

APVRS SHOW DAILY

The Official Conference News of APVRS 2018

by **pie** magazine
posterior segment • innovation • enlightenment

Highlights

- 5** Genetics-based therapies are emerging to combat retinal diseases.
- 10** Young ophthalmologists gathered to learn from the experts in the field.
- 14** With 3D visualization, surgeons can see more and do more.

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by *Hazlin Hassan*

The 12th Congress of the Asia-Pacific Vitreo-retina Society (APVRS) opened yesterday to the spectacular beat of drums, as more than 10,000 delegates gathered at the modern COEX Convention and Exhibition Center, Seoul, Korea.

"We tried very hard to prepare prestigious scientific programs, to invite distinguished speakers from all over the world, and to hear experiences and studies from Asian countries. I hope all of you will enjoy this, as well as enjoy Seoul," Professor Won Ki Lee, Congress President, said in his welcome address.

He recalled the third meeting of the APVRS held in Busan, South Korea, more than ten years ago, which he described as a small yet familial and friendly event.

Since then, the APVRS has grown tremendously, as the number of attendees in Seoul has shown.

Next year, the 13th meeting will be held in Shanghai, China, with some 5,000 delegates already slated to attend, he said.

"Outside is very cold, chilly and even snowing. But inside here, our hearts are filled with warmth and excitement," Professor Dennis Lam, President of the APVRS said in

his welcoming speech, referring to the minus degree weather which blanketed Seoul in a layer of snow on Thursday.

Delegates from some 30 countries have gathered at this week's meeting, he noted.

"APVRS is developing very quickly, reaching new heights every year. This annual congress is growing in content and quality, drawing more and more delegates," he added.

Cont. on Page 8 >>

Photo of the Day



Dancing with the stars of APVRS



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wet AMD (wet age-related macular degeneration), DME (diabetic macular edema), BRVO (branch retinal vein occlusion), mCNV (myopic choroidal neovascularization)

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Emerging Horizons

The Case of Treat-and-Extend for nAMD

by Joanna Lee

"Our pivotal studies leading to the introduction of anti-VEGF treatment have been really proactive, if you really think about it," said symposium chairman, Dr. Adrian Koh, who is also the founding partner and senior consultant at the Eye & Retina Surgeons, Camden Medical Centre in Singapore. He was drawing on the main goals of the symposium to highlight the importance of proactive treatment regimens for neovascular AMD (nAMD) at a lunch symposium yesterday at the 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018) in Seoul, Korea.

While fixed treatments are standard, acting before the disease advances is defined as being proactive, Dr. Koh said in the opening of the symposium.

Professor Srinivas R. Sadda from the Doheny Eye Institute, USA, expounded on the proactive treatment approach.

In treat-and-extend, the treatment is initiated with loading doses until the disease is stabilized. This simply means that they would gradually extend the treatment time between treatments until the fluid recurs of VA decline, that is, to determine the "maximal fluid-free interval".

However, the treatment interval will be adjusted according to the VA or anatomic response. This is in contrast to the reactive *pro re nata* (PRN) strategy where patients are monitored regularly and treated according to their VA or anatomic criteria.

He highlighted that a majority of clinicians are now using T&E, with many indicating they would treat the condition until it is dry on OCT and then move on to T&E. He showed that in randomized controlled trials, a proactive aflibercept regimen is associated with good visual outcomes in Year 1 and beyond, with as much as 48% of patients who had received aflibercept in the first year maintaining VA gains in the second year with injection intervals of 12 weeks.

He gave examples of a few case studies involving individual patients

which demonstrated the interval periods between treatments and how effective the timed intervals are in T&E, drawing attention in particular to the multi-centered, randomized and open labeled ARIES study involving 287 patients which was designed to assess the efficacy of "early" versus "late" initiation of T&E with aflibercept in nAMD over 2 years.

It was concluded in the ARIES study that aflibercept T&E in the first year produced similar outcomes to q8 dosing ("late-start" T&E) with fewer injections at the week 52 interim analysis. Clinical practice also indicates that proactive T&E dosing with aflibercept can achieve VA gains in the first year which are then maintained later with the need for fewer injections. This also means that T&E may therefore reduce the burden of treatment on both patients and caregivers.

Furthermore, Professor Masahito Ohji from Shiga University of Medical Science, Japan, shared his findings on the ALTAIR study which sought to determine an optimal regimen for T&E.

The randomized study involved a 2-week versus 4-week interval adjustment during a treatment with T&E using aflibercept. Prof. Ohji said the usual T&E regimen involved extension or shortening of the intervals but the unique feature of the ALTAIR study is in the maintenance portion of the study. "If the patient has residual but decreased fluid, the interval was maintained as the previous one with the minimum interval being 8 weeks and

the maximum interval at 16 weeks,"

Prof Ohji said that all in all, the VA gains were achieved in both treatment groups after the endpoint of the first year with VA gains maintained to Week 96 in both treatment groups. Up to 60% of patients reached their last treatment intervals of 12-weeks or beyond at Week 96 while 46% of patients reached the last treatment interval of 16 weeks at Week 96. The safety profile of intravitreal aflibercept in ALTAIR was also consistent with results from previous studies, he said.

