At the Forefront of ‘Back of the Eye’ Innovations: APVRS

by Gloria D. Gamat

Rapid advances in the retinal field are exploding in Australia, New Zealand and the Asia-Pacific regions. As witnessed in this year’s APVRS Congress, there’s so much going on in the vitreo-retinal field that the back of the eye has ‘moved to the forefront’ after all.

It has been a great collaboration that made this all possible. Surgeons willing to take time out of their busy schedules are here to share clinical pearls. Industry has been here all weekend to support the event, and for that there is much gratitude. Attendees have made this one of the strongest APVRS congresses yet. And knowledge from every corner – from digital and hardcopy posters to presenters – has made Asia-Pacific a bit freer from posterior segment disease after this weekend. Let’s enjoy this ‘golden age of Asia-Pacific retina’ while it lasts, because it is a very exciting time indeed to be involved for the benefit of patients regionally and internationally.

Advances in diagnostic imaging, ophthalmic surgical devices and superior pharmaceutical options across all retinal diseases often took the congress spotlight this year.

Since its founding in 2006, APVRS has once more provided an excellent platform for practicing vitreo-retinal experts not only to keep abreast of the latest technologies in this sub-specialty, but also a great opportunity to network and collaborate with their peers.

So, if you loved APVRS 2015, don’t forget to attend the 10th APVRS from 8-10 December, 2016 in Bangkok, Thailand, at the Bangkok Convention Centre at CentralWorld Thailand. It is slated to be held in conjunction with the 38th annual academic meeting of the Royal College of Ophthalmologists of Thailand. In fact, souvenirs from Thailand already have been available at The 10th APVRS Booth here at the congress. Visit http://2016.apvrs.org for more information on this powerhouse congress headed to Bangkok next year.
As a leader in ophthalmology, Bayer understands the importance of taking responsibility to drive science for a better life. This means addressing unmet needs through scientific progress and innovation and facilitating medical education and knowledge sharing. As such, Bayer supports multiple projects and initiatives worldwide as well as partnering with multiple organisations to help improve the lives of people living with a visual impairment or blindness.

For further details please come and see our team at the Bayer Booth in the exhibition area.
Alcon Symposium Discusses Surgical, Pharma Advances in Retinal Care

by Matt Young

The standard aging process involving posterior vitreous detachment may lead to symptomatic vitreomacular adhesion (VMA), vitreomacular traction (VMT), and full-thickness macular hole (FTMH).

That’s according to Dr. David Chow, MD, FRCSC, assistant professor, St. Michael’s Hospital, University of Toronto, and director, Toronto Retina Institute, Canada, who spoke as part of the Alcon lunch symposium on “New Surgical and Pharmacological Advances in Retinal Care” on Saturday.

“Symptomatic VMA and VMT are now diagnostic entities created by the era of OCT imaging,” Dr. Chow said. “These are now easy to diagnose as a result of an OCT scan. Prior to the development of OCT there was no clinical recognition of these entities, as the traction could not be seen clinically. The OCT-based classification for the vitreoretinal interface should be adopted.”

That said, the clinical diagnosis of symptomatic VMA likely would show up on OCT as VMT, he said.

Typical symptoms include metamorphopsia and blurring, he said, but not necessarily large drops with visual acuity.

Three options are now available for managing VMA and VMT:

Watchful waiting, ocriplasmin (JETREA*, Alcon, Fort Worth, Texas), and vitrectomy.

In two phase 3 multicenter studies involving hundreds of patients each, VMA resolved in 26.5% of patients overall on JETREA*, compared to only 10.1% with a vehicle alone.

“In Canada, we have done extremely well,” he said. “In our clinic, we have experienced a 73% success rate [in terms of VMA release with JETREA*] in the first 100 cases, largely due to the careful patient selection.”

JETREA* is more effective in patients with FTMH ≤400 μm, no ERM, and VMA ≤ 1500 μm, compared with no patient selection.

“Resolution was also associated with significant positive visual outcomes,” Dr. Chow said. In addition, “thorough ocular examination, OCT review and modified injection technique may result in superior outcomes with JETREA*. Managing patients’ expectations is extremely important for patients, including any adverse events.”

Almost all patients in whom JETREA* is effective resolve their VMT within one month, with rare exceptions resolving by as late as day 45.

Adverse events related to JETREA* usage are non-serious, mild in severity and resolve quite quickly, he said. Proper patient selection is critical to minimize these, he emphasized.

