

Sponsored Seminar

Luncheon Seminar 1

Recent Advance of Corneal Biology and its Clinical Use

Sponsored by Senju Pharmaceutical Co., Ltd.

Organizer

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

64: LS1-1

Advanced surgical therapy of corneal endothelial disease: A revolution in evolution

Speaker: Friedrich E. Kruse¹

1. Department of Ophthalmology, University of Erlangen-Nuremberg, Erlangen, Germany.

TBD

Commercial Relationships: Friedrich Kruse, None

65: LS1-2

Matricellular Functions of Lumican on Corneal Homeostasis

Speaker: Winston Kao¹

1. Department of Ophthalmology, University of Cincinnati College of Medicine, Cincinnati, OH, United States.

Lumican (Lum) has multi matricellular functions. It is a constituent of the extracellular matrix and serves as a matrikine. We have recently shown that Lum binds ALK5 (type 1 receptor of TGF β) via its C-terminal domain to promote epithelium wound healing. In this study, we attempt to elucidate the mechanism by which a Lumikine promotes epithelium wound healing. Administration of LumC₁₃ and LumC_{13C-A} peptides promoted epithelium migration, but not LumC₃₃ Δ C20. The promoted epithelium migration was abrogated by the administration of the neutralizing anti-TGF β antibody in Lum^{-/-} and ablation of Alk5 and Tgfbr2. Interestingly, the effect of LumC_{13C-A} was abrogated by administration of kinase inhibitors of ALK5 (SB431542, 10 μ M); Src inhibitor (SrcI-1, 2 μ M), EGFR inhibitor (AG1478, 10 nM); pERK1/2 inhibitor (PD98059, 5 μ M); PI3K inhibitor (Wortmannin, 1 μ M), while EGF effects were only abolished by AG1478, Wortmannin and partially by PD98059, but not by SB431542 and SrcI-1. The effects of LumC₅₀ on wound healing of HTCE cells was abolished by transduction of EREG-shRNAi. The polymerization of ALK5/TGFBR2 is required for the binding of Lum to ALK5 at the early phase of wound healing. Interaction of Lum/ ALK5 may lead to an alternative signaling pathway mediated via the Src-pERK1/2 axis for accelerated wound healing characterized by an increase in cell mobility and lifting of cell cycle suppression during the early phase of wound healing. The up-regulation of EREG may then serve as a feed-forward mechanism for sustained ERK1/2 activation.

Commercial Relationships: Winston Kao, None

New therapeutic modality for corneal endothelial disease using Rho-associated kinase inhibitor eye drops

Speaker: Noriko Koizumi ^{1,2}

1. Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyotanabe, Kyoto, Japan. 2. Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kyoto, Japan.

Corneal endothelial dysfunction accompanied by visual disturbance is a primary indication for corneal endothelial transplantation. However, despite the value and potential of endothelial graft surgery, a pharmacological approach for treating corneal endothelial dysfunction remains an attractive proposition. Previously, we reported that the selective Rho-associated kinase (ROCK) inhibitor Y-27632 promotes cell adhesion and proliferation and inhibits the apoptosis of primate corneal endothelial cells in culture. These findings lead us to develop a novel medical treatment for the early phase of corneal endothelial disease using ROCK inhibitor eye drops. In experiments using partial endothelial dysfunction animal models, we showed that corneal endothelial wound healing was accelerated via the topical application of ROCK inhibitor, resulting in the regeneration of a corneal endothelial monolayer with a high endothelial cell density. Based on the results of those animal experiments, we are now attempting to advance the clinical application of ROCK inhibitor eye drops for patients with corneal endothelial dysfunction. A pilot clinical study showed the positive effect of using ROCK inhibitor eye drops to treat patients with Fuchs' corneal endothelial dystrophy or intraocular surgery induced corneal edema. We believe that our new findings will contribute to the establishment of a new approach for the treatment of corneal endothelial dysfunction.

Commercial Relationships: Noriko Koizumi, Senju Pharmaceutical Co. (P)

Support: Program for the Strategic Research Foundation at Private Universities from MEXT

Clinical Trail: UMIN000003625

Luncheon Seminar 2

Postoperative Care for Ophthalmic Surgery

Sponsored by Otsuka Pharmaceutical Co.,Ltd.

Organizer

Jun Shimazaki

Tokyo Dental College Ichikawa General Hospital, Ichikawa, Chiba, Japan

67: LS2-1

Endophthalmitis Prophylaxis for Cataract Surgery

Speaker: Takashi Suzuki¹

1. Department of Ophthalmology, Ehime University, Graduate School of Medicine, Toon, Ehime, Japan.

Postoperative endophthalmitis is a complication of cataract surgery, and sometimes results in severe visual loss. Prophylactic interventions for endophthalmitis can be pre-, peri- or some instances postoperative disinfection. Endophthalmitis prophylactic interventions based on the clinical evidence will be explained.

Commercial Relationships: Takashi Suzuki, None

Clinical Trail: JapicCTI-111691

68: LS2-2

Postoperative Care of Ocular Surface after Ophthalmic Surgery

Speaker: Tetsuya Kawakita¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku, Tokyo, Japan.

Ocular surgery sometimes induce ocular surface inflammation and epithelial damage mainly due to dryness during surgery, which might be the cause of persistent corneal epithelial defect and/or infection. Therefore ocular surface conditions after ocular surgery is important, especially for the existence of primary or secondary severe dry eye syndrome. Recently, we can use Rebamipide eye drops for dry eye syndrome, which enhance mucosal defense, scavenging free radicals. This drug has been widely used for gastritis for long period, and safety was proved.

In this time, we apply Rebamipide eye drops was used after ocular surgery with the existence of potential risk of postoperative ocular surface damage. The effectiveness of Rebamipide eye drops will be discussed with case presentation.

Commercial Relationships: Tetsuya Kawakita, None

Postoperative Care for Refractive Surgery

Speaker: Kazutaka Kamiya ¹

1. Dept of Ophthalmology, Kitasato University, Sagamihara, Kanagawa, Japan.

Refractive procedures enjoy very high success rates and are among the most commonly performed elective surgeries in medicine. With better insights into preoperative screening, the overwhelming majority of cases have successful outcomes. Unfortunately, however, all refractive surgeons must appropriately manage unsuccessful cases. Unsuccessful refractive surgery procedures may relate to each step of the refractive surgery process: preoperative screening, surgical planning, intraoperative events, and postoperative biomechanical or healing anomalies. It is important to identify these complications in the early and late postoperative periods and to provide effective management. In this seminar, I review the most commonly encountered postoperative complications after LASIK and phakic IOL implantation and the most current methods in prevention and treatment.

Commercial Relationships: Kazutaka Kamiya, None

Luncheon Seminar 3

Clinical and Basic Updates on Angiogenesis and Vascular Biology in the Eye

Sponsored by Novartis Pharma K.K.

Organizer

Susumu Ishida

Hokkaido University Graduate School of Medicine,
Sapporo, Hokkaido, Japan

70: LS3-1

Clinical updates: neovascularization related to retinal/ choroidal disease

Speaker: Atsushi Otani¹

1. Department of Ophthalmology,, Japanese Red Cross Society, Wakayama Medical Center, Wakayama, Japan.

It takes more than 5 years when anti-VEGF therapy approved for age-related macular degeneration in Japan, and treatment for retinal disease has been developed. Especially, there are many researches and clinical experiences for neovascularization related choroidal disease for the past few years and more suitable treatment for each patient are conducted based on these evidences.

In this lecture, I will introduce the latest topics about clinical experience of choroidal neovascularization including case experience and my treatment strategy.

Commercial Relationships: Atsushi Otani, None

71: LS3-2

Stemming Vision Loss with Stem Cells (and a little help from VEGF, HIFs and VHL)

Speaker: Martin Friedlander^{1,2}

1. Department of Cell and Molecular Biology,, The Scripps Research Institute, La Jolla, CA, United States. 2. The Lowy Medical Research Institute, La Jolla, CA, United States.

The vast majority of diseases that lead to vision loss in industrialized nations do so as a result of abnormalities in the retinal or choroidal vasculature. Inherited retinal degenerations are commonly thought of as neuronal degenerations traditionally attributed to the loss of neuronal elements and accompanying decreased metabolic demand leading to vascular atrophy. Newly emerging paradigms describe the existence of trophic "cross-talk" between local vascular networks and the tissues they supply (the "neurovascular unit"); such interactions likely help maintain a functional differentiated state in many tissues. In fact, endothelial cells (EC) are also now known to provide trophic substances that stimulate self-renewal and expand differentiation of neural stem cells. Given such inter-dependency of vascular EC and surrounding tissues, it may be possible to use one cell type to rescue the other in the face of severe stress such as hypoxia or genetically encoded cell-specific degenerations. Anti-angiogenic approaches are currently the basis for treatment and human clinical trials and the use of combination therapies targeting multiple angiogenic pathways may provide increased efficacy and fewer off-target effects than current VEGF antagonists alone. We are also hopeful that a new therapeutic paradigm, one in which it may be possible to "mature" or stabilize immature, abnormal vessels, will be of far greater benefit to patients suffering from ischemic retinopathies. This may be possible through the use of autologous bone marrow or cord blood derived hematopoietic stem cells that selectively target sites of neovascularization and gliosis where they provide vasculo- and neurotrophic effects. Such a therapeutic approach would obviate the need to employ destructive treatment modalities and facilitate vascularization of ischemic and otherwise damaged retinal. In addition, the neurotrophic paracrine effects of these cells as well as neural progenitors will be discussed in the context of retinal degenerative disease. Finally, with the advent of induced pluripotent stem cell (iPSC) technologies, it is now possible to think about generating autologous grafts of various cell types derived from a patient's own somatic tissue. The use of iPSC-derived RPE cells for the treatment of atrophic macular degeneration will also be discussed in this context.