In another exciting study, Dr. Min Sagong from the Department of Ophthalmology at Yeungnam University College of Medicine, Daegu, South Korea, and his team used a modified protocol where the early recurrence group using T&E had improved or maintained VA in all eyes while the late recurrence group using PRN had it in 92.8% at 12 months.

The study also suggests that the choice of the treatment regimens according to the recurrence interval during the observation phase is clinically meaningful. With the results, Dr. Min shared this regimen might be an ideally individualized protocol for neovascular AMD with diversity in Korea.

Overall, the emerging data from clinical trials underscore the efficacy of aflibercept T&E in the first year and beyond. In clinical practice, proactive T&E regimen with aflibercept is tied with rapid vision gains that are maintained with a reduced burden of treatment for patients. ☺

The 12th APVRS

Korean Healthcare Guideline for nAMD

Management of nAMD patients:
Within the scope of the approved label, the criteria below is reimbursed for nAMD without the limitation of injection number. nAMD is classified as "rare & incurable disease" and the patients pay only for 10% of total treatment cost.

1. Subject: Patient who has subfoveal choroidal neovascularization by age-related macular degeneration, except for patient with (fractiform) scar or atrophy.
2. Administration method:
 - (1) If there is no clinical improvement after initial 3 injections, following treatment will not be reimbursed.
 - (2) Switch from ranibizumab is allowed (with dosage report), if there is no clinical improvement after 3 injections with switched Eylea, following treatment will not be reimbursed.
 - (3) From 5th injection, treatment for a patient with BQVA 0.1 or below will not be reimbursed (in case of monocular vision, reimbursement will be decided case by case).
3. Combination therapy with Verteporfin (Visudyne) will not be reimbursed.

Bevacizumab is not approved for nAMD in Korea and the reimbursement criteria of Ranibizumab/Lucentis[®] is same as Eylea.

- In previous label in Korea
- At least 8-week interval should be kept after 3 monthly loading for aflibercept
- Following treatment is reimbursed only with the signs of recurrence.
- Therefore, standard T&E regimen cannot be applied in Korea.

Speakers Focus on

“Industry Controversies”

by John Butcher

Speakers focused on some of the more controversial issues facing the ophthalmology industry in one of yesterday's sessions at the 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018).

Questions were posed on a number of issues from the risks and rewards of floaterectomies to the place of lasers in an industry rapidly shifting to drugs, and the use of artificial intelligence.

American ophthalmologist Dr. Richard Spaide took on the mantle of defending optical coherence tomography (OCT). He posed the question of its purpose, before answering with a series of examples, each demonstrating an occasion where OCT uncovered something often unrelated to the original complaint, including a 71-year-old man who had central retinal vein occlusion of the right eye and had been treated elsewhere with anti-VEGF agents. In his case, an OCT scan uncovered a carotid doppler that otherwise may have been missed, he said.

It is a quick test, he told the audience, which shows vascular layers not visible to other testing and offers multiple opportunities, including the detection of vascular disease, research into diabetes, monitoring AMD and evaluating vision loss.

One of largest controversies in ophthalmology is whether lasers or drugs should be used to treat macular diseases, Malaysian ophthalmologist Kenneth Fong told the audience.

Experts have come down strongly on both sides of the argument, he said. Dr. Jeff Luttrull said that “laser has every advantage over drug therapy other than speed of action,” while Dr. Steve Charles described them as the “agonal throes of the declining laser industry.”

Recent statistics on the use of lasers and drugs show drugs are winning, he said, with the use of intravitreal injections to treat eye conditions rising dramatically since 2005, while the use of lasers has been in sharp decline.

However, lasers should not be abandoned, Dr. Charles argued. Many countries need laser treatment because they are unable to afford continuous,



Dr. Richard Spaide



Dr. Jorge Fortun



Dr. Daniel Ting

unending, intravitreal injections, while in some cases patients are unresponsive to drug therapies, he said. In addition, there are an increasing number of cases of diabetic macular edema (DME), central serous chorioretinopathy (CSCR) and proliferative diabetic retinopathy (PDR), for which laser treatment is helpful.

There are issues with subthreshold laser use, he said, including variable treatment parameters used in published studies, a high risk of undertreatment by inexperienced users, and a lack of any trials comparing subthreshold lasers with anti-VEGF.

However, there are a wide range of diseases it has been claimed to treat, including DME and CSR, dry AMD and PDR, among others.

Subthreshold laser treatment remains a “cost-effective option” that should not only be considered in rescue situations, he concluded. Despite a drop in its use, it still has a future in the management of retinal diseases, he added.

Dr. Jorge Fortun, associate professor of clinical ophthalmology at the Bascom Palmer Eye Institute, brought up the controversial issue of floaterectomies, and the lack of them being conducted by ophthalmologists.

He asked the audience to consider the question whether the risks were being overstated and the rewards underestimated.

Innovations in surgical technology have reduced the rate of complications, he said, with some of the latest studies showing complication rates of between zero and three percent.

Meanwhile, patient studies have shown floaters to be a significant issue for patients, perhaps more so than most ophthalmologists consider, he added.

Studies have shown 63 percent of patients with floaters were bothered by them all the time, with 71 percent having moderate to extreme difficulty reading, 62.6 percent having difficulties working, and 84.7 percent having difficulties driving.