In My Hands: New 27+ Micro-Incision Vitrectomy (MIVS)

Meanwhile, Prof. I-Van Ho, MBBS, MPH, Ph.D., FRANZCO, associate professor of ophthalmology and head of ophthalmic surgery at the Australian School of Advanced Medicine, Macquarie University, and vitreoretinal surgeon at Sydney Eye Hospital Retinal Unit, Australia, spoke about 27+ micro-incision vitrectomy (MIVS).

The perfect vitrectomy system, he said, includes an efficient cutter to save on time and provide tissue mobilization/ separation. It is also safe and marked by smaller instruments.

“Micro-incision vitrectomy surgery is now the gold standard,” he said.

A 20G system works well but involves a larger instrument with multiple other instruments, a larger wound (leading to leaks, infection and discomfort), and inferior fluids.

MIVS 23G/25G/25G+ procedures lead to smaller wounds, superior fluids and smaller instruments and multifunction capabilities, he said.

The Constellation* Vision System (Alcon), however, is one of the most advanced systems because it is an efficient cutter, is safe and works via smaller instruments.

I was shocked how close to the retina I could get [with 27+], and get under the membrane and trim off the membrane.

- Prof. I-Van Ho

“Any system must be able to cut quickly for us,” he said. “When I first started training, cut rates were 800-900 cpm, but now we’re up to a 7,500 cpm cut rate [with 27+].”

A higher cut rate is preferable because as cuts per minute increase, the discrete aspirated volume decreases. This is not a precipitous drop, but rather offers a higher level of control and safety, as sensitive tissues are not pulled into the cutter.

“The 27+ probe stiffness experience is more similar to the 25+ probe than the 25G,” he said.

Dr. Ho has began using the 27+ device and reported 48 cases with it.

“Patients who have had 27+ in one and 25+ in the other said that [the former] felt more comfortable,” he said. “Also, because

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In My Hands (continued)

we are cutting at a high rate, we can cut more safely into the vitreous. Because you have very good fluidics control you can move and work very close to the retinal surface. The cut rate is at 7,500 cpm. I’m trimming close, and I have quite good control with it. I was shocked how close to the retina I could get, and get under the membrane and trim off the membrane. Certainly, it’s a step forward to allow us to do our surgery a lot safer.”

Overall, with smaller instrumentation, Dr. Ho said that one can operate safer and closer to the retina with 27+. Diabetic delamination with 27+ may also turn out to be superior, he said.

Indications for the system include ERM/VMT/MH, AMD/VH and submacular ha, vitreous debris/floaters, retinal detachment, and diabetic vitrectomy, he said. Potential limitations come into play with silicone oil, thick membranes, chronic vitreous haemorrhage, and vitreous biopsy, he said.

Electrophysiology Meets Genomics in Diagnosing Retinal Dystrophies

By John Kron

The interaction between electrophysiology and genomic medicine can play an important role in the clinical diagnosis of retinal dystrophies.

With the ever increasing ability to identify genomic changes in the patient, the functional assessment of the visual system provided by electrophysiology, when combined with structural imaging, can direct ophthalmologists on when and how to utilize genetic testing.

“Five years ago a lot of mutational data was acquired because the electrophysiological data identified the potential gene to screen,” said Graham Holder, Consultant Electrophysiologist and Director of Electrophysiology, Moorfields Eye Hospital, London.

“But now as we move into exome gene screening we’re getting a huge amount of data that is making things more difficult and it’s going to be the electrophysiology that helps identify which of the many gene changes are actually disease-causing, assuming there’s an identified phenotype,” said Dr. Holder.
The phenotype, which is the expression of the genotype in a real life environment, is generally highly complex in retinal dystrophies due to marked heterogeneity. A precise understanding of the phenotype through clinical examination including the electrophysiology is critical to interpreting the genetic diagnostic information, he said.

This message was affirmed by Robyn Jamieson, Associate Professor of Genetic Medicine at Westmead Children’s Hospital, in Sydney, Australia.

“It’s absolutely right that you have to link up the genotype and phenotype. The bioinformatics screening practices are improving, so you can do techniques to reduce the list of disease-causing genotypes; however there can be tricks and difficulties” that need to be taken into account, said Dr. Jamieson.

The diagnostic challenges in relation to electrophysiology and genomic medicine were further discussed in depth through the presentation of a series of cases to a panel of experts at the symposium, titled Retinal Dystrophies and Electrophsiology.

Another important message for ophthalmologists from Dr. Jamieson was that “it’s really important not just to think we can just send it off for a gene test and that will sort it out because there can be a lot of tricks. Gene tests can be clear cut, but are not always.”

She illustrated this point in a presentation of a 26-year-old female patient in early first trimester who had previously received a diagnosis of Leber congenital amaurosis (LCA) and requested an assessment of the risk of passing on this mutation to the fetus.