Commercial Relationships: Martin Friedlander, None

Luncheon Seminar 4**Focus on Risk Factors of Dry Eye Disease: What Factors Lead to Dry Eye?****Sponsored by Santen Pharmaceutical Co., Ltd.****Organizers**

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo, Japan

Kohji Nishida

Osaka University Graduate School of Medicine, Suita, Osaka, Japan

72: LS4-1**Dry eye after cataract surgery****Speaker: Yuan Jin**¹

1. Zhongshan Ophthalmic Center, Sun Yat-Sen University, Guangzhou, China.

Cataract surgery has clearly been shown to worsen ocular surface disease at least temporarily. The incidence of dry eye after phacoemulsification was 9.8% to 19.3%. Symptoms and signs of dry eye occurred as early as seven days post-phacoemulsification and the severity pattern may partly improved over time. The changes in corneal sensitivity, tear film instability, and ocular surface damage were common pattern in dry eye patients after cataract surgery. The cornea innervation and decrease in goblet cells density(GCD), which were correlated with corneal incision and ocular inflammation, had not recovered at several months after cataract surgery. Long microscopic light exposure times can have an adverse effect on dry eye test values. Misuse of eyedrops also is one of the major pathogenic factors that causes dry eye after cataract surgery. Eye drops should be carefully administered before and after cataract surgery to avoid or reduce the occurrence of dry eye postoperatively. Furthermore, meibomian gland function may be altered without accompanying structural changes after cataract surgery. We recommend that ophthalmologists should evaluate patients both before and after phacoemulsification to prevent further damage to the ocular surface and able to manage the patient promptly and effectively so the patient will not have a poor quality of life and vision due to dry eye syndrome. The current trend is to diagnose and treat ocular surface disease using a stepwise regimen tailored to the individual patient and disease severity. Ocular surface preparation is beneficial not only in patients with established ocular surface disease, but also in those with minimal signs or symptoms of surface disease.

Commercial Relationships: Yuan Jin, None**72b: LS4-2****Medication-related dry eye****Speaker: Taiichiro Chikama**¹

1. Hiroshima University, Hiroshima, Japan.

Dry eye is divided into two major subtypes: aqueous tear-deficient dry eye and evaporative dry eye. One of the risk factors of evaporative dry eye is drug toxicity with ophthalmic solutions. Each ophthalmic solution is made of a main drug and inactive ingredients, including preservatives in particular. The cytotoxicity of the preservatives attracts attention. Benzalkonium chloride, which is the representative preservative of ophthalmic solutions, presents cytotoxicity even with low concentration having surface-active action more in comparison with other preservatives.

Toxic keratopathy tends to appear in patients using multiple ophthalmic solutions and frequent administration, especially in cases with aqueous tear-deficient dry eye. Furthermore, toxic keratopathy is known to be relatively easy to develop in cases having fragile epithelial cell junction such as diabetes and corneal dystrophy. Therefore, ophthalmologists should pay attention and notice any changes of ocular surface after alteration of prescription. At the follow-up examination, any changes of subjective symptoms and the ocular surface by the fluorescein staining should be examined positively not to miss a tendency to exacerbation of the epithelium disorder and surface wettability.

The first approach for toxic keratopathy is discontinuance in ophthalmic solutions for a few weeks. Then, alteration of ophthalmic solutions or to other treatments should be considered following a review of in-use ophthalmic solutions and background factors such as diabetes, corneal dystrophy.

Commercial Relationships: Taiichiro Chikama, None

73: LS4-3

Contact lens-related dry eye

Speaker: Shizuka Koh ¹

1. Department of Ophthalmology, Osaka University Graduate School of Medicine, Suita, Osaka, Japan.

As the Tear Film & Ocular Surface Society has addressed “Contact Lens Discomfort” in recently published report, contact lens discomfort is an important issue for both patients and practitioners. It is reported that more than 50% of soft contact lens (SCL) wearers suffer dry eye symptoms. Blurry, fluctuating vision associated with ocular dryness has been a common problem for the SCL wearers. Interactions between contact lens and tear film dynamics and treatment options for contact lens-related dry eye will be reviewed in this presentation.

Commercial Relationships: Shizuka Koh, None

74: LS4-4

Dry eye with MGD

Speaker: Jong Suk Song ¹

1. Korea University, Seoul, Korea (the Republic of).

Blepharitis can be divided into anterior blepharitis and posterior blepharitis. Meibomian gland dysfunction (MGD) is one type of posterior blepharitis. Although MGD is a common disease and a major cause of dry eye syndrome, it is often overlooked in clinical practice. According to many reports, the prevalence of MGD increases as people get older, and Asian countries reported higher prevalence compared with western countries. Based on the pathogenesis of MGD, hyperkeratinization of the epithelium of the excretory duct and orifice is the main factor that leads to obstruction of the meibomian glands. This effect is influenced by endogenous factors such as age, sex, and hormonal disturbances as well as by exogenous factors, such as topical medication. For the diagnosis of MGD, the lid margin is often rounded with thickening, telangiectasia and hyperkeratinization. The meibomian gland orifices are frequently obstructed. When applying pressure to the lid margin, abnormal turbid, granular, or toothpaste-like meibum can be expressed from the orifice. Sometimes, there is little or no expulsion of secretion even under firm pressure to the lid margin. New devices such as meibography and interferometry have been used to quantitatively evaluate MGD. Non-contact meibography can show the detailed architecture of the glands and detect a partial or total loss of acinar tissue in a low secretion phase. Instead, ocular surface interferometry can quantitatively measure the lipid layer thickness according to the dominant color in the interference patterns, and it can detect the earlier low delivery phase of MGD pathogenesis. Treatment of MGD consists of lid hygiene, systemic antibiotics, topical antibiotics and steroids, and treatment of associated conditions. Several new therapeutic approaches designed to interrupt the process from early low delivery phase to late low secretion phase have been used in clinical practice.

Commercial Relationships: Jong Suk Song, None

Luncheon Seminar 5**Adding Up the Benefits-FloraGLO® Lutein and OPTISHARP™ Natural Zeaxanthin****Sponsored by Kemin Human Nutrition & Health Asia/DSM Nutrition Japan K.K.****Organizer**

Yoko Ozawa

Keio University School of Medicine, Shinjuku, Tokyo,
Japan**245: LS5-1****Adding Up the Benefits-FloraGLO® Lutein and OPTISHARP™ Natural Zeaxanthin****Speaker: Richard L. Roberts¹**

1. Scientific Affairs and Technical Services, Kemin Human Nutrition and Health, Des Moines, IA, United States.

Although FloraGLO® Lutein has been reported to be helpful in reducing the risk potential for Age-Related Macular Degeneration (AMD) in numerous clinical studies, many of those studies have been considered to be too small in size to generalize the results to larger, more diverse populations. Furthermore, the addition of zeaxanthin to eye health products has become a more important issue than in the past. With the completion of the AREDS2 study in 2013, the evidence that supplementation with lutein and zeaxanthin helps reduce the risk of progression of AMD is now stronger and more generalizable. However, that data is only the tip of the iceberg. Recent research is now indicating that supplementation with lutein and zeaxanthin may be beneficial for a much larger segment of the population. Increases in macular pigment optical density (MPOD), reduction in the potential for cataracts, reduction in glare sensitivity, reduction in the potential for blue light damage and increases in contrast sensitivity have all been shown to result from supplementation with lutein and zeaxanthin. Those results and improvements in other visual response factors following such supplementation will be among the topics discussed during this presentation.

Commercial Relationships: Richard Roberts, Kemin Human Nutrition and Health (E)

Luncheon Seminar 6

Clinical Effects of Astaxanthin on the Eye

Sponsored by AstaReal Co., Ltd.

Organizer

Nobuyo Yawata

Duke-NUS Graduate Medical School, Singapore, Singapore

246: LS6-1

Clinical Effects of Astaxanthin on the Eye

Speaker: Nobuyoshi Kitaichi ¹

1. Ophthalmology, Health Sciences University of Hokkaido, Sapporo, Japan.

Astaxanthin is found abundantly in the red-orange pigment of marine animals such as salmon / salmon roe and the shell of crabs and shrimp. It is commonly indicated as antioxidants and immune modulators. It was shown the anti-inflammatory effects on acute uveitis (intraocular inflammation) as well as the inhibition of choroidal neovascularization. Also, astaxanthin eye drops successfully ameliorated the damage of ultraviolet-induced photokeratitis to scavenge reactive oxygen species in animal models.

Among healthy human volunteers, accommodation function of the eye recovered by intake of astaxanthin for 14 days or later. Then the subjects reported the reduced eye fatigue significantly during the randomized double-blind placebo-controlled study. Laser speckle flowgraphy showed that administration of astaxanthin elevated the choroidal blood flow velocity without any adverse effects in humans

Commercial Relationships: Nobuyoshi Kitaichi, AstaReal Co., Ltd. (F)

Luncheon Seminar 7

Let's Master the Pathogenesis and Treatment of Short BUT-type Dry Eye!

Sponsored by Santen Pharmaceutical Co., Ltd.

Organizer

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo, Japan

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

public health problem in Japan.

Commercial Relationships: Debra Schaumberg, Mimetogen (C), Eleven Biotherapeutics (C), Pfizer, Inc (C)

Support: Provision of facilities, transport of equipment, data analysis, and data management were supported by Santen Pharmaceutical Co, Ltd, Osaka, Japan. Dr. Schaumberg is supported by NIH Grant EY022663.

247: LS7-1

Epidemiology of Dry Eye: The Osaka Study

Speaker: Debra A. Schaumberg^{1,2}

1. Ophthalmology & Visual Sciences, University of Utah School of Medicine, Salt Lake City, UT, United States. 2. Epidemiology, Harvard School of Public Health, Boston, MA, United States.

A surge of research over the past two decades has shown that DED is a common multifactorial disease of the tears and ocular surface that results in debilitating symptoms of ocular surface pain, tear instability, and fluctuating visual disturbances. Study of the epidemiology of DED continues to be challenging, but useful data are now available on the prevalence of DED in various populations, certain risk factors, and its impact on quality of life. In the largest studies, the age-adjusted prevalence of DED in the US was 7.8%, or 3.23 million women, and 4.3%, or 1.68 million men aged ≥ 50 y. Several studies indicate a greater prevalence in many countries of Asia. Among these studies is the Osaka Study, which recruited 672 young and middle-age Japanese office workers were in a cross-sectional study focused on DED and using both patient-reported as well as clinical parameters of dry eye. Among the 561 study participants who completed questionnaires (mean age: 43.3 ± 9.1 years), the prevalence of probable or definite DED based on the Japanese criteria was 76.5% women compared with and 60.2% among men ($P=0.002$). Workers over 30 years old had a 2-fold higher risk of DED, as did workers using a VDT >8 hours per day. The Osaka Study also included an assessment using the Japanese version of the Work Limitations Questionnaire aimed at evaluating the impact of DED on work productivity and at-work performance. This analysis indicated significantly worse performance and productivity among those with versus without DED (P for trend = 0.01 across categories of no DED, probable DED, and definite DED). On 4 work productivity subscales, DED was associated with significantly lower on-the-job time management ($P = 0.009$) and combined mental performance and interpersonal functioning ($P = 0.011$). Further, the annual DED productivity losses were estimated to be \$6160 per employee when measured by total production and \$1178 per employee as calculated on the basis of wages. The Osaka Study is unique among epidemiologic investigations in DED for its focus on a younger population with long hours of VDT use. Through such work, the Osaka Study has helped place DED in its proper context as a significant

248: LS7-2

Pathophysiology of and therapy for short BUT type dry eye in Korea

Speaker: Kyoungyul Seo ¹

1. Department of Ophthalmology, Yonsei University College of Medicine, Seodaemun-gu, Seoul, Korea (the Republic of).

Current status of treatment and understanding of short BUT type dry eye in Korea

Commercial Relationships: Kyoungyul Seo, Santen (R)

249: LS7-3

Pathophysiology of and Therapy for Short BUT-Type Dry Eye in Japan

Speaker: Kazuo Tsubota ¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku-ku, Tokyo, Japan.

It is well-known that dry eye is a multifactorial chronic disease of the tear film and keratoconjunctival epithelium, and it is classified into the aqueous deficient type or evaporative type. We reported dry eye with only decreased tear break-up time (BUT) two decades ago. This type of dry eye has strong subjective symptoms and an unstable tear film in spite of normal tear secretion and with little or no staining of the ocular surface and this subtype of dry eye is widely recognized as short BUT-type dry eye.

The unstable precorneal tear film causes optical irregularity and affects visual functions. Therefore, short BUT-type dry eye decreases functional visual acuity even though there is no corneal epithelial damage in the optical zone. Since the strong symptoms are caused by the tear film instability, the improvement of BUT is the key point in the treatment of short BUT-type dry eye. The cause has not been clarified but it is supposed that mucin levels in the tear fluid and ocular surface are associated with it. Short BUT-type dry eye may not respond to treatment by sodium hyaluronate ophthalmic solution (HA), and therefore, it was difficult to achieve enough improvement because until 5 years ago, only HA could be used in Japan. Diquafosol sodium ophthalmic solution, which promotes water and mucin secretion on the ocular surface, was launched in 2010, and the treatment of short BUT-type dry eye was obviously advanced in Japan.

In this seminar, I would like to talk about the properties of short BUT-type dry eye and its previous and current treatment.

Commercial Relationships: Kazuo Tsubota, Santen Pharmaceutical Co., Ltd. (F), Santen Pharmaceutical Co., Ltd. (R), Functional Visual Acuity Meter (P), KOWA Co. (F), MediProduct, Inc. (F), JIN Co., Ltd. (F), Otsuka Pharma (F)
Support: Santen Pharmaceutical Co., Ltd.; JIN Co., Ltd.; KOWA Co.; MediProduct, Inc.; Otsuka Pharma.

Pathophysiology of and therapy for short BUT type dry eye in France

Speaker: Christophe Baudouin ^{1,2}

1. Quinze-Vingts National Ophthalmology Hospital, Paris, France. 2. Team S12, Vision Institute, Paris, Paris, France.

The short Break-up time type of dry eye disease is a variety of dry eye disease in which major tear instability is observed accompanied by symptoms and no or poor corneal staining. Whether this syndrome is truly a dry eye or a specific entity is under debate. However it corresponds to a tear disorder and associates some characteristics of all other types of dry eye. Meibomian gland disease is usually considered as the main mechanism of the short BUT type, as a result of increased tear instability and evaporation. Another explanation may also be an impairment of the mucus layer following decreased density of goblet cells and abnormal secretion of soluble mucins. In this case, still difficult to diagnose with routine tests, short BUT would be associated to the lack of wettability of the ocular surface and could deserve specific treatments.

Commercial Relationships: Christophe Baudouin, Alcon (C), Allergan (C), Santen (C), Thea (C)

Luncheon Seminar 8**A Trend in Prescription Use of NSAIDs in Asian Countries and the Further Possibility of its Use****Sponsored by Senju Pharmaceutical Co., Ltd.****Organizer**

Hiroshi Fujishima

Tsurumi University Dental Hospital, Yokohama,
Kanagawa, Japan**251: LS8-1****Comparison of anti-inflammatory effects between prednisolone acetate 1% monotherapy and bromfenac 0.1% added with prednisolone acetate 1% after cataract surgery****Speaker: Uyen T. Nguyen**¹

1. Ho Chi Minh City Eye Hospital, Ho Chi Minh, Viet Nam.

Inflammation control after cataract surgery with topical anti-inflammatory eye drops play a significant role in maintaining good surgery outcome. At the moment, there has been a shift in ophthalmologists' choice for post-op topical anti-inflammatories, from corticosteroids to NSAIDs. Many studies have demonstrated that compared to corticosteroids, NSAIDs are as effective, with less side effects, reduces pain, and can even prevent cystoid macular edema (one of the most popular late consequences of cataract surgery). There are many types of topical NSAIDs available at the moment, one of which is bromfenac 0.1%, with its daily dose of two drops per day, helps patients comply better. In Vietnam, we have little experience with using NSAIDs after cataract surgery. That is why we carry out this study to compare the effectiveness as well as other effects of bromfenac 0.1% and another corticosteroid (prednisolone acetate 1%), to serve as a reference for ophthalmologists in choosing post-op topical anti-inflammatories. This is a randomized controlled trial carried out in patients diagnosed with grade 2-3 cataract (Lucio Buratto classification), with no other ocular or systemic problems. All patients underwent phacoemulsification surgery performed by one surgeon. After surgery, they were randomized into two groups depending on the post-op anti-inflammatory eye-drops used: prednisolone acetate 1% and bromfenac 0.1%. The ocular inflammation status (evaluated by the Laser Flare Meter) and side effects were recorded after surgery 1 day, 3 days, 7 days, 14 days, 28 days, and after 56 days. The study was carried out at Ho Chi Minh City Eye Hospital from July to November 2014.

Commercial Relationships: Uyen Nguyen, None**252: LS8-2****Paradigm shift in topical NSAID use in South Korea****Speaker: Jong Suk Song**¹

1. Ophthalmology, Korea University, Seoul, Korea (the Republic of).

Topical non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used in cataract surgery to reduce intraoperative miosis and manage postoperative pain and inflammation. Therefore, topical NSAIDs have been reported to be effective in preventing cystoid macular edema (CME) after cataract surgery. However, topical NSAIDs were not popularly used in South Korea. As I think, there were several reasons. First, older generation of Korean ophthalmologists, who trained younger generation, did not use topical NSAIDs after cataract surgery. Therefore, most Korean ophthalmologists had little experience of topical NSAIDs during residency training. It might become a barrier to using topical NSAIDs. Second reason is that the incidence of cystoid macular edema after cataract surgery is not high. Although we know topical NSAIDs are effective in preventing CME, we do not want to take a risk of adverse effect of topical NSAIDs. Last reason is that attractive topical NSAIDs, which show high efficacy and low adverse effects, were not commercially available in South Korea. However, recently bromfenac has been introduced to South Korea. And now paradigm shift begins in topical NSAIDs use in South Korea, for cataract surgery as well as refractive surgery. In this session, I'd like to present the past and the ongoing paradigm shift in topical NSAIDs use in South Korea.

Commercial Relationships: Jong Suk Song, None

Use of NSAIDs in Japan and future possibilities

Speaker: Hiroshi Fujishima ¹

1. Department of Ophthalmology,, Tsurumi University Dental Hospital, Yokohama, Kanagawa, Japan.

Study Group: allergy

Non-steroidal anti-inflammatory ophthalmic solutions were recruited for daily clinical use from 1986 in Japan. In terms of anti-inflammatory effects, while the good efficacy of steroid eye drops is well known, serious side effects such as steroid induced glaucoma or steroid related ocular infections have also been noted. NSAIDs can avoid the severe side effects of steroid eye drops and many reports suggest their equivalent potency in various ocular inflammatory diseases comparable to the anti-inflammatory effects of low concentration steroid eye drops. Side effects unique to NSAIDs such as corneal epithelial defects do happen but adverse impact on the visual acuity is indeed very low. Based on these background, the use of NSAIDs is currently spreading in Japan, especially for post-cataract surgery or post-vitreotomy inflammation, ocular surface disorders including conjunctivitis, or other inflammatory diseases. With the advent of newer surgical and diagnostic technologies, and based on recent basic and clinical research data, additional indication targets for NSAIDs are expanding. In this session, I would like to introduce bromfenac, which is the most frequently used NSAID in Japan, the diseases which are subject to treatment by bromfenac, and future possible applications of bromfenac such as its use in allergic conjunctivitis or dry eye disease.

Commercial Relationships: Hiroshi Fujishima, Santen (F), Senju (F), Alcon (F), Allergan (F), Kobayashi (F), Otsuka (F)

Luncheon Seminar 9

Clinical Cases Using the Latest Microperimeter and OCT

Sponsored by NIDEK CO., LTD.

Organizer

Shuichi Yamamoto

Chiba University, Graduate School of Medicine, Chiba,
Chiba, Japan

254: LS9-1

Clinical Evaluation of “Long Axial length Normative Database”

Speaker: Da-Wen Lu ¹

1. Ophthalmology, Tri-Service General Hospital,, National Defense Medical Center, Taipei, Taiwan.

Study Group: NDMC

OCT has become a “must-have” device in making clinical decisions and more accurate follow-ups of retinal diseases and glaucoma. In recent years, various parameters, new functions or software have been added to OCT, which require us to be always updated with these trends. The Long Axial Length Normative Database, released by NIDEK, was specifically designed for eyes with long axial length, which many Asians tend to have. This database has been evaluated from various angles and it's my pleasure to share how it helps with many clinical cases at this seminar. Provided information will surely be beneficial for diagnosing early-stage glaucoma accurately and I hope it will help in your daily practices.

Commercial Relationships: Da-Wen Lu, NIDEK (F)

Support: NIDEK research grant

255: LS9-2

Diagnosis and Evaluation of Macular Diseases using MP-3

Speaker: Ichiro Maruko ¹

1. Ophthalmology, Tokyo Women's Medical University , Tokyo, Japan.

The treatments for retinal disease, especially macular disease, have been remarkably developed in recent years. These are thought to be the contribution of the advanced imaging devices. Spectral domain optical coherence tomography (SD-OCT) has been used for the precise and accurate diagnosis, treatment decision, and follow-up examinations due to observe the morphologic changes at the posterior pole including the macula and optic disc, noninvasively. However, the evaluations of not only the morphologic changes but also functional changes might be required clinically at the moment.

The newest microperimeter (NIDEK, MP-3), which can simultaneously examine the visual field and the abnormal lesions at the fundus, is expected to provide the functional and morphological assessments for various retinal diseases in combination use with NIDEK OCT. This morphology and function of retina, “morphofunctional retina,” seminar includes various case reports and provides the useful informations for your clinical practice of the next day.

Commercial Relationships: Ichiro Maruko, None

Luncheon Seminar 10

Ocular Mucosal Barrier Dysfunction

Sponsored by Otsuka Pharmaceutical Co., Ltd.

Organizer

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

427: LS10-1

Topical treatments of dry eye in Japan

Speaker: Yuichi Hori¹

1. Department of Ophthalmology, Toho University Omori Medical Center, Ota, Tokyo, Japan.

Dry eye is a common ophthalmic disease in Asia and Western countries. More than 10 million people in Japan are thought to have dry eye. Recently, two new eye drops (rebamipide and diquafosol tetrasodium) have been introduced in Japan to treat dry eye. The drugs, which were categorized as "tear stimulation: secretagogues" in the 2007 Dry Eye Workshop report, induce expression of the gel-forming mucin, MUC5AC, secreted from conjunctival goblet cells. Rebamipide was marketed originally as an oral therapeutic drug to treat gastric mucosal disorders and gastritis. A recent study reported that rebamipide eye drops up-regulated expression of a gel-forming mucin and membrane-associated mucins on the ocular surface epithelium. Randomized clinical trials in Japan have reported that rebamipide improved ocular surface epithelial damage and symptoms in patients with dry eye. Several clinical studies also have reported that rebamipide was useful for treating ocular surface diseases such as dry eye characterized by a short break-up time, lid wiper epitheliopathy, or persistent corneal erosion. These data indicate that rebamipide is a useful treatment option for dry eye and ocular surface diseases.

Commercial Relationships: Yuichi Hori, Santen Pharmaceutical Co., Ltd (F), Otsuka Pharmaceutical Co., Ltd. (R), Alcon Japan Ltd. (R)

Support: Grants-in-aid for Scientific Research #24592657

428: LS10-2

The molecular basis of ocular surface glycoalyx dysfunction

Speaker: Pablo Argueso¹

1. Schepens Eye Research Institute and Massachusetts Eye and Ear, Dept. of Ophthalmology, Harvard Medical School, Boston, MA, United States.

Glycosylation of proteins is the most frequent and diverse form of co- and post-translational modification in living organisms. Indeed, all cells in nature are covered with a dense and complex array of glycoconjugates called the glycoalyx. Interaction of cell surface glycans with carbohydrate-binding proteins regulates a spectrum of biological activities crucial for the development, growth, function or survival of an organism. This seminar will discuss recent findings on the biological role of the carbohydrate-binding protein galectin-3 at the ocular surface, and its unique regulatory functions during inflammatory conditions.

Commercial Relationships: Pablo Argueso, None

Support: NIH Grant EY014847

Luncheon Seminar 11

Considerations in the Contemporary Glaucoma Treatment

Sponsored by Alcon Japan Ltd.

Organizer

Tetsuya Yamamoto

Gifu University Graduate School of Medicine, Gifu, Gifu, Japan

429: LS11-1

Treatment and Management for Primary Open-angle Glaucoma

Speaker: Takeo Fukuchi¹

1. Division of Ophthalmology and Visual Science, Graduated School of Medical and Dental Sciences, Niigata University, Niigata, Niigata, Japan.

According to the Tajimi study, primary open-angle glaucoma (POAG) is the major glaucoma type in the clinical practice even in Japan. Although POAG has been often discussed including high-tension glaucoma (HTG) and normal-tension glaucoma (NTG), HTG and NTG are different each other in the aspect of their management and treatment. From our study results, progression of visual field defect in HTG tended to depend on the averaged follow-up IOP itself, but that in NTG tended to depend on the variation of follow-up IOP. Furthermore we recommend absolute IOP value to set the target pressure for HTG patients, but IOP reduction for NTG patients.

Nevertheless we have to take care both IOP value and IOP variation to manage the POAG patients first of all. Prostaglandin analogs has been still the first choice of POAG management. It is reasonable from the effects of IOP reduction seen in particularly NTG patients. In addition, we have 2 types of fix combination for glaucoma in Japan. They are extremely useful to achieve and maintain the adherence of glaucoma medication. In addition, alpha 2 agonist and Rock inhibitor have been available in Japan.

In my presentation, I would like to discuss pathogenesis of POAG and IOP, as well as recent glaucoma managements with medical therapy.

Commercial Relationships: Takeo Fukuchi, None

430: LS11-2

Outcome considerations in glaucoma treatment

Speaker: Ching Lin Ho^{1,2}

1. Singapore National Eye Centre, Singapore, Singapore. 2. Duke-NUS Graduate Medical School, Singapore, Singapore.

Glaucoma is a chronic, progressive, incurable disease that can result in significant visual disability in a patient's lifetime. The goals of glaucoma therapy are preservation of visual function to avoid visual disability and to minimise disruption to quality of life. These are thus the outcome measures for glaucoma treatment. IOP levels, optic disc imaging indices and visual field indices are parameters we manipulate or monitor as clinicians to achieve these outcomes.

In the management of glaucoma in a patient, we need to consider the overall health and the likelihood of visual disability within the patient's lifetime, as well as the potential benefits versus possible risks of each treatment modality. The treatment dilemma is in avoiding both overtreatment and undertreatment. Visual field loss may not negatively impact quality of life as much as the treatment may in the early stages, yet substantial optic nerve damage if allowed to occur can lead to irreversible and crippling visual loss.

The residual vision, consequences of treatment, as well as economic, functional and psychosocial factors interact to impact on the quality of life of patients with glaucoma. Effective communication with each patient, his/her attitude, expectations and understanding with regards to the condition and its treatment will affect adherence and persistence with treatment and follow-up. Individualised glaucoma treatment tailored to the needs and preferences of each patient, while taking into account the efficacy, potential adverse effects and costs of treatment are essential to achieving a desirable outcome.

Commercial Relationships: Ching Lin Ho, None

Contemporary Glaucoma Treatment

Speaker: Yoshiaki Kiuchi ¹

1. Ophthalmology and Visual Science, Hiroshima University, Hiroshima, Japan.

ExPRESS glaucoma filtration device is a small shunt device made by stainless steel without valves and plate. Express implant is inserted under the scleral flap and reaches the anterior chamber and drains the aqueous humor from anterior chamber to sub-conjunctival space.

The ExPRESS implant surgery is very similar to trabeculectomy surgery in both efficacy and technique, but is less traumatic. Because the ExPRESS implant surgery does not require iridectomy, we can avoid the complication related iridectomy such as bleeding and vitreous loss and may be prone to early recovery from visual acuity damage. To clarify the position of Express implant in the strategy of glaucoma surgeries, we examined the effect and complication of ExPRESS implant surgery on Japanese glaucoma subjects. We found ExPRESS implant surgery has similar effect to trabeculectomy on primary open angle glaucoma and pseudoexfoliation glaucoma when the target pressure is high. However the trabeculectomy showed better effect than ExPRESS implant surgery when the target pressure is low.

We also found we should keep lower intraocular pressure (IOP) level at early post-surgical phase of ExPRESS implant surgery than after trabeculectomy to maintain good IOP levels for long time.

Commercial Relationships: Yoshiaki Kiuchi, None

Clinical Trail: UMIN000008981

Luncheon Seminar 12

The History and Prospects of Orthokeratology Contact Lenses; Global and Japanese Development

Sponsored by Universal View Co., Ltd. / TORAY INDUSTRIES, INC.

Organizer

Kenneth Kenyon
Tufts Medical School, Boston, MA, United States

432: LS12-1

Orthokeratology: A Global Perspective

Speaker: Kenneth Kenyon^{1,2}

1. Ophthalmology, Tufts Medical School, Boston, MA, United States. 2. Ophthalmology, Harvard Medical School, Boston, MA, United States.

During the more than 3 decades since orthokeratology was devised, its clinical refinement has produced increasing applications and successful outcomes, especially in situations where refractive surgery is not feasible.

Apart from a brief history of orthokeratology's development, the current state of the art with respect to indications, contact lens designs and treatment regimens plus clinical outcomes will be reviewed. Recognizing anatomical differences between Asian and Western corneas which necessarily dictate modifications of orthokeratology lens parameters is also of importance.

A recent development utilizing orthokeratology methodology enhanced by brief topical exposure to specific protease enzymes to treat presbyopia has produced enhanced and sustained effects, thereby suggesting potentially broader applications for enzymatic orthokeratology variations.

Clearly orthokeratology has become an ever more safe and effective means of refractive correction. Hence its future evolution and increased utilization seems assured.

Commercial Relationships: Kenneth Kenyon, Yolia Health (I)

433: LS12-2

Orthokeratology (Ortho-K) in Japan ~ 6 years after approval ~

Speaker: Kenichi Yoshino¹

1. Ophthalmology, Yoshino Eye Clinic, Taito-ku, Tokyo, Japan.

The first orthokeratology lens was approved by Ministry of Health, Labour and Welfare in 2009 and now widely accepted in Japan, as it seems to be able to slow the progression of myopia. There are three approved lens makers distributing orthokeratology lens in Japan. This session will explain the history and prospects of the Japanese orthokeratology market. There have been some unique developments, such as orthokeratology lens specifically designed to fit the corneas of Asian people, a lens material with high oxygen transmission rate and an application software to help selecting the first trial lens.

Commercial Relationships: Kenichi Yoshino, None

Luncheon Seminar 13**The Efficacy and Biological Significance of Aflibercept as a VEGF Family Blocker****Sponsored by Bayer Yakuhin, Ltd. / Santen Pharmaceutical Co., Ltd.****Organizer**

Susumu Ishida

Hokkaido University Graduate School of Medicine,
Sapporo, Hokkaido, Japan**434: LS13-1****The effect of intravitreal aflibercept treatment for Japanese patients with exudative Age-related macular degeneration****Speaker: Yuji Oshima**¹

1. Department of Ophthalmology,, Graduate School of Medical Science, Kyushu University, Fukuoka, Japan.

Age related macular degeneration (AMD) is the main cause of legal blindness for western countries. The population of the patients with AMD is increasing not only western countries but also Asian countries in recent years. Polypoidal choroidal vasculopathy (PCV) is the one of the type of exudative AMD, and it is well known that the incidence of PCV is higher in Asian population than in Caucasian. After MARINA, ANCHOR study, intravitreal injection of anti-VEGF drug especially ranibizumab to treat for exudative AMD is established standard method. Aflibercept is the new anti-VEGF drug and the efficacy for wet AMD patients have reported in VIEW study. Aflibercept treatment for Japanese wet AMD patient has approved in 2012, and its efficiency for Japanese patient has been recognized. In this talk, I would like to present the effect of Aflibercept treatment for Japanese AMD patient including the effect for PCV patients.

Commercial Relationships: Yuji Oshima, None**Support:** JSPS KAKENHI Grant # Kiban C26462641**435: LS13-2****Evolving Therapeutic Option for Diabetic Macular Edema -Aflibercept-****Speaker: Kousuke Noda**¹

1. Department of Ophthalmology, Hokkaido University Graduate School of Medicine, Sapporo, Hokkaido, Japan.

The prevalence of diabetes is rapidly increasing worldwide in association with population aging and lifestyle changes. In the eye, diabetes compromises the barrier function of retinal microvasculature as one of the manifestations of diabetic retinopathy (DR) and causes fluid accumulation in the macula, *i.e.*, diabetic macular edema (DME). Whereas the pathogenesis of DME is multifactorial in origin, preclinical and clinical studies have so far elucidated that vascular endothelial growth factor (VEGF), a potent angiogenic factor, predominantly plays a role in the pathogenesis of DME and currently anti-VEGF therapy has emerged as a part of first line treatment in DR.

Aflibercept, recombinant human chimeric fusion protein, is composed of domains from human VEGF receptors (VEGFR)-1 and -2 fused to the Fc domain of human immunoglobulin G1. This chimeric protein targets all ligands that bind to VEGFR-1 and VEGFR-2, including all isoforms of VEGF-A, VEGF-B, and placental growth factor (PlGF). Preclinical studies of aflibercept have shown a high binding affinity of this molecule for VEGF-A along with a long duration. In addition, it was demonstrated that PlGF, which increases vascular permeability similar to VEGF-A, was elevated in eyes with DR. Therefore, aflibercept is an attractive therapeutic agent for DME; in fact, two phase III studies of aflibercept in patients with DME, VIVID-DME and VISTA-DME showed rapid reduction in edema and significant improvement in visual acuity compared to the control group treated with laser monotherapy.

This presentation focuses on the potential benefit of aflibercept in the treatment of DME based on its pharmacological characteristics.

Commercial Relationships: Kousuke Noda, None

Luncheon Seminar 14

Prevention of AMD –Up to date

Sponsored by B.L.J. Company, Ltd.

Organizer

Taiji Sakamoto

Kagoshima University Graduate School of Medicine and Dental Sciences, Kagoshima, Kagoshima, Japan

436: LS14-1

How has the Prevention Research of AMD progressed?

Speaker: Yasuo Yanagi¹

1. Department of Ophthalmology, Graduate School and Faculty of Medicine, The University of Tokyo, Tokyo, Japan.

I would like to break my presentation into three parts: the first being “what are lutein and zeaxanthin?” in which I will explain about the basics of these macular pigments. The second part will be about the functions of these macular pigments, and the last one will be about “lutein and zeaxanthin and age-related macular degeneration” in which I will talk about the clinical significance of macular pigment.

Commercial Relationships: Yasuo Yanagi, Santen Pharmaceuticals (F), Novartis Pharma (F)

437: LS14-2

Nutrient Supplement for early AMD

Speaker: Yoko Ozawa^{1,2}

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku, Tokyo, Japan. 2. Laboratory of Retinal Cell Biology, Keio University School of Medicine, Tokyo, Japan.

Age-related macular degeneration (AMD) has become a social issue in this super-aging society. Although drugs targeting neovascularization to treat advanced AMD are now expanded, the therapeutic outcomes are not always satisfactory and the high costs will be stressful for the patients. Therefore, the patients with early AMD wish to prevent the progression to advanced AMD.

Nutrient supplement has been a home remedy, taken under the patients' own responsibility. Thus, some of the patients may have used the supplement in an inefficient way. However, we now know that a certain combination of the nutrient supplement can prevent AMD progression, efficiently. To diffuse the knowledge among the patients has become our responsibility.

In this talk, the possible mechanisms of the nutrient supplement to prevent AMD is discussed to help understand the significance of taking micronutrient supplement for a long time.

Commercial Relationships: Yoko Ozawa, Wakasa Seikatsu Co., Ltd. (F), NOVARTIS Pharmaceutical Co., Ltd. (F), Alcon Research LTD (F), JINS CO., LTD. (F)

Support: JSPS KAKENHI (24592647)

Luncheon Seminar 15

Innovation 2015 in Dry Eye Disease

Sponsored by R-Tech Ueno, Ltd.

Organizer

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo,
Japan

438: LS15-1

Innovation 2015 in Dry Eye Disease

Speaker: Penny A. Asbell¹

1. Department of Ophthalmology, Mount Sinai School of Medicine, New York, NY, United States.

Dry eye disease (DED) is probably the most common reason for patients to seek eye care. Ocular surface disease impacts patients with dry eye disease, pre and post eye surgery (Cataract, LASIK), and is frequently associated with diabetes, and glaucoma treatment and poor wound healing. It is a form of chronic eye pain associated with variable vision that likely has inflammation as a core mechanism in its pathogenesis. New approaches to in-office diagnosis and evaluation include: MMP-9 tear concentration, tear osmolarity, ocular imaging-Keratograph. Understanding biomarkers of inflammation associated with DED may allow for better classification of patients and personalized treatment. New approaches for treatment include serum components, anti-inflammatory agents, MGD treatments. Further clinical trials will help elucidate the efficacy and safety of new approaches to diagnose and treat DED to provide the best clinical care for our patients.

Commercial Relationships: Penny Asbell, R-tech Ueno (F), Oculus (F), Alcon (F), Merck (F), NEI (F), B&L/Valeant (C), Nicox (C), Candeo (C), Eleven Biotherapeutics (C)

Luncheon Seminar 16

The Future of Eyeglasses - Functional Eyewear

Sponsored by JIN Co., LTD.

Organizer

Norihiko Yokoi

Kyoto Prefectural University of Medicine, Kyoto, Kyoto,
Japan

589: LS16-1

The Future of Eyeglasses - Functional Eyewear

Speaker: Kazuo Tsubota¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku-ku, Tokyo, Japan.

For many years, the conventional view on eyeglasses has centered on vision correction. However, a new concept of "Functional Eyewear" has emerged where even people who had no need for conventional refractive glasses can benefit. This new concept is rapidly gaining ground, and progress has been made in the development of glasses based on personal needs such as "Moisture glasses" for people with dry eye and "Blue Light Filtering Glasses" for those who do large amounts of visual display terminal (VDT) work. In addition, current developments in this field include the incorporation of cutting-edge technologies which have made it possible for functional eyewear to sense blinking and eye movement in real-time. In this talk, I would like to discuss the latest topics on the evolution of functional eyewear and its possibilities for utilization in the ophthalmic field based on evidence-based research.

Commercial Relationships: Kazuo Tsubota, JIN Co., Ltd. (F), Moisture Glasses (P), Santen Pharmaceutical Co., Ltd (F), MediProduct, Inc. (F), Functional Visual Acuity Meter (P), KOWA (F)

Support: JIN Co., Ltd.; Santen Pharmaceutical Co., Ltd.; MediProduct, Inc.; Kowa Co.

Luncheon Seminar 17**Recent Advances in Corneal Surgical Treatments -Present and Future-****Sponsored by Alcon Japan Ltd.****Organizer**

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

590: LS17-1**Evolution of Advanced Corneal Surgery -Present and Future****Speaker: Tsutomu Inatomi**¹

1. Department of Ophthalmology,, Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan.

The evolution of advanced corneal surgery encapsulates the development of new techniques and concepts for the surgical reconstruction of the cornea. Much progress has currently been made in the deeper understanding of the corneal structure as well as technical innovations. The goal of advanced corneal surgery is focused on not only visual rehabilitation, but also on understanding biological responses in the cornea post surgical wound healing and transplantation. Innovative processes such as cellular therapy based on regenerative medicine and laser technology open new therapeutic pathways to overcome corneal blindness and the limitations associated with conventional therapies.

The current trend of replacing the affected areas of the cornea minimizes the disadvantages associated with keratoplasty and provides better visual function and lessens immunological response. Photorefractive therapeutic keratectomy, automated lamellar keratoplasty, and deep anterior lamellar keratoplasty have all now become alternative surgical options. Innovations in laser technology such as the femtosecond laser now offer more flexibility and improved accuracy of the corneal excision compared with conventional hands-on manual incisions.

In addition, endothelial keratoplasty has initiated a revolution of surgical modalities aimed at treating endothelial dysfunction. The numerous reports of successful postoperative outcomes has led Descemet Stripping Automated Endothelial Keratoplasty (DSAEK) to become the surgical option of choice, however, Descemet Membrane Endothelial Keratoplasty (DMEK) is quickly becoming a new contender in the evolution of endothelial therapy that appears to hold great promise in the near future.

In this lecture, the current landmark achievements on the evolutionary path of corneal surgery and pathophysiological advancements will be reviewed, with added discussion on predicting the future direction of corneal surgery.

Commercial Relationships: Tsutomu Inatomi, None**591: LS17-2****Art, Philosophy and Science of Corneal Surgery****Speaker: Shigeto Shimmura**¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku, Tokyo, Japan.

Since the first successful case of penetrating keratoplasty (PK) by Eduard Zirm in 1905, keratoplasty techniques have evolved slowly over the 20th century. However, the 21st century has already seen an explosive evolution in corneal surgery techniques thanks to advances in instruments, laser technology and scientific knowledge. Increasing demands by patients has also been a drive in devising safer, and more effective techniques to achieve better visual results, as well as treating disease that were thought incurable. Our understanding of cell biology and immunology has proven that more emphasis is needed on adjunctive therapy in addition to surgical techniques. New evidences show that the cornea may have a much greater self-healing ability that we have previously believed. The emergence of regenerative medicine using various cell sources will shift the treatment of corneal disease from technique-based surgery to cell-based surgery. My talk for this seminar will introduce possible paradigm-shifts in corneal surgery, and what we can expect in the coming decades.

Commercial Relationships: Shigeto Shimmura, None**Support:** Highway Program for Realization of Regenerative Medicine of the Ministry of Education, Culture, Sports, Science and Technology, Japan

Luncheon Seminar 18

Clinical Practice of Pathologic Myopia - Clinical Study for Myopic CNV and Case Conference

Sponsored by Novartis Pharma K.K.

Organizers

Akito Hirakata

Kyorin University School of Medicine, Mitaka, Tokyo, Japan

Kyoko Ohno-Matsui

Tokyo Medical and Dental University, Bunkyo, Tokyo, Japan

LS18-2

Case Presentation Speaker: Hyeong Gon Yu ¹

1. Department of Ophthalmology, Seoul National University College of Medicine, Seoul, South, Korea (the Republic of).

592: LS18-1

Overview on RADIANCE study

Speaker: Hyeong Gon Yu ¹

1. Department of Ophthalmology, Seoul National University College of Medicine, Seoul, South, Korea (the Republic of).

Pathologic myopia is one of the leading causal diseases of social blindness in Asian countries. Pathologic myopia shows various type of the fundus findings, of which myopic CNV occupies 10% of them. Since 2014, ranibizumab has been approved for treatment of CNV secondary to pathologic myopia in some countries. The efficacy and safety of ranibizumab for myopic CNV was proven in RADIANCE study, which is the phase III, randomized controlled study, conducted in Asia Pacific and European countries. In this lecture, I would like to overview the result of the RADIANCE study, followed by our case presentations and discussion over the various types of pathologic myopia which we have seen in our clinical practice.

Commercial Relationships: Hyeong Gon Yu, Novartis (C)

LS18-3

Case Presentation Speaker: Gemmy Cheung Chui Ming¹

1. Singapore National Eye Centre, Singapore, Singapore.

LS18-4

Case Presentation Speaker: Won-Ki Lee¹

1. The Catholic University of Korea, Seoul, Korea (the Republic of).

Luncheon Seminar 19**Key Factors in Glaucoma Treatment: Start and Strengthen**

Sponsored by Santen Pharmaceutical Co., Ltd.

Organizers

Yasuaki Kuwayama

Fukushima Eye Clinic, Osaka, Osaka, Japan

Goji Tomita

Toho University Ohashi Medical Center, Meguro, Tokyo.

593: LS19-1**Which patients and when to start ... PPG and early phase****Speaker: Atsuya Miki**¹

1. Ophthalmology, Osaka University, Suita, Osaka, Japan.

Standard automated perimetry (SAP) has long been a standard method for diagnosing and monitoring glaucoma. However, evidence suggests that substantial structural damages of the optic nerve head and retinal nerve fiber layer (RNFL) can occur before the development of clinically detectable visual field damage. Newly developed imaging instruments such as optical coherence tomography (OCT) have attracted attention as promising techniques to diagnose glaucoma earlier than existing methods such as SAP. Especially, trend-based progression analysis of OCT-measured RNFL thickness is useful for predicting the patients' prognosis as well as for confirmation of the diagnosis. This presentation will show how to use OCT-measured parameter analyses such as trend-based RNFL thickness analysis in early stages of glaucoma.

Commercial Relationships: Atsuya Miki, Nidek Co. (C), Santen Pharmaceutical (R), Pfizer Japan (R), Hoya Inc. (R), Otsuka Pharmaceutical (R)

594: LS19-2**Consider risk factors ... Desired patients to strengthen earlier****Speaker: Makoto Aihara**¹

1. Yotsuya Shirato Eye Clinic, Tokyo, Japan.

In the early stage of glaucoma treated with PG analogues, we should consider the prognosis of the patients even though the first drug is effective to reduce IOP around 20 to 30%. When do you strengthen the medical treatment of the early glaucoma? Recent epidemiological or RCT studies suggest many risk factors for incidence of glaucoma and its progression. Considering points to strengthen the treatment are divided into two groups based on the phase of treatment. One is the background of the patient at the initial phase of treatment and diagnosis, and another is the ocular and systemic signs obtained at the follow-up phase.

In the former, at the initial phase, high IOP even treated with PG analogues, is on the top of the risk factors. Also, family history, age, the presence of exfoliative materials, systemic diseases such as hypotension or diabetes, and factors suggesting insufficient peripheral circulation related to ocular perfusion pressure, must be considered to be a poor prognosis of the glaucoma. In addition to these factors affecting RGC vulnerability, the pattern of visual field damage should be considered. Even in the early stage of glaucoma, cecentral, especially inferior damage should be the target to strengthen the treatment because the progression of the damage in this area leads to the poor QOV.

In the latter, at the follow-up phase, the eye and the patients often indicate various risk factors of glaucoma progression. Of course, the progression of visual field or optic disc damage in a few years, must be the definite factor to strengthen the treatment. Otherwise, disc hemorrhage, large IOP fluctuations, and IOP elevation, must be the points to strengthen the treatment. In addition to these ocular signs of poor prognosis, long-term changes of ocular and systemic conditions should be considered.

The second lines of the medical treatment are beta-blocker, carbonic anhydrase inhibitor, or alpha2 agonist. To strengthen the treatment in the early stages of glaucoma, care should be taken to confound the adherence by increasing the number of eye drops or the side effects. The balance between the efficacy and safety is important to strengthen the medical treatment. Effective use of the combined drugs may be one of the better choices to keep the adherence. Some of the combined drugs of PG analogue and beta-blocker are effective to strengthen IOP-reduction by keeping the dropping time once daily, probably for the patients with risk factors but expecting poor adherence. The combined drugs of beta-blocker and carbonic anhydrase inhibitor are also effective for the patients with risk factors and thus maximum IOP reduction.

Monitoring the risk factors in the background of the patients and finding them during the long-term treatment are always required and will contribute to suppress progression and poor prognosis. The better choice to reduce IOP and to keep adherence is also required to strengthen the medical treatment.

Commercial Relationships: Makoto Aihara, None

595: LS19-3

Keep lifelong vision ... Desired patients to strengthen more

Speaker: Hiroshi Sakai ¹

1. University of the Ryukyus, Nishihara, Japan.

To prevent the blindness or low vision from glaucoma and keep the quality of life of the patients in lifelong are the missions of ophthalmologists. What kind of situations or the subtype of the glaucoma are desired to strengthen more? Low vision or blindness from glaucoma is 3 to 5 times more prevalent in the patients with primary angle closure glaucoma (PACG) than primary open angle glaucoma (POAG). Pseudoexfoliation (PEX) glaucoma is also a risk of the blindness. In addition, PEX is a risk factor of the failure of the surgical treatment such as trabeculectomy to reduce the intraocular pressure (IOP). Unilateral blindness can be caused by secondary glaucoma with high IOP. IOP lowering is important especially in glaucoma patients who have high IOP. The first choice of the treatment for PACG or secondary glaucoma should be to remove the cause as much as possible, and the medical treatment using anti-glaucomaotous eye drops is the second line treatment for residual high IOP. The first line therapy to reduce IOP in glaucoma patients with high IOP is prostaglandine analogues (PGs), and when IOP lowering by PGs is not sufficient, fixed combination of beta-blocker and carbonic anhydrase inhibitor such as Cosopt is preferred. IOP lowering is also important in the glaucoma patients who have normal range IOP. The target IOP level should be lower in patients with younger age, severe visual field damage, or risk factors of progression such as disc hemorrhage. The patients who has high risk of visual impairments is desired to strengthen the treatments more.

Commercial Relationships: Hiroshi Sakai, None

Afternoon Seminar 1**Evolving Femtosecond Laser Technology in Cataract and Refractive Surgery****Sponsored by Alcon Japan Ltd.****Organizer**

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

180: AS1-1**Evolving Femtosecond Laser Technology in Cataract and Refractive Surgery****Speaker: Shigeru Kinoshita**¹

1. Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan.

This talk will summarize the research and development and clinical efficacy of femtosecond laser for cataract and refractive surgery.

Commercial Relationships: Shigeru Kinoshita, Alcon Japan (F), AMO (F)

181: AS1-2**Introducing Femtosecond-laser to Cataract Surgery****Speaker: Hiroko Bissen-Miyajima**¹

1. Department of Ophthalmology, Tokyo Dental College Suidobashi Hospital, Chiyoda-ku, Tokyo, Japan.

The introduction of femtosecond-laser technology to current cataract surgery is an exciting revolution, especially since phacoemulsification has been the standard technique for over 30 years. In this seminar, I will cover the current status of femtosecond-laser assisted cataract surgery worldwide, the way of adapting this technology to the clinic, the advantages and drawbacks of each step of cataract surgery, clinical outcomes, and the indication for complicated cases.

Since the first clinical usage of femtosecond laser to cataract surgery in 2008, the laser has been installed in over 60 countries. The cost effectiveness and the allocation of space for the larger than usual ophthalmic apparatus have been discussed, and the personal experience with LenSx[®] (Alcon) will be presented. The term "laser" is emphasized, however, the precise analysis of the eye with optical coherence tomographer (OCT) is the key to the success of this surgery. Thus, the modification of the patient interface has been very helpful and has improved the surgical outcome. The achievement of a perfect anterior capsulotomy and the ideal position of intraocular lens in the capsular bag have the potential of improving postoperative visual quality. The new pattern of laser application to crystalline lens will reduce or disuse phacoemulsification, and the complications related to phacoemulsification, such as rupture of posterior capsule or loss of endothelial cells could be avoided. Primary and secondary corneal incisions are made by the laser, and the ideal structure of the wound has been investigated. However, the senile ring and vessels around the cornea-scleral limbal area should be avoided. For corneal astigmatism, intrastromal incision to reduce the astigmatism has become possible.

In addition to the regular cataract cases, the combination of OCT and laser show advantages in complicated cases, such as mature cataract and dislocated lens. These cases will be presented by video. The problem we face at this time is that the indication of femtosecond-laser assisted cataract surgery is limited to the cases with sufficient dilation of the pupil and suitable size of palpebral fissure. We are still at the starting point of this new technology and will expect further development in near future.

Commercial Relationships: Hiroko Bissen-Miyajima, None

Afternoon Seminar 2

Current Management of Choroidal Neovascularization due to Pathological Myopia

Sponsored by Bayer Yakuhin, Ltd.

Organizer

Kyoko Ohno-Matsui
Tokyo Medical and Dental University, Bunkyo, Tokyo,
Japan

182: AS2-1

Epidemiology and Diagnosis of mCNV in Asia

Speaker: Gemmy Cheung¹

1. Singapore Eye Research Institute, Singapore, Singapore.

Choroidal Neovascularization (CNV) is a complication of pathologic myopia and can lead to severe visual loss. The first part of this talk will cover the epidemiology of pathologic myopia including complication and impact on vision. The second part will cover diagnosis of myopic CNV, with particularly emphasis on imaging techniques.

Commercial Relationships: Gemmy Cheung, Novartis (C), Novartis (F), Novartis (R), Bayer (C), Bayer (F), Bayer (R), GlaxoSmithKline (F), Roche (F), Allergan (R)

183: AS2-2

Treatment of myopic CNV

Speaker: Yasushi Ikuno¹

1. Department of Ophthalmology, Osaka University Graduate School of Medicine, Suita, Osaka, Japan.

Myopic choroidal neovascularization is one of the major causes of legal blindness in pathological myopia. Diagnosis and treatment of mCNV was quite challenging because of small lesion in atrophic fundus. Recently the anti-VEGF therapies has proven to be effective to shrink the CNV and consequent visual improvement. MYRROR study, a prospective, randomized, sham-controlled, double-masked clinical trial has shown a significant visual gain compared to controls. In this session, quick review of mCNV will be presented, and tips of diagnosis and treatment will be discussed.

Commercial Relationships: Yasushi Ikuno, None

Afternoon Seminar 3**The Consensus of the Asia Dry Eye Society on the Concept of Dry Eye****Sponsored by Santen Pharmaceutical Co., Ltd.****Organizers****Kazuo Tsubota**

Keio University School of Medicine, Shinjuku, Tokyo, Japan

Zuguo Liu

Xiamen Eye Center of Xiamen University, Xiamen, Fujian, China

Hyo-Myung Kim

Korea University, Seoul, Korea (the Republic of)

184: AS3-1**Diagnostic Methodology of Dry eye syndrome****Speaker: Hung-Won Tchah¹**

1. University of Ulsan, Seoul, Korea (the Republic of).

Study Group: none

Dry eye is one of the most commonly encountered problems in ophthalmology. It is challenging to define due to a wide spectrum of abnormalities to the ocular surface and a variety of presenting symptoms that can change from patient to patient. In addition, the results of dry eye clinical tests tend to agree poorly with patient-reported symptoms. Historically, dry eye disease was defined as reduction of the aqueous phase of tear film. In 2007, the International Dry Eye Workshop updated the original definition and classified dry eye as: "a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage of the ocular surface. Current methods of diagnosis include a slit-lamp examination with and without different stains, including fluorescein, rose bengal, and lissamine green. Other methods are the Schirmer test, tear function index, tear break-up time, and functional visual acuity. Emerging technologies include meniscometry, optical coherence tomography, tear film stability analysis, interferometry, tear osmolarity, the tear film normalization test, ocular surface thermography, and tear biomarkers.

Commercial Relationships: Hung-Won Tchah, None**185: AS3-2****Pathophysiology and classification of the dry eye****Speaker: Xuguang Sun¹**

1. Ocular Microbiology, Tongren Eye Center, Beijing, China.

The dry eye is a very popular ocular surface disease in the world.

The pathophysiology of the dry eye is involved in several mechanisms:

- 1 age-related
- 2 inflammation
- 3 immunology and auto-immunology
- 4 systemic metabolism
- 5 life-style ect.

Generally the development of dry eye is related to several factors:

- 1 ocular factors : MGD, eye lid and blinking, ect.
- 2 systemic factors: hormone, medicines, ect.
- 3 environmental factors: air pollution, dry air, study and work conditions, VTS ect.

Up to now, there are several types of classification for the dry eye with different methods in the world. But clinically a practical classification should be included in:

I. Classification of dry eye according to the mechanism.

1. Aqueous-deficient: such in Sjogren syndrome and other systemic diseases**2. Excessive evaporative:** the disorder caused by abnormal lipid layer of tear film such as in MGD, blepharitis, video terminal syndrome and so on.**3. Mucins-deficient:** such in the lesions in epithelium on the ocular surface caused by drugs toxic, chemical injury**4. Abnormal fluid dynamics of tear film:** such in blinking abnormality, and conjunctiva chalasis**5. Combined:** combined with any two or more types above. This type of dry eye is most common in clinical practice . From type one to type four, if any single type of dry eye is progressed , it could become the combined type.

II. Dry eye is generally graded according to a combination of symptoms and signs of patients. It is useful for guidance to therapy of the dry eye.

1. Mild dry eye, just symptoms, without signs
- 2 moderate dry eye, symptoms with signs, but after treatment, signs will disappear.
- 3 and severe dry eye: severe symptoms with signs that cannot completely disappear after treatment.

Commercial Relationships: Xuguang Sun, None

Short Breakup Time (BUT)-Type Dry Eye

Speaker: Norihiko Yokoi ¹

1. Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kamigyo, Kyoto, Japan.

Short breakup time (BUT)-type dry eye, first reported by Toda, Shimazaki, and Tsubota in 1995, is considered as a subtype of dry eye. It is characterized by a bilateral presentation, a non-abnormal reflex tear secretion, and minimal ocular surface damage, yet the BUT is abnormal and shorter. The core mechanism of this type of dry eye is thought to be the associated unstable tear film (TF) (i.e., quality of tears). In recent years, attention is increasingly focused on the treatment of this subtype, as it may comprise the majority of dry eye cases. In short BUT-type dry eye, although the subjective symptoms, including dryness and vision-related symptoms such as blurred vision and ocular fatigue, are sometimes very severe. However, it is sometimes overlooked or misdiagnosed because even though the symptoms can be severe, the ocular surface epithelial damage is minimal and the shorter BUT is the only objective sign. Moreover, in accordance with the most recent diagnostic criteria for dry eye, it is often diagnosed as probable dry eye. As for the pathology of short BUT-type dry eye, recent studies have pointed out the abnormality of membrane associated mucin and secretory mucin as suspected causes. Among the breakup patterns which are seen in short BUT-type dry eye, 'spot break', a term we coined and determined to be the most striking pattern, is related to the severe symptoms. However, the mechanism by which short BUT-type dry eye is accompanied by severe symptoms remains unclear. Currently, it is attributed to the distribution of the TF breakup, which is observed relatively around the center of the cornea in this type of dry eye, which is related to the lesion with greater sensitivity and even more greatly related to the optical quality, as evidenced by the analysis of corneal topography and wavefront aberration. At present, eye drops which facilitate mucin production are available in Japan to treat this dry eye subtype. In this presentation, short BUT-type dry eye, together with the recent advances in this field, will be introduced.

Commercial Relationships: Norihiko Yokoi, None

Afternoon Seminar 4

Amniotic Membrane and Umbilical Cord in Regenerative Medicine

Sponsored by ROHTO PHARMACEUTICAL CO., LTD.

Organizer

Shigeto Shimmura

Keio University School of Medicine, Shinjuku, Tokyo,
Japan

361: AS4-1

Amniotic Membrane and Umbilical Cord in Regenerative Medicine

Speaker: Scheffer C. Tseng^{1,2}

1. R&D Department, TissueTech, Inc., Miami, FL, United States. 2. Ocular Surface Center, Miami, FL, United States.

Developmentally, both amniotic membrane and umbilical cord are derived from the inner cell mass and hence share the same cell origin as the fetus. Unlike adult wound healing, where both innate and adaptive immunity prevails to rapidly summon inflammatory and subsequent immune responses, fetal wound healing evades such a defense strategy and yet leads to regeneration. The mystery of "scarless" fetal wound healing has been lingering around for several decades. This lecture will first review clinical applications of cryopreserved human amniotic membrane and umbilical cord in and beyond ophthalmology in the fields of fetal surgeries, skin, tendon, nerve and gum. Furthermore, this lecture will summarize the current published and unpublished data supporting the hypothesis that the mystery might lie in the novel matrix, termed HC-HA/PTX3, uniquely present in both amniotic membrane and umbilical cord. To delve into the mechanistic understanding of these clinical applications, we will also provide evidence that this unique HC-HA/PTX3 matrix is capable of suppress both innate and adaptive immune responses by targeting activated but not resting neutrophils, macrophages and lymphocytes, while at the same time suppressing myofibroblast differentiation (thus preventing scarring) and angiogenesis. Moreover, HC-HA/PTX3 can also reprogram differentiated cells into progenitors leading to regeneration.

Commercial Relationships: Scheffer Tseng, TissueTech (E), TissueTech (P), NIH, NEI (R)

Support: NIH, NEI, R43/44 EY017497, EY021045, EY022502 and RO1 EY06819

Afternoon Seminar 5

Recent Topics for Better Understanding the Etiology of Early AMD

Sponsored by WAKASA SEIKATSU CO., Ltd.

Organizer

Susumu Ishida

Hokkaido University Graduate School of Medicine,
Sapporo, Hokkaido, Japan

362: AS5-1

Serum calcium level and large drusen

Speaker: Kenji Yamashiro¹

1. Department of Ophthalmology and Visual Sciences, Kyoto University Graduate School of Medicine, Kyoto, Kyoto, Japan.

Drusen is small extracellular deposit between the retinal pigment epithelium and the inner collagenous layer of Bruch's membrane. Large drusen ($\geq 125 \mu\text{m}$ in diameter) is one of the most important risk factors for the development of late stage age-related macular degeneration (AMD). The elucidation of the background for large drusen formation will lead to prevention of AMD development. Our recent study using 971 large drusen cases and 3,209 controls in a community-based cross-sectional survey in Japan identified a strong association of serum calcium level, ARMS2 A69S (rs10490924) genotype, Chlamydia pneumoniae IgG, and age to the large drusen formation. The hypocalcemia participants had a higher prevalence of large drusen. Supplementary calcium intake might prevent large drusen formation, which results in prevention of late AMD development in Asian.

Commercial Relationships: Kenji Yamashiro, None

363: AS5-2

Lutein's effect to protect the retina

Speaker: Yoko Ozawa^{1,2}

1. Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan. 2. Laboratory of Retinal Cell Biology, Keio University School of Medicine, Tokyo, Japan.

Increase in the number of patients with age-related macular degeneration (AMD) has now become a social issue in the aging society. For preventing AMD, the recent large-scale clinical study, Age-related Eye Disease Study 2 (AREDS2), suggested the use of antioxidant micronutrient supplements including lutein. However, the biological effect of lutein and the related molecular mechanisms may not be well-recognized by the users. In this talk, the lutein's effect in the retina is introduced showing the animal and cellular experiments. The knowledge will help understand why lutein is recommended to take for preserving the retinal health.

Commercial Relationships: Yoko Ozawa, Wakasa Seikatsu Co., Ltd. (F), NOVARTIS Pharmaceutical Co., Ltd. (F), Alcon Research LTD (F), JINS CO., LTD. (F)

Support: JSPS KAKENHI (24592647)

Afternoon Seminar 6

Latest Multifocal IOL in Japan

Sponsored by Alcon Japan Ltd.

Organizer

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo, Japan

540: AS6-1

Overview of multifocal IOL market

Speaker: Kazuno Negishi¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku, Tokyo, Japan.

Multifocal intraocular lens (IOL) implantation has become widely accepted as an effective method for the correction of presbyopia after cataract surgery. Since the AcrySof® ReSTOR® IOL +4.0 D was firstly introduced to Japan in 2008, the families of the AcrySof® IQ ReSTOR® IOL (Multifocal +3D and Multifocal Toric +3.0 D), and have been released in the sequence. In addition, the AcrySof® IQ ReSTOR® +2.5 D IOL has been launched in Japan this year. The AcrySof® IQ ReSTOR® IOL is now the most popular multifocal IOL officially approved in Japan, which can be indicated for a great variety of the patients.

The AcrySof® IQ ReSTOR® IOL +4.0 D provides good near and distance visual acuity. It may have become outdated and be unavailable in most countries because of the inferiority of intermediate vision. However, it can be still indicated for the patients who read at the distance of around 30 cm, which is the popular reading distance for Japanese.

The AcrySof® IQ ReSTOR® +3.0 D IOL provides the broadest range of vision for true performance at all distances, and widely accepted in the world. The AcrySof® IQ ReSTOR® Multifocal Toric +3.0 D IOL offers astigmatic patients true performance at all distances for the broadest range of vision.

The AcrySof® IQ ReSