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Experts Urge Widescale Eye Screening

by John Butcher

Widescale health programs aimed at bringing better vision to vast numbers in developing countries could have major implications for quality of life and productivity, experts said at yesterday's APAO 2019 Congress in Bangkok, Thailand.

Many struggle to do simple daily tasks and lose work due to poor near sight, ophthalmologists said, and the problem is likely to get worse as populations age unless action is taken.

Correcting presbyopia in the adult population would have a dramatic impact, Prof. Nathan Congdon, MD, MPH, Ulverscroft Chair of Global Eye Health at Queen's University Belfast, United Kingdom, told the audience yesterday at a prevention of blindness symposium at the APAO 2019 Congress in Bangkok, Thailand.

Around 1.09 people globally were living functionally with presbyopia according to 2017 figures, he said, with the majority having either non- or under-corrected near vision impairment, which resulted in a productivity loss of \$25 billion.

It is truly a global condition, and one that will eventually effect everyone if they live long enough, but which correcting can lead to "life-changing results," he said.

Prevalence differs across countries, depending on how many older people there are and the rate of myopia, he continued. In wealthy regions

almost everyone with presbyopia has their vision corrected, while in Africa there is an under-correction rate of around 80 to 90%, and in Asia 30 to 40%, he said.

When the sheer number of people in Asia is taken into account, this translates to hundreds of millions with uncorrected presbyopia in that region alone, he continued, many of them suffering from poor vision function, reduced work productivity and lower quality of life as a result.

Cont. on Next Page >>

● SnapShot! ●



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They suffer difficulty performing simple tasks, such as reading small print or using their phone, are often less productive at work and in many cases do not work at all due to the condition.

Studies have shown raised productivity can be achieved across a number of professions by correcting presbyopia, he said; 21.7% among tea pickers, 14% for textile workers, and 9.8% for spinners.

Future trends mean there will be even greater need to correct presbyopia, according to Prof. Congdon, as population age and dependence grows on devices that require good short distance vision. Already 98.6% of people globally and 93.2% in China use near electronic devices, he said, with smartphone subscriptions set to increase to 8.9 billion by 2022.

The implications of large-scale correction would be positive and many, Prof. Congdon told the audience. Firstly, studies have shown that it is affordable, he said, and that screening would offer opportunities to detect sight-threatening eye diseases such as cataract, glaucoma and diabetic eye diseases. In addition,



large scale correction would help to alleviate poverty, increase well-being, promote gender equality, and improve economic growth, he said.

For many it would do more than improve their productivity, he added, it would bring them back into the workplace by making them a viable employee again.

Sam Brundett, who works for Vision Spring, a non-profit organization that aims to create access to affordable eyeglasses, also pushed the benefit of widespread vision correction.

The organization ran the Prosper Trial, providing near sight glasses to presbyopic rural India tea workers in order to measure the impact on their productivity, he told the audience. Set on three tea estate in Assam where worker income is directly tied to daily productivity, the trial was run during the high season for tea picking, he said.

All those involved in the trial were permanent workers more than 40 years old and had undergone eye exams with

some needing glasses and others not. The results were a 22% average rise in productivity as a result of wearing glasses and a 32% rise for workers aged over 50, he said.

Secondary outcomes included that 98.5% found the glasses to be useful, and 94.4% said they would be prepared to pay on average of \$6.10 for them.

The research was picked up by many major global publications, according to Mr. Brundett, probably because it framed the study as looking at productivity rather than just health intervention.

More research is expected soon, he added, this time looking at productivity in the garment trade. ☺

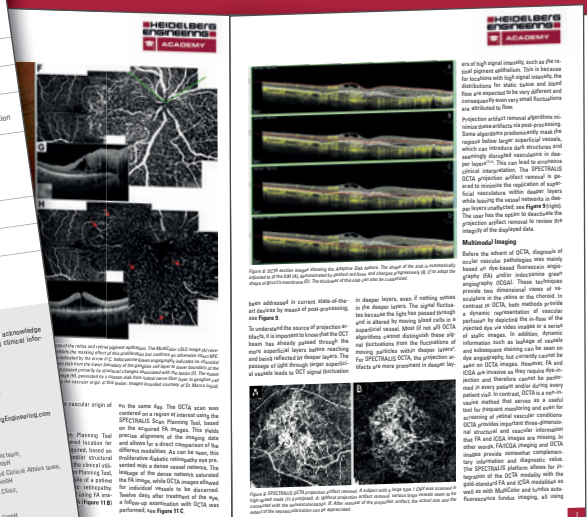
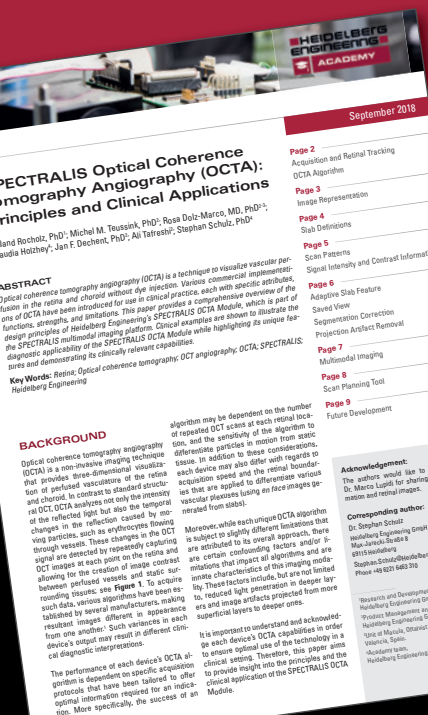