Floaters are a serious issue for patients, he continued, citing studies that showed respondents were prepared to face an 11 percent risk of death and a seven percent chance of blindness from treatment if it could cure their floaters.

With all this in mind, there is a place for floaterectomies, he said, although he personally would always require detailed informed consent from the patient first.

Dr. Daniel Ting broached the subject of artificial intelligence and its place in the ophthalmology industry.

Describing it as the fourth industrial revolution, he said it was rapidly becoming an important part of many industries, including crime prevention, vehicles and gaming and would soon be a major factor in healthcare too following a surge of interest within the industry over the past two years.

The opportunities are many, he told the audience, including for disease prediction and mass screening. AI trials have shown it to be considerable faster than humans, often more accurate and sometimes able to detect things people simply cannot.

There remain questions over its use though, he said, such as whether technology should make final decisions on patient care, or be used as a tool by surgeons, and perhaps most importantly who takes responsibility when things go wrong.

The healthcare industry is still figuring out how exactly to use AI, he said, but there is a huge market for it waiting to be developed. 🌐

Emerging Ophthalmic Therapies from the **Genetics Frontline**



by Joanna Lee

The journey going back into the basic blueprint to unlock and expand treatment possibilities found in our genes to progress forward was a dream that now turns into reality, as Dr. Anand Rajendran pointed to a “realistic dream” in his talk entitled “The AMD Phenotype and Genetic Influences”. Looking into personalized medicine, he outlined the magnitude of AMD’s threat while arguing how genetic studies could help mitigate age-related macular degeneration (AMD).

This dream to mitigate AMD through genetics is possible as AMD is one of the most well-defined genetically of the complex retinal disorders. Over half of the heritability of AMD can be explained by 2 major loci harboring the coding and non-coding variations at the chromosome 1q (CFH) and chromosome 10q (ARMS2/HTRA1).

There have also been 52 independently associated variants spanning 34 loci identified at the genome, a widely significant association, he said.

In late AMD, they had also found a unique feature where common allele variants also have a very high effect size.

Currently, as Dr. Anand had shared through a study in India, the major determinants of nAMD (neovascular AMD) in the Indian population appears parallel to that of other populations while little is known about early AMD. However, the findings for early AMD suggest potential differences in the pathophysiology of AMD development.

Knowing the physiology is one aspect of genetics in regenerative medicine. From the treatment angle, Professor Dr. Rajendra Apte from the Washington University School of Medicine in St. Louis, Missouri, USA, shared about gene therapy in retinal disease. He shed light on the underlying conditions which determine gene therapy approaches while highlighting the RPE65, which is a key enzyme in the visual cycle.

It is found that the prevalence of RPE65-associated inherited retinal disease (IRD) is in approximately 1,000 to 2,000 patients in the US, while prevalence of Leber Congenital Amaurosis (LCA) was found in 5% of retinal dystrophies and 20% of blindness in children attending schools for the blind. However, the cost of Luxturna (Voretigene neparvovec-rzyl, Spark Therapeutics, PA, USA) in the investigations turned out to be \$425,000 per eye. He went on to discuss exciting gene therapy studies for IRD and gene therapy which targets VEGF.

Following this, Dr. Bo Lai from the Henan Eye Institute at Henan Eye Hospital discussed “Adeno-Associated Viral Vector-Mediated Gene Therapy for Leber Hereditary Optic Neuropathy (LHON), one of the most common inherited mitochondrial diseases in China where there are 150,000 cases mostly affecting males between 20-30 years old. LHON is a cause of blindness and there is no effective treatment for it to date. Using a few case studies, Dr. Bo shared how gene therapy may be a new avenue for treating LHON.

Associate Professor Dr. Elliot Sohn from the University of Iowa Institute for Vision Research, USA, then shared about “Surgical Considerations for Subretinal Injections of Gene Therapy and Stem Cells”. With the landmark FDA approval of Luxturna for RPE65 mediated IRD, questions arose for subretinal such as whether it is okay to detach the fovea or should different IRDs be treated differently, and if the size of the gauge used matters, if the speed of injection matters and what are optimal conditions and impact of cells in subretinal space. Dr. Sohn then unfolded the steps for retinal gene therapy and stem cell surgeries. In their trial, they’d found that detaching fovea may be undesirable in some IRDs, and size does matter in the sense that a 31-G gauge gives better results while the optimal temperature for the cell storage of the retinal precursor cells is 37°C.



From Johns Hopkins Hospital’s Wilmer Eye Institute, Dr. Mandeep Singh shared on “Retinal Photoreceptor Transplantation and Regeneration” where he reminded the audience to distinguish that photoreceptor transplantation increases or restores visual function while retinal pigment epithelium (RPE) transplantation protects and stabilizes vision, making a case between protection versus restoration. An interesting discovery was that photoreceptor cells do exchange cytoplasmic materials, begging the question if a new mechanism for therapy could be in the pipelines for deeper investigation. All in all, photoreceptor transplantation can restore and not just protect vision as the procedure restores visual circuit in areas of geographic atrophy. ☺

Advances Being Made in Macular Hole Surgery Techniques

by John Butcher

Research is advancing techniques to deal with macular holes, according to ophthalmologists.