Over a period of two months of extensive genetic, as well as clinical and electrophysiological testing, the answer remained inconclusive of whether the woman actually had LCA. “It was only after a review of the literature that an unusual gene mutation NMNAT1 associated with LCA was identified and the patient was found to be a carrier and was reassured about the risk for the fetus,” said Dr. Jamieson.
Latest Advances in Diagnostic Imaging Technology

by John Kron

Advances in ophthalmic diagnostic imaging achieved in recent years was the key theme of presentations on Saturday. The technologies ranged from optical coherence tomography (OCT) and adaptive optics, to laser and ultrasound.

The utility achieved by OCT technology was “striking,” said Dr. Praveen Patel, MB, BChir, MA, FRCOphth, MD(Res), lead consultant for medical retina clinical trials and retinal imaging, and consultant ophthalmologist at Moorfields Eye Hospital in London, England.

“When we acquire OCT images in our clinic patients, we get two main types of information. One is qualitative assessment of the retina such as hyporeflective areas suggestive of macular fluid. We get a number as well – a quantitative assessment of macular thickness,” said Dr. Patel.

“We now have a further piece of information – motion – by comparing sequential scans taken in the same place to indicate blood flow,” he said.

Dr. Patel noted that while many of the technological advances have been made with the hardware, the software is also making important contributions.

An example of software development was “a novel algorithm” to detect blood flow and non-perfusion of the retina, presented by Prof. Marten Brelen, BMBCh(Oxon), FRCOphth, Ph.D., assistant professor at the Department of Ophthalmology and Visual Sciences at the Chinese University of Hong Kong.

The algorithm amplifies an 8-10 second video of the retina – filmed by attaching an iPhone to a standard retinal camera – by using computational techniques such as spatial decomposition and pooling to highlight pulsations that equate to retinal blood flow, he said.

Laser speckle flowgraphy (LSFG) is another technique for imaging retinal blood flow, said Prof. Akiko Kogure, M.D., Ph.D., from the Department of Ophthalmology, Tokyo Women’s Medical University School of Medicine, Tokyo, Japan.

The image is produced when a coherent light source is scattered on a diffusing...
surface to produce speckles – in this case, in relation to blood cells moving – which are then converted into a color map. Warm colors (reds, yellows) indicate good blood flow, cold (blues) for poor flow. LSFG was utilized in the clinical setting in the diagnosis of disorders such as polypoidal choroidal vasculopathy (PCV), said Dr. Kogure.

Cellular imaging of cone photoreceptors with adaptive optics (AO) devices is another field that is making significant advances.

“There’s no question that we’ve now entered a period of cellular imaging where patients can put their chin on the device just like an OCT, look at the cross and you can get fantastic images of their photoreceptors,” said Prof. Lyndon Da Cruz, MBBS, MA(Oxon), FRCOphth(Lond.), Ph.D., FRACO(Aust.), consultant retinal surgeon and medical retina specialist at Moorfields Eye Hospital, London, England.

There are still limitations on what AO can be used for in clinical practice, noted Prof. Da Cruz. However it can be effective in some cases, particularly selection of patients for surgery such as rescue of patients with retinal pigment epithelium (RPE) transplantation for wet age-related macular degeneration (AMD) that requires confirmation that photoreceptors are present, he said.

Additional advantages of AO imaging in relation to retinal vasculature were presented by Dr. Yasuki Ito, M.D., Ph.D., from the Department of Ophthalmology, at Nagoya University Graduate School of Medicine, Nagoya, Japan.

Even though the number of pixels of the standard fundus camera is steadily increasing, AO enables higher resolution of retinal vascular images in comparison because it compensates for ocular aberrations, he said.

The benefits of higher resolution achieved by swept-source OCT (SS-OCT) compared to spectral domain (SD-OCT) were presented by Prof. Shu Yen Lee, MBBS, MMed(Ophth), FRCS(Ed), FAMS, Senior Consultant and Adjunct Associate Professor, at the Vitreo-Retinal Department of the Singapore National Eye Centre, Singapore.

SS-OCT provides better diagnostic information for a wide range of disorders including high myopia, posterior staphyloma and myopic chorioretinal atrophy, she said.

In a presentation comparing OCT with OCT angiography (OCTA), Dr. Fred Chen, M.D., Ph.D, director of the Ophthalmic Research Institute of Australia, Perth, Australia, said “a lot more work needs to be done” on the utility of OCTA including reducing artefacts and segmentation error.
With increasing incidence globally, diabetic retinopathy poses a significant treatment burden. An expanding array of options for management are replacing laser treatment, which is now complementary rather than the primary therapeutic weapon it once was. The diabetic retinopathy symposium at the APVRS congress explored these options, considering their risks, benefits and potential economic impact.