Prof. Nathan Congdon



Sam Brundett

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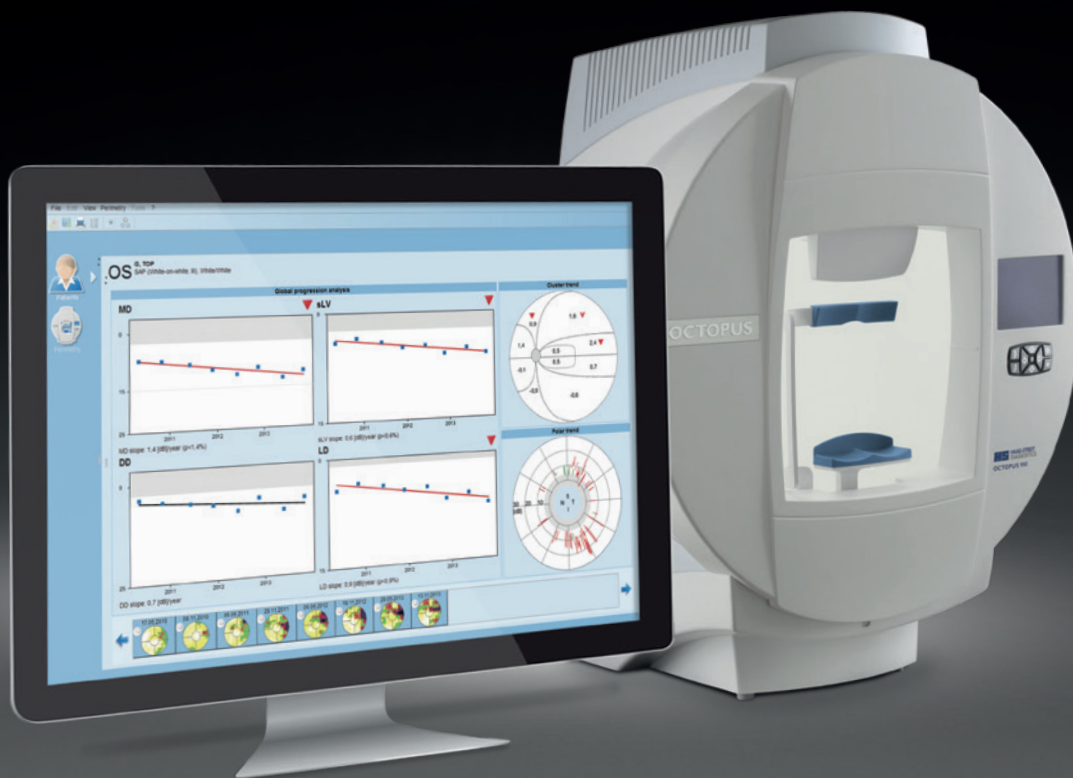


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DIAGNOSTICS

Comparison of Surgical Modalities in Treating Endophthalmitis

by Gerardo D. Sison III

Endophthalmitis has proven to be a devastating condition characterized by infection and subsequent inflammation in the vitreous cavity. It can often cause profound vision loss in many patients following cataract surgery.

At the APAO 2019 Congress yesterday, a free paper session was held that focused on surgical and medical retina updates. Dr. Vivek Dave, a vitreo-retina consultant at the LV Prasad Eye Institute, India, discussed the role of intraocular lens explantation in delayed-onset endophthalmitis.

Based on Dr. Vivek Dave's presentation entitled "Clinical Presentations and Comparative Outcomes of Primary Versus Deferred Intraocular Lens Explantation in Delayed-Onset Lens Explantation in Delayed-Onset Endophthalmitis"

As classified in the Endophthalmitis Vitrectomy Study, endophthalmitis is considered acute-onset (occurring within 6 weeks post-surgery) or delayed-onset (occurring more than 6 weeks post-surgery). In the midst of the discussion, Dr. Dave steered the conversation towards comparative outcomes and the importance of timing in primary versus deferred intraocular lens (IOL) explantation in delayed-onset endophthalmitis.

Common knowledge has shown that during delayed-onset endophthalmitis, organisms are sequestered in the capsular bag and become difficult to eradicate. This often leads to resultant inflammation that persists in an unpredictable manner. IOL explantation, therefore, has a definite role in the management of delayed-onset endophthalmitis, according to Dr. Dave.

While the role of IOL explantation is well elucidated, the exact time frame of performing the explantation is not clearly known. Furthermore, the bearing

of explantation timing on the final visual outcome is also not well defined. This lack of data prompted a retrospective comparative case series conducted at the LV Prasad Eye Institute in Hyderabad, India.

Results showed that out of a total of 77 eyes, 25 subjects underwent primary IOL explantation and 52 subjects deferred IOL explantation. In summarizing the results, key differences in both groups were comparable with respect to mean age and gender as well as etiology of endophthalmitis. However, Dr. Dave noted that vision at presentation was better in the cases that underwent delayed IOL explantation compared to those that underwent primary explantation (27% vs 7.27%, $P=0.04$).

Looking at the complications that occurred post IOL explantation, the two most common complications were decompensation of the cornea and occurrence of retinal detachment. The occurrence of these complications was comparable in both the groups thus alluding to the fact that attempting early explantation of the IOL did not increase the incidence of major complications. More importantly, the number of repeat intravitreal antibiotic injections required were statistically different ($P<0.0001$) and much lower in those that underwent a primary IOL explant compared to those that underwent a delayed IOL explant.

In the same vein, the days required for inflammation to resolve completely after IOL explant was approximately 1 month in the primary IOL explant group versus 2 months in the delayed IOL explant group. Based on these results, this showed that doing an explant early settles the eye down quicker.

"In delayed-onset endophthalmitis where IOL explantation is contemplated, it is better to explant earlier than later," concluded Dr. Dave. "There is a definite reduction in the number of repeat interventions required to quiet the eye although the final visual acuity attained may be independent of the timing of IOL explantation."

