APTOS 2022

SHENYANG, CHINA

September 3 – 4, 2022

The 7th Asia Pacific Tele-Ophthalmology Society Symposium

PROGRAM BOOK

APTOS

ASIA PACIFIC TELE-OPHTHALMOLOGY SOCIETY

CONTENTS

FOREWORD

From Congress President

Dear Friends & Colleagues,

On behalf of the He Eye Specialist Hospital, I would like to offer you a warm welcome to the 7th Asia Pacific Tele-Ophthalmology Society (APTOS) Symposium! It is a great honour for us to co-host APTOS 2022 and contribute to the field of digital healthcare. Although the physical meeting is once again replaced by an online meeting, we cherish this chance to share with you China's digital transformation, especially in the fields of medical care and artificial intelligence.

As a nationally approved town for ophthalmic industrial development, Shenyang is home to many scientific research organizations in China, including He Vision Group and the Eye Gene Bank. With strong support from the government, we are actively building an ecosystem for the ophthalmic community with a complete industry value chain integrating scientific research, education and medical care with the ophthalmic industry.

Owing to the pandemic, tele-ophthalmology has played an increasing significant role in ensuring equitable and efficient access to eye care services, particularly in underserved areas. We thank all our speakers who share the same vision with us in believing that digital ophthalmology, coupled with its enabling technologies, is the key to a future in which there will be vision for all. I hope you will enjoy APTOS 2022 and look forward to seeing you online.

Yours sincerely,

Wei He

Wei HE, MD
Congress President, APTOS 2022

FOREWORD AND WELCOME MESSAGES

FOREWORD

From Scientific Program Committee Chair

Dear Friends & Colleagues,

During the COVID-19 pandemic, the Asia Pacific Tele-Ophthalmology Society (APTOS) Congresses were affected greatly like other international congresses. The 5th, 6th, and 7th Congresses, which should be routine, in-person meetings hosted respectively in Seoul, Bangkok, and Shenyang, were turned into virtual meetings. As the Scientific Program Chair, I can't help expressing my gratitude towards speakers who make special efforts to join us live, either by staying up late or getting up really early. I'm also thankful for those who pre-record their talks, which, more often than not, is even more time-consuming than giving a live presentation.

The annual APTOS symposium is characterized by its unique inter-disciplinary balance – we have speakers representing the ophthalmic community, data scientists and AI engineers. The development of tele-ophthalmology and its enabling technologies requires inter-disciplinary collaboration. We have a few generations of clinician-scientists in ophthalmology that have successfully translating science into medicine, bridging the gap between bench and bedside. Can we groom generations of clinician-data scientists that will take hold of the future in which digitalization will provide us with so much data that possibly only computer algorithms can handle? This brings us to the theme of this year's meeting – the future of digital ophthalmology and eye care. What kind of future are we shaping? What will we reap from our seeds of innovation?

Join us at APTOS 2022 so that you can be ready for the digital transformation that is already here.

Yours sincerely,

Paisan RUAMVIBOONSUK, MD
Scientific Program Chair, APTOS 2022
Vice-President, Asia Pacific Tele-Ophthalmology Society

WELCOME MESSAGE

From President, Asia Pacific Tele-Ophthalmology Society

Dear Friends & Colleagues,

Welcome to the 7th Asia Pacific Tele-Ophthalmology Society (APTOS) Symposium! APTOS 2022 is our third virtual meeting despite our sincere wish and attempts in organizing physical, in-person ones. On behalf of APTOS, I would like to thank all our speakers and presenters who are joining us this year to create this excellent occasion for fruitful exchange and mutual inspiration.

We have all been stricken by the pandemic in the past few years to a certain extent. While some countries have already opened up, some are still bound by Covid-19-related restrictions. The pandemic has transformed the way that people practice medicine. Telemedicine-based consultation has become far more important than ever before. Challenges remain though. It is through meetings like the APTOS Symposium in which we frankly discuss the future of tele-ophthalmology and its enabling technologies, including artificial intelligence and home use devices

The future of digital ophthalmology and eye care is all ours. APTOS is more than happy to drive the change so that the right to sight can be a dream come true for everyone in the near future. I very much hope that you will enjoy the talks and the presentations we put together at APTOS 2022, in particular the APTOS Roundtable, and get inspired as much as we do, so that you can also be the change.

Yours sincerely,

Mingguang HE, MD, PhD
President, Asia Pacific Tele-Ophthalmology Society

COUNCILS AND COMMITTEES

HOST

Asia-Pacific Tele-Ophthalmology Society

(APTOS)

Founded by a group of outstanding tele-ophthalmology specialists in the Asia-Pacific region in May 2016, the Asia Pacific Tele-Ophthalmology Society (APTOS) aims to bring together clinicians, researchers, technicians, institutes and organizations to form an alliance that promotes communication, exchange and collaboration in tele-ophthalmology. It provides a platform on which eye care or tele-medical professionals can share knowledge and collaborate to deliver efficient, accessible and quality universal eye care throughout the region.

Contact us:
APTOS Secretariat
c/o State Key Laboratory (Ophthalmology)
Zhongshan Ophthalmic Center, Sun Yat-Sen University
1/F, No. 7 Jinsui Road
Zhujiang New Town, Tianhe District
Guangzhou, Guangdong, P.R. China
Webiste: www.asiateleophth.org
Email: secretariat@asiateleophth.org

CO-HOST

HESH
He Eye Specialist Hospital

He Vision Group

Established in 1995, He Vision Group is a holdings chain enterprise specializing in eye medical and optometry service. The Group devotes itself to eye health screening, education and health management for the entire life cycle and all-round population.

Contact us:
Address: No. 128, N. Huanghe Street, Shenyang
Website: https://hevisiongroup.com/index.php?a=lists&catid=124
Phone: (+86) 400-9090-400
Fax: (+86) 024-86528900

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Wei HE, MD

Scientific Committee – Chair
Paisan RUAMVIBOONSUK, MD

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Pitipol CHOOPONG
Liesse GATEKA
Xingru HE
Wipada LAOVIROJJANAKUL
Fei YU

Secretary
Xingyu HE, MD

Secretary Assistants
Helen YAN

APTOS Secretariat
Florence CHUNG
Bill WONG

SCIENTIFIC PROGRAM COMMITTEE & FACULTY

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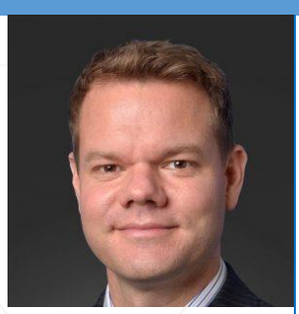
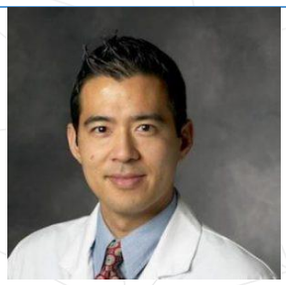
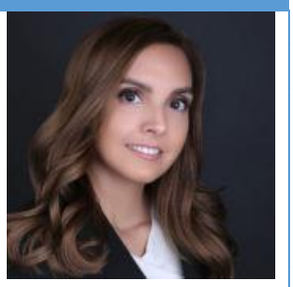
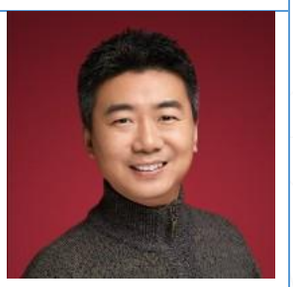
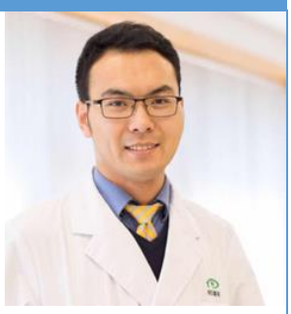
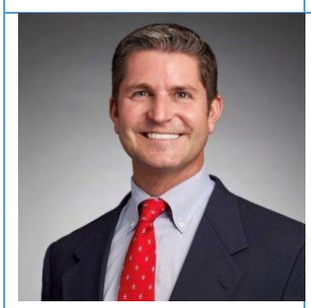
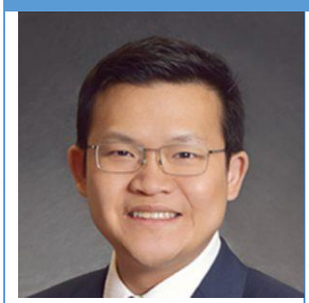
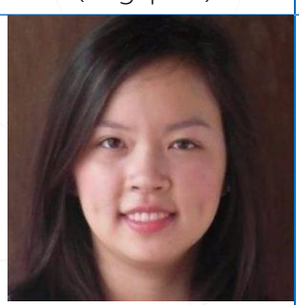
Invited Speakers			
			
Lama AL-ASWAD (U.S.)	Sally BAXTER (U.S.)	Marten BRELEN (Hong Kong)	Peter CAMPBELL (U.S.)
			
Rebecca CANINO (U.S.)	Robert CHANG (U.S.)	Friedrich CHEN (China)	Frank CHENG (U.S.)

COUNCILS AND COMMITTEES

Invited Speakers			
			
Carol CHEUNG (Hong Kong)	Anthony V. DAS (India)	Malvina EYDELMAN (U.S.)	Daniela FERRARA (U.S.)
			
Zongyuan GE (Australia)	Michael GIRARD (Singapore)	Ranya HABASH (U.S.)	Chao HE (China)
			
Mingguang HE (Australia)	Xingru HE (China)	Michelle HRIBAR (U.S.)	Shenming HU (China)
			
Nicolas JACCARD (United Kingdom)	Judy KIM (U.S.)	Jochen KUMM (U.S.)	Olivia LI (United Kingdom)

Invited Speakers			
			
Shijin LI (China)	Hanruo LIU (China)	T. Y. Alvin LIU (U.S.)	Ziming LIU (China)
			
Mark LOBANOFF (U.S.)	Anat LOEWENSTEIN (Israel)	Andreas MUELLER (Australia)	Stephen ODAIBO (U.S.)
			
Kousik RAJENDRAN (India)	Kim RAMASAMY (India)	Padmaja RANI (India)	Tyler RIM (Singapore)
			
Eric ROSENBERG (U.S.)	Joel SCHUMAN (U.S.)	Danli SHI (China)	Yuan SHI (Singapore)

COUNCILS AND COMMITTEES

Invited Speakers			
			
Gavin TAN (Singapore)	Daniel TING (Singapore)	Richa TIWARI (Singapore)	Ching-Yao TSAI (Chinese Taipei)
			
Mengyu WANG (U.S.)	Ningli WANG (China)	Sophia WANG (China)	Sangchul YOON (South Korea)
			
Ran YAM (Israel)	Siamak YOUSEFI (U.S.)	Xiulan ZHANG (China)	

THE APTOS COUNCIL

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YOON
(Korea)

Mingzhi ZHANG
(China)

PROGRAM AT A GLANCE

PROGRAM OVERVIEW

Date: September 3, 2022 (Saturday)
Time: 08:30 – 15:30 (GMT+8)
Online via Zoom

08:30 – 09:00	***Opening Remarks & Launch of 2nd APTOS Big Data Competition***
09:00 – 10:30	***Symposium 1: Use of Tele-Ophthalmology & AI Worldwide: Current Situations & Challenges***
10:30 – 10:45	***Coffee Break***
10:45 – 12:30	***Symposium 2: Ophthalmic Innovations: What's New?***
12:30 – 13:00	***Lunch Break***
13:00 – 14:15	***Symposium 3: AI, Digital Health Solutions & Prevention of Blindness***
14:15 – 15:30	***Symposium 4: Natural Language Processing – Ophthalmology EHRs***

Date: September 4, 2022 (Sunday)
Time: 08:30 – 15:30 (GMT+8)
Online via Zoom

09:00 – 10:15	***APTOS Roundtable: The Future of Digital Ophthalmology & Eye Care***
10:15 – 10:30	***Coffee Break***
10:30 – 11:45	***Symposium 5: AI Product Development, Deployment & Regulations***
11:45 – 13:00	***Symposium 6: Teleglaucoma, the Use of AI & Digital Visualization in the Anterior Segment***
13:00 – 13:30	***Lunch Break***
13:30 – 15:00	***Free Papers***
15:00 – 15:30	***Social Program & Closing Remarks***

SCIENTIFIC SESSIONS

PRE-MEETING – SEPTEMBER 2, 2022 (Friday)

Time	Venue	Language	Theme
14:00 – 16:30	Online via Zoom	English	Amazon HealthLake AI Workshop

SEPTEMBER 3, 2022 (Saturday)

Time	Venue	Type	Theme
09:00 – 10:30	Online via Zoom	Invited	Use of Tele-Ophthalmology & AI Worldwide: Current Situations & Challenges
10:45 – 12:30	Online via Zoom	Invited	Ophthalmic Innovations: What's New?
13:00 – 14:15	Online via Zoom	Invited	AI, Digital Health Solutions & Prevention of Blindness

PROGRAM AT A GLANCE

Time	Venue	Type	Theme
14:15 – 15:30	Online via Zoom	Invited	Natural Language Processing – Ophthalmology EHRs

■ SEPTEMBER 4, 2022 (Sunday)

Time	Venue	Type	Theme
09:00 – 10:15	Online via Zoom	Invited	APTOS Roundtable: The Future of Digital Ophthalmology & Eye Care
10:30 – 11:45	Online via Zoom	Invited	AI Product Development, Deployment & Regulations
11:45 – 13:00	Online via Zoom	Invited	Teleglaucoma, the Use of AI & Digital Visualization in the Anterior Segment
13:30 – 15:00	Online via Zoom	Free Paper	Tele-Ophthalmology & AI Challenge

■ CONGRESS INFORMATION

Name of Event
The 7th Asia Pacific Tele-Ophthalmology Society Symposium (APTOS 2022)

Venue
Online via Zoom

Registration
Free

Time
September 3, 2022: 08:30 – 15:30 (GMT+8)
September 4, 2022: 09:00 – 15:30 (GMT+8)

E-Poster Gallery
Scan the QR code to login. Feel free to comment on each of the e-posters and send direct messages to presenters via the chat box.