A series of speakers at yesterday's 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018) in Seoul, Korea, presented new studies on macular hole surgery that potentially offer improvements in patient outcomes.

During the early morning session Dr. Liu Guangfeng of Peking University (Beijing, China) talked about macular hole surgery success rates and new techniques for treating larger macular holes.

Macular hole surgery techniques include pars plana vitrectomy (PPV), internal limiting membrane (ILM) peeling and gas tamponade, he told the audience, with success rates for small to medium sized macular hole closure of between 90 and 100 percent.

However, larger macular holes usually present an increased risk of surgical failure, he said, including a failure to close in the first place, re-opening post-surgery, and a flat open closure or flat macular hole margins with bare retinal pigment epithelium.

In 2010 the inverted ILM flap technique for large macular hole surgery was first introduced, he added. Professor Jiang Yanrong and Professor Ma Zhihong had since suggested the ILM peeling technique plus the flute needle technique could be effective in treating large macular holes.

Dr. Liu was involved in a study to examine those claims, which included 23 patients who had undergone macular hole surgery using ILM peeling plus flute-needle vacuum assistant hole closure and air tamponade, at Peking University Institute of Hematology, between February 2017 and June 2018.

During the surgeries included in the study a flute-needle was attached to the vitrectomy machine, he said, and a foot pedal was used to control the vacuum.

The result was that 75 percent of holes were closed in 3 days post-surgery and after air-fluid exchange all macular holes were closed, with visual acuity significantly improved.



Prof. Wen-Chuan Wu

He concluded that the flute-needle vacuum assistant closure technique for large idiopathic macular holes could improve closure rates, but that further study is needed to compare the improvement of visual function from the technique with the inverted ILM flap technique.

Professor Wen-Chuan Wu, of Kaohsiung Medical University in Taiwan, also looked at macular hole closures, talking specifically on the management of refractory macular holes with blood and gas assisted autologous neurosensory retinal free flap transplantation.

There have been a series of advances in macular hole surgery over the years, he told the audience, with the discovery in 1991 that PPVT combined with vitreous cortex detachment and fluid-gas exchange could close macular holes in a significant number of cases, through the introduction of ILM peeling in 1997, and research on autologous internal limiting membrane fragment transplantation for refractory macular holes in 2015.

While progress has been made, the fragile nature of the ILM has made repositioning an autologous flap within the macular hole difficult, with the flap often lost during fluid-gas exchange, as well as scar formation on the macular hole after surgery in many cases, he said.

His research has been aimed at evaluating the anatomical and functional outcomes of autologous neuroretinal transplantation combined with whole blood or viscoelastic materials using the treatment of ten eyes with huge post-vitrectomized refractory macular holes.

The research's conclusions, he said, had been positive, with the neurosensory retinal flap thicker, with sturdier tissue and more easily positioned on the surface of the macular hole, in contrast to an ILM flap.

The neurosensory retinal free flap acts as a scaffold and forms a macular plug to seal the macular hole, he said, although the exact mechanism by which it does this remains unclear.

Post-surgery examinations showed an easily distinguishable neurosensory retinal flap in the macular hole and integration between the retinal graft and retinal layers, suggesting that autologous neurosensory retinal free flap transplantation "may represent an innovative technique for treatment of huge post-operative refractory macular hole."

Dr. An-Lun Wu maintained the theme, talking about the treatment of macular hole retinal detachment with macular plugs in highly myopic eyes.

Macular hole retinal detachment is a "vision-threatening" complication of pathological myopia, the best treatment for which is still under discussion, he told the audience.

Macular buckling had been the favored technique, he said, but vitrectomy had become recognized as a more successful treatment since 2013.

His research had been on 35 cases of highly myopic eyes with MHRD, who underwent an initially successful vitrectomy with a macular plug and were reviewed over a space of three years.

It concluded that the macular plug technique provided "favorable" long term outcomes, but that late reopened macular hole and retinal detachment could occur up to one year after the primary successful surgery. The main risk factors for postoperative visual deterioration were progression of myopic maculopathy and the pre-existing disease of glaucoma, he added. 🌀



While a hole is becoming of a donut, we cannot say the same thing about the macula.



한국망막학회
The Korean Retina Society



The 12th APVRS

Congress of Asia-Pacific Vitreo-retina Society

SEOUL 2018



December 14 - 16

Coex Convention and Exhibition Center, Korea



>> Cont. from Page 1



"Seoul is a vibrant city where the traditional and the cutting edge exist side-by-side in perfect harmony. I hope you make the most of your time here at the congress and also in the city. We hope to see you again next year in Shanghai," he said.

APVRS Secretary-General Associate Professor Andrew Chang reminisced about the year 2006 when three visionaries, Yasuo Tano, Dennis Lam, and Ian Constable, thought about creating a network among the Asian countries to share knowledge and promote research and education in the field.



APVRS Tano Lecture awardee
Prof. Masahito Ohji (left)

This opening ceremony saw this year's APVRS Tano Lecture awarded to Professor Masahito Ohji, Professor and Chairman, Shiga University of Medical Science, Japan.