Based on Dr. Vivek Dave's presentation entitled "Endoscopic Vitrectomy in Endophthalmitis: Initial Experience of 33 Eyes at a Tertiary Eye Care Center"

Current knowledge suggests that early vitrectomy is likely to be beneficial in

cases of endophthalmitis. Many a times in the acute setting, even if surgeons want to go by the guidelines and do an extensive early vitrectomy, they are often hampered by the fact that visualization is compromised because of corneal edema, hemorrhage, or a general lack of the adequate visualization.

An ophthalmic endoscope helps circumvent this limitation by allowing adequate visualization. No recent study has reported the outcomes of management of endophthalmitis using endoscopic visualization, which prompted a retrospective non-comparative case series conducted at the LV Prasad Eye Institute.

Inclusion criteria included clinical and microbiologic records of all patients who underwent endoscopic vitrectomy from April 2013 to March 2018. Data collected included age, gender, duration of follow up, anatomic success, and whether evisceration was required or not.

Anatomic success is defined as resolved inflammation and absence of hypotony. In addition, no need for evisceration or enucleation as well as an attached retina at the last visit was also grounds for anatomic success.

Results of the case series showed anatomic success in 24 out of 33 eyes. That's over half of the studied subjects. Vision of $>20/400$ was achieved in 15 percent of studied eyes where further visual potential was noted with overall potential visual benefit assessed as possible in almost half of all eyes.

Overall, endoscopic vitrectomy allows a greater clearance of the organism and early resolution of endophthalmitis. Current literature world-wide describing endophthalmitis outcomes with presence of concurrent corneal infection, suggests an evisceration rate between 14%-45%. In the current study, results showed an evisceration rate of only 3.03% due to early intervention being possible using an endoscopic approach. Lesser need for evisceration avoids psychological trauma to the patient as they do not have to live with the notion of "having had their eye removed" Also, an opportunity to visualize the retina early in the course of management can help predict overall visual prognosis and direct the intensity with which further course of treatment is planned. 🌟



Innovative Ways of Treating Eye Trauma



by John Butcher

Ophthalmologists focused on eye trauma and innovative ways to treat it during a morning session at yesterday's APAO 2019 Congress in Bangkok, Thailand.

Talks included an overview of the causes of eye injuries and emergency treatment, as well as innovative techniques to help damaged eyes heal.

Dr. Jina Han, cornea and anterior segment fellow and doctoral candidate at New Zealand National Eye Centre, University of Auckland, New Zealand, began with an overview of eye injuries, which she said mainly affects working age males.

Eye injuries account for 15.2 per 100,000 hospital admissions, she told the audience and penetrating eye injuries 3.6 per 100,000, although in New Zealand penetrating eye injuries and globe ruptures are more common.

The first stage in treating an eye injury is establishing the cause, be it blunt, penetrating or chemical, she said, as well as the point and velocity of impact.

Once that is established there are a series of six basic steps that should be taken, she told the audience. They begin with ruling out life threatening injuries, followed by treating any chemical injuries, ruling out globe threatening injuries, examining both eyes and eyelids, considering radiological imaging and finally plan management.

If it is a penetrating eye injury it is also important to look for any critical signs, she added, including full thickness corneal/scleral lac, shallow/flat AC, a peaked or irregular pupil, iris TID and whether there is lens material or vitreous in the AC. If the globe is ruptured the surgeon may want to consider surgical repair, she added, as well as ruling out IOFB.

Chemical injuries account for 0.02 per 100,000 hospital admissions in the UK, she continued, with injured parties usually young and male. The highest rate is among young children aged one to two years, she said, followed by 18 to 64 year olds. This type of injury is also more common in low socioeconomic groups and residential areas, she added.

According to data from Croyden Eye Unit, in the United Kingdom, of 221 chemical injuries recorded there, 89% were the result of accidents (63% at work) and 11% assaults, with 75% of those affected male. Other data from Aachen in Germany showed of 236 chemical injuries 70% of patients were male and 61% were the result of industrial accidents.

Alkali injuries are more common than acid ones, largely because alkali chemicals are more often in home and industrial products, but injuries from either are equally serious, she said.

The first rule in the event of a chemical injury is to irrigate, she stressed, immediately at the scene of the incident and continuously for one or two hours afterwards.

With chemical injuries it is also important to consider whether there is retained debris in the eye, she added.

Finally, the physician should consider the potential for other problems to occur at a later date as a result of the chemical injury, such as ocular surface injury, limbal stem cell depletion, cornea stromal injury, ant chamber injury and chronic elevated intraocular pressure.

Dr. Mo Ziaei, from the University of Auckland in New Zealand, focused on using amniotic membrane transplants (AMT) to help repair damaged eyes.

Since the first successful use of AMT for conjunctival surface reconstruction in 1995, in rabbits with limbal stem cell deficiency, the technique has become an increasingly popular development in ophthalmology, he said, developing into a \$450 million industry today with a further 15% growth expected by 2020.

AMT involves using the inner-most layer of the placenta, located next to the fetus, which is procured under sterile conditions after a Cesarean section and can be cryopreserved for up to 24 months.

The amniotic membrane consists of three layers, he continued, the epithelium, the basement membrane and the stroma. It has a series of important biological properties that make it useful for healing optical damage, including anti-scarring, anti-inflammatory, anti-angiogenic, anti-bacterial, immunomodulatory, epitheliotropic and neurotropic.

It can be used for corneal or conjunctival surface reconstruction and in conjunction with other surgeries, such as a limbal conjunctival autograft, keratolimbal allograft or strabismus.

AMT can also be used as a treatment for conjunctival tumors, Dr. Ziaei told the audience, in this case the four important goals being to prevent recurrence, cause minimal collateral damage from adjunctive therapies, bring about long term control of postoperative inflammation and cicatrization and detect recurrence should it happen. The amniotic membrane's transparent nature allows surgeons to look for tumour recurrence beneath its surface, he added.