■ SOCIAL PROGRAM

Ophthalmology Fun Quiz

Date: September 4, 2022
Time: 15:00 – 15:15 (GMT+8)
Venue: Online via Zoom
Format: 10 Multiple-Choice Questions

CONGRESS INFORMATION

AI WORKSHOPS

We will be conducting **AI workshops** online as a pre-meeting of APTOS 2022 on September 2. Details are given as follows:

Date: September 2, 2022
Time: 14:00 – 16:30 (GMT+8)
Venue: Online via Zoom

Time	Session	Registration
14:00 – 16:30	Amazon HealthLake AI Workshop	

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KEYNOTE LECTURES & AWARDS

BEST PAPER & BEST POSTER AWARDS

The Best Paper Award and the Best Poster Award are set up to encourage innovations in ophthalmology. The abstracts (one free paper and one poster) that score the highest in the respective categories will be chosen for the Awards. Abstracts will be reviewed and rated based on their originality and scientific importance. The Best Paper presenter will receive **US$200** while the Best Poster presenter will receive **US$100** in addition to a certificate of appreciation. All the submitted abstracts do stand a chance to win.

Best Paper Award:

Dr Nasser SHOEIBI
(Iran)

Nasser SHOEIBI, Seyedeh M. HOSSEINI, Majtaba ABRISHAMI, Mohammad R. A. ASTANE, Eye research center, Mashhad University of Medical Sciences, Mashhad, Islamic Republic of Iran

Safety and feasibility of tele-screening for ROP during the COVID-19 pandemic

Best Poster Award:

Dr Wai Ming YIP
(Hong Kong)

Wai Ming YIP, Wing Lam CHAN, Jason LI, Paul LEE, Kendrick C. SHIH, Edmund Y. LAM, Desmond YAP, The University of Hong Kong, Hong Kong

Application of Self-Supervised Learning Algorithms on Retinal Images of Patients with Diabetes Mellitus to Predict Renal Outcome

SEPT 2, 2022 (FRI)

AI WORKSHOPS

Amazon HealthLake AI Workshop
14:00 - 16:30 Venue: Online via Zoom
*Instructor(s): Yuan **SHI**, Kousik **RAJENDRAN***

SEPT 3, 2022 (SAT)

TELE-OPHTHALMOLOGY

Use of Tele-Ophthalmology & AI Worldwide: Current Situations & Challenges

09:00 - 10:30 Venue: Online via Zoom
*Chair(s): Xingru **HE**, Kim **RAMASAMY**, Gavin **TAN**, Ching-Yao **TSAI***

09:00 ***United States***
*Rebecca **CANINO***
09:15 ***India***
*Kim **RAMASAMY***
09:30 ***Singapore***
*Gavin **TAN***
09:45 ***Future-Proofing Patient-Centred Ophthalmology Service Delivery***
*Olivia **LI***
10:00 ***The Experience in Utilizing Novel Tele-Ophthalmologic Anterior Segment Screening Technology in China***
*Shenming **HU***
10:15 ***Economic and Environmental Impacts of Teleophthalmology***
*Padmaja **RANI***

ARTIFICIAL INTELLIGENCE

Ophthalmic Innovations: What's New?

10:45 - 12:00 Venue: Online via Zoom
*Chair(s): Mingguang **HE**, Xingru **HE***

10:45 ***Newborn Eye Screening with AI Implemented as Precision Medicine***
*Jochen **KUMM***
10:58 ***The Phorcides AI LASIK Calculator for Topography-Guided Planning***
*Mark **LOBANOFF***
11:11 ***AI-Powered Diagnosis***
*Pearse **KEANE***
11:24 ***Augmented Virtual Reality***
*Anat **LOEWENSTEIN***
11:37 ***AI-Empowered Systemic Disease Prediction from Retinal Photographs***
*Tyler **RIM***
11:50 ***Retina AI***
*Zongyuan **GE***
12:03 ***Comparing School-Aged Refraction Measurements Using the 2WIN-S Portable Refractor in Relation to Cycloplegic Retinoscopy***
*Ziming **LIU***
12:16 ***Digital Treatment in Ophthalmology***
*Ran **YAM***

AI, Digital Health Solutions & Prevention of Blindness

13:00 - 14:15 Venue: Online via Zoom
*Chair(s): Wei **HE**, Andreas **MUELLER**, Sangchul **YOON***

13:00 ***Digital Health Solutions***
*Ranya **HABASH***
13:12 ***AI for Primary, Secondary, and Tertiary Prevention of ROP***
*J. Peter **CAMPBELL***
13:24 ***Beyond the Hype: How can AI Help in the Fight against Blindness in Low-Resource Environments***
*Nicolas **JACCARD***
13:36 ***Embracing Technological Solution: AI to End Avoidable Vision Loss***
*Sangchul **YOON***
13:48 ***Integration of Online Training Platforms with Hospitals to Optimize Hospital-Based Training in China***
*Friedrich **CHEN***
14:00 ***Innovations in Myopia Prevention & Control in China***
*Shijin **LI***

SCIENTIFIC PROGRAM SCHEDULE

Natural Language Processing – Ophthalmology E HRs & Language Modelling

14:15 - 15:30 Venue: Online via Zoom
*Chair(s): Zongyuan **GE**, Mingguang **HE**, Xingru **HE***

14:15 ***Big Data & EMRs***
Anthony V. ***DAS***
14:28 ***Deep Learning Approaches for Predicting Glaucoma Progression Using EHRs and Natural Language Processing***
Sophia ***WANG***
14:41 ***Predicting Multiclass Surgical Outcomes for Glaucoma Patients Using Deep Learning and Natural Language Processing***
Michelle ***HRIBAR***
14:54 ***Social Determinants of Health Data Availability for Patients with Eye Conditions***
Sally ***BAXTER***
15:07 ***Building Medical NLP Workflows Using Amazon HealthLake/Amazon Comprehend Medical***
Kousik ***RAJENDRAN***
15:20 ***AI-Based Medical Report Generation***
Danli ***SHI***

SEPT 4, 2022 (SUN)

TELE-OPHTHALMOLOGY

APTOS Roundtable: The Future of Digital Ophthalmology & Eye Care

09:00 - 10:15 Venue: Online via Zoom
*Moderator(s): Mingguang **HE**, Xingru **HE**, Paisan **RUAMVIBOONSUK***

Panelist(s):
Marten ***BRELEN,***
Daniela ***FERRARA,***
Judy ***KIM,***
Stephen ***ODAIBO,***
Eric ***ROSENBERG,***
Daniel ***TING,***
Richa ***TIWARI,***

ARTIFICIAL INTELLIGENCE

AI Product Development, Deployment & Regulations

10:30 - 11:45 Venue: Online via Zoom
*Chair(s): Carol **CHEUNG**, Mingguang **HE***

10:30 ***Worldwide Adoption Growth of FDA-Cleared EyeArt® Autonomous AI Technology for Diabetes Eye Testing***
Frank ***CHENG***
10:42 ***Artificial Intelligence in the Clinical Development of Geographic Atrophy***
Daniela ***FERRARA***
10:54 ***AI Product Development and Deployment***
Richa ***TIWARI***
11:06 ***Deploying AI Products in China***
Chao ***HE***
11:18 ***Regulation of AI Products and Digital Health Solutions***
Malvina ***EYDELMAN***
11:30 ***Deployment of AI-Assisted Diabetic Retinopathy Screening: Real World Experience in the United States***
T. Y. Alvin ***LIU***

Teleglaucoma, the Use of AI & Digital Visualization in the Anterior Segments

11:45 - 13:00 Venue: Online via Zoom
*Chair(s): Robert **CHANG**, Hanruo **LIU**, Ningli **WANG***

11:45 ***Detecting Glaucoma Progression using Unsupervised Classical and Deep Archetypal Analysis***
Siamak ***YOUSEFI***
11:57 ***Teleglaucoma Kiosks***
Lama ***AL-ASWAD***
12:09 ***Assessment of 3D Surface Shape Patterns of the Optic Nerve Head and Peripapillary Retinal Nerve Fiber Layer in Glaucoma with Unsupervised AI***
Mengyu ***WANG***
12:21 ***Glaucoma Detection & Progression Prediction Using AI***
Joel ***SCHUMAN***
12:33 ***Digital Gonioscopy Based on ASOCT Scans with Deep Learning***
Xiulan ***ZHANG***

12:45 ***OCT and AI-based Assessment of Optic Nerve Head Robustness without the Need to Perform Biomechanical Testing***
Michael ***GIRARD***

SUBMITTED PROGRAM-FREE PAPERS

SUBMITTED PROGRAM- FREE PAPERS

SEPT 4, 2022 (SUN)

FREE PAPER SESSION

13:30 - 15:00 Venue: Online via Zoom
*Chair(s): Mingguang **HE**, Xingru **HE***

13:30 ***Smartphone Annotation Tool for faster and accurate Image - labelling for Diabetic - Retinopathy and Common Retinal disorders***
Arvind K. ***MORYA***
13:38 ***Safety and Feasibility of Tele-Screening for Retinopathy of Prematurity during the COVID-19 Pandemic***
Nasser ***SHOEIBI***
13:46 ***Rural Teleophthalmology Camp Model for Eye Care during COVID-19***
Sheila ***JOHN***
13:54 ***Is Glaucoma Training Essential for Remote Screening of Glaucoma Based on Fundus Photographs?***
Neetha ***KUZHUPPILLY***
14:02 ***Pre-Treatment with Frequent Topical Betamethasone in Ahmed Glaucoma Valve Implantation***
Nader ***NASSIRI***
14:10 ***Automated Glaucoma Screening Tool Integrated Offline on a Smartphone-Based Fundus Camera***
Kalpa ***NEGILONI***
14:18 ***Evaluating a Novel Bayesian Diagnostic Algorithm for Red Eye Complaints in Primary Care Settings***
Alexander ***DEANS***
14:26 ***Artificial Intelligence-Based Risk Assessment Model for Chronic Ocular Graft-Versus-Host Disease***
Jing ***WANG***
14:34 ***Profile of Age-Related Macular Degeneration in Bhutan: A 3-year National Study***
Bhim ***RAI***
14:42 ***A Study of Efficacy of Injection Ranibizumab in Retinal Vein Occlusive Disorders***
Sunanda ***HALDAR***
14:50 ***Tackling a Global Public Health Challenge with an Ultra-Low-Cost, Portable, Lightweight, High-Performance Wavefront Auto Refractometer***
Divya ***RAO***

SUBMITTED PROGRAM- E-POSTER

ARTIFICIAL INTELLIGENCE

Application of Self-supervised Learning Algorithms on Retinal Images of Patients with Diabetes Mellitus to Predict Renal Outcome
*First Author: Wai Ming **YIP***
*Co-Author(s): Wai Lam **CHAN**, Jason **LI**, Paul **LEE**, Kendrick C. **SHIH**, Edmund Y. **LAM**, Desmond **YAP***

Forensic and Ethical Concerns about Processing, Evaluating and Data Security of Ophthalmological Images for DICOM
*First Author: Kazim H. **OR***

Real-World Performance of an Artificial Intelligence System (EyeArt®) for Detection of Referable Diabetic Retinopathy in an Asian Population in Hong Kong
*First Author: Sunny **AU***
*Co-Author(s): Steffi **CHONG**, George **SHUM**, Tiffany **ONG**, Callie **KO***

Segmentation of Hard Exudates in Retinal Images Using BCDU-Net
*First Author: Nafise **AMERI***
*Co-Author(s): Nasser **SHOEIBI**, Mojtaba **ABRISHAMI***

Using Deep Learning for Assessing Image Quality of 3D Macular Scans from Spectral-Domain Optical Coherence Tomography
*First Author: Ziqi **TANG***
*Co-Author(s): Xi **WANG**, Anran **RAN**, Carol **CHEUNG***

CATARACT

A New Method for Nucleus Extraction in Complicated Cataract Surgery
*First Author: Nader **NASSIRI***
*Co-Author(s): Sara **KAVOUSNEZHAD**, Kourosh **SHIEBANI**, Saman **NASIRI**, Nariman **NASSIRI***

Considerations for Organising Mobile Eye Services for Cataract Surgery
*First Author: Rajan **SONDH***
*Co-Author(s): Saeed **AZIZI**, Riaz **ASARIA***

CLINCAL & EPIDEMIOLOGIC RESEARCH

Biological Effect of Columbianadin on Blood-Brain Permeability: Theapeutic Role in the Medicine through Scientific Data Analysis
*First Author: Dinesh K. **PATEL***

Biological Importance of Artemetin against Various Types of Micro-Organisms: Therapeutic Benefit in the Medicine through Scientific Data Analysis
*First Author: Dinesh K. **PATEL***

CORNEA

Lyciym Barbarum Polysaccharide Suppresses Corneal Fibroblasts Differentiation upon Epithelial-Stromal Injury
*First Author: Ho Lam **WONG***
*Co-Author(s): Yau Kei **CHAN**, Kendrick C. **SHIH***