The APVRS Tano Lecture was established in 2009 in memory of Professor Yasuo Tano, APVRS's founding President.

Every year, the APVRS honors an individual of over 45 years of age for exemplary leadership and significant contributions in advancing the understanding, diagnosis and treatment of vitreoretinal diseases with the APVRS Tano Lecture.

In his lecture titled "Submacular Hemorrhage," Professor Ohji paid his respects to Professor Tano, who was his professor and had advised him to specialize in the retina, and taught him how to do vitrectomies.

Professor Ohji explained the different conditions which may lead to submacular hemorrhage.

These include age-related macular degeneration (AMD), polypoidal choroidal vasculopathy (PCV), macroaneurysm (MA), pathological myopia, and trauma.

He noted that PCV is the most common disease in which patients develop submacular hemorrhage. Half of AMD patients are diagnosed as PCV in Asia, he said.

Warning on the toxicity of subretinal hemorrhage, he said that in 1982, Drs. Glatt and Machemer had experimented on a

rabbit where autologous blood was injected into the sub-retinal space of rabbits.

"Just one day after the injection, there was marked damage of photoreceptor cells. By seven days, photoreceptor cells were almost gone," he said.

Sub-retinal hemorrhage, if left untreated carries a grave visual prognosis.

One of the methods to treat sub-retinal hemorrhage include using sub-retinal injections of tissue plasminogen activator (t-PA).

"It improved in three out of five cases or 60 per cent," said Dr. Ohji.

The use of t-PA may have potential side effects such as retinal pigment epithelial toxicity, increased risk of breakthrough vitreous haemorrhage and systemic toxicity.

Other treatment strategies include injection of gas, or pneumatic displacement, anti-vascular endothelial growth factor (VGEF) therapy and vitrectomy.

"We found that pneumatic displacement is a simple and effective treatment for sub-retinal hemorrhage," he said.

Gas injected into the vitreous cavity can displace sub-retinal hemorrhage without the use of t-PA in some cases, with visual acuity after gas injection improving, making this treatment an alternative to vitrectomy.

Postoperative visual acuity following vitrectomy for eyes with massive sub-retinal hemorrhage is very poor, he noted. ☺

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Seeing the Light in Managing Diabetic Retinopathy



Management of diabetic retinopathy session panel

by Joanna Lee

It was a vignette of the current trends in the field where various strategies and technologies have come a long way in the management of diabetic retinopathy (DR), all brought to light during a session chaired by Dr. Taraprasad Das, Dr. Suber Huang and Dr. Hyung Chan Kim at the 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018) in Seoul, Korea.

Dr. Das opened the session with his presentation, giving an overview of the prevalence of DME looking at data presented from multi-center studies. One of them is the Wisconsin Epidemiologic Study of Diabetic Retinopathy, which is a long-term study. Looking at the prevalent numbers, he said this is a dangerous trend because of the increasing costs of treating the disease as the global market for DR is expected to reach \$2,490 million by 2022.

Bringing into focus on the development of new tools in the diagnosis of DME was Camden Medical Centre's director of eye and retina surgeons, Associate Professor Dr. Adrian Koh, whose presentation touched on the development of optical coherence tomography (OCT) as a revolutionary non-invasive tool to assess retinal structures at the microscopic level. Its advances has definitely allowed for faster and higher resolution scans of the macula beginning with the early time domain types to the current swept source types.

Dr. Koh pointed that the OCT has become an "indispensable tool in the diagnosis and treatment and prognosis of

patients with DME" as OCT angiography (OCT-A) in particular allows physicians to see the flow of the macula, assessment of macular ischemia via various vascular plexuses. He also highlighted the exciting possibilities that new wide-field OCT and adaptive optics-OCT will further help to broaden diagnosis capabilities. He highlighted that OCT-A is cost-effective.

With the recent development of microaneurysm being a predictor of diabetic retinopathy¹, Konkuk University Medical Center, Seoul's Dr. Hyung Chang Kim's talk on "Biomarkers in DME" touched on how DME is managed and brought up pertinent questions on whether there are different DR/DME patient phenotypes and if there are different biomarkers that can be found. He uncovered prognostic biomarkers such as systematic biomarkers like HbA1c and organ-specific biomarkers such as MA turnover and subclinical ME. Dr. Kim also touched on predictive biomarkers which are OCT patterns, disorganization of retinal inner layers (DRIL), DCP (deep capillary plexuses) loss, choroidal thickness, cytokine profile, hyperreflective foci and IRF (intraretinal fluid) volume.

In discussing "Anti-VEGF's in DME... Improving Visual Outcomes", Dr. Atul Kumar from All India Institute of Medical Sciences, New Delhi, expounded on the role of anti-VEGF therapy in DME using ranibizumab (RBZ) and bevacizumab (BCZ) and their respective DRCR protocols. Also discussed was the use of aflibercept. Overall, he pointed that physicians are

now pursuing gains in visual acuity rather than focusing on the maintenance of visual loss from DME.