AMT is both an increasingly popular and versatile procedure for damaged eyes, he concluded, as surgeons are become more aware of its benefits and the range of products using amniotic membranes develops further.

Alternatives to traditional AMT, but which use amniotic membranes, are in development, including eye drop containing amniotic extracts, he told the audience.

"The spectrum of clinical indications for AMT continues to expand and encompass a varying range of ocular surface pathology," he said. 🌐

The Latest in Presbyopia Treatment

By Khor Hui Min

Farsightedness caused by loss of elasticity of the lens of the eye, usually occurring as a natural part of the aging process, is known as presbyopia. It typically affects people in their middle and old age, where they experience trouble focusing on nearby objects.

Various treatments for presbyopia were discussed in the refractive surgery session chaired by Dr. Robert Ang, Dr. Klaus Ditzén, and Dr. Olan Suwan-Apichon at the APAO 2019 Congress in Bangkok, Thailand.

Prof. Dr. Sunil Shah presented on the biochemical changes and improved visual performance after a new presbyopia therapy, focusing on laser scleral microporation.

"Preliminary results suggest laser scleral microporation (LSM) performed using the Er:Yag laser to be a safe and effective procedure for restoring visual performance in all ranges of vision including near, intermediate and distance. The mechanism of action of LSM is still being studied but early results are compelling. Ongoing studies are being pursued," said Dr. Shah, who is a consultant ophthalmologist at the Birmingham and Midland Eye Centre at City Hospital, and an honorary consultant at Birmingham Children's Hospital, United Kingdom.

"Patients gained a median of 4.5 lines of near and intermediate visual acuity (range 2-8) and mean gain of 7 lines of Jaeger. However, none of the patients experienced complications that decrease postoperative best-corrected visual acuity (BCVA) or quality of vision," he added.

Assoc. Prof. Dr. Jodhbir Mehta of the Singapore National Eye Centre (SNEC) spoke on the dynamic accommodative changes in macaque primate eyes following laser scleral microporation assessed with ray-tracing aberrometry.

"In current accommodation theory, UBM studies have shown that as the same time the anterior zonules relax, reducing their tension on the lens such that the lens changes shape anteriorly, the posterior zonules contract, moving the posterior capsule forward. This complex action of the zonules is suspected to be reciprocal. This vitreal-



zonular complex stiffens with age, losing its elasticity," explained Dr. Mehta, who is adjunct associate professor of Yong Loo Lin School of Medicine, National University of Singapore.

In his research, he was able to restore true physiological accommodation to old monkey eyes and there was a corresponding increase in effective range of focus. Specific optical correlations were identified during dynamic accommodation pre-operation/post-operation LSM, which may explain the improvement in dynamic accommodative capacity in these monkeys.

Dr. AnnMarie Hipsley, founder and chief scientific officer of Ace Vision Group, presented on simulation of restored accommodation after scleral therapies using finite element analysis.

"To understand the complex interactions of accommodation, we built a computational model of the involved ocular mechanism to inform new treatment approaches for presbyopia. 3D finite element model (FEM) is capable to predict changes in the lenticular and extralenticular structures," said Dr. Hipsley.

"Applying age related ocular changes allow us to illuminate effects on the accommodation biomechanics to predict ciliary muscle impact and lens deformation behavior and test 'what-if' scenarios. 3D FEM is a promising tool for understanding the accommodation mechanism of both a healthy young eye and an old presbyopic eye. Moreover, 3D virtual eye models offer an innovative way to evaluate ophthalmic therapies and surgical interventions and impact design of new technologies for presbyopia," she added.

Dr. Robert Ang of the Asian Eye Institute, the Philippines, discussed the pros and cons of PresbyLasik and corneal inlays. He said presbyopia treatment in one eye offers the least sacrifice in distance vision with adequate functional near vision. Nonetheless, patient expectations need to be managed.

Meanwhile, Dr. Klaus Ditzén from the Eye Surgery Center, Weinheim, Germany, presented on PRESBYOND laser blended vision. Dr. Sri Ganesh, chairman and managing director of Nethradhama Hospital in Bangalore, India, discussed PRESBYOND and the small incision lenticule extraction (SMILE) procedure.

Dr. John Chang, president of the International Society of Refractive Surgery, compared trifocals with extended depth of focus (EDOF). A new technology, the EDOF intraocular lens (IOL) may be an option for patients who want to correct presbyopia after cataract surgery.

Prof. Dr. Dimitri Azar, from Verily (formerly Google X), spoke on the Verily/Alcon smart lens technology. The Verily team has started working on the glucose sensing CL and is now concentrating on accommodating electronic autofocus lens. Exciting times lie ahead in the engineering of novel solutions to technical challenges of building wireless sensing capabilities into a contact lens, including sensors, miniaturization of low power electronics, and data analytics.

It was a fruitful meeting of minds among those at the forefront of research and development in the area of presbyopia treatment, and the presentations sparked interest and stimulated the creativity among delegates in attendance. ☺



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References:

1. Full prescribing information of Diquas Ophthalmic Solution: Pharmacodynamic, Mechanism of action, Date of revision of package insert: May 2018.
2. Shizuka Koh et al. Clinical Ophthalmology 2015;9:865-872. An overview of the clinical utility of 3% diquafosol ophthalmic solution, focusing on the results of clinical studies on various types of dry eye, including aqueous-deficient dry eye, short tear film breakup time-type dry eye, and post dry eye after laser in situ keratomileusis. It also introduces the additive effect of diquafosol on sodium hyaluronate monotherapy for dry eye, and the effect of 3% diquafosol ophthalmic solution for dry eye-related conditions.
3. Masatsuga Nakamura et al. adv ther 2012;29(7): 579-589. The basic researches of diquafosol in this review are summarized, and all results were based on the authors' laboratory experiments to understand the action mechanisms of diquafosol for the treatment of the dry eye. All results of clinical studies are derived from the results of clinical trials of 3% diquafosol ophthalmic solution in Japan.