Simple Limbal Epithelial Transplant – A Novel Technique in the Management of Limbal Stem Cell Deficiency in Chemical Injury Due to Alkali Burn
*First Author: Arvind K. **MORYA***

Therapeutic Role of Strictinin in the Medicine for the Treatment of Human Disorders
*First Author: Dinesh K. **PATEL***

GENERAL OPHTHALMOLOGY

A Rare Case of Necrotising Fasciitis of the Eyelid Secondary to *Pseudomonas Aeruginosa* Infection

SUBMITTED PROGRAM- E-POSTERS & VIDEOS

*First Author: Muzzaffar Mad **ISA***
*Co-Author(s): Rosnita **ALIAS**, Adlina Abdul **RAHIM**, Azhany **YAAKUB***

An Eye with Double Occlusion
*First Author: Kasman **JAAFAR***
*Co-Author(s): Nor Anita Che **OMAR**, Rosiah **MUDA**, Che Ku Hafiza Che Ku **AMRAN**, Julieana **MUHAMMED***

An Inherited Eye at Risk – Case Report of Von Hippel-Lindau Syndrome
*First Author: Sue Zian **GOH***
*Co-Author(s): Intan Shafinaz Mohd **RADZUAN**, Hanisah Binti Abdul **HAMID**, Rosnita Binti **ALIAS**, Wan Hazabbah Wan **HITAM***

Bilateral Blindness in Cavernous Sinus Thrombosis
*First Author: Kasman **JAAFAR***
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Case Series: Unusual Features of Goldenhar Syndrome
*First Author: Sue Zian **GOH***
*Co-Author(s): Hanisah Binti Abdul **HAMID**, Fang Sin **YEE**, Rosnita Binti **ALIAS**, Wan Hazabbah Wan **HITAM***

Evaluation of Asymptomatic Cardiac Disease in Patients with Ocular Pseudoexfoliation
*First Author: Nader **NASSIRI***
*Co-Author(s): Maryam **YADGARI**, Sara **KAVOUSNEZHAD**, Kourosh **SHIEBANI***

False Brain Tumour
*First Author: Kasman **JAAFAR***
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Giant Cell Arteritis: A False Alarm of Toothache
*First Author: Nur Hafizah **MAFFAR***
*Co-Author(s): Teo Shee **KIANG**, Hayati Abd **AZIZ**, Francesca M. **VENDARGON**, Azhany **YAAKUB***

Review on Methods to Eliminate Mask Induced Fogging during Slit Lamp Examination
*First Author: Kah Wei **ONG***
*Co-Author(s): Meng Hsien **YONG***

Squamous Cell Carcinoma of Conjunctiva Masquerading as Pterygium: A Case Report
*First Author: Manpreet **KAUR***
*Co-Author(s): Anurag Ambroz **SINGH***

Vitamin B12 Deficiency as a Cause of Neurotrophic Keratopahty
*First Author: Nader **NASSIRI***
*Co-Author(s): Sara **KAVOUSNEZHAD**, Kourosh **SHIEBANI**, Saman **NASIRI**, Nariman **NASSIRI***

GLAUCOMA

Outcome of Mirco Pulse Transscleral Diode Laser Cyclophotocoagulation in Refractory Glaucoma
*First Author: Ambreen **GUL***
*Co-Author(s): Fuad Ahmad Khan **NIAZI***

Therapeutic Benefit of Hinokiflavone in the Medicine for the Treatment of Human Diseases
*First Author: Dinesh K. **PATEL***

LENS

Biological Potential of Tectoridin in the Medicine for their Effectiveness against Rat Lens Aldose Reductase
*First Author: Dinesh K. **PATEL***

Posterior Capsular Optic Capture for Traumatic Subluxated Intraocular Lens after Facial Massage
*First Author: Tuan Mohd Amirul Hasbi Tuan **PAIL***
*Co-Author(s): Eyelyn Tai Li **MIN**, Shawarinin **JUSOH**, Aliff Irwan **CHONG***

SUBMITTED PROGRAM- E-POSTERS & VIDEOS

OCULAR IMAGING

Tuberous Sclerosis and the Ophthalmological Work-Up: Can a Peri-Papillary Astrocytoma Masquerade as Myelinated Nerve Fibres?
*First Author: Saurabh **HARAL***
*Co-Author(s): V. S. **GUPTA***

RETINA & VITREOUS

A Proposed Classification and Surgical Strategy for Full-Thickness Macular Holes
*First Author: Zongming **SONG***
*Co-Author(s): Zhengwei **YANG***

Comparison of Two Ultra-Widefield Cameras with High Image Resolution and Wider View for Identifying Diabetic Retinopathy Lesions
*First Author: Zongming **SONG***
*Co-Author(s): Yuanyaun **XIAO**, Handong **DAN***

Management of Vasoproliferative Tumors of Retina with Macular Complications by Par Plana Vitrectomy Combined with Cryotheapy
*First Author: Zongming **SONG***
*Co-Author(s): Wenhua **ZHONG***

The Effect of Macular Photocoagulation on Visual Field among Patients with Diabetic Macular Edema
*First Author: Nader **NASSIRI***
*Co-Author(s): Maryam **YADGARI**, Sara **KAVOUSNEZHAD**, Kourosh **SHIEBANI**, Naveed **NILFORUSHAN**, Mohammadreza **ARZAGHI***

TELE-OPHTHALMOLOGY

Can YouTube Teach You How to Do Ptosis Surgery?
*First Author: Deniz **KILIC***

Community Optometrist/Vision Technician-Led Post-Operative Cataract Care: How to Bring Community Participation
*First Author: Isha **AGARWALLA***
*Co-Author(s): Ramesh **AGARWALLA***

Diagnostic Performance of an AI-Based Referable Diabetic Retinopathy Detection Tool Integrated on a Portable Fundus Camera for Screening at Primary-Care Centres
*First Author: Divya **RAO***
*Co-Author(s): Manavi **SINDAL**, Nikita **SONAWANE**, Florian **SAVOY**, Kalpa **NEGILONI***

Use of Artificial Intelligence and Robotic Tele-Consultation in Vision Threatening Diseases during SARS2 COVID-19
*First Author: Rita **VOUGHT***
*Co-Author(s): Victoria **VOUGHT**, Priya **TAILOR**, Bernard **SZIRTH***

ABSTRACTS- FREE PAPERS

FREE PAPERS

ARTIFICIAL INTELLIGENCE

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Artificial Intelligence-Based Risk Assessment Model for Chronic Ocular Graft-Versus-Host Disease

*First Author: Jing **YANG***
*Co-Author(s): Wenxin **ZHAO**, Duoru **LIN**, Haotian **LIN**, Lingyi **LIANG***

Purpose: To develop an artificial intelligence (AI) model for identifying patients with high risk of chronic ocular graft-versus-host disease (coGVHD).
Methods: A total of 326 patients after allogeneic hematopoietic stem cell transplantation (HSCT) visited to the cornea clinic of our hospital and the hematology clinic of Nanfang Hospital from October 2019 to February 2022 were enrolled in this prospective, cross-sectional study. All participants completed the medical history collection, the ocular surface disease index (OSDI) questionnaire and underwent ophthalmic examinations. The models were trained and tested by 146 coGVHD cases and 124 non-coGVHD controls. The validation was performed with 33 coGVHD cases and 23 non-coGVHD controls. The AI models were established using the LightGBM. Three models were trained: 1) medical history factors including age, demographic data, transplant data, systemic GVHD; 2) OSDI questionnaire; 3) hybrid factors combining medical history and OSDI. Model performances were assessed by the area under the receiver operating characteristic curve (AUC).
Results: In the testing dataset, the AUC was 0.766 (95%CI: 0.551-0.953) for medical history factors, 0.926 (0.775-1.0) for OSDI, and 0.962 (0.876-1.0) for hybrid factors. In the validation, the model of hybrid factors showed high discrimination (AUC=0.991, 95%CI: 0.968-1.0). Furthermore, oral chronic GVHD, number of chronic GVHD involved organs, and donor age were identified as the top three most relevant factors to coGVHD diagnosis.
Conclusions: The AI model based on medical history and OSDI can accurately discriminate coGVHD patients and have the potential to serve as a complementary screening instrument for transplant physicians or patients' self-testing.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Automated Glaucoma Screening Tool Integrated Offline on a Smartphone-Based Fundus Camera

*First Author: Divya **RAO***
*Co-Author(s): Swati **UPADHYAYA**, Florian **SAVOY**, Kalpa **NEGILONI**, Venkatesh **RENGARAJ***

Purpose: The study aimed to evaluate the performance of a novel, automated screening tool for referable glaucoma using an offline AI deployed on a smartphone-based fundus camera.
Methods: This cross-sectional study was conducted in 6 satellite vision centers(VC) of a tertiary eye hospital. On 299 subjects, two disc-centered fundus images of sufficient quality were taken with validated portable fundus camera by minimally trained ophthalmic assistants. The images were analyzed independently by an 'offline AI' and 'VC doctors through teleophthalmology' (masked to diagnosis) and graded as normal, glaucoma or disc suspect based on pre-defined criteria. Additionally, 58(19%) subjects deemed referable by either AI or VC doctor were referred to glaucoma specialist at tertiary eye hospital. The AI output was compared against VC doctor (image grading) and specialist diagnosis (glaucoma workup).
Results: Sensitivity of the offline AI to detect confirmed glaucoma was 91.30%(95%CI 71.96-98.93) and specificity 92.14%(95%CI 88.35-95.01) when compared to VC teleophthalmology doctors. Combining glaucoma and suspects as referable, sensitivity and specificity of the AI algorithm was 73.17%(95%CI 62.24–82.36) and 98.6(95%CI 96 - 99.7). For the 70 subjects referred to the base hospital, sensitivity of AI to pick up glaucoma was 91.3%(95%CI 79.21-97.58) for the specialist vs 97.83%(95% CI 88.47-99.94) for the VC doctor.
Conclusions: The AI showed robust performance in detecting glaucoma with minimal over referral of normal cases. The AI can potentially be used as a clinical decision support tool to improve the diagnostic consistency of VC doctors for glaucoma.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Evaluating a Novel Bayesian Diagnostic Algorithm for Red Eye Complaints in Primary Care Settings

*First Author: Alexander **DEANS***
*Co-Author(s): Amy **BASILLIOUS**, Robin **DEANS***

Purpose: Diagnoses of red eye pose significant challenges to primary care providers, causing suboptimal triaging and unnecessary tests. Current diagnostic aids are static flowcharts which do not provide dynamic, stepwise

ABSTRACTS- FREE PAPERS

workups. The research team created a novel artificial intelligence (AI)-based diagnostic algorithm which employs a Bayesian feedback process to recreate itself continuously at each step of decision-making. Its diagnostic accuracy for red eye complaints was tested against that of primary care physicians and ophthalmologists.
Methods: Seventy-two patients with red eye were prospectively assessed by a primary care provider ('referrer'), who completed a questionnaire about ocular symptoms/findings (without requiring slit lamp examination). An ophthalmologist then attributed an independent "gold standard diagnosis". The algorithm employed questionnaire data to produce a differential diagnosis.
Results: Referrer diagnostic accuracy was 34.7%, while the algorithm's top diagnosis was correct in 69.4% of cases, increasing to 90.3% with its top 2 diagnoses included and 94.4% with the top 3. The algorithm's sensitivity for urgent cases (angle-closure glaucoma, endophthalmitis, iritis, and corneal ulcer) (n= 24) using the top diagnosis was 83.3% (95% CI: 62%-95%), with specificity of 95.8.0% (95% CI: 86%-99%).
Conclusions: A referrer diagnostic accuracy of 34.7% demonstrates that 'red eye' presents diagnostic challenges for primary care providers. A novel AI algorithm successfully improved diagnostic accuracy to a range of 69.4%-94.4% and is highly specific for urgent cases. It can be used as an adjunct to clinical judgement in these settings to optimize referrals and patient care.

GENERAL OPHTHALMOLOGY

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Tackling a Global Public Health Challenge with an Ultra-Low-Cost, Portable, Lightweight, High-Performance Wavefront Auto Refractometer

First Author: Divya ***RAO***
Co-Author(s): Kaushik ***MURALI****, Chethan* ***RAO****, Diwakar* ***RAO****, Anand* ***SIVARAMAN***

Purpose: Uncorrected refractive errors are a major public health concern. Most autorefractors are bulky, expensive and have limited adoption in low-resource settings. The aim of the study was to validate the performance of a simple, portable autorefractor (PA) against subjective refraction (SR) and open field autorefractor (OFA).
Methods: Refractive error was assessed without cycloplegia on consecutive adults (BCVA 20/20) in a prospective study over five months. Subjects underwent objective retinoscopy, and subjective refraction measurements using the PA and OFA. Agreement between the PA and the other methods was evaluated using Bland-Altman analysis.
Results: On 132 subjects (30.53 ± 9.36 years), the mean paired differences (95% limits of agreement) between the PA and SR were –0.0862 (-0.1975 to 0.0252), 0.0607 (-0.0291 to 0.1505) and 0.0308 (-0.0820 to 0.1435) and that between PA and OFA was -0.1326 (-0.2512 to -0.0140), -0.0002 (-0.1055 to 0.1051) and -0.1276 (-0.2438 to -0.0114) for spherical equivalent (M), J0, and J45 (astigmatic components of power vectors), respectively. The study device (PA) agreed within 0.5 D of SR and OFA in 84.1% and 78% of eyes respectively for spherical equivalent power.
Conclusions: The study found strong agreement between the measurements obtained with the portable auto refractometer against subjective refraction and open-field autorefractor.