In relation, Dr. Kenneth Fong from Sunway Medical Centre, Petaling Jaya, Malaysia, spoke about subthreshold laser for DME. He expounded on how subthreshold lasers work by changing the microenvironment through RPE cells with no need to kill the RPE cells. He said there are a few types of DME conditions, which are suitable for subthreshold laser, namely, when there's a clinically significant extravascular edema, fovea-involving mild edema with good vision, and within a combination treatment in thicker foveas. He concluded that subthreshold actually works while bearing in mind that surface area and density are cornerstones. It may take time to work, with 6 to 12 weeks' allowance for it to show its effect yet, it is a cost-effective measure not only to be considered when anti-VEGF and steroids have failed.

One of the meeting's chair, Dr. Suber Huang, the CEO of Retina Center of Ohio, USA, shared on the "Shifting Paradigms in the Surgical Management of Diabetic Retinopathy", giving an update on the changes in surgical approaches. He also touched on vitreo-macular traction, a topic he said that remains poorly understood and anti-VEGF treatment before surgery. Overall, he said while surgical principles remain the same, advanced instrumentation has made surgery faster and safer. He also foresaw that extended release devices, biotherapeutic, gene and cell-based therapies would give rise to more management options. In line with the previous speakers, he said the emergence of biomarkers of retinal function would improve our ability to manage the disease and predict outcomes.

Professor Dr. Michael Ip from the University of California in Los Angeles, spoke on how best to manage recalcitrant DME, looking at a study which investigates the protocols of treating this type of DME. He concludes that anti-VEGF is first line therapy for DME while observing that DME occurs in a substantial number of eyes treated with anti-VEGF. 🌐

¹ Pappuru RKR, Ribeiro L, Lobo C, et al. Microaneurysm turnover is a predictor of diabetic retinopathy progression. *Br J Ophthalmol*. 2018: 311887 [Epub ahead of print]

Tricks and Tips for Young Eye Surgeons



Dr. Adrian Fung

by John Butcher

Ophthalmologists gathered at a special event aimed at young eye surgeons on the first day of the 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018) yesterday in Seoul, Korea.

Australian ophthalmologist Adrian Fung opened the session with advice for younger surgeons; a series of tricks and tips that he said would help them perform operations better and with less stress.

"Every step in an operation counts," he told the audience, "from the moment you walk in the room." Not getting things right at the beginning can make other steps more difficult leading to a "snowball" of problems, he warned.

Surgeons should always have a plan, he continued. Not just one, but a plan A, a plan B and a plan C.

"You need to mentally think through the surgery before you begin," he said, and having prepared plans in place, and back-up plans in case things change, makes the job easier.

A surgeon works best if they know what to do in emergencies, he continued, before advising younger surgeons in the audience to keep a syringe and sterile air on hand that can be injected into an eye to maintain pressure if needed.

"You want to do a minimum of steps

to achieve your goal," he said. "Younger surgeons tend to go over things too often and second guess themselves. The longer you spend in the eye the harder it is and the more complications you might cause."

He advised the audience to be friends with their surgical team, to keep them informed, let them know what equipment is to be used and in what probable order.

"You're only as good as your surgical team," he said, adding that awareness of what is happening and what others are doing in the operating room is highly important.

Knowing the equipment well is also important to conducting a good operation, he added. Many ophthalmologists train well, but do not know their equipment and fail to have a plan in case machinery fails.

"Visualization is everything," continued Dr. Fung. "I am constantly thinking when I am operating, how can I improve the view?"

That might mean moving blood from the cornea or something else that gets rid of obstructions and maintains clear sight.

That may mean conducting certain parts of an operation early, while visibility is still good, he said, adding, "Laser first if the view is good for example."

When conducting a vitrectomy, be systematic, he advised. "Cut as you enter

and cut as you exit. It will reduce drag," he said.

Stress is a major issue for ophthalmologists, noted Dr. Fung, and in times of stress there is a "tendency to speed up."

When that begins to happen, a surgeon should "stop and reassess the situation calmly," he added.

Junior surgeons will inevitably encounter complications during surgery, he told the audience, and in such an instance it is important to talk with colleagues.

Try to have high personal expectations for operations but lower them for patients, he added.

He advised surgeons to document everything, not with notes but in graph form, which he said was "worth a thousand words."

"I video all my surgery because you never know when you might have complications," he said.

Finally, he advised younger surgeons to learn from both their own experiences and those of others.

"The more pros and cons you know the better you will be," he said. "Force yourself to learn new techniques as a young surgeon." 🗨️