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Expert Earns of Major Risks to Global Health

download the the 'APAO Congress' app, the current session and click the 'Q&A' at the bottom to raise your questions to every one of the speakers!



by John Butcher

Donald Tan, senior consultant at Singapore National Eye Centre (SNEC) warned of major risks to global eye health at yesterday's lunch symposium at the APAO 2019 Congress.

Challenging keratitis epidemics in Asia are a serious issue, he told a large audience, and rising levels of antibiotic resistance threaten physicians' abilities to treat patients.

Microsporidia outbreaks in 1990, recent Acanthamoeba outbreaks and global fungal and Cytomegalovirus epidemics in 2006 were serious threats to public health that could be repeated, he said, and prompted the setting up of the Asia Cornea Society Infectious Keratitis Study (ACSIKS).

The study covered eight countries and 27 centers, including India, China, Japan, Korea, Taiwan, Hong Kong, and the Philippines and collected 6,659 cases, according to Dr. Tan, and involved two phases, the completion of a clinical study, followed by the creation of a central repository of samples.

It demonstrated the huge levels of fungus infection across the region and significant differences between countries, he told the audience.

Antibiotic resistance in Asia and globally should also be deeply concerning to ophthalmologists, Dr. Tan said.

Studies of the sensitivity to *Pseudomonas aeruginosa* to antibiotics showed high levels of resistance across parts of Asia, with the highest levels in India, the Philippines and China, he continued.

Moxifloxacin has been a popular antibiotic, he added, but the penalty has been very high levels of resistance to it in countries across the region.

Most worrying is the appearance of multi-drug resistance among some bacteria, he warned, particularly in China, India and the Philippines.

When selecting which antibiotic to use in fighting an eye infection, it is important to know something about pharmacokinetics (PK), the absorption, distribution, metabolism and excretion of a drug, which is dependent on the route of administration, and pharmacodynamics (PD), the biological and therapeutic effect of a drug, continued Dr. Tan.

PD is the more important of the two as it tells us how a chosen antibiotic works for a particular organism, he added.

Minimum inhibitory concentration (MIC), which falls under PD terminology, refers to the lowest concentration of a drug needed to prevent visible growth of a bacterium after overnight incubation, he added. When an organism is resistant to antibiotics the MIC level rises, he said.

On occasion, although a bacterium is resistant to a particular antibiotic, increasing the concentration can have an impact by raising the MIC level, he added, although the risk benefit ratio of effect and safety due to added toxicity should be considered in doing so.

Dr. Tan then described his own antibiotic approach, which he said involved using levofloxacin, which "appears to be the best broad spectrum antibiotic for general use, simply because of its lower resistance compared to moxifloxacin and gatifloxacin."

In severe cases of bacterial keratitis an aggressive dosing of either combination treatment (fortified gentamicin/cefazolin) or aggressive monotherapy can work, he said.

In milder cases of bacterial keratitis, aggressive monotherapy alone, involving frequent dosing of preservative-free Levofloxacin can also have an impact, he added.

In corneal surgery, Dr. Tan said he uses Cravit 1.5% 3H (Santen, Japan) with a high dose of topical steroids, gradually tapering the steroids and then stopping the antibiotics completely.

In the last two years, he said he had also switched from Cravit 0.5% to Cravit 1.5% for all corneal infections and surgical prophylaxis surgery.

Cravit has several major advantages, he added, as it can be used in high concentrations due to its low toxicity and has low antibiotic resistance. ☺



Dr. Donald Tan



'Youth Forum' at APAO 2019

by Gerardo D. Sison III

As the field of ophthalmology is growing with young and upcoming ophthalmologists, more opportunities to engage in the profession are becoming more accessible for young ophthalmologists (YO). We'll go over some interesting programs and other pieces of advice for young ophthalmologists (YO) organizations that were discussed in the youth forum at the APAO 2019 Congress yesterday.

Joining a YO organization

Dr. S. Grace Prakalapakorn kicked off the session with an introduction into the world of YO. As a past member of the AAO YO International Subcommittee, Dr. Prakalapakorn wanted to share her thoughts on updated activities for young ophthalmologists around the world. So who exactly is a young ophthalmologist?

According to different societies and meetings, the definition can range anywhere from members in training to residents, fellows, and specialists in their first five years of practice. For example, the Hong Kong Ophthalmological Society includes all trainees up to three years post-fellowship. Despite the differences in definitions, young ophthalmologists are generally still developing their skill-set and mode of practice.

Many of these YO organizations and committees have similar goals such as addressing the educational needs of new ophthalmologists, communicating concerns to leadership members, and supporting involvement in various activities. Dr. Prakalapakorn suggested joining AAO or another organization and attending regular meetings to expand YO networks. YO members can even contribute articles to different programs such as the EyeWiki International

Ophthalmology contest.

There are many international resources for YOs around the world. For those in countries considered developing nations may be eligible for free membership in various YO organizations. The Global Ophthalmology Guide on the One Network provides worldwide, region-specific information on topics such as diabetic retinopathy and angle closure glaucoma. Some online CME courses are also available from John Hopkins.

In the Asia-Pacific region, there are several organizations, such as those in India and Hong Kong. The Singapore Society of Ophthalmology (SSO) was not only established to increase participation and engagement of YOs but also to support research aspirations and set up platforms for scientific presentations. Their three main pillars of focus are communication and engagement, education and fellowships, and community outreach and volunteer work.