GLAUCOMA

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Is Glaucoma Training Essential for Remote Screening of Glaucoma Based on Fundus Photographs?

First Author: Neetha ***KUZHUPPILLY***
Co-Author(s): Yogish ***KAMATH****, Preeti* ***GUPTA****, Shilpa* ***PATIL****, Vivekanand* ***UNDRAKONDA****, Harish J.* ***RAJEGOWDA***

Purpose: To determine if there is difference in optic disc assessment between glaucoma specialists and nonglaucoma trained ophthalmologists.
Methods: Three fellowship trained glaucoma specialists and two non-glaucoma trained ophthalmologists were provided via internet, 1201 fundus photographs. Each investigator, using ImageJ software, manually annotated the disc and cup margins. Disc area, cup area, rim area, cup height, cup width, disc height, disc width, average cup-disc ratio (ACDR), vertical cup-disc ratio (VCDR) and horizontal cup-disc

ABSTRACTS- FREE PAPERS

ratio (HCDR), were measured in pixels from each photograph. Intraclass correlation coefficient (ICC) was used to analyze the agreement between all five ophthalmologists, the glaucoma trained and non-glaucoma trained groups. ICC estimates were calculated on average-measures, absolute-agreement, 2-way random-effects model.
Results: All five ophthalmologists annotated all 1201 photographs. The disc parameters- disc area, height and width showed excellent reliability between all five ophthalmologists, the glaucoma specialists and nonglaucoma trained groups with ICC values more than 0.9. In assessing the rim area, the glaucoma specialists had excellent reliability of ICC 0.901 whereas the non-glaucoma trained ophthalmologists had good reliability with ICC of 0.849. In measuring the ACDR, VCDR and HCDR, the glaucoma specialists showed good reliability with ICC of 0.808, 0.788 and 0.761 respectively whereas the non-glaucoma trained ophthalmologists showed moderate reliability with ICC values of 0.610, 0.697, and 0.453 respectively.
Conclusions: Fundus photographs can be evaluated reliably by both glaucoma trained and non-glaucoma trained ophthalmologists for optic disc parameters implicated in glaucoma. Training in glaucoma may give an edge in assessment of the cup and rim.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Pre-Treatment with Frequent Topical Betamethasone in Ahmed Glaucoma Valve Implantation

First Author: Nader ***NASSIRI***
Co-Author(s): Maryam ***YADGARI****, Sara* ***KAVOUSNEZHAD****, Farsad* ***NOORIZADEH****, Kourosh* ***SHEIBANI***

Purpose: To evaluate the efficacy of pre-treatment with topical betamethasone in Ahmed glaucoma valve (AGV) implantation.
Methods: We randomly assigned patients undergoing AGV to 2 arms of the study. The case group received AGV implantation with preoperative betamethasone eye drops, and the control group did not receive preoperative betamethasone. Follow-up examinations were performed on postoperative day 1, at least weekly for 4 weeks, and then every 1 to 3 months. Our main outcome measure was the rate of success, defined as intraocular pressure (IOP) < 15 or IOP < 18 mm Hg.
Results: We analyzed 62 eyes divided to case (n = 33) and control (n = 29) groups. The success rate was significantly higher in the intervention group than in the control group at 12 months postoperatively when considering either IOP < 15 or IOP < 18 mm Hg as success ($p < 0.001$) and also at 6 months when considering IOP < 18 mm Hg as success ($p < 0.041$). The reduction in the number of anti-glaucoma medications used postoperatively was significantly higher in the betamethasone group at follow-up at 1 and 3 months and 1 year.
Conclusions: Pretreatment with topical betamethasone in AGV implantations increases the success rate and reduces the need for medications.

RETINA

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

A Study of Efficacy of Injection Ranibizumab in Retinal Vein Occlusive Disorders

First Author: Sunanda ***HALDAR***

Purpose: To investigate anatomical and functional response following administration of injection ranibizumab (Intravitreal) in retinal vein occlusive disorders.
Methods: This is a hospital based, prospective, interventional, clinical study on efficacy of injection ranibizumab in retinal vein occlusive disorders. Depending on the inclusion criteria, exclusion criteria and regularity of follow up, 100 eyes of newly diagnosed patients of retinal vein occlusion were selected. The BCVA (best corrected visual acuity), fundus examination and 3D-OCT (optical coherence tomography) were recorded in 3 months follow up.
Results: In this study, mean age group in BRVO (branch retinal vein occlusion) is 59.24 years, in CRVO (central retinal vein occlusion) is 58.14 years with 54 males and 46 females. Reduction of CMT (central macular thickness) over 2nd month to 3rd month is significant (0.009 and 0.048) in both BRVO and CRVO. Improvement in mean BCVA over 1st month to 2nd month is significant (0.0015 and 0.01) in both BRVO and CRVO, over 2nd month to 3rd month is significant (0.0003 and 0.0042)in both BRVO and CRVO.

Conclusions: Ranibizumab is an efficient and safe therapy in the management of macular edema secondary to retinal vein occlusive disorders. There is rapid decrease of macular thickness and significant improvement in visual acuity.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Profile of Age-Related Macular Degeneration in Bhutan: A 3-year National Study

First Author: Bhim ***RAI***
Co-Author(s): Michael ***MORLEY****, Paul* ***BERNSTEIN****, Ted* ***MADDESS***

Purpose: To determine the severity of age-related macular degeneration (AMD) at first presentation among the Bhutanese patients attending national vitreoretinal (VR) clinics to inform national health policy on the potential benefits of a screening program.
Methods: A retrospective cross-sectional study was conducted on all new AMD cases in Bhutan over 3 years. Demographic data, clinical details and diagnostic procedures performed (fundus photography, OCT and fluorescent angiography) were recorded and clinical staging were performed. If a patient presented with asymmetrical AMD, the eye with more severe AMD was considered, and if both the eyes had the same severity one eye was chosen randomly.
Results: Of 521 new AMD patients aged 71.9 ± 11.3 years, 306 (58.7%) were males (p=0.005). At their first presentation, 234 patients (44.9%) already had late-stage AMD. Importantly, 69 patients (29.5%), that is half of total neovascular AMD (nAMD) patients, had disciform scar (DS) which were beyond treatment, and 7 (3.0%) had geographic atrophy (GA). Fourteen of nineteen polypoidal choroidal vasculopathy (PCV) patients were younger than 50 years.
Conclusions: Half of nAMD cases presented as DS not amenable to the treatment. Many potentially treatable nAMD patients had already lost central vision and were legally blind. Young people with PCV losing vision early in life with longer morbidity-affected life and socio-economic burden was concerning. Incorporating a screening program and telemedicine services for AMD with effective health education, and maintaining a national AMD Registry, would potentially lower AMD-related blindness and visual impairment, and improve quality of life with visual rehabilitation.

TELE- OPHTHALMOLOGY

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Rural Tele-Ophthalmology Camp Model for Eye Care during COVID-19

First Author: Sheila ***JOHN***
Co-Author(s): Sangeetha ***SRINIVASAN***

Purpose: Due to Severe Acute Respiratory Syndrome (SARS) Coronavirus 2 (COVID-19) pandemic, the eye camp activities have been re-structured since March 2020. As a result, only a limited number of patients are being screened on a daily basis. We describe the process of conducting eye camps during COVID-19 using teleophthalmology mobile vans to determine the major causes of blindness.
Methods: We developed a smartphone-based grading Patients underwent comprehensive eye examination, vision testing, refraction, slit lamp examination and fundus photography at Thiruvallur and Kanchipuram districts of Tamilnadu, India, from March 2021 to May 2022 as per the COVID-19 Guidelines for eye camp activities prescribed by the Government of India. Social distancing was enforced to minimize risk of exposure with hand hygiene, appropriate personal protective equipment (PPE) like gloves, masks and shields, and rigorous sterilization of equipment after every patient. Ophthalmologists at base hospital had teleconsultation with patients at campsite using internet connectivity (256- 512 Kbps).
Results: 218 camps were conducted across Tamilnadu. 21046 patients underwent ophthalmic evaluation. Of which, 916 patients had teleconsultation; 11917 had refractive error and was identified as the commonest cause of avoidable blindness; 4365 patients had cataract; 310 had retinal disease, and an additional 359 had diabetic retinopathy. 9705 patients were prescribed low-cost spectacles, and those with cataract or retinal diseases were referred to the base hospital for further evaluation and intervention.
Conclusions: A mobile teleophthalmology unit conducting eye camps is a very effective tool especially during COVID-19 to prevent blindness in rural villages.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom

Smartphone Annotation Tool for Faster and Accurate Image -Llabelling for Diabetic -

ABSTRACTS- FREE PAPERS

Retinopathy and Common Retinal Disorders
*First Author: Arvind K. **MORYA***

Purpose: Deep Learning (DL) and Artificial Intelligence (AI) have become widespread due to the advanced technologies and availability of digital data. Supervised learning algorithms developed for an annotation tool with a customizable feature set. We evaluated viability of having an in house annotation tool which works on a smartphone.
Methods: We developed a smartphone-based grading system to help in grading multiple retinal fundi. We designed the flow of user interface (UI) keeping in view feedback from experts. Quantitative and qualitative analysis of change in speed of a grader over time and feature usage statistics was done. The dataset size was approximately 200,000 images with adjudicated labels by a minimum of 3 doctors. Results for an AI model trained on the images graded using this tool and its validation over some public datasets.
Results: We created a DL model and analysed its performance for a binary referrable DR Classification task, whether a retinal image has Referrable DR or not. A total of 32 doctors used the tool for minimum of 2000 images each. Data analytics suggested significant portability and flexibility of the tool. Grader variability for images was in favour of agreement on images annotated. Mean of 89.11% was seen in agreement.
Conclusions: Our aim was to make Annotation of Medical imaging easier and to minimize time taken for annotations without quality degradation. The user feedback and feature usage statistics confirm our hypotheses of incorporation of brightness and contrast variations, green channels and zooming add-ons in correlation to certain disease types.

Sept 2, 2022 (Sunday), 13:30 – 15:00
Venue: Online via Zoom
Safety and Feasibility of Tele-Screening for Retinopathy of Prematurity during the COVID-19 Pandemic
*First Author: Nasser **SHOEIBI***
*Co-Author(s): Seyedeh M. **HOSSEINI**, Mojtaba **ABRISHAMI**, Mohammad R. A. **ASTANE***

Purpose: To evaluate the use of remote reading of digital retinal photographs in the diagnosis of severe (treatment-warranted) retinopathy of prematurity (ROP) during longitudinal screening for ROP in NICUs not accessing bedside ophthalmology exam during the COVID19 pandemic in northeast Iran.
Methods: According to ROP standard timelines, infants were examined longitudinally, over a series of examinations, by digital photography using the RetCam-120 Digital Retinal Camera (Massie Research Laboratories Inc., Dublin, CA) from July 2020 to April 2021. Images were transferred in a web-based route to ROP reading center in a tertiary ophthalmology hospital to be interpreted by trained vitreoretinal surgeons. Treatment-warranted ROP was defined as the presence of plus disease or the presence of any stage 3 ROP. Treatment with intravitreal bevacizumab was done in NICU. All patients were examined bedside after discharge from NICU at the referral ROP center.
Results: A total number of 523 exams was done for 213 patients (1-13, median 2). The mean birth age of the patients was 30 weeks (24-40) and the mean birth weight was 1351 grams (680-3500). Severe (treatment-warranted) ROP was diagnosed in 18 eyes (10 patients) during admission in NICU. Intravitreal injection of bevacizumab was performed in NICU. In the final bedside clinical exam in the referral ophthalmic center, no case of advanced ROP was recognized. Tele-screening had a 100% sensitivity in diagnosing treatment-needed ROP.
Conclusions: This pilot study showed that longitudinal remote reading of digital photographs using the RetCam-120 system has excellent sensitivity in detecting treatment-warranted ROP.

ABSTRACTS- E-POSTER

E-POSTERS

ARTIFICIAL INTELLIGENCE

Application of Self-supervised Learning Algorithms on Retinal Images of Patients with Diabetes Mellitus to Predict Renal Outcome

*First Author: Wai Ming **YIP***
*Co-Author(s): Wai Lam **CHAN**, Jason **LI**, Paul **LEE**, Kendrick C. **SHIH**, Edmund Y. **LAM**, Desmond **YAP***

Purpose: To develop self-supervised deep learning algorithms for the prediction of diabetic kidney disease in Chinese adults using fundoscopic photos.
Methods: 14197 fundoscopic photos of 3264 Hong Kong patients with lab data are labelled. Photos were labelled as case if incident estimated glomerular filtration rate (eGFR)<60 ml/min/1.73m2 and the rest was labelled as control.
The methodology begins with the self-supervised learning method. It is training the model with pretext tasks using unlabelled images before training with labelled images. The pretext tasks, for instance, include learning representations of input images by employing Multi Instance Contrastive learning (MICLe) where retinal images from different angles and eyes of the same patients form positive pairs that attract while images from different patients form negative pairs that repel.
In the downstream task the ResNet-18 convolutional neural network backbone trained and obtained after the self-supervised training is fine-tuned with labelled examples.
Results: Area under receiver operating characteristic curve (AUROC) of 1 year prediction of the approach using retinal images, age and albuminuria was 0.85. The one using retinal images was 0.81. For the approach using retinal images, age and albuminuria, the sensitivity, specificity, positive predictive value, negative predictive value and accuracy were 0.68, 0.84, 0.73, 0.80 and 0.77 respectively. The F1 score was 0.703 and Matthews Correlation Coefficient (MCC) was +0.523.
Conclusions: Using fundoscopic photos to predict diabetic nephropathy demonstrated excellent classification ability, but there was still plenty of room for improvement. Therefore, some further steps will be actualized.

Forensic and Ethical Concerns about Processing, Evaluating and Data Security of Ophthalmological Images for DICOM

*First Author: Kazim H. **OR***

Purpose: DICOM (Digital Imaging and Communications in Medicine) the images in ophthalmological examinations are shared and/or compared. If this system becomes the new standart, there may problems with processing, evaluating and forensic and ethic concerns about data security.
Methods: DICOM is the international standard for medical images and related information. It defines the formats for medical images that can be exchanged with the data and quality necessary for clinical use. Processing and evaluating images may cause problems. Data leaks or unauthorised access to patient`s data may cause forensic and ethical problems.
Results: The ophthalmological images are processed in DICOM, which may change the information in the images. Digital evaluation of these images may cause diagnosis mistakes, which may arise from evaluating systems. In both of these terms, it is not easy to find the responsible “person” for it. Law works so, that normally physicians are responsible for these aspects. Who or what will be responsible for mistakes in patients´ data in DICOM? Another point is, that the system is all digital and it can be hacked and/or leaked. This can be millions of patients´data in a time. Who will be responsible for it? Physicians aren´t resposible for this any more. Who will be charged?
Conclusions: DICOM data is an important tool, to process and evaluate ophthalmological patients´ images. The progression today seems not to solve the problems of processing and evaluating the images and to protect the data 100 % from being hacked and leaked.

Real-World Performance of an Artificial Intelligence System (EyeArt®) for Detection of Referable Diabetic Retinopathy in an Asian Population in Hong Kong

*First Author: Sunny **AU***
*Co-Author(s): Steffi **CHONG**, George **SHUM**, Tiffany **ONG**, Callie **KO***

Purpose: Artificial intelligence (AI) is gaining popularity in ophthalmology, and authority approved diabetic retinopathy (DR) screening systems are now commercially available.
Methods: Fundus photos taken from December 2020 to June 2021 in a public tertiary hospital DR screening program in Hong Kong were retrospectively studied. Two vitreoretinal trained ophthalmologists graded the photos, and agreed results were compared to analysis

ABSTRACTS- E-POSTER

report by the FDA-cleared EyeArt® autonomous AI system (Eyenuk, Inc, Los Angeles, USA). Primary and secondary outcomes are to calculate the sensitivity and specificity of referable DR, and detecting any DR or diabetic macular edema respectively. All ages of Asian patients were included, no matter of their cataract status. Patients with retinal vein occlusion, retinal artery macroaneurysm, age-related macular degeneration were excluded.
Results: 204 eyes from 102 patients were included for analyses. Mean age was 44.2 ± 13.8 (range 25 – 77) with a male-to-female ratio of 1: 2.6. Five eyes (2.5%) were ungradable due to media opacity, 41 eyes (20.1%) had positive DR confirmed by ophthalmologists, and 26 patients (25.5%) had referable DR. The sensitivity of the EyeArt® system for referable DR was 96.2% (95% CI: 80.4 — 99.9%), and specificity was 94.7% (95% CI: 87.1 — 98.6%). For detecting any DR or diabetic macular edema, the EyeArt® system had a sensitivity of 92.7% (95% CI: 80.1 — 98.5%) and specificity of 93.7% (95% CI: 88.7 — 96.9%).
Conclusions: The FDA-cleared EyeArt® system is a reliable AI tool for DR screening in Asian patients in Hong Kong. Usage in primary care should be considered.

Segmentation of Hard Exudates in Retinal Images Using BCDU-Net

*First Author: Nafise **AMERI***
*Co-Author(s): Nasser **SHOEIBI**, Mojtaba **ABRISHAMI***

Purpose: The importance of Diabetic Retinopathy (DR) screening requires attention to the development of Computer-Aided Diagnosis (CAD). For this purpose, the deep learning technique and the developed U-Net canonization network have been used. Using this network, it receives retinal images and shows the segmentation of the hard exudate lesion as a binary image.
Methods: We used BCDU-Net-v2 convolutional network developed for image segmentation. The network exploits the strengths of BConvLSTM modes and densely connected convolutions. The BCDU-Net-v2 encryption path consists of four steps. Each step consists of two 3×3 convolution filters by a 2×2 max pooling function and ReLU. The original U-Net may learn redundant features in successive convolutions. To reduce this problem, densely connected convolutions are proposed. This helps the network improve its performance with the idea of "Collective Knowledge". Each step in the decoding path in standard U-Net, the corresponding feature map is cut in the contract path and copied in the decryption path. These feature maps are then combined with the output of the upsampling function. In BCDUNet-v2, BConvLSTM is used to process these two types of feature maps in a more complex way. A problem with intermediate layers during the training phase is that the distribution of activations varies. This problem makes the training process very slow. Batch normalization is used to increase the stability of a neural network.
Results: The result of this research has been evaluated on the IDRID dataset with three important indicators of dice coefficient, sensitivity, and accuracy achieve at 76.81%, 72.24%, and 99.30%, respectively, and the effectiveness of the approach was confirmed.
Conclusions: We presented a developed deep convolutional network called BCDU-net-v2 to perform hard exudate lesion segmentation. The results showed that this method can solve the problem with 99.30% accuracy. Also, in the future, we plan to solve the problem in the form of multi-lesion segmentation.

Using Deep Learning for Assessing Image Quality of 3D Macular Scans from Spectral-Domain Optical Coherence Tomography

*First Author: Ziqi **TANG***
*Co-Author(s): Xi **WANG**, Anran **RAN**, Carol **CHEUNG***

Purpose: To develop a deep learning system (DLS) to assess the quality of optical coherence tomography (OCT) macular scans.
Methods: This study was a retrospective analysis of OCT images obtained from the Chinese University of Hong Kong Eye Centre and Hong Kong Eye Hospital. The scans from Cirrus OCT macular cube 512×128 and Spectralis OCT macular volume 512×31, 1024×25, and 1024×19 were included. Scan quality was labeled as gradable or ungradable at B-scan level and volume-scan level. Gradable B-scan/volume scan was defined as no artifacts or OCT artifacts that do not affect the central area. Ungradable B-scan/volume scan was defined as OCT artifacts affecting the central area. 2,277 Cirrus scans and 33,633 Spectralis B-scans of 1,557 volume scans were divided into training (70%), fine-tuning (20%), and test (10%). We developed a 3D residual network-18 for Cirrus 3D cube scans, a dense convolutional network-121 for Spectralis 2D B-scans, and a multiple-instance learning model for Spectralis 3D volume scans.
Results: For testing the Cirrus cube scans, Spectralis B-scans, and Spectralis volume scans, the DLS achieved the area under receiver operating characteristic curves of 0.930, 0.972, and 0.906; sensitivities of 94.6%, 90.1%, and 86.5%; specificities of 83.3%, 94.2%, and 95.7%;

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and accuracies of 93.3%, 91.1%, and 87.2%.
Conclusions: The DLS achieved good performance to distinguish gradable and ungradable OCT macular images. As a volume-level quality indicator, the DLS allows only gradable scans to be referred, which can smooth clinical operational flow for enhancing disease screening and diagnosis.

CATARACT

A New Method for Nucleus Extraction in Complicated Cataract Surgery

First Author: Nader ***NASSIRI***
Co-Author(s): Sara ***KAVOUSNEZHAD****, Kourosh* ***SHIEBANI****, Saman* ***NASIRI****, Nariman* ***NASSIRI***

Purpose: To introduce a new method of nucleus extraction to reduce the chance of vitreous loss.
Methods: In patients undergoing phacoemulsification as well as intracapsular and extracapsular cataract extraction in a 0.5 mm distance from the anterior limbus a large keratotomy is performed using a three-step method. After performing the capsulotomy a preplaced suture is made using 7-0 silk and the surgical assistant lifts the anterior corneal lip using this preplaced suture to exposes the anterior chamber. At this point the surgeon inserts two 23-gauge needles from opposite directions into the nucleus body, and slowly extracts the nucleus upward.
Results: In classic method of nucleus extraction the surgeon tries to extract the nucleus by pushing it from superior limbus using a loop and from inferior limbus using a muscle hook, which may cause vitreous loss. Our new method for nucleus extraction only uses two 23-gauge needles and we have conducted many nucleus extractions using this method with rare complications.
Conclusions: We have devised a simple and easy to learn method to extract the nucleus with less chance of vitreous loss.

Considerations for Organising Mobile Eye Services for Cataract Surgery

First Author: Rajan ***SONDH***
Co-Author(s): Saeed ***AZIZI****, Riaz* ***ASARIA***

Purpose: To highlight what considerations should be taken when organising a mobile eye service for cataract patients and describe the barriers that exist for patients accessing treatment from a mobile eye service.
Methods: A literature review was conducted to identify articles discussing global health, cataract surgery and mobile eye services.
Results: Considerations should include patient selection, which can be achieved through screening. Case complexity, equipment availability and surgical expertise may influence patient selection. Some countries are reliant upon equipment donations from high-income countries. Alternative surgical techniques may be considered if phacoemulsification equipment is unavailable. Some patients require subsidised transport costs to increase surgical uptake. Motorised transport is accessible for some patients. Furthermore, poor transport infrastructure makes equipment and staff transport difficult. Biometry reduces postoperative refractive error, thus eliminating post-operative visual impairment. However, this is not always utilised. Cataract surgery team members that should be considered include ophthalmologists, non-physician cataract surgeons, ophthalmic officers, integrated eye care workers, ophthalmic and operating room nurses. Multimedia interventions have improved education and consenting of procedures in patients with low numeracy and literacy skills. Site selection is an important consideration determined by the demand of people in a particular location, population density and size of area to be served. Finally, it is important to consider costs for workplace rent, patient transportation, volunteers, publicity, patients' food, and clinical team hospitality.
Conclusions: When organising mobile eye camps, transport costs, finances, site selection, the team, and patient selection should be considered to maximise success when offering these services.

CLINCAL & EPIDEMIOLOGIC RESEARCH

Biological Effect of Columbianadin on Blood-Brain Permeability: Theapeutic Role in the Medicine through Scientific Data Analysis

First Author: Dinesh K. ***PATEL***

Purpose: Plant derived natural products have important role in the medicine. Coumarins class phytochemicals are an important class of secondary metabolite found to be present in

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the varieties of plants. Chemically the coumarins have benzopyrone structures in their core which facilitate coumarins to attach with different receptors and enzymes through non-covalent bond.
Methods: Biological importance of columbianadin has been investigated in the medicine through scientific data analysis of different research work. Pharmacological potential of columbianadin for their effectiveness on human disorders have been investigated through scientific data analysis of different scientific research work. Biological effect of columbianadin on Blood-Brain Barrier permeability has been investigated through scientific data analysis of different scientific research work.
Results: Scientific data analysis of different scientific research revealed the biological potential of columbianadin in the medicine for their effectiveness against various forms of human disorders. Columbianadin is a coumarin class phytochemical found to be present in the Angelicae pubescentis. Biological effect of columbianadin on Blood-Brain Barrier permeability were investigated through scientific data analysis of various scientific research work and revealed moderate absorption.
Conclusions: Scientific data analysis revealed the biological effect of columbianadin on Blood-Brain Barrier permeability.

Biological Importance of Artemetin against Various Types of Micro-Organisms: Therapeutic Benefit in the Medicine through Scientific Data Analysis

*First Author: Dinesh K. **PATEL***

Purpose: Plant derived natural products have been used in the medicine and other allied health sectors as a good source of food material and raw material for the development of new drugs molecule in the pharmaceutical sectors for the treatment of numerous human disorders. Herbal based drugs derived from natural sources are gaining popularity in the medicine mainly because of their lesser side effects and numerous pharmacological activities.
Methods: Biological importance and therapeutic benefit of artemetin in the medicine for their antimicrobial activity have been investigated through scientific data analysis of different scientific research work. Pharmacological activity scientific data of artemetin for their antimicrobial activity in the medicine have been collected and analyzed in the present work through scientific data analysis of different scientific research work.
Results: Scientific data analysis of different scientific research for the biological effectiveness of artemetin against various types of microorganism have been investigated and found to have significant biological potential in the medicine. Artemetin was found to be present in the Tanacetum parthenium and Artemisia absinthium. Scientific data analysis revealed the biological potential of artemetin in the medicine for their moderate antiprotozoal activity against Plasmodium falciparum and Trypanosoma brucei.
Conclusions: Scientific data analysis revealed the health beneficial aspects of artemetin in the medicine for their effectiveness against various form of microorganism.

CORNEA

Lyciym Barbarum Polysaccharide Suppresses Corneal Fibroblasts Differentiation upon Epithelial-Stromal Injury

*First Author: Ho Lam **WONG***
*Co-Author(s): Yau Kei **CHAN**, Kendrick C. **SHIH***

Purpose: The study is to assess whether Lycium barbarum polysaccharide (LBP) solution can be a novel therapy in modulating corneal fibroblasts differentiation after epithelial-stromal injury in an eye-on-a-chip model.
Methods: A 3D model made of PDMS elastomers is created to mimic the anatomy and physiology of the corneal stroma. The chip consists of a cell culture chamber and is connected to two channels where medium or LBP is supplied. Human fibroblasts are suspended in collagen to form a three-dimensional hydrogel construct. Cells are pre-treated with 2 mg/mL LBP for 24 hours, followed by 10 ng/mL TGF-b1 for another 24 hours.
Results: Cells pre-treated with LBP showed a decreased expression of alpha-smooth muscle actin, which is a prominent marker of myofibroblasts. Pro-fibrotic proteins such as vimentin, collagen II and collagen III are as well reduced. Cell-laden hydrogel pre-treated with LBP revealed no significant contraction compared to that in control group ($p=0.29$) while group pre-treated with TGF-b showed increased contraction by 17.3% ($p<0.001$). The stiffness of the hydrogel treated with TGF-b1 alone had an increase by 3.55-fold ($p=0.02$) yet that in the LBP group showed no significant difference compared to that in control group ($p=0.9964$).

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Conclusions: LBP can be a potential topical therapy to prevent corneal scarring prior to surgery. Optimized LBP concentration can potentially lead to fewer adverse effects compared to standard pharmacological treatments while minimizing fibroblast differentiation.

Simple Limbal Epithelial Transplant – A Novel Technique in the Management of Limbal Stem Cell Deficiency in Chemical Injury Due to Alkali Burn

First Author: Arvind K. ***MORYA***

Purpose: To assess the most simple and economical surgical technique of SLET in the management of chemical injury(lime-instillation) leading to LSCD. Improvement in visual recovery and decrease in signs were clinically noted. Also the viability of a very cost-effective surgical technique of autologous limbal - stem cell.
Methods: U GA autologous conjunctival limbal graft was retrieved from RE and transplanted in lime - injured LSCD LE with fresh AMG after removal of pannus in a tertiary eye care centre of India. 11-year male came with complaint of sudden onset and gradually progressive painful decrease of vision in LE along with watering, redness and photophobia due to chemical - injury. On examination Visual acuity was finger counting 3 metres, 360-degree limbal-ischaemia, total macular corneal - haze. Under GA conjunctival limbal autograft was harvested from RE of 1mm by 3.5mm from superior-limbus. 360 degree conj. peritomy up to 2-3 mm from limbus and pannus removed. AMG from uncomplicated LSCS was placed over cornea with help of fibrin-glue. Then timbal-autograft was divided into 8-10 pieces and placed over AMG in mid-peripheral area with thelp of glue and BCL placed.
Results: After 3 months vision improved to 0.40 logMAR.
Conclusions: SLET is a reproducible, single stage technique for effective management of LSCD. Stem cell graft acts as a barrier, preventing conjunctival epithelium from growing onto the cornea. Being an autologous transplant no immunosuppression treatment is required. SLET is very cost effective for not only higher tertiary centres but equally beneficial for small & developing Ophthalmic Centres with minimum requirement of higher - end infrastructure.

Therapeutic Role of Strictinin in the Medicine for the Treatment of Human Disorders

First Author: Dinesh K. ***PATEL***

Purpose: Medicinal plants and their derived plant extracts and active phytochemicals have numerous biological applications in the traditional medicine as more than 80–85% of populations rely on these products worldwide to meet their primary health care needs. Medicinal plants have been used in the traditional medicine for the treatment of human disorders due to presence of different kind of phytochemicals.
Methods: Biological potential of strictinin in the medicine for the treatment of human disorders has been investigated through scientific data analysis of different scientific research work. Numerous scientific data have been collected and analyzed in the present work to know the therapeutic importance of strictinin in the medicine.
Results: Strictinin is an important phytochemical of natural plant material and their derived products including Rosa soulieana. Strictinin is found to be present in the green tea and other plants. Scientific data analysis revealed the biological importance of strictinin in the medicine for the treatment of human disorders.
Conclusions: Scientific data analysis revealed the biological potential of strictinin in the medicine.

GENERAL OPHTHALMOLOGY

A Rare Case of Necrotising Fasciitis of the Eyelid Secondary to Pseudomonas Aeruginosa Infection

First Author: Muzzaffar Mad ***ISA***
Co-Author(s): Rosnita ***ALIAS****, Adlina Abdul* ***RAHIM****, Azhany* ***YAAKUB***

Purpose: To report a case of necrotising fasciitis of eyelid due to *Pseudomonas aeruginosa* infection.
Methods: A case report.
Results: A 65-year-old man with no comorbidity presented with left eyelid swelling and redness for 5 days. It was progressively worsening and associated with pain. Upon eye examination, left eye visual acuity was 6/12. The lower lid is swollen,tender, and erythematous with purulent eye discharge. There were erosions and an ulcerated middle third of the left lower lid with an overlying necrotic patch.

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The conjunctiva was injected inferiorly. The optic nerve function test was intact with no ophthalmoplegia and normal intraocular pressure. The funduscopy examination and other systemic examinations were unremarkable. Wound debrided, desloughed, and removal of the necrotic patch was performed. Pus culture yielded Pseudomonas aeruginosa. He was commenced on intravenous Augmentin for 3 days, and subsequently changed to intravenous Ciprofloxacin according to microorganism sensitivity. An urgent contrast-enhanced computed tomography of the orbit has not shown an orbital extension. Blood investigation showed neutropenia, further investigations did not show any evidence of infections, inflammations, or hematological malignancies. However, he refused for bone marrow aspirate and trephine biopsy procedure. After a few days in the ward, the symptoms and signs improved. During clinic follow-up, the symptoms were completely resolved without residual.
Conclusions: Necrotising fasciitis should be suspected in a patient with neutropenia. Prompt treatment with wound debridement and intravenous antibiotics is mandatory.

An Eye with Double Occlusion

*First Author: Kasman **JAAFAR***
*Co-Author(s): Nor Anita Che **OMAR**, Rosiah **MUDA**, Che Ku Hafiza Che Ku **AMRAN**, Julieana **MUHAMMED***

Purpose: Combined central retinal artery occlusion (CRAO) and central retinal vein occlusion (CRVO) is an uncommon presentation of retinal vascular disease. It causes sudden visual acuity loss and is associated with poor prognosis and severe complications. We report a very rare case of combined CRAO and CRVO in a patient with no known medical illness.
Methods: A case report.
Results: A 45-year-old man presented with complaint of sudden onset reduced central vision over the left eye, with best-corrected visual acuity (BCVA) of 2/60. Assessment of left eye showed tortuous and dilated retinal veins, attenuated arteries with swollen optic disc, retinal hemorrhages temporal to optic disc as well as macula edema. Fundus angiography revealed suspicious area of capillary-fall-out and inferior leakage at macula. Detailed investigation indicated hyperlipidemia and normal carotid Doppler ultrasound. The patient was subjected to 2 times injections of intravitreal ranibizumab. After 7 months, his vision improved with a BCVA of 6/9. Although the left eye central vision improved to 6/9, patient was left with a constricted visual field.
Conclusions: In short, combined CRVO and CRAO can occur in young adult who has hyperlipidemia. Hence, timely diagnosis and prompt intervention on risk factors may help to significantly restore visual function and prevent further complications.

An Inherited Eye at Risk – Case Report of Von Hippel-Lindau Syndrome

*First Author: Sue Zian **GOH***
*Co-Author(s): Intan Shafinaz Mohd **RADZUAN**, Hanisah Binti Abdul **HAMID**, Rosnita Binti **ALIAS**, Wan Hazabbah Wan **HITAM***

Purpose: Von hippel-lindau syndrome is a rare autosomal dominant, familial neoplastic disease.
Methods: A case report.
Results: We report a case of von hippel-lindau syndrome in a healthy 11 years old girl who presented to us initially with blurring of vision on her right eye for the past 1 month and had strong family history of blindness and brain tumours. On examination, her visual acuity in the right eye was light perception and left eye was 6/9. There was 15 degree exotropia and positive relative afferent pupillary defect present in the right eye. Fundus examination of the right eye had tobacco dusting and almost total retinal detachment with macula off, sparing only the supero-nasal retina while the left eye had multiple retinal haemangioblastomas in the peripheral and mid-peripheral retina with surrounding subretinal fluid, pink optic disc, a flat macula with dilated and tortuous veins, fundus fluorescein angiography done revealed even more subclinical retinal hemangioblastomas. Magnetic resonance imaging of spine showed no spinal lesions and computed tomography of the brain was normal. In view of positive family history of brain tumour and retinal haemangioblastoma, the diagnosis of von hippel-lindau syndrome was made and we initiated laser photocoagulation of the retinal haemangioblastomas. She was able to maintain her vision in the left eye with 6 months of close follow up and laser provided.
Conclusions: Early diagnosis and intervention is important to prevent blindness and retinal detachment in patients with von hippel-lindau and early detection of Von Hippel Lindau associated tumour.

Bilateral Blindness in Cavernous Sinus Thrombosis

*First Author: Kasman **JAAFAR***

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*Co-Author(s): Nor Anita Che **OMAR**, Rosiah **MUDA**, Che Ku Hafiza Che Ku **AMRAN**, Julieana **MUHAMMED***

Purpose: Cavernous sinus thrombosis (CST) is a rare, life-threatening disorder. It can be resulting from complication of facial infection, sinusitis, orbital cellulitis or following trauma. We report a case of blindness due to bilateral CST in a patient with chronic headache.
Methods: A case report.
Results: A 49-year-old male with underlying hypertension and stroke, presented with chronic right-sided headache for 5 months and both eye convergent squint for 3 weeks. On examination, visual acuity (VA) was 6/9 on the right eye and 6/7.5 on the left. There was limited abduction bilaterally, anterior segment was normal, no proptosis, and no evidence of optic disc swelling. Initial Computed tomography (CT) brain was normal. Patient defaulted follow-up for 7 months until he presented again at casualty with left body weakness and diagnosed as right lacunar infarct. On subsequent examination, noted right eye complete ptosis and bilateral proptosis with worsening of eye movement bilaterally. Computed tomography angiography (CTA) was done and revealed bilateral CST. Patient was treated with intravenous antibiotics for 2 weeks and was started on oral warfarin. However, on follow-up visits, VA worsened to NPL on the right, and counting finger on the left. Other cranial nerves (CN) functions were also affected (CN III, IV and V). Repeated CT angiography showed bulging of cavernous sinus with dilated superior ophthalmic vein bilaterally. Patient however defaulted his subsequent follow–up.
Conclusions: Prompt recognition of CST is critical for a good outcome. Despite advanced treatment with antibiotics and anticoagulation, the risk of long-term sequelae of the disease remains significant.

Case Series: Unusual Features of Goldenhar Syndrome

*First Author: Sue Zian **GOH***
*Co-Author(s): Hanisah Binti Abdul **HAMID**, Fang Sin **YEE**, Rosnita Binti **ALIAS**, Wan Hazabbah Wan **HITAM***

Purpose: To report 2 cases of Goldenhar syndrome with unusual features. Goldenhar syndrome is a rare, congenital disease due to the abnormal development of the first and second branchial arches.
Methods: A case report.
Results: The first case is a 7-year-old girl noted to have a left eye limbal dermoid, left thumb polydactyly, accessory tragi, skin tags over left cheek, short neck, flat nasal bridge and a left mild hydronephrosis with dilated calyces. The second case is a 9-month-old boy with cleft palate, left hemifacial microsomia, left 6th and 7th cranial nerve palsy, bilateral microtia grade 4 with canal atresia, developmental delay, moderate conducting hearing loss bilaterally, patent ductus arteriosus, congenital hypothyroidism and mild laryngomalacia. In our first case, unusual features not usually seen in Goldenhar syndrome such as left thumb polydactyly and left hydronephrosis with dilated calyxes, while our second case had multiple cranial nerve palsies. Due to the multitude of anomalies seen in Goldenhar syndrome, radiographic investigations are required to look for systemic involvement and support clinical diagnosis while a multidisciplinary approach is required to manage these cases. The presence of limbal dermoid and multiple cranial nerve involvement restricting extraocular movement and lid closure may lead to ocular complications highlighting the importance of early eye screening and timely intervention to prevent complications.
Conclusions: Early eye screening and diagnosis, long term follow up and timely intervention to prevent complications associated with Goldenhar syndrome is crucial in managing patients with Goldenhar syndrome.

Evaluation of Asymptomatic Cardiac Disease in Patients with Ocular Pseudoexfoliation

*First Author: Nader **NASSIRI***
*Co-Author(s): Maryam **YADGARI**, Sara **KAVOUSNEZHAD**, Kourosh **SHIEBANI***

Purpose: To evaluate asymptomatic cardiac disease in patients with ocular pseudoexfoliation.
Methods: Forty-two patients with ocular pseudoexfoliation (with or without glaucoma) and 40 patients without pseudoexfoliation, who had no positive signs or symptoms of cardiac diseases, were enrolled in this study. For each participant a standard treadmill exercise test, as a noninvasive and reliable method for detecting ischemic heart disease, was performed under supervision of a cardiologist. The prevalence of ischemic heart disease was compared in the case and control groups.
Results: The mean age of participants was 68.38 ± 8.10 years in the case and 62.45 ± 8.40 years in the control group. There was no statistically significant difference between the two groups in terms of diabetes mellitus, hyperlipidemia, smoking, and family history of ischemic heart disease. Twenty patients (47.6 %) with pseudoexfoliation and 9 participants (22.5 %) without pseudoexfoliation had hypertension (P = 0.02). There were 10 (23.8 %)

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positive exercise tests in the pseudoexfoliation group and 8 (20 %) positive exercise tests in participants without pseudoexfoliation (P = 0.78).
Conclusions: Based on our findings ocular pseudoexfoliation was not associated with increased risk of asymptomatic ischemic heart disease as evaluated by the treadmill exercise test.

