EYE-S01

The Latest in Retina: 5 Things to Know

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Gene-related medical management, including both diagnosis and treatment, has been recognized as a high potential field for not only inherited retinal diseases, but also others. Luxturna has opened a window for the landing possibility. Optogenetics is doing more. Macular dystrophy may be treatable now, instead of gene drugs. Extended drug delivery is another field worth attention. New glue-type tamponade may be useful for retinal detachment surgery. AI is also a new tech worth mention.

EYE-S02

The Latest in Glaucoma: Five Things to Know

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Optical coherence tomography (OCT) has allowed for the quantification of retinal nerve fiber layer (RNFL) changes, and a method for detecting glaucoma based only on OCT is of potential value. The RNFL probability (p-) maps have shown clinical utility in the diagnosis of glaucoma, and recent work in artificial intelligence also suggests that the RNFL p-map is more useful than other parameters for differentiating healthy eyes from those with glaucoma. However, there are artifacts that can resemble damages due to glaucoma, and it is important to understand the nature and frequency of artifacts that can be confused with changes due to glaucoma.

Topical medication with reliable effectiveness and safety is often as the preferred approach in the management of glaucoma. Medications with new mechanisms of action from that of the currently used include nitric oxide donating prostaglandin F2 alpha analogue, selective prostanoid EP2 receptor agonist, Rho kinase inhibitors, and bimatoprost implant.

Microinvasive glaucoma surgery (MIGS) is intended to achieve lower IOP in glaucoma patients with less surgical time, fewer serious complications compared to other glaucoma surgeries, and rapid recovery with minimal impact on the patient's quality of life. An update on the emerging MIGS techniques for the treatment of open-angleglaucoma, and their surgical results in recent studies are summarized in this presentation.

EYE-S03

Combined or Sequential Surgery for Coexisting ERM/cataract

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Coexisting epiretinal membrane (ERM) and cataract in one eye become more popular due to ageing population grows fast. Macular optical coherence tomography is essential in patients with high-risk, highly suspected or confirmed by fundus examination, or even routine check before cataract surgery to exclude simultaneously macular disorders. Combined vitrectomy and modern cataract surgery can be a good choice for these cases with concurrent ERM/cataract to gain better quality of vision in one-time surgery. But prolonged time of surgery, restricted performance of the surgery by vitreoretinal surgeons in certain hospitals, fewer benefits from National Health Insurance, and less precise prediction of intraocular lens power are main drawbacks. Sequential surgery is another treatment model. Vitrectomy for ERM in advance may endanger the process of the operation by obscuration of the surgical field by visual-significant cataract. Subsequent cataract surgery may encounter some problems such as anterior chamber deepening, zonular weakness, and compromised posterior capsule in vitrectomized eyes. Cataract surgeries are

usually performed initially in these patients. Inaccurate calculation of intraocular lens power can be noticed by axial length measurement interfered by ERM using optical biometry. Besides, poorly visual recovery after cataract surgery caused by ERM, may cause disappointment or even legal issues of the patients.

EYE-S04

Steroids Should be/not be Used Early in the Treatment of Refractory DME

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In EURETINA guideline, steroids can be considered as a first-line therapy for pseudophakic, major cardiovascular history, and post-vitrectomy patients, or patients reluctant to receive monthly injections. The outcomes of refractory DME switch from ranibizumab to dexamethasone implant have been published. The mean final and maximal central retinal thickness (CRT) after dexamethasone implant treatment was significantly lower than baseline CRT. Maximal BCVA after dexamethasone implant treatment was significantly higher than baseline BCVA. Thicker baseline CRT, lower HbA1C, and worse BCVA had better responses to the treatment. Multivariate logistic regression and general linear model analyses confirmed thicker baseline CRT, and worse baseline BCVA had better responses to the treatment. Switching to dexamethasone implant is feasible and safe for treating DME patients refractory to ranibizumab in real world. Conversion to dexamethasone implant achieved a significant CRT improvement. Higher baseline CRT and worse BCVA were the predictive factors for better therapeutic responses. Our study demonstrated the feasibility of switching to intravitreal dexamethasone implant in cases of DME that are refractory to intravitreal ranibizumab treatment. Conversion to dexamethasone implant treatment resulted in a significant improvement in CRT. Higher baseline CRT and worse BCVA can predict better therapeutic responses. OCT biomarkers can also be used to predict who may benefit the most after dexamethasone implant treatment. The reduction of disorganization of the retinal inner layers, subretinal fluid, large outer nuclear layer cyst, intraretinal cyst, and ellipsoid zone disruption were correlated with better CRT improvement (more than 100 mm). Subretinal fluid and ellipsoid zone disruption recovery can also predict better visual prognosis. We suggest that the dexamethasone implant should be considered as a first line treatment in DME patients with subretinal fluid. Further studies could explore different dexamethasone implant treatment strategies for DME, such as first-line or early switch therapy, for better BCVA improvement.

EYE-S05

Understanding Your Patient's Central and Peripheral Image Quality

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The eye, like any other optical system, suffers from a number of specific optical aberrations, which can reduce the quality of retinal images and visual perception. When the central (macular) image is sharp, the image in the periphery may not be necessarily clear at the same time. This is optically called spherical aberration (SA). There are two types of aberrations; lower-order aberrations (0, 1st and 2nd order), and higher-order aberrations (3rd,4th…). Higher order aberrations (HOAs) of the eye are unable to be corrected by cylinder or spherical corrections and include SA, coma and trefoil. Spherical aberrations can cause halos surrounding point light sources and a reduction in contrast sensitivity. The eyes of young people tend to be less affected by spherical aberrations due to the partial compensation of the positive SA of the cornea by the negative SA of the crystalline lens. However, as we age, the SA of the cornea does not change, and the SA of the lens gradually turns from negative to positive. Thanks to modern technology, we can measure corneal SA first, and implant an IOL with negative SA during cataract surgery to achieve the target ocular SA and improve the visual quality. Studies have shown greater contrast sensitivity, particularly in dim light, with negative SA IOLs compared with spherical IOLs. But lower SA reduces pseudophakic depth of field, and there has been concern about optical degradation if the IOL were to tilt or decenter. Therefore, if there is likelihood of IOL decentration, it is recommended to choose an aspheric IOL with zero SA. If the IOL is not likely to decenter, and depth of field is critical to patient, aspheric IOL with zero or less negative SA is recommended; if the patient prefers better image quality, an IOL with negative SA should be considered.

EYE-S06

Near Peripheral Vision~the Forgotten Image Quality

Meng-Chi Wang
Superintendent, Trust Me Eye Center

Near peripheral vision is important for daily life activities such as driving, reading and computer use. But it is difficult to evaluate near peripheral vision in clinical practice, so near peripheral vision is overlooked in our daily practice.

I will review studies about optical image quality in the periphery of pseudophakic eyes. Instrument for fast whole-field peripheral refraction in human eyes will also be discussed. How we use instrument to predict post-op visual quality is a big challenge of our future work ,

EYE-S07

Role of Corneal Topography/Tomography Imaging in Assessing Image Quality

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Visual acuity is used to assess the ability to discern the details of objects. However, the assessment of vision is often limited by many factors. That's why people who have the same visual acuity may have fundamental differences in visual quality. Therefore, it is very important to evaluate the visual quality. In reality, however, it is difficult to define visual quality with a single parameter, so functional vision tests include measures of contrast sensitivity, disability glare, intraocular stray light, aberrations and etc. This article will explore the role of corneal topography/tomography imaging in assessing image quality.

EYE-S08

Role of Corneal Wavefront Imaging in Assessing Image Quality

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In normal eyes, the aberrations due to the crystalline lens are usually opposite to those of the corneal aberrations. The added total aberration is less. In abnormal eyes, such as keratoconus, the asymmetries of the cornea often raise its aberrations to a high level, making the cornea responsible for almost all of the total ocular aberration. Contact lens, tear film, corneal refractive surgeries may also affect corneal wavefront. Although corneal wavefront may affect image quality, inverse correlations between high order abberations and blurred vision may occur, and suggest a paradoxical protective effect of high order abberations. Other objective measurements such as modulation transfer function, point spread function, strehl ratio may offer supplemental information for the assessment of image quality. In addition, tear film quality, pupil size, and neuroadaptation to surgically induced high order abberations have also been demonstrated to affect vision. Further research is warranted to comprehensively address this topic.

EYE-S09

Positive/negative Dysphotopsias Influence on Image Quality

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Dysphotopsia is unwanted, disturbing retinal images after cataract surgery, and is one of the main reasons for patients' dissatisfaction even with good uncorrected visual acuity postoperatively. Dysphotopsia includes positive and negative one. The incidence can be as high as nearly 50% as patients reported some aspect of dysphotopsia at some time after cataract surgery. Positive dysphotopsia includes light streaks, light arcs, starbursts, or central flashes, and negative dysphotopsia is considered as a illumination gap occurred at the optic edge of intraocular lens. In this talk, we will brief through the etiology, risk factors, prevention and management of this pseudophakic dysphotopsia.