Starting a YO chapter

Dr. DivaKant Misra, a vitreo-retina surgery fellow and general secretary of Young Ophthalmologists Society of India (YOSI), gave some practical tips on setting up a YO chapter. Why start a YO chapter? It provides an opportunity for leadership development and creates local involvement and awareness for the organization.

Forming a subcommittee of an existing organization can be done by requesting guidance and acceptance from leadership members. Once it is approved, a committee should be formed consisting of a president, vice president, secretary, treasurer and other executive members as needed. When choosing leaders, it's important to find

someone passionate because there is no pay involved and it involves plenty of spare time.

Starting from humble beginnings, YOSI has developed into what it is today since 2013. According to Dr. Misra, other chapters can learn from its success to garner increased participation in the organization. For instance, creating opportunities for magazine publications can increase involvement and participation in the community with additional collaboration in leadership sessions. On a similar note, having a very strong leadership can help create further collaborative action with other organizations.

Creating mentor-mentee programs can also be integrated into YO organization chapters. Social activities and international collaboration can further increase awareness and create involvement in the community. Hosting educational sessions and workshops can help drive YO participation and growth in the profession. For instance, YOSI held a "hackathon" where doctors and engineers were brought together to come up with unique solutions for healthcare.

With the prevalence of the internet and social media, organization chapters can also create YouTube channels for educational purposes. Facebook groups and pages can also increase connectivity and drive more teaching opportunities for YOs.

Overall, there are many ways for young ophthalmologists to be active as they grow in the field. The prevalence of many organizations and resources has made it easy for YOs to stay involved, collaborate with others, and become leaders. As discussed in this brief youth forum, many of these tips can be utilized to join an organization and create active chapters that drive their mission.



Clinical Pearls in *IOL Fixation*

by Khor Hui Min



Dr. Athiya Agarwal



Every surgeon faces a dilemma when implanting an intraocular lens (IOL) in an eye with a deficient or absent capsule. This symposium is intended to help delegates master the various techniques to use in such scenarios, including sutured IOL, Hoffman pockets, iris supported IOL, anterior chamber (AC) IOL, toric IOL, glued IOL or Yamane technique.

In this symposium chaired by Dr. Amar Agarwal, Lt. Col. Dr. Sritatath Vongkulsiri and Dr. Shin Yamane, many videos showcasing the various techniques were shown for better understanding.

Dr. John Chang, president of the International Society of Refractive Surgery, talked about premium IOLs in the setting of capsular rupture or instability. According to Dr. Chang, for sulcus fixation vs. bag fixation, he found that sulcus fixation IOLs had the worst refractive outcomes (27 eyes, 31.8%, within 0.5D vs. 51 eyes, 52%, within 0.5D bag-fixed, $p > 0.001$).

"For stability, it is best to use 3-piece IOL bag-fixed," said Dr. Chang. With $p = 0.007$, sulcus fixation is slightly worse than bag fixation. None of the bag 3-piece IOLs had dislocated nor needed secondary surgical procedures. As a comparison, 2 of in bag 1-piece IOL needed secondary surgery.

However, visual acuity was best with 1-piece IOL bag-fixed (42.3% for 3-piece IOL vs. 55.6% for 1-piece IOL) achieving final refractive outcome ($\leq 0.5D$ of target, $p = 0.183$).

For anterior capsular (AC) tear, he found that in 6 patients with 14.7 months follow-up (range: 9-22 months), all eyes had AC tears bridged by fibrous tissue.

Strong zonular forces in the region of the equator then resist further extension of the tear into the posterior capsule. The edges of the tears remained sufficiently opposed to allow bridging by fibrous tissue. In cases like these, haptics should be placed 90° away from ART.

On the other hand, in cases with anterior capsular extension, visual acuity is best with 1-piece bag, but needed 2 secondary interventions. Stability was best in 3-piece bag. The lens should be placed 90° away from the tear.

Prof. Dr. David Chang, an internationally recognized cataract subspecialist and founder of the Peninsula Eye Surgery Center in California, USA, presented on sulcus fixation of 3-piece IOLs with severe zonulopathy. He talked about suturing the capsular tension ring (CTR) to the sclera, suturing the haptic to the iris, moving it to the sulcus, sulcus and iris suture, and AC IOL.

Dr. Athiya Agarwal, founder and director of Dr. Agarwal's Eye Hospital in India, presented on tips, tricks and techniques revolving around glued IOLs. Meanwhile, Dr. Amar Agarwal, chairman and managing director of Dr. Agarwal's Eye Hospital and Eye Research Centre, presented on glued IOLs in combination with other surgeries including IOL scaffold, single-pass four throw pupilloplasty and pre-descemet's endothelial keratoplasty (PDEK).

Dr. Shin Yamane from Yokohama University Hospital, Japan, spoke in detail about the theory and application of the Yamane technique. It is a sutureless needle-guided intrascleral IOL implantation technique with lamellar scleral dissection, which was

first published by Dr. Yamane in 2014. At the American Society of Cataract and Refractive Surgery (ASCRS) 2016 annual meeting two years later, Yamane was awarded the Grand Prize for his video on the technique. The flanged IOL fixation technique is a simple and minimally invasive method for achieving good IOL fixation with firm haptic fixation.

Besides that, Dr. Hungwon Tchah from the University of Ulsan, South Korea, spoke on the iris claw IOL.

"The retropupillary fixation of an iris claw lens is one of the good options for aphakic patients. Results are comparable to scleral-fixed posterior chamber intraocular lens (SF PCIOL). It's a short learning curve, but a longer follow-up may be needed for the endothelial cell density (ECD)," said Dr. Tchah.

Prof. Dr. Soon-Phaik Chee from the Singapore National Eye Centre talked about the sutured CTR. According to Dr. Chee, subluxated in-the-bag IOLs with plain or modified CTR can be scleral fixated and restored to position. Capsular tension segment (CTS) can be inserted into a capsular bag that can be dissected open.