False Brain Tumour

*First Author: Kasman **JAAFAR***
*Co-Author(s): Nor Anita Che **OMAR**, Ahmad Kamal Ghanimi **ZAMLI**, Che Ku Hafiza Che Ku **AMRAN**, Julieana **MUHAMMED***

Purpose: Idiopathic intracranial hypertension (IIH), or pseudotumor cerebri, is an increase in cerebrospinal fluid pressure of unknown etiology. We report a rare case of IIH in a young and morbidly obese female patient.
Methods: A case report.
Results: A 27-year-old obese female with known case bronchial asthma and peripheral neuropathy presented with sudden onset of left eye reduced vision for one day duration. It was associated with chronic headache for 2 months. Assessment revealed unilateral left optic disc swelling. Extraocular movement was full and there was no diplopia. Blood investigations were normal and not suggestive of demyelinating diseases or connective tissue diseases. Computed tomography (CT) brain and magnetic resonance imaging (MRI) brain were also normal. Lumbar puncture was performed and revealed a high opening pressure of 37cmH20. The patient was diagnosed as IIH and was given oral Acetazolamide. Throughout follow-up, patient needed to undergo therapeutic lumbar puncture for 3 times within 4 months to alleviate the symptoms. Although the symptom of headache was controlled, her left eye visual acuity had worsened from 6/6 to 6/60, with a progressive constricting visual field. Intracranial probe insertion for monitoring of intracranial pressure (ICP) was performed but no ventriculoperitoneal shunt indicated as for now. Regular oral acetazolamide managed to keep the ICP within normal range.
Conclusions: IIH is a diagnosis of exclusion. It is not usually life threatening but can be a lifelong problem. Even though symptoms can be relieved with treatment, the symptoms can recur and if left untreated it can lead to permanent loss of vision.

Giant Cell Arteritis: A False Alarm of Toothache

*First Author: Nur Hafizah **MAFFAR***
*Co-Author(s): Teo Shee **KIANG**, Hayati Abd **AZIZ**, Francesca M. **VENDARGON**, Azhany **YAAKUB***

Purpose: Giant cell arteritis (GCA) is a granulomatous inflammatory vasculopathy with Caucasian predominance. It usually affected white people aged more than 50 years old and rarely occur in Asians population.
Methods: A case report.
Results: We reported a case of giant cell arteritis with systemic and ocular involvement is reported here. This is a 62 years old Indian lady with underlying adult onset Still's disease presented with right eye profound vision loss, painful eye on movement, temporal headache and toothache. Her right eye visual acuity was vague light projection in one quadrant. The right eye examination showed presence of relative afferent pupil defect, impaired optic nerve function test with diffusely chalky white optic disc swelling. The erythrocyte sedimentation rate (ESR) was 108 mm/hr and the C-reactive protein (CRP) was 55.5 mg/L. Ultrasound of right temporal artery showed thickened right superficial temporal artery wall measuring 0.4cm. MRI/MRA brain, orbit and neck revealed right optic perineuritis with no other abnormality detected. However, patient refused for temporal artery biopsy. She was started on IV methylprednisolone 250mg QID for 3 days followed by oral prednisolone. Steroids led to the resolution of her painful eye on movement, temporal headache and toothache. There was no involvement of the fellow eye.
Conclusions: Giant cell arteritis is one of ophthalmic emergency. Complete and thorough history and clinical assessment is crucial to avoid underdiagnosed or misdiagnosed of this rare condition. This condition is preventable if we manage to diagnose early and treated immediately and aggressively.

Review on Methods to Eliminate Mask Induced Fogging during Slit Lamp Examination

*First Author: Kah Wei **ONG***
*Co-Author(s): Meng Hsien **YONG***

Purpose: Review on the alternatives to eliminate mask induced fogging during slit lamp examination to minimize airborne disease transmission.
Methods: A systematic review.
Results: Strategy searching revealed 30 related articles in total. Some articles discussed the methods to eliminate mask-induced-fogging

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during slit lamp examination or while using surgery lenses, while the others were directed to consumers on how to prevent fogging on eyeglasses. In view of the same principle applied, systematic review was done and compiled to serve as tips for all ophthalmologists as safety guidance, and to facilitate workflow. Methods were further classified into two categories. Doctor methods include keeping the condensing lens slightly away from the face, applying pressure on the mask via finger while holding the lens, taping the mask, clear lens with soap before use, lens warmers, anti-fogging sprays, use lens with anti-fog coating or clear pod. Patient methods include choosing a right mask, pinching the metal strip on the mask, cross-tying of patients' mask, use of double mask, breathing downwards, placing a tissue beneath the mask and DIY antifogging noseband to alleviate fogging.
Conclusions: Facemask is always the most effective, easy, and cheap method to prevent the spread of COVID-19 disease. Healthcare workers including ophthalmologists shouldn't request patients to remove the face mask for any reasons for safety purposes to both parties as there are always better alternatives out there. Creativity and innovations are necessary sometimes to aid in the examinations and achieve comfortable vision for the doctors.

Squamous Cell Carcinoma of Conjunctiva Masquerading as Pterygium: A Case Report

First Author: Manpreet ***KAUR***
Co-Author(s): Anurag Ambroz ***SINGH***

Purpose: To report a case of squamous cell carcinoma of conjunctiva presenting as pterygium.
Methods: A 60-year-old male presented with a fleshy mass in RE from last 12 months which was progressing in size. On examination, there was a fleshy nasal pterygium with feeder vessels. Surgical excision was done and the tissue was sent for histopathological examination which confirmed the diagnosis of squamous cell carcinoma. The patient was kept on MMC 0.02% eyedrops postoperatively and followed up.
Results: The patient remained symptom free for 1 year, then was lost to follow-up.
Conclusions: Squamous cell carcinoma is a rare tumor of the conjunctiva and can masquerade as pterygium. So, all pterygia should be sent for histopathological examination.

Vitamin B12 Deficiency as a Cause of Neurotrophic Keratopahty

First Author: Nader ***NASSIRI***
Co-Author(s): Sara ***KAVOUSNEZHAD****, Kourosh* ***SHIEBANI****, Saman* ***NASIRI****, Nariman* ***NASSIRI***

Purpose: To present a case of neurotrophic keratopathy caused by B12 deficiency.
Methods: Based on our clinical findings and with the diagnosis of B12 deficiency we started B12 treatment for the patient. After 3 weeks the patient showed a dramatic response with corneal sensation reversal, an increase of visual acuity, improved neurotrophic keratopathy and significantly improved neurological findings.
Conclusions To the best of our knowledge, there is no report regarding vitamin B12 deficiency induced keratopathy and this is the first report that describes this aspect of vitamin B12 deficiency.
Results: Based on our clinical findings and with the diagnosis of B12 deficiency we started B12 treatment for the patient. After 3 weeks the patient showed a dramatic response with corneal sensation reversal, an increase of visual acuity, improved neurotrophic keratopathy and significantly improved neurological findings.
Conclusions: To the best of our knowledge, there is no report regarding vitamin B12 deficiency induced keratopathy and this is the first report that describes this aspect of vitamin B12 deficiency.

GLAUCOMA

Outcome of Mirco Pulse Transscleral Diode Laser Cyclophotocoagulation in Refractory Glaucoma

First Author: Ambreen ***GUL***
Co-Author(s): Fuad Ahmad Khan ***NIAZI***

Purpose: Current study was conducted to evaluate the outcomes of micro pulse transscleral diode laser (μP-TSCPC) in terms of safety and efficacy in various types of refractory glaucoma.
Methods: It was a prospective interventional trial including 31 eyes of 30 patients with refractory glaucoma. Patients underwent μP-TSCPC with Cyclo G6 glaucoma laser (Iridex). Micropulse P3 probe delivered 2000mW for 80seconds for each 90 degree arc 3mm away from limbal margin. Duty cycle was 31.3 % with 0.5ms on time and 1.1ms off time. BCVA and IOP was documented pre-laser and post-laser

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1 week, 1 month till 6 months.
Results: Mean age of patients was 55.16±13.9SD years. There were 20 (64.5%) males and 11 (35.5%) females. The mean pre-laser IOP was 33.26±7.0. Mean post-laser IOP was 11.77±3.6 at 1 week, 14.42±5.7 at 1 month and 15.97±5.2 at 3month (P=0.000).Significant reduction in IOP from baseline was seen at each follow-up. Mean pre-laser BCVA was 0.07±0.20 snellen decimal. Mean post-laser BCVA was 0.07±0.20.BCVA was preserved in all patients (100%) with no complete loss of vision in any eye. 2 patients had mild early post-laser inflammation, hyphaema, hypotony and IOP spike was seen in 1 patient each. At 6 months, treatment success was seen in 27 (87.1%) patients. Use of antiglaucoma medications decrease from 3.74±0.8 to 0.26±0.81 (p=0.000).
Conclusions: ɥP-TSCPC is safe, effective and noninvasive method of treatment for refractory glaucoma leading to both persistent reduction of intraocular pressure and decrease need for topical anti-glaucoma.

Therapeutic Benefit of Hinokiflavone in the Medicine for the Treatment of Human Diseases

First Author: Dinesh K. ***PATEL***

Purpose: More than 80% of the populations of developing countries used different kinds of herbal medicine for the treatment of human diseases in the primary health care system. Flavonoids are important class of phytochemical found to be present in the different medicinal plants including different class of pigments in plants. Hinokiflavone is an important class of phytochemical found to be present in the Platycladus orientalis and Selaginella tamariscina.
Methods: Biological potential hinokiflavone in the medicine for their effectiveness against human disorders have been investigated through scientific data analysis of numerous scientific data analyzed in the present work. Biological potential of hinokiflavone has been investigated in the present work through scientific data analysis of numerous scientific research works.
Results: Scientific data analysis revealed the biological source of hinokiflavone and result revealed the presence of hinokiflavone is an important class of phytochemical in the Platycladus orientalis and Selaginella tamariscina. Present work scientific data analysis revealed the therapeutic importance of hinokiflavone in the medicine for the treatment of numerous kinds of human disorders.
Conclusions: Scientific data analysis revealed the biological potential and therapeutic benefit of hinokiflavone.

LENS

Biological Potential of Tectoridin in the Medicine for their Effectiveness against Rat Lens Aldose Reductase

First Author: Dinesh K. ***PATEL***

Purpose: Polyphenols are a group of plant secondary metabolites found to be present in the plants and their derived products. Polyphenols are natural antioxidants and are produced in plants against pathogens and oxidative stress. Fruits, vegetables, cereals, legumes are some of the main source of polyphenols. Tectoridin was found to be present in the Pueraria thunbergiana and Belamcanda chinensis.
Methods: Biological importance of tectoridin in the medicine has been investigated through scientific data analysis of different scientific research works. Biological importance of tectoridin has been tested for their aldose reductases inhibitory potential against rat lens through scientific data analysis of different scientific research work to know their biological importance in the diabetes.
Results: Scientific data analysis of different research works revealed the biological importance of tectoridin in the medicine. Scientific data analysis of different scientific research work revealed the therapeutic potential of tectoridin in the medicine. Scientific research data analysis signified the biological importance of tectoridin on rat lens aldose reductase enzymes.
Conclusions: Scientific data analysis of different research work revealed the biological importance of tectoridin.

Posterior Capsular Optic Capture for Traumatic Subluxated Intraocular Lens after Facial Massage

First Author: Tuan Mohd Amirul Hasbi Tuan ***PAIL***
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Purpose: To report a case of posterior capsular optic capture for traumatic subluxated intraocular lens after facial massage.
Methods: A case report.
Results: Intraocular lens (IOL) subluxation is

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relatively uncommon after uneventful cataract surgery. We report a case of subluxated IOL following a vigorous facial massage, managed successfully with the posterior capsular optic capture technique.
A 68-year-old man with a history of uneventful extracapsular cataract extraction 8 years ago for phacomorphic glaucoma complained of blurred vision in his right eye two days after undergoing a facial massage. The pre-operative visual acuity was 3/60 with the IOL noted to be subluxed superiorly, with its haptics abutting the corneal endothelium. There was zonular dialysis superiorly covering approximately 2 clock hours. Patient underwent repositioning of IOL via posterior capsulotomy and optic capture technique. Postoperatively, the patient had a good recovery, attaining a visual acuity of 6/12.
Conclusions: Vigorous facial massage may result in lens subluxation via traumatic rupture of the zonules. IOL repositioning with posterior optic capture is an option for treatment of anteriorly dislocated IOLs with a stable capsular bag.

OCULAR IMAGING

Tuberous Sclerosis and the Ophthalmological Work-Up: Can a Peri-Papillary Astrocytoma Masquerade as Myelinated Nerve Fibres?

*First Author: Saurabh **HARAL***
*Co-Author(s): V. S. **GUPTA***

Purpose: To study the role of OCT and UBM in the ophthalmological work-up of Tuberous Sclerosis.
Methods: A 5-year-old male, a diagnosed case of tuberous sclerosis was referred from the Dept. of Paediatrics for an opthamological workup. Unaided visual acuity (UCVA) was 6/6 Snellen. Indirect ophthalmology showed a peripaillary lesion, about 2DD diameter, involving the superior arcade that lead to a preliminary assumption of myelinated nerve fibres. Peripheral retinal scan was negative. However, macular OCT showed a retinochoroidal lesion suggestive of a retinal astrocytoma. Macular OCT with enhanced depth imaging (EDI) showed the lesion to be a well-defined solitary mass lesion without distortion of the surrounding retinochoroid complex neither any edema nor any activity. Further, a UBM showed that the lesion involved only the retinochoroidal complex without extending or involving the sclera nor any evidence of calcifications
Results: A diagnosis of Retinal Astrocytoma concurrent with the systemic diagnosis of Tuberous sclerosis was made and the patient has now been kept on follow-up.
Conclusions: A high index of clinical suspicion is not only required but also imperative in phacomatoses with ophthalmic involvement so that our armamentarium of newer imaging modalities can be put to good use to rule out masquerading lesions and arrive at a correct diagnosis, irrespective of the systemic or ophthalmic management and prognosis.

