laser phototherapeutic keratectomy. We review our clinical experience in managing lesions associated with epidemic keratoconjunctivitis (EKC) with topical Losartan.

Methods: We conducted a retrospective analysis of the effects of topical Losartan on EKC lesions. High-contrast and low-contrast vision were assessed, along with corneal optical density using Scheimpflug analysis. Patients also provided self-reported feedback on changes observed during and after treatment.

Results: Five patients, for whom topical steroids were unsuitable or not viable for long-term use, received topical Losartan as an alternative treatment. Treatment outcomes varied across cases.

Conclusions: While topical Losartan is less effective than steroids in clearing EKC lesions, it appears to be a viable option for long-term maintenance when steroids are contraindicated or undesirable. Clinical outcomes suggest that an initial steroid treatment followed by sustained topical Losartan may have a role in preventing or reducing the recurrence of symptomatic photophobia. Further clinical evaluation is needed to establish optimal treatment protocols.

9:49

The effect of donor age on the rebubble rate in DMEK surgery

Authors:
Dr Liam Kalas, Silvie Hoang, Dr Warren Apel, Dr John Hogden & Dr Andrew Apel.

Lamellar keratoplasty has increasingly emerged as the preferred surgical intervention for managing Fuchs' endothelial dystrophy, effectively replacing the traditional penetrating keratoplasty. The two types are Descemet Stripping Automated Endothelial Keratoplasty (DSAEK) and Descemet's Membrane Endothelial Keratoplasty (DMEK). Notably, DMEK is particularly advantageous due to its association with quicker visual recovery, a lower rejection rate, and enhanced vision rehabilitation outcomes. However, DMEK exhibits a rebubble rate 2.5 times higher than that of DSAEK.

The specific etiologies of DMEK detachment remain unclear; however, several factors are believed to contribute. This includes donor demographics such as age, the surgeon's technique and level of experience, the recipient's ocular history that may compromise support for the air bubble, as well as the recipient's age and diabetic status.

There is a prevailing bias towards the use of older donor grafts for DMEK procedures. This preference is primarily due to the observed increases in corneal thickness and stiffness, along with reduced elasticity associated with older donor tissue. Such characteristics facilitate the ease and more rapid unscrolling of the graft during surgery, allowing for optimal placement in the correct orientation and position. Accordingly, utilizing older donor tissue may simplify the surgical technique, leading to reduced endothelial cell loss intraoperatively and improved graft adherence to the host. This notion suggests younger donor grafts may exhibit higher detachment rates, which in turn leads to increased rebubble requirements.

Our study analyzed data from 356 DMEK procedures performed at The Eye Health Centre between February 2012 and December 2020. We assessed the effect of donor age (<50yo vs >50yo) on the frequency and average number of rebubble. We also split the data into two time periods (2012-2014 and 2015-2020) to see if any changes over time. Our findings were :
No difference in average rebubble number between two groups (<50yo vs >50yo) in both time periods
1.28 ± 1.32 vs 1.11 ± 0.99 in 2012-2014
0.90 ± 0.88 vs 0.94 ± 0.92 in 2015-2020

No difference in rebubble frequency between two groups in both time periods

The current literature reveals conflicting viewpoints on how donor age influences the rebubble rate. Some studies suggest that grafts from younger donors tend to have a higher rebubble rate, while others assert that the donor age has no significant impact on the rebubble rate. Given these mixed findings, it is too early to dismiss the use of young donor tissue for DMEK surgery. It should be noted that their high endothelial cell density can be advantageous for longer graft survival.

9:56
Contribution of posterior corneal astigmatism to total corneal astigmatism using the Anterion

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Financial Disclosure: None

Introduction: This study aimed to evaluate the contribution of posterior corneal astigmatism to total corneal astigmatism using the Anterion device.

Study Design: A retrospective analysis of 425 eyes from 400 consecutive patients was conducted using corneal scans from the Anterion (Heidelberg) device.

Methods: Anterior, posterior, and total corneal astigmatism were assessed. Vector analysis was used to estimate aggregate astigmatism and error between simulated anterior and total corneal astigmatism.

Results: The mean magnitude of posterior corneal astigmatism was -0.40 ± 0.36 D. The anterior corneal surface showed a vertically steep corneal meridian (60 to 120 degrees) in 55.66% of eyes, while 88.21% of eyes had a steep meridian on the posterior corneal surface. With age, the steep anterior corneal meridian tended to shift from vertical to horizontal, while the posterior meridian remained relatively stable. A correlation between anterior and posterior corneal astigmatism magnitude was observed when the steeper anterior meridian was vertically ($R2 = 0.5$) or obliquely ($R2 = 0.4$) aligned, but not when horizontally aligned. The mean vector difference between simulated anterior corneal astigmatism and total corneal power was 0.05 D ± 0.60 D @ 3 degrees.

Conclusion: Neglecting posterior astigmatism leads to inaccurate estimation of total corneal astigmatism.

10:03

DMEK from then to now: advances in surgical outcomes over a decade

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Financial disclosures: Nil

Descemet's membrane endothelial keratoplasty (DMEK) techniques have evolved over the last decade as the procedure has become more commonplace. A surgical learning curve has been established in the literature however the present study sought to investigate whether other factors may also correlate with improved outcomes.

Study design: Retrospective case series

Method: From a retrospective case series at a single ophthalmic practice in Brisbane, QLD, 180 DMEK procedures performed between 2012 and 2022 were selected and categorised by date. Cases performed between 02/2012 and 08/2014 were compared against those performed between 07/2018 and 12/2022. Outcome measures were early graft failure (<12 weeks), delayed graft failure (>12 weeks), rate of re-bubbling procedures and average donor age.

Results: Mean donor age increased significantly from 62 in the earlier group to 72 in the more recent group (p=<0.001). The rate of re-bubbling procedures decreased from 66% to 46% (p=0.025). Early graft failure rates decreased from 18.2% to 8% (p=0.047). Delayed graft failure rates decreased but did not reach statistical significance.

Conclusion: Across 10 years of DMEK procedures at a single practice, surgical outcomes have improved significantly. The present data suggests this may be correlated with an increase in average donor age however other factors as discussed may also contribute for this trend.

10:10

Refractive outcomes of triple surgery: DMEK combined with cataract extraction and MF IOL

Authors:
Dr Amy Li, Dr John Hogden, Jane Scott, Phuc Ngo, Jessica Wilson, Silvie Hoang, and Dr Andrew Apel

Cataract surgery combined with Fuch's endothelial corneal dystrophy (FED) has been traditionally perfomred with monofocal intraocular lenses. The reasons for this include concerns that other styles of lenses may lead to poorer unaided visual outcomes. In addition, the calculation of the intra ocular lens power is difficult with pre-existing corneal edema.

Based on our experiences with multifocal toric intraocular lenses, we were able to combine DMEK surgery with cataract extraction and still get fabulous results for distance and near vision uncorrected with very low residual astigmatism and spherical error.

In our study, we evaluated visual and refractive outcomes for 32 FED patients (49 eyes) who underwent combined cataract and DMEK surgery using Alcon Panoptix MF IOLs at The Eye Health Centre (TEHC) from November 2019 to December 2023. Our findings indicated:

- Mean unaided distance visual acuity was 6/9 or better by 3-4 months
- Mean spherical refraction was + 0.15DS (± 0.74) by 3-4 months and + 0.22DS (± 0.34) by >12 months
- Mean residual astigmatism was less than 0.5DC by 3-4 months
- Mean unaided near vision was N6.2 (±2.3) by 3-4 months and N5.4 (±2.1) by >12 months

The process to achieve these results will be explained in the presentation. In conclusion, it is possible to implant multifocal intraocular lenses in combined DMEK and cataract extraction surgery and achieve successful visual and refractive outcomes.

10:17

Necrotising scleritis, conjunctival masses and neurotrophic keratopathy in a Quantiferon Gold positive patient

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Financial disclosures:
There are no financial disclosures

Introduction: Scleritis is a sight threatening inflammatory process of the sclera, aetiology includes idiopathic, autoimmune, infectious and rarely systemic infections such as Tuberculosis (TB).

Study design: Case report

Methods: Collection of patient data from private and public medical records

Results: A 75-year-old woman of Indonesian background presented with 6 days of loss of vision in the right eye. She had a background of right cerebellopontine meningioma resection, leading to right lagophthalmous and neurotrophic cornea. Examination showed necrotising scleritis with conjunctival masses and choroidal detachments. She had a three-day course of intravenous corticosteroids followed by oral corticosteroid taper. A scleral leak developed and subsequently a scleral patch graft and excision of the conjunctival masses was performed. Histopathology of the conjunctival masses revealed a benign reactive stromal tumour presumed to be secondary to chronic exposure. The Quantiferon Gold returned positive, with no respiratory/constitutional symptoms and an unremarkable computed tomography of the chest, suggestive of latent TB. Given her good clinical response to corticosteroids, no features of TB on conjunctival biopsy and risks of anti-TB medications in this age group, a decision to withhold anti-TB medications with close observation was made.