Besides that, Dr. Takeshi Sugiura from Sugiura Eye Clinic in Japan presented on the scleral suture fixation and understanding with an endoscope and UBM. Lt. Col. Dr. Sritatath Vongkulsiri from the Phramongkutklao Hospital, Phramongkutklao College of Medicine, Bangkok, talked about the pars plana refixation of dislocated IOL.

The detailed examples and videos were very informative and illustrative, and we hope the delegates will benefit from the symposium. ☺



Gazing into the Future of Retinal Diseases

by Joanna Lee

A new kind of aroma is arising from various labs and institutes of researches around the world and this morning's session represented a microcosm of what's freshly cooking in the area of translational research.

In his first time at APAO Congress and as one of the chairs of this session, Dr. R. Theodore Smith, the Director of Biomolecular Retinal Imaging at New York Eye and Ear Infirmary of Mount Sinai in New York, USA, introduced "Hyperspectral Autofluorescence Imaging for Early AMD Detection". The prototype of this hyperspectral AF detects RPE fluorophores and has a separate signal for detecting drusen and sub-RPE deposits.

The use of artificial intelligence (AI) in creating IPS-derived RPE cells was discussed. Dr. Masayo Takahashi said the process to derive "beautiful RPE cells" needs "sommeliers". So, they employed the help of labdroid – "Mahoro". The robot, according to Dr. Takahashi could

learn and produce more stable and better culture condition within a shorter time, with precision.

Dr. Tae Yokoi discussed pathologic myopia and the importance of using anti-VEGF therapy early to prevent the formation of CNV-related macular atrophy. An interesting point she mentioned was CNV-related macular atrophy is not so much an atrophy as it is a "hole in the Bruch's membrane" and thus, it's better to fix Bruch's membrane.

Dr. Kelvin Teo from the Singapore National Eye Centre shared the results of their primary study investigating safer delivery of the non-pathogenic adeno-associated viral vector (AAV) to the retina during gene therapy. The peel and pool method was used to counter the challenge with the internal limiting membrane and was found to be an effective and sustainable method.

Meanwhile, virtual imaging clinics can optimize diabetic retinopathy (DR) screening referrals and ocular imaging has

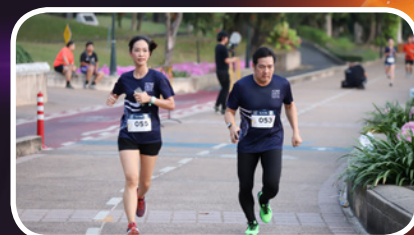
the potential to predict the development of the disease. Dr. Gavin Tan shared these lessons from the development of a national DR screening program in Singapore. Telemedicine involving non-physician graders was accurate and cost-effective for DR screening. Data gleaned from telemedicine can be used to develop artificial intelligence to screen DR.

Victor Chong, a consultant ophthalmic surgeon from Optegra Eye Hospital and Royal Free Hospital, London, UK, presented his ongoing research in developing a pupillometry using the smartphone to allow diagnosis and monitoring of DR. A "retina selfie" was even proposed. However, he listed the challenge in imaging the retina via smartphones as it requires pupillary dilation and is looking for collaborators.

Last but not least, Dr. Ki Ho Park shared an interesting development of technology that allows for continuous 24-hour monitoring of IOP fluctuation, blood pressure and body position. 🧐



APAO Charity Run: Run for Sight! Run for Life!



Women: Holding up Half the Sky in Tough Cases

by Joanna Lee

“Women hold up half the sky,” – so goes a Chinese saying. And what could not be more befitting than a group of women ophthalmologists gathering on an International Women’s Day morning at the APAO 2019 Congress in Bangkok, Thailand, to look into complicated retinal cases together at the WIO (Women in Ophthalmology) Symposium titled “Unlocking the Doors to Challenges in Medical Retina and Uveitis”.

In a session chaired by Drs. Shu-yen Lee, Kessara Pathanapitoon and Seung Young Yu, the audience was drawn into a journey filled with perplexity and at times, a glimpse into the valley and hopes of each patient as seen through the different cases brought to light by an all-women line up of physicians.

Dr. Nuzhat Choudhury from the Department of Ophthalmology at Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, shared about a 48-year-old patient who had presented 6 years ago with complaints of a reduced vision in her right eye for 10 days. In this case, the patient was diagnosed with vasculitis retinae but she was also later treated with Anti-Koch’s therapy while also treated for diabetes mellitus. This case highlighted questions pertaining to the side effects of steroids in treatment which raises morbidity. Immune modulating drugs, according to Dr. Choudhury, also have their own side effects. Furthermore, the complication is raised when the patient has low tolerance to both steroid and immune modulating drugs.

The next two cases presented by Dr. Mirna Kumaradas led to a diagnosis of the rare auto-immune retinopathy which were characterized by anti-retinal

antibody positivity, visual field loss with photopsia and nyctalopia and absence of fundus lesions or degenerative diseases that can explain the VF or ERG loss. Dr. Kumaradas called for the establishment of a comprehensive diagnostic criteria and a standardized assaying system as first steps to understanding this disease which could cause blindness.

A 14-week pregnant woman with sudden vision loss in her right eye came to Dr. Anne-Marie Lobo from the University of Illinois at Chicago, USA. In this case, it was the challenge of treating multifocal choroiditis (MFC), an inflammatory chorioretinal disease of unknown etiology, and choroidal neovascularization (CNV) that was addressed. Dr. Lobo’s presentation highlighted that there may be difficulty differentiating between CNV and inflammatory lesions while looking at the OCT-A.