Dr. Taraprasad Das from the L V Prasad Eye Institute in India introduced the session. He discussed the current model of treatment in India, which is costly both financially and in terms of man-hours lost. He postulated that improving the efficiency of laser, for example with micropulse, could reduce the duration and cost of treatment. Reducing the number of anti-VEGF loading doses would also help.

Dr. Adrian Koh, director of Eye and Retina Surgeons at Camden Medical Centre in Singapore cautioned delegates not to lose the art of examination by going straight to the technology for diagnosis. He advised that practitioners “continue to examine patients and make up your mind even before you have the results.”

He discussed the merits of examination, fundus photography (which is good for record keeping), optical coherence tomography (OCT) and fundus fluorescein angiography. Quantitative data is important, said Dr. Koh, but there is a need to consider qualitative results of imaging as well. “OCT not only helps us diagnose, but also guides timing of injections,” he said. It is useful in monitoring patients on intravitreal therapy, gauging prognosis and also it is a wonderful tool to educate patients and their families about the condition.

The symposium moved on to consider treatment models and compare the efficacy of anti-VEGF regimens versus laser treatment.

Dr. Victor Chong of the Oxford Eye Hospital, London, said that laser is still a valid treatment modality even in the era of anti-VEGF. He explained that of patients who have had up to ten anti-VEGF injections, many will still require laser treatment in addition. Commenting on the amount of scarring traditional laser leaves, he said: “It’s embarrassing.” Technology is evolving however; the new developments include Micropulse (Iridex, USA), which is “the only laser that doesn’t cause any scarring.”

Dr. Kenneth Fong, ophthalmologist at the Sunway Medical Centre in Malaysia, spoke further on the question of whether we still need laser treatment for PDR. He stated that improvements are indeed noted with anti-VEGFs, but there is recurrence of new vessels once the anti-VEGF has worn off. He concluded that we should not throw laser away altogether, but advised upgrading to a pattern scanner.

Dr. Paul Mitchell, retinal specialist and professor of Clinical Ophthalmology at the University of Sydney. For example in one study, patients on fixed monthly anti-VEGF dosing gained two lines over those treated with laser. He commented that you can see exceptional outcomes, both fluid and vision. He lamented that most patients in the community are actually undertreated; that is in fact the norm. Once the retina is dried and vision optimized, then treatment can be stopped, said Prof. Mitchell.

The anti-inflammatory effect of steroid treatments can be beneficial in diabetic retinopathy. Dr. Sobha Sivaprasad, Consultant Ophthalmologist at Moorfields Eye Hospital, London, United Kingdom, outlined the actions of steroids in this context, including stopping leucostasis, blocking prostaglandins and also working against VEGF.

She described steroid implants as being second line in pseudophakic eyes that aren’t responding to laser or anti-VEGF. Initiating steroids at a later stage of disease carries limited benefits for visual acuity but it is effective at drying out the retina. In some cases steroids are first line- for example in pregnant patients, patients with recent cardiovascular events, and those who desire less frequent injections.

Another option for complex diabetic retinopathy is surgical treatment. The pros and cons of small gauge vitrectomy were explored by Dr. Kazuhito Yoneda from the Kyoto Prefectural University of Medicine’s Department of Ophthalmology, Japan.

With consideration of treatment goals and impacts, the options for patients are continuing to advance. Dr. Das commented that the focus of current care is “not just vision preservation, but also vision improvement.”
Delegates gathered at the Bayer lunchtime symposium, (chaired by Dr. Jennifer Arnold, MBBS, FRANZCO, retinal and macular specialist at Marsden Eye Specialist, NSW, Australia) to hear about the evidence so far in trials of aflibercept, an agent that binds and holds VEGF.

The session began with some insights into diabetes with Associate Professor Vincent Wong, endocrinologist and director of the Diabetes and Endocrine Service at Liverpool Hospital, NSW, Australia. He explained that the impact of this condition on patients is multifaceted and that of all the potential complications of diabetes, problems involving the eye are the most worrying for patients.

Intensive (versus conventional) therapy delays onset and slows progression of diabetic retinopathy; however one study (ACCORD) examining this effect was terminated due to higher mortality in patients targeted for intensive blood sugar control. Ideally, treatment should reduce complications as much as possible without causing more episodes of hypoglycemia.

Julie Heraghty, CEO at the Macular Degeneration Foundation of Australia told delegates that diabetic eye disease is “the next challenge.” She is concerned that twenty years from now, the number of people with diabetes will likely increase to 592 million. She would like governments to get the message that “they must act now and they must act quickly on all levels: prevention, early detection, treatment and rehabilitation.”

Paul Mitchell, Professor of Clinical Ophthalmology at the University of Sydney, presented results from the VIVID and VISTA studies. These studies examined the differences in outcomes between laser photocoagulation and aflibercept treatment groups (2 mg administered either every four or every eight weeks).

Both aflibercept groups displayed rapid gains in visual acuity, which were maintained.

The result was similar in the 4-weekly and 8-weekly groups, so the latter protocol is preferred by patients due to its lower injection frequency.

Disease progression rates were lower in the injection groups compared with the laser group. The majority of patients in the injection arms avoided visual loss and gained about 2 lines of acuity.

Other outcome measurements were promising. “Significantly more patients [on aflibercept] had a major improvement of their overall retinopathy score compared with those who had laser,” said Professor Mitchell.

The safety profile of aflibercept was encouraging. It was well tolerated and there were no reports of endophthalmitis. For non-ocular events, the incidence was comparable between the aflibercept arms and the laser treatment group.

Prof. Mitchell was pleased that a few months ago, aflibercept became available to the general Australian patient population. Presenting his case of a 56 year-old man from Samoa, Prof. Mitchell described improvement in visual acuity from 6/24 to 6/15 after three injections. The patient had himself commented on his improved vision.

Prof. Mitchell said further work was needed to determine the ideal treatment protocol.

The importance of good management of diabetes is not only important for the health of our communities, said Ms. Heraghty. We must act now: “so people don’t lose the most precious gift of all. Their sight.”

At the conclusion of the symposium, Dr. Andrew Chang, MBBS(Hons), PhD, FRANZCO, FRACS, retinal specialist at Sydney Retina Clinic and Day Surgery, Australia and APVRS Congress Convenor, took the stage to offer his thanks to Bayer for the company’s support of and financial contribution to the congress.
Surgical Management of Pathological Myopia Complications

by Claire Noonan

Myopic macular degeneration (MMD) is a leading cause of blindness worldwide. At the symposium of pathological myopia at APVRS 2015, delegates heard about advances in management of myopic foveoschisis.

Prof. Chi-Chun Lai, Professor and Chairman of Ophthalmology at Chang Gung University in Taiwan, described a method for closing macular holes, where an ILM clump is inserted and then overlaid with autologous blood. The patient’s blood then clots; the clot sealing the gap. He said that after this, “visual acuity recovers progressively.”

Complications of myopic maculopathy surgery were described in case presentations by Dr. Andrew Chang, MBBS(Hons), PhD, FRANZCO, FRACS, retinal specialist at Sydney Retina Clinic and Day Surgery, Australia and APVRS Congress Convenor. Dr. Chang cautioned that a macular hole can develop post-surgery for foveoschisis and that we can’t predict in which patients this will happen. Vitrectomy can improve and stabilize vision, but its complications can be significant.

Barbara Parolini, director of the vitreoretinal service at the Instituto Clinico S. Anna di Brescia in Italy, advised delegates to change their understanding. “It is the sclera that detaches from the retina, not the retina detaching from the sclera; myopic eye is an eye with a pathology mainly in the sclera.” She recommended using long scans to show the eye’s profile, as they allow visualization of a staphyloma progressing with time.

Dr. Parolini told the congress that vitrectomy for MHMD carried high rates of recurrence and a risk of detachment. She is developing a new technique: L-shaped macular buckle to support a posterior staphyloma in high myopia. A macula buckle works well when the retina is detached, she said. Vitrectomy can be done later if needed, whereas early vitrectomy carries the risk of producing a hole. She would argue that a macula buckle should be done before, not after vitrectomy, “because to shorten the eye is the key to improving this pathology.”
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PROVIDING A FORUM FOR KNOWLEDGE EXCHANGE

The Vision Academy serves as a forum for retina specialists to exchange knowledge and build best practices. As such, it provides an opportunity to discuss and address new challenges and treatments in ophthalmology, driving optimised, compassionate patient care.

DRIVING MEDICAL EDUCATION FOR IMPROVED PATIENT CARE

The Ophthalmology Global Preceptorship Program facilitates engagement with ophthalmologists and aids their professional development by sharing knowledge and best practice in the in-clinic management of retinal diseases.

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JUMP-STARTING INNOVATIVE IDEAS IN OPHTHALMOLOGY

The EyeFocus Accelerator is the world’s first eyecare-focused tech accelerator for startups that address unmet needs surrounding the detection, prevention and available support for people living with visual impairment or blindness and strive to improve patients’ quality of life.

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