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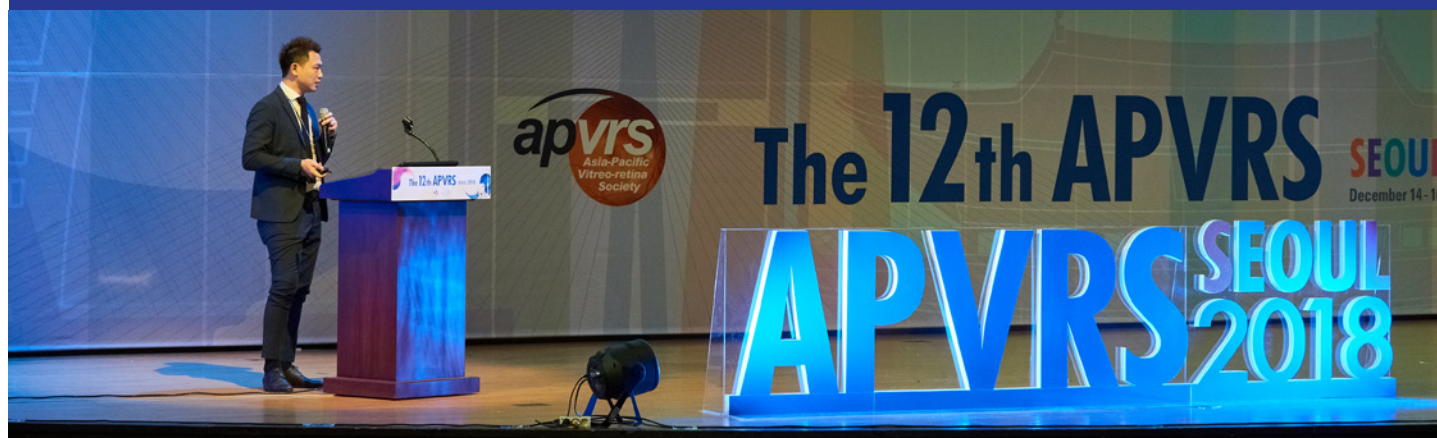


The PIE family at VRSI, Jaipur



All That Glitters is GOLD

(Or Setting Gold Standards in State-of-the-Art Retinal Imaging)



by Hazlin Hassan

Deep learning and swept-source optical coherence tomography are some of the latest exciting developments that may well set gold standards for retinal imaging, delegates at the 12th meeting of the Asia-Pacific Vitreo-retina Society (APVRS) in Seoul, heard yesterday.

Dr. Daniel Ting, consultant at the Singapore National Eye Center, presented on the latest developments in 'Deep Learning in Retina.' Deep learning has sparked great interest in the medical world, he said.

Some say ophthalmology is the best field to test out artificial intelligence (AI) techniques in the healthcare industry, with a goldmine of sheer volume of data and imaging methods that make it the perfect area for advances in computer. The AI system picks up pixels invisible to the human eye, said Dr Ting.

Deep learning has brought about breakthroughs in processing images as the algorithm can more accurately detect a patient's risk in developing diseases using a scan of their retina.

In a 'Deep Eye' study to develop and validate a Deep Learning System (DLS) for Diabetic Retinopathy and Related Eye Diseases Using Retinal Images from Multi-ethnic Populations with Diabetes, with cases from China, Hong Kong, United States, Mexico, Australia and Singapore, the diagnostic performance of DLS in detecting referable diabetic retinopathy,

referable glaucoma suspect, and referable age-related macular degeneration was evaluated.

"It shows that the human and the machine are achieving a similar performance," he said.

He said the deep learning system (DLS) is an alternative DR screening tool for low-income countries that do not have screening programs, which may help to prevent vision loss.

To a question, he noted that the DLS did not mean the end for human doctors. Patients still like doctors with a human touch. "It acts more like an assistive tool; it allows us to make decisions quicker. Physicians still need to be the final one to say yes you have a certain disease or no you don't. Patients appreciate the human touch from doctors as well."

Dr. Soonil Kwon from Doheny Eye Institute, University of California, Los Angeles, presented on the use of fluorescence lifetime imaging ophthalmoscopy (FLIO) and Alzheimer's disease.

He noted that fluorophore is directly influenced by microenvironment and interaction with other molecules and that even a small microenvironmental change can be detected. Therefore, FLIO can be a helpful tool for discovering subtle functional alterations in various diseases, and in early detection of retinal diseases. The process takes only two minutes and is non-invasive, he added. In ophthalmology, it can be used to monitor

conditions such as macular pigment changes in macular holes, and disease progression in Stargardt Disease.

Dr. Soonil shared that FLIO may be useful as a non-invasive tool to detect Alzheimer's disease, a condition that would otherwise only be diagnosed in a post-mortem autopsy of the brain. He noted that the retina is a part of the central nervous system which shares many similarities with the brain and FLIO may be able to detect subtle changes in the retina which can indicate a diagnosis of Alzheimer's disease.

Associate Professor Colin Tan, Deputy Head of Retina at Tan Tock Seng Hospital, Singapore, shared how the swept-source optical coherence tomography (SS-OCT) may be used in cases of myopia.

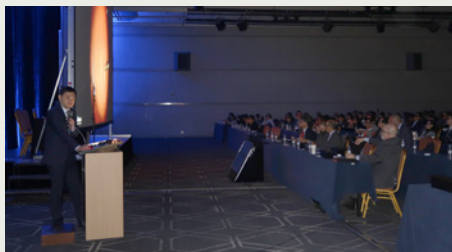
It provides high resolution, non-invasive imaging of the retina, and has a faster scanning time, deeper penetration into the retina and choroid, he said.

The SS-OCT is able to identify changes not seen on conventional imaging techniques or fundus examination, and can help to identify features of pathologic myopia, he added.

"The SS OCT is certainly very helpful and helps us to identify features of pathologic myopia and especially helps us to visualize deeper structures such as the choroid, or even the underlying sclera more clearly than if using typical OCT and this is a very useful tool when we want to image patients with high myopia," he concluded. ☺

See More, Do More with 3D Visualization

by Hazlin Hassan



Dr. Zhang Chun speaks on macular surgery with digital 3D visualization.