RETINA & VITREOUS

A Proposed Classification and Surgical Strategy for Full-Thickness Macular Holes

*First Author: Zongming **SONG***
*Co-Author(s): Zhengwei **YANG***

Purpose: To propose a clinical classification for full-thickness macular holes (FTMH) and correspondingly surgical strategies based on macular hole size and to validate its practical value in a large series of cases.
Methods: A total of 221 patients (241 eyes) diagnosed with FTMH were enrolled and classified into different types over a 6-year period from 2013 to 2019. The surgical methods included pars plana vitrectomy (PPV), gas tamponade, flute-needle aspiration, ILM manipulations (basically peeling and scraping, additionally inverted ILM flap, insertion, or transplantation for recurrent macular holes), and autologous blood clot (ABC). Functional and anatomical outcomes pre- and post-operation were recorded. The surgical safety was evaluated by surgical complications.
Results: Based on macular hole size, the FTMH were divided into five types (small: <300μm, medium: ⩾300μm and <600μm, large: ⩾ 600μm and < 900μm, huge: ⩾900μm, and recurrent). Best-corrected visual acuity (BCVA) significantly improved from 1.07 ± 0.44 logMAR to 0.80 ± 0.43 logMAR in total ($P < 0.0001$). The closure rates of the five types were as follows: FTMH, 100% (37/37) in small MH; 97.9% (94/96) in medium MH; 94.1% (80/85) in large MH; 93.7% (15/16) in huge MH; 28.6% (2/7) in recurrent MH, with significant differences ($P < 0.001$). FTMH had a recurrence rate of 2.9% after surgery. No sever complications were observed during surgeries.

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Conclusions: The proposed classification and surgical methods for FTMH offer rememberable, practical and effective clinical strategies with promisingly high degree of anatomical and visual outcomes.

Comparison of Two Ultra-Widefield Cameras with High Image Resolution and Wider View for Identifying Diabetic Retinopathy Lesions

*First Author: Zongming **SONG***
*Co-Author(s): Yuanyaun **XIAO**, Handong **DAN***

Purpose: To compare the agreement of DR severity and relative visible retinal area among three fundus camera systems, and the capacity of detecting lesions outside ETDRS 7-field between Optos and Clarus.
Methods: All ETDRS 7-field, blinded Optos and blinded Clarus images were graded according to ETDRS DR scale and analyzed by weighted kappa statistics. The number and type of lesions outside the ETDRS 7-field were calculated and analyzed by Chi-square. Relative visible retinal area for all images were calculated using Image J software and analyzed by nonparametric Wilcoxon matched-pairs signed-rank test. P values < 0.05 were indicated as statistical significance.
Results: In total, 386 eyes of 203 patients completed all three fundus examinations. Weighted kappa for agreement was 0.485 between ETDRS 7-field and blinded Optos image, 0.924 between ETDRS 7-field and blinded Clarus images, 0.461 between blinded Optos and Clarus image. The relative visible retina area of ETDRS 7-field image was195±28 DA, Single Optos image 371±69 DA, Single Clarus image 261±65 DA, two montage Clarus image 462±112 DA, four montage Clarus image 598±139 DA. The relative visible retinal area had statistical significance in any above two images. In total, 2015 and 4338 DR lesions outside the ETDRS 7-field were detected in single Optos and Clarus image respectively (P <0.001).
Conclusions: Clarus may be an ideal device for screening of early DR compared with ETDRS 7-field and Optos, it can improve early diagnosis DR. It may replace ETDRS 7-field and Optos in determining DR severity in future.

Management of Vasoproliferative Tumors of Retina with Macular Complications by Par Plana Vitrectomy Combined with Cryotheapy

*First Author: Zongming **SONG***
*Co-Author(s): Wenhua **ZHONG***

Purpose: To report the efficacy of pars plana vitrectomy (PPV) combined with cryotherapy in treating vasoproliferative tumors of the retina (VPTR) with macular complications.
Methods: Retrospective noncomparative interventional case series. Eleven eyes of 10 patients diagnosed with VPTR were accomplished the inclusion criteria and enrolled in this study. Best corrected visual acuity (BCVA), medical optometry, slit-lamp biomicroscope, intraocular pressure (IOP), fundus photograph, B-scan ultrasonography, axial length (AL), fundus fluorescence angiography (FFA) and spectral domain optical coherence tomography (OCT) were performed on all cases. Logarithm of the minimum angle of resolution (logMAR) was used to calculate visual acuity. Main outcome measures were BCVA, tumor activity, retinal morphological structure and postoperative complications.
Results: All patients underwent 23- or 25-G PPV for macular complications,which included MH (n=3) and ERM (n=11). Tumor was treated with cryotherapy. Mean logMAR BCVA dropped from 0.62±0.58 to 0.39±0.46. The difference of mean BCVA before and after treatment was statistically significant (t=2.48, P=0.033). Control of tumor activity was achieved in nine cases. The rest two eyes were active. Compared with preoperative tumor activity, the difference was statistically significant (P = 0.000). Increased central retinal thickness (CRT) and disrupted retinal layers were associated with macular holes and the traction of retinal proliferative membrane. Postoperative complications were ERM in two eyes (18%), uveitis and retinal exudation in one eye (9%) respectively.
Conclusions: PPV combined with cryotherapy contributed to improve macular morphology and VA significantly, meanwhile, was effective in tumors shrinking and regression as well as preserving retinal integrity.

The Effect of Macular Photocoagulation on Visual Field among Patients with Diabetic Macular Edema

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Purpose: To evaluate visual changes after macular photocoagulation in diabetic macular edema.
Methods: Twenty six eyes with history of diabetes and clinically significant macular edema candidate for macular photocoagulation were included in this prospective interventional case series. All patients underwent 10-2 and 24-2 Humphrey Visual Field Test using Swedish Interactive Thresholding Algorithm (SITA)

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strategy and also optic nerve and macular optical coherence tomography (OCT), before and 6 months after macular laser photocoagulation. Then visual field of each eye was compared before and after photocoagulation.
Results: The mean age of patients was 57.60 ± 8.99 years. There were no statistically significant changes after photocoagulation compared to before the procedure regarding the mean deviation, pattern standard deviation and foveal threshold in visual field 10-2 and 24-2 tests except for pattern standard deviation in the 10-2 test.
Conclusions: Based on our results it seems that visual field is not affected by macular laser photocoagulation.

TELE-OPHTHALMOLOGY

Can YouTube Teach You How to Do Ptosis Surgery?

*First Author: Deniz **KILIC***

Purpose: The methods of surgical training has undergone major alteration in recent years. YouTube videos are used by ophthalmology residents to get ready for forthcoming cases. The most popular oculoplastic procedures include Ptosis surgery, which involves the liftig of the eyelids in many ways. It will be one of those procedures that ophthalmology residents regularly research. Therefore it was aimed to evaluate the effectiveness of YouTube videos as learning tools for ptosis surgery.
Methods: Between April 1 and May 1, 2022, a search for "ptosis surgery" on YouTube was conducted. A total of 43 videos that met the inclusion criteria were evaluated for quality, reliability, and accuracy using the DISCERN questionnaire score (min-max: 16-75) and the Journal of the American Medical Association (JAMA) score (min-max: 0-4). The instructional value of the content was evaluated using a surgical scoring system and the Global Quality Score (GQS) (min-max: 0-5).
Results: The mean DISCERN score was 29.2 ± 8, and the mean JAMA score was 0.9 ± 1, indicating poor quality; the mean GQS was 2.1 ± 2.1, indicating moderate quality.
Conclusions: YouTube videos do not generally seem to be helpful as educational resources for residents learning about ptosis surgery, even though some of the studied videos include relevant information. However, further studies should be done to evaluate the accuracy and value of the medical information offered by internet sites from the perspective of the patients.

Community Optometrist/Vision Technician-Led Post-Operative Cataract Care: How to Bring Community Participation

*First Author: Isha **AGARWALLA***
*Co-Author(s): Ramesh **AGARWALLA***

Purpose: After an year of introducing shared-care pathway, we aimed to quantify the proportion of cataract patients discharged successfully to the community vs those who revisited for post-operative follow-up. Community partnership with trained staff in the peripheral and rural areas for Primary care is a sustainable and efficient solution to long term ophthalmic care.
Methods: We collected data on patients of community clinic with PMJAY cards who underwent cataract surgery at our centre in Dibrugarh over a three-month period. Electronic medical patient records were used to establish whether patient was discharged on the day of surgery, and whether they revisited the department post-operatively. Any pre- and post-operative complications were recorded.
Results: A total of 419 cataract surgeries were carried out over the three-month period (August 2021 to October 2021). 401 patients i.e., over 95% of the patients were discharged to our Community Optometrist/ Vision technician for their postoperative care. The remaining 5% of the patients were referred to the hospital's ophthalmic service due to post-operative complications. Of these 18 patients, 8 had inflammation and pain, 1 had cystoid macular oedema and 2 had corneal oedema.
Conclusions: Community optometrist and vision technician-led post-operative care for uncomplicated patients is an efficient way of reducing the workload associated with cataract surgery. Setting up more vision centres along with collaborative partners is the most sustainable way towards eradicating blindness.

Diagnostic Performance of an AI-Based Referable Diabetic Retinopathy Detection Tool Integrated on a Portable Fundus Camera for Screening at Primary-Care Centres

*First Author: Divya **RAO***
*Co-Author(s): Manavi **SINDAL**, Nikita **SONAWANE**, Florian **SAVOY**, Kalpa **NEGILONI***

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Purpose: This study aimed to assess the performance of an automated artificial intelligence(AI) screening tool for referable DR(RDR) deployed offline on smartphone-based fundus camera at Primary eye-care centres(PEC).
Methods: This retrospective study included 306 diabetic patients, visiting 12PECs. After a comprehensive eye exam, minimally trained nurses captured two images (disc and macula centred) using a portable fundus camera. Following an automated image quality feedback, images were analysed for RDR(moderate NPDR or worse and/or CSME) instantly without the need for internet. Images were graded by blinded tele-ophthalmic PEC graders(ICDR classification). Patients with RDR diagnosed by either the doctor or the AI were referred to the base hospital. AI was compared against PEC graders (image grading) and experts (clinical exam) at base hospital.
Results: A total of 498 eyes (271 patients) were included and the sensitivity of AI against PEC doctors was 95.74%(95% CI 85.46- 99.48%), specificity 75.89%(95% CI 69.75 - 81.34%), positive predictive value was 45.45%(95% CI 39.59- 51.44%) and negative predictive value was 98.84%(95% CI 95.62- 99.70%). There were 2 false-negative cases(1 moderate NPDR and 1 CSME) and 54 false-positive cases with nearly 50% having mild NPDR. Sub-analysis of 50 referred patients against expert clinical diagnosis demonstrated sensitivity of AI and VC doctors as 100% and 75% respectively.
Conclusions: The novel AI-based screening algorithm for diabetic retinopathy integrated offline with smartphone-based fundus camera acts as a robust, fast, easy-to-use triaging tool making DR screening affordable and scalable in resource-constrained communities.

Use of Artificial Intelligence and Robotic Tele-Consultation in Vision Threatening Diseases during SARS2 COVID-19

*First Author: Rita **VOUGHT***
*Co-Author(s): Victoria **VOUGHT**, Priya **TAILOR**, Bernard **SZIRTH***

Purpose: Vision threatening diseases (VTDs) include age-related macular degeneration (AMD), cataracts, diabetic retinopathy (DR) and glaucoma. Timely detection and referral play a significant role in the management of VTDs especially during SARS-2 COVID-19. The objective of this study was to integrate artificial intelligence (AI) automated imaging grading along with Robotic Tele-Consultation (RTC).
Methods: The Department of Ophthalmology at Rutgers NJMS performed a feasibility pilot study in part with the Department of Endocrinology and the community at large to evaluate the potential impact of early retinal screening, education, and the implementation of AI and RTC. Fifty-two patients underwent non-mydriatic retinal imaging screening using a 45-degree retinal camera. Images were uploaded to cloud-based AI. Results from the AI software were compared to a board-certified retina specialist. Patients were offered real-time RTC with a remote ophthalmologist.
Results: Of the 52 patients, 21 patients were diagnosed with no DR during an in-person evaluation, 18 with mild non-proliferative DR (NPDR), 2 with moderate NPDR, 1 with severe NPDR. Four eyes were ungradable via tele-ophthalmology and AI could not grade 6 eyes. Comparison of agreeability between the in-person diagnosis and tele-ophthalmology was 0.859±0.058 ($p<0.001$), between the in-person diagnosis and AI was 0.751±0.082 ($p<0.001$), and between tele-ophthalmology and AI was 0.883±0.063 ($p<0.001$).
Conclusions: Although there was an increased specificity of VTD, compliance with suggested in person follow-up visits was under 10%. Adding AI and on-site real-time RTC consultation with a remote ophthalmologist improved our triage process and follow-up to 100%.

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B

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E, O - Google

Description of Financial Interests:

C *- Consultant/Advisor receiving consultant fee, paid advisory boards, or fees for attending a meeting.*

E *- Employee employed by or received a W2 (annual compensation) from a commercial company.*

L *- Lecture fees or honoraria, travel fees or reimbursements when speaking at the invitation of a commercial company.*

O *- Equity/Stock owners with equity ownership/stock options in publicly or privately traded firms, excluding mutual funds.*

P *- Patents and/or royalties for intellectual property.*

S *- Grant support or other financial support to the investigator from all sources, including research support from government agencies (e.g., NIH), foundations, device manufacturers, and/or pharmaceutical companies.*

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