Conclusion: It is possible that latent TB is found to not be implicated and not treated in scleritis, however this requires judicious consideration and may be supported by histopathology findings.

10:24

Patient reported outcomes in infectious keratitis: a systematic review

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Financial disclosures:
This study was not funded.

Introduction: Infectious keratitis is a sight-threatening condition which has a profound impact on patients quality of life. PROMs offer the opportunity to identify the impact of this condition and provide an alternative modality to objectively examine treatment response and outcomes. The primary objectives of this review were to systematically evaluate PROM tools used in infectious keratitis, assessing their validity and the quality of life (QoL) domains affected. The review aims to identify the current available PROM used to measure infectious keratitis, appraising their use in this disease process on a global scale, and identifying the burden infectious keratitis has on quality of life.

Study Design & Method: The protocol implemented for review was published in the International Prospective Register of Systematic Reviews (PROSPERO, CRD42023464686). A literature review was performed in Pubmed, Medline OVID, Embase OVID, Cochrane, Scopus, Web of Science and Psychinfo in October 2023. Full-length studies, published in English, featuring named and externally validated PROMs which were used to evaluate QoL outcomes of patients with infectious keratitis were included. Non-validated PROMs used in patients with infectious keratitis were excluded. Studies including but not explicitly defining corneal pathologies were also excluded. Study characteristics, PROMs and key results were summarised for all studies utilising Excel. Psychometric quality, validity and risk of bias of each PROM were assessed using previously validated criteria.

Results: Eight studies evaluated PROMS in infectious keratitis, with eight different PROMs [one generic, seven ophthalmic but not keratitis-specific] utilised. All patients with infectious keratitis demonstrated impaired QoL in all PROMs, with domains representing vision and visual function most impaired. Other QoL domains affected included emotional and mental state, mobility and dependence. Known group validity was high in seven (88%) PROMs. Only one paper (13%) utilised psychometric analysis to validate the PROMs before use.

Conclusion: Infectious keratitis has a negative impact on patient's QoL, across multiple domains. A variety of PROMS have been used to assess QoL in keratitis with most awaiting validation for infectious keratitis. The study was limited by the number of available studies in the literature.

11:50

Incisional biopsy in clinic with interferon alpha chemotherapy for the treatment of ocular surface squamous neoplasia (OSSN)

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Financial dislosures: Authors have no financial disclosures

Introduction: To assess the diagnostic methods and recurrence outcomes of OSSN treated with interferon alpha 2b.

Study Design: Retrospective study

Method: All patients treated with interferon alpha 2b (IFN), in a single tertiary public teaching hospital, that had clinical presentations of 'Ocular surface squamous neoplasia', 'Squamous cell carcinoma', or 'Conjunctiva intraepithelial neoplasia' between 2020 to 2024 were retrospectively analysed.

Results: A total of 45 patients and 45 eyes were treated with IFN for OSSN. Of the 45, 19 were diagnosed with OSSN via incisional or excisional biopsy in the outpatient clinic setting and the remaining 19 underwent excision of lesion in theatre. 5 were treated with IFN with no prior biopsy. All patients except two received 3 months total of IFN treatment. The remaining two received 6 and 7 months of IFN treatment, respectively. Among those that received treatment post biopsy in clinic, the mean time to recurrence was 24 months as compared with 36 months in patients who underwent excision of lesion in theatre.

Conclusion: Outcomes are favourable for patients undergoing incisional/excisional biopsy in the outpatient clinic setting then receiving IFN treatment for OSSN. Utilizing this option may prevent diagnostic and treatment delays, as well as reduce healthcare costs in the public system.

13:15
Microbial Keratitis presentations

Presenter:
Dr Matthew Green

Topic 1: Queensland Microbial Keratitis Database 2005-2024 – 20 Years of Data

This lecture will focus on the Queensland Microbial Keratitis Database, which has collected detailed clinical data on microbial keratitis cases in the state. The database offers unique insights into:
- Microbial pathogen profiles (bacterial, fungal, and viral).
- Trends in antibiotic resistance and microbial virulence.
- Clinical outcomes based on microbial profiles.
- Geographic variations in microbial pathogens and treatment outcomes.

This session will enable clinicians to better understand the microbiological challenges posed by keratitis and inform decisions on empirical and culture-based treatment strategies.