With the NGENUITY 3D Visualization System, vitreoretinal surgeons can say goodbye to looking down a microscope lens.

The latest in visualization technology can now be used by eye surgeons for a better experience in the operating theatre, an Alcon Retina Symposium at the 12th Asia-Pacific Vitreo-retina Society Congress (APVRS 2018) in Seoul, Korea, noted yesterday.

Zhang Chun, M.D., from Xiamen Eye Center, China, shared a video presentation on how surgeons may use the NGENUITY 3D Visualization System (Alcon, Forth Worth, TX, USA) to perform better macular surgeries.

"Macular surgery with digital 3D visualization system is different from traditional macular surgery," he explained to delegates at the symposium.

Rather than looking through a conventional microscope, surgeons wear 3D glasses and look at a large flat screen. His videos of surgeries involving cases including hemorrhage, macular hole, and retinal detachment demonstrated to delegates how the Alcon NGENUITY system helps surgeons conduct their surgeries easier, with excellent depth of field and high magnification achieved.

Furthermore, Dr. Zhang added that better visualization is necessary for macular surgery and important to examine the peripheral region of the retina, and gave an example of how the

NGENUITY allowed him to find a tiny hole in the peripheral region during a procedure.

The system also provided improved ergonomics for surgeons with its heads-up screen that allowed for a more natural posture compared to bending over a conventional scope.

Dr. Zhung noted that he did not experience neck or backaches after a three-hour surgery to repair a retinal detachment. Surgeons often experience fatigue and potential injury during conventional surgeries, he said.

There was also no difficulty in learning how to use the system based on his experience, he noted, adding that surgeons enjoy an immersive sensation similar to virtual reality.

"The 3D visualization system possesses some unique advantages, and impressed me. It is very valuable in training. The system provides amazing visual quality. Surgery-supporting staff can see the exact same 3D image as the primary surgeon," he shared.

During the same session, Motohiro Kamei, M.D., of Aichi Medical University, Japan, shared on "Surgical Visualization Proliferative Diabetic Retinopathy."

The system provides a better experience for surgeons with higher

visualization, a wide viewing system, chandelier illumination and heads-up surgery instead of looking through the eyepieces of a surgical microscope, he said.

According to Dr. Kamei, surgeons get to operate in a better posture which is crucial as some operations can take between five to 12 hours. "The position is good for the surgeon," he said.

The system is less invasive, with a higher cut rate of 7500-10000 cpm and beveled tip, he added.

The system provides many advantages, including lower endoillumination levels at 10 to 20 percent comparing to 100 percent during conventional surgeries, he said. It is also easier for supervisors to teach beginner surgeons, as everyone sees the same view on the big screen. "I can indicate to him how and where to grasp and how to move the forceps; it is very easy to educate (others)," he added.

Surgeons can also enhance the image on the screen with NGENUITY, by playing around with its features such as enhanced depth perception, color filters and magnification. The brightness, contrast, color hue and saturation can all be adjusted on the system. ☺

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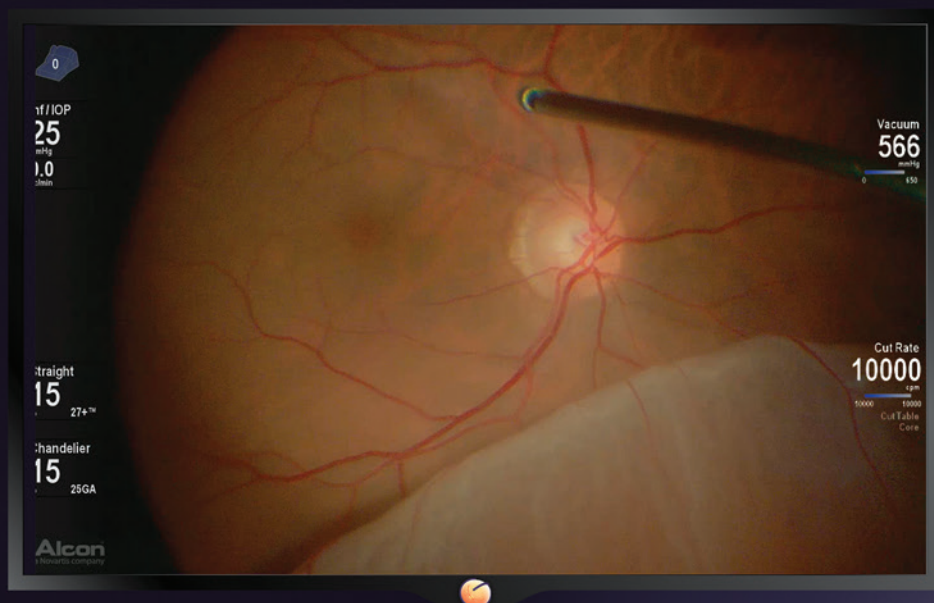
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Reference: 1. Alcon Data on File. Yin L, Sarangapani R. Assessment of visual attributes for NOENUITY® 3D Visualization System 1.0 for digitally assisted vitreoretinal surgery. Alcon Modeling and Simulation. January 2016.