As the patient was treated with anti-VEGF during her pregnancy, questions also arose on the role of anti-VEGF treatments during pregnancy as there isn’t any definitive guideline. Although the patient successfully gave birth to a baby girl two weeks ahead of her due delivery date, this case also posed a challenge to doctors to think about the possibility of anti-VEGF usage associated with spontaneous maternal and/or fetal complications such as spontaneous abortion, pre-eclampsia and congenital anomalies.

Both Dr. Nor Fariza Ngah from Malaysia and Dr. Eli Pradhan, president of the Nepal Vitreo Retinal Society next presented cases for which they sought advice and help from the panel of chairs and members of the

audience. For Dr. Eli Pradhan’s 60-year-old female patient who was diabetic and hypertensive for 5 years, the case confounded the audience as the patient presented with a diminishing vision which had been going for 8 years. There was no history of similar illnesses, ocular trauma, previous surgeries or prolonged use of medications. FFA and MRI on the brains showed nothing conclusive. She was diagnosed with RE choroidal hemangioma and given plaque brachytherapy and subsequently with sector retinal photocoagulation and anti-VEGF treatments a year later. Her VA then improved to 6/60 from 2/60 before plaque therapy and was maintained for a year. However, it is now 1/60. Her optic disc remains pale. Is it recurrent choroidal hemangioma? Radiation retinopathy? Or CRVO? Or CRVO with macular edema? Many other doctors came forward during the Q&A session to offer empathetic advice.

“Detailed history taking and clinical alert is a key to early diagnosis” said Dr. Shwu-Juan Sheu from Kaoshiung Veterans General Hospital, Taiwan, in a light-hearted presentation put forth the discovery of her female patients’ photophobia, photopsia and metamorphosia that was related to the latter’s intake of topiramate drug for weight loss upon her inquiry into her lifestyle and history.

As characterized by the patients’ journeys, the session took on an empathetic and human tone. It was also peppered by several doctors from the audience expressing their joy of being present at the session along with wishes for a “Happy International Women’s Day”. ☺



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FLACS Promise Better Safety and Outcomes in

by Hazlin Hassan

With more and more cataract patients asking for better vision, it has become increasingly important for surgeons to reduce refractive error. However, there are a number of potential sources of errors in cataract surgeries.

Femtosecond laser-assisted cataract surgery (FLACS) provides many advantages for patients undergoing cataract surgery and helps surgeons avoid errors, several doctors shared yesterday at the surgical video symposium titled "Optimizing Outcomes with Innovative Cataract Refractive Suite Technologies" during the APAO 2019 Congress in Bangkok, Thailand.

The main advantage of using femtosecond laser-assisted cataract surgery is having a well-centered, standardized capsulotomy, and greater precision and predictability.

The Cataract Refractive Suite by Alcon, the world's first and only complete cataract refractive suite, offers advanced technologies to assist in every phase of the procedure.

Dr. Haripriya Aravind, who is in practice in India, said that with any phacoemulsification procedure, what is most critical is to have good fluidics and anterior chamber stability. This is all the more true when dealing with challenging cataracts, she said.

The Alcon CENTURION provides anterior chamber stability during each step of surgery, and offers optimized energy technology through enhanced fluidic management and surgical precision. It combines multiple intelligent phaco technologies and other key features, including Active Fluidics Technology, Balanced Energy Technology and Applied Integration.

"With the CENTURION phaco system, with Active Fluidics, one is able to set a target intraocular pressure and the machine tries to maintain the IOP based



Cataract Surgery



on what has been set," she said.

In challenging cases, the combination of appropriate techniques and technology increase the margin of safety and improves efficiency, she said.

Advances in surgical techniques have resulted in smaller incisions, continuous capsulotomy, IOL in the bag, more accurate measurements, refinement of IOL power formulae, and improved IOL technology, said Dr. Tim Roberts, from Australia, who was one of the earliest users of FLACS and has 9 years of experience using the system.

FLACS helps to make cataract surgery a precise and reproducible laser procedure, he said.

There is also evidence that FLACS is as safe and could be safer than conventional manual cataract surgery, he noted. FLACS creates a more precise capsulotomy, and reduces ultrasound energy usage, postoperative corneal edema and corneal endothelial cell loss.

He listed situations where FLACS is most beneficial, including compromised endothelium, shallow anterior chamber, dense cataract, zonulopathy, and capsule issues.

In most studies, complications did not arise in complex cases, he said, adding that FLACS has been found to be beneficial in all cases. "Capsulotomy is consistently round and intact, eliminating the risk of the manual capsulotomy tearing out when the zonules are weak."

The pre-fragmented nucleus allows surgeons to do much less manipulation in the bag with lower phaco power and time, reducing the risk of zonular dialysis, corneal endothelial cell loss, and

iris prolapse.

There are caveats, however, according to Dr. Roberts. Difficult cases are difficult, Alcon's LenSx femtosecond laser system is not a 'genie in a bottle' and surgeons should perform 10 successful FLACS cases before doing a difficult case, he said.

Dr. Prin Rojanapongpun, from Thailand, shared with delegates a video of him conducting cataract surgery using the VERION Image Guided System which can help minimize data transcription errors, improve clinical efficiency, increase toric and multifocal IOL confidence, ensure surgical consistency, and boost visual outcomes.

"With the VERION overlay, I can see everything, all the numbers. It shows what parameters I am working on," he said.

The VERION Image Guided System is a completely new way of looking at cataract refractive surgery. Instead of checking for refractive error at the end of the procedure, VERION helps minimize potential sources of error during each step of the surgical process.

He also used the ORA SYSTEM technology, which is a real-time intraoperative refractometer that uses wavefront aberrometry to assess the refractive power of the eye during surgery. It also allows surgeons to position the IOL correctly.

"It seems that the ORA does outperform our routine planned IOL," he said to a question by moderator Dr. Ronald Yeoh, from Singapore, on patient outcomes. ☺

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