Presenter:
Professor Stephanie Watson

Topic 2: Microbial keratitis can be challenging to diagnose and treat. In everyday practice, the clinician may come across cases of keratitis with atypical presentations and courses. This lecture will provide clinicians with an approach to patients with such atypical keratitis.

Presenter:
Dr Andrew Apel

Topic 3: Update on Microbial keratitis treatment (Dr Andrew Apel)

Microbial keratitis (MK) is an ophthalmic emergency that can lead to significant vision impairment and complications such as corneal melting, perforation, endophthalmitis, and scarring. This presentation aims to implement the latest evidence-based strategies for treating MK to improve patient outcomes.
In Queensland, the most prevalent pathogen causing MK is bacteria, accounting for 93% of cases, with the Pseudomonas aeruginosa strain being particularly common. Fluoroquinolone monotherapy is the first-line treatment for Pseudomonas infections, which has a high susceptibility rate of 99.6% in Queensland. A large systematic review found that all commonly prescribed topical antibiotics exhibit similar efficacy for bacterial keratitis, whether they are fluoroquinolones or aminoglycoside-cephalosporin combinations.
On the other hand, acanthamoeba (0.5%) and fungal keratitis (6.3%) are rare in Queensland but remain challenging to treat. The visual prognosis for these infections is generally poor, often necessitating TPK. Topical natamycin is still the primary treatment for fungal keratitis, as it has been proven to be more superior to the newer antifungal voriconazole. For acanthamoeba keratitis (AK), key treatments include biguanides and diamides, and in refractory cases, oral voriconazole and miltefosine have shown effectiveness.

There is an ongoing debate regarding the use of adjuvant steroids in treatment. One perspective is that steroids may exacerbate the infection and impede healing. In contrast, another perspective is steroids can reduce inflammation, thereby minimizing corneal neovascularization, melting, and scarring. A large randomized controlled trial, the Steroid for Corneal Ulcer Trial (SCUT), concluded that overall, there was no significant improvement in bacterial keratitis with adjuvant steroids. However, steroids may be beneficial in certain subgroups, particularly in patients with large deep central ulcers that have poor baseline visual acuity (<CF) and non-Nocardia origin.

The increasing emergence of antibiotic resistance in countries like the US and India highlights the need for newer antibiotic and treatment options. A new concept involving reactive oxygen species has been proposed, as it possesses antimicrobial properties by damaging pathogen cell walls, metabolism and DNA, preventing replication. This can be achieved through methods such as photo-dynamic therapy, with two types available for MK treatment: riboflavin + UVA and rose bengal + green light. The latter is effective against a range of pathogens, including MRSA and Pseudomonas, as well as fungal and acanthamoeba keratitis. Additionally, it has benefits in promoting corneal stiffening and increasing resistance to collagenase, both of which help prevent corneal melting and perforation.

Overall, early identification and appropriate treatment choices are crucial to avoid serious complications associated with MK.

Presenter:
Maria Cabrera Aguas - University of Sydney

Topic 4: Antimicrobial resistance in bacterial keratitis

Antimicrobial resistance (AMR) is an intrinsic or acquired characteristic encoded by several genes that can be transferred between bacteria to resist the killing effect of an antimicrobial medication. Some external factors include antibiotics not used correctly, inappropriate disposal of antibiotics, and lack of effective strategies for prevention of transmission of resistant bacteria in healthcare centres.

In 2015, The WHO released a Global action plan on AMR. This plan recommended to address knowledge gaps on geographical patterns of antibiotic resistance to guide the treatment of patients; to inform local, national and regional actions; and to monitor the effectiveness of interventions. Health agencies mainly monitor AMR for systemic infections but not for ocular infections. However, in the US, the Antimicrobial Resistance Monitoring in ocular microorganisms study (ARMOR) monitors AMR profiles and trends among bacterial isolates in ocular infections.

Due to the lack of AMR surveillance programs in ocular infections in Australia, the Corneal Research Group at University of Sydney, Save Sight Institute established the Bacterial ocular surveillance system (BOSS) in collaboration with NSWHP in 2016.

The aim of this presentation is to report AMR trends in bacterial keratitis from UK, Asia, North America and Australia.

In a recent review on AMR in bacterial keratitis with data from the UK, Australia, Asia and North America, Gram-positives were the most common causal organisms ranging from about 50 to 90% of cases. The most common Gram-positives were S aureus, CoNS, and S pneumoniae whilst the Gram-negatives ranged from 11-50% of cases. The most Gram-negative consistently was P aeruginosa which is related to contact lens wear.

In terms of AMR trends, for Gram positives, the resistance to cephalosporins range up to 30%. For fluoroquinolones, the resistance ranged from 5-30% in the UK, Australia and North America and from 0-47% in Asia.

For Gram negatives, the highest fluoroquinolone resistance range was found in Asia (3-57%), whereas in the other locations, the range was up to 10%.
Data from the ARMOR study from 2009-2019 included 34% of S aureus and 34% of ConS were resistant to ciprofloxacin, on the other hand, the rates of ciprofloxacin resistance were low among P aeruginosa.

Data from the 2019-23 BOSS national data included 2917 organisms from all centres. Of these, 74% were Gram-positives.

The most common organisms were CoNS, S aureus and Pseudomonas aeruginosa in Sydney, Adelaide and Melbourne, whereas the most common organism in Perth was P. aeruginosa followed by S aureus and CoNS.

For CoNS for all centres, 24% of CoNS were resistant to cefalotin. The cefalotin resistance varied across all centres ranging from 19% in Sydney to 42 % in Adelaide. 7% of CONS were resistant to ciprofloxacin, ranging from 6 % in Melbourne and Sydney to 18 in Perth

13:45

Risk factors for Acanthamoeba keratitis with a focus on orthokeratology

Authors:
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Financial disclosures: Nicole Carnt has received Honoraria from Menicon, Ltd

Introduction: As orthokeratology has increased in popularity to treat myopia, safety concerns have arisen.

Study Design: Case control

Method: Forty-four patients with Acanthamoeba keratitis (36 contact lens wearers) seen at Sydney Eye Hospital (2019-2024) completed a risk factor survey and were compared to 144 asymptomatic contact lens wearers. A sub-analysis compared orthokeratology wearers with Acanthamoeba keratitis (n=7) with other lens wearers (n=29) to assess differential risk factors. Disease outcomes were compared for orthokeratology, other lens wearers and non-wearers.

Results: Poor hygiene of storage cases, tap water use and inadequate lens disinfection were risk factors for all contact lens wearers ($p<0.05$). Orthokeratology lens wearers were more likely to top off hydrogen peroxide disinfecting solution ($p=0.015$) than other lens wearers. Orthokeratology wearers were more likely to delay seeking medical attention by > 1 week after symptom onset ($p=0.049$), compared to other contact lens wearers who presented more promptly. In the orthokeratology group, 16.6% (1/5) had outcome VA ≥ 6/12 compared to 60.9% (14/23) of other lens users and non-wearers ($p=0.054$).

Conclusions: Orthokeratology wearers with Acanthamoeba keratitis were more likely to dilute lens disinfection compared to other lens wearers. Although orthokeratology lens wearers delayed seeking care, they did not experience worse outcomes than other lens users and non-wearers.

13:45

Severe Acanthamoeba keratitis can be complicated by ocular inflammation which presents a significant management challenge.

Author:
Arthur Okonkwo

We Present a 47 years old female who presented with a prolong history increasing left eye pain and reduced vision. She was a non-contact lens wearer and there is no history of trauma. A diagnosis of Varicella Zoster Keratitis had been made prior to referral to Sydney Eye Hospital. Subsequent culture and corneal scraping revealed PCR positivity for Acanthamoeba and cysts were seen on confocal microscope. Topical treatment was started. The chronic keratitis resulted in a corneal perforation that failed corneal gluing necessitating a patch graft to preserve the eye structural integrity. At post operative course; the patient presented with increasing eye pain and hypopyon. Topical steroid therapy was then commenced alongside the anti-acanthamoeba agents. A balance of topical steroids and anti-acanthamoebal therapy was needed to control the inflammation and avoid toxicity.

The need for an early diagnosis to avoid the inflammatory complications and use of steroids and immunosuppressants to manage the inflammatory complications in acanthamoeba keratitis will be discussed.

14:10

Losartan, Does it really work??
An update on emerging therapies for corneal scarring

Authors:
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4. Royal Victorian Eye and Ear Hospital, East Melbourne, Victoria.

Purpose: Corneal scarring from trauma and microbial keratitis is the most significant cause of corneal blindness worldwide and accounts for the highest number of corneal transplantations in developing countries. Due to the restricted access of donor corneas in most countries, scientists are developing various therapies to treat corneal scarring. A range of complex aetiologies and compensating inflammatory and fibrotic pathways is involved in corneal scarring, making it extremely challenging for therapy development. Nonetheless, drug safety and efficacy must be demonstrated in preclinical studies. This also means the appropriate preclinical models must be applied to validate the drug for a specific aetiology. Our study aims to examine this critical step in R&D to inform both scientists and clinicians in the decision-making process of therapy validation and application, while answering some burning questions of Lorsartan as an emerging drug to treat corneal scarring.

Methods: Our comprehensive review on the preclinical models of corneal scarring explains the pathogenesis of corneal scarring from various aetologies and critically assesses the types of preclinical models used by scientists for therapy validation.

Results: Our study found that a proportion of emerging therapies did not use the appropriate model during preclinical validation or effectively demonstrate the safety profile of the therapies.

Conclusion: Future theraputic validation must understand the pathogenesis of the specific aetiology and use the correct model during preclinical validation. Clinicians must pay close attention to the validation of an emerging drug before application.

14:20

Thick or thin:
A 12 year retrospective analysis of keratitis on corneal grafts

Author:
Natalie Allen

Aim: Keratitis is a common acute presentation, but the stakes are much higher on a transplanted cornea. This study aimed to evaluate the incidence of keratitis on corneal grafts and the common causative organisms, underlying trends, and impact on graft outcomes.

Method: All patients who underwent corneal grafts in Auckland from 2010-2022 were included. A combination of online data via Clinical Portal and paper clinical records were used to collect demographics, type of graft, visual acuities, clinical features, organisms cultured, and the outcome of the graft. Patient factors such as the number of unattended appointments and compliance were collected. The study recieved ethical approval from the Health and Disability Ethics Committee (EXP18674).

Results: Over the 12-year study period the rate of keratitis among all corneal grafts (n=1191) was 5.0% (n=59). This included bacterial (n=39), viral (n=11), autoimmune (n=5), fungal (n=3), and amoeba (n=1). Of those grafts with keratitis, 55.9% (n=33) went on to decompensate and 62.7% (n=37) had a visual acuity of 6/120 or worse. Increased appointments not attended ($p<0.001$) and undocumented compliance issues ($p<0.001$) were both positively associated with increased likelyhood of keratitis. The highest risk keratitis subtype for corneal melt was peripheral ulcerative keratitis, which had a 100% (n=4) melt rate.

Conclusion: Keratitis on a corneal graft is a potentially devastating complication that drastically increases the likelyhood of graft failure. Compliance with medications and attendance at follow up appointments are paramount. Special care should be taken in patients with a background of peripheral ulcerative keratitis, as a flare of this on a corneal graft means a corneal melt or perforation is highly likely.

15:40

Keratoprosthesis: What we do and what you can do

Author:
Luke Northey

- What kind of patients we are looking for (the differences between)
- Criteria for Boston OOKP
- Criteria for Modified OOKP
- What things can be done **locally** (Manual A scan, B scan, MFERG, RAPD if possible, Retinal Projection, old notes + old biometry, complete ocular history list)
- What we would do - endoscopic VR (Stage 1A), local anesthetic review, independent glaucoma/VR/cornea/retina/plastics consultant team

15:50

Ocular trauma at Sydney Eye Hospital – what's next?

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The management of ocular trauma has traditionally been a challenging area in Ophthalmology in part due to the nature of the injury but also the visual rehabilitation which in most cases requires a multidisciplinary approach. Certain factors have contributed to patients not always getting the best possible outcome regarding their visual rehabilitation. Some of these include patients lost to follow-up or compliance issues to regular appointments because these patients usually require multiple subspeciality clinics for further care. Another major factor includes the fact that a majority of our ocular trauma referrals to Sydney Eye Hospital come from regional areas where these cases are acutely managed before they return back to their local centres to either follow-up with their local Ophthalmologist/Optometrist for conservative management or to travel back to Sydney for multiple follow-up appointments which can be practically and economically challenging for these patients to comply with coming from regional centres. We understand that there is a need for a streamlined trauma service whereby these patients can have a clinic to go to that will provide a multidisplinary approach to their visual rehabilitation in a single clinic to try to improve their compliance to and in turn improve their chances of meaningful visual outcomes.

The current presentation aims to introduce a new ocular trauma service provided at the Sydney Eye Hospital which not only manages the acute issues of ocular trauma but to also streamline a visual rehabilitation service aimed to improve visual outcomes for our patients. The presentation will also provide some anterior segment cases that have benefit from reconstructive surgery that was managed through the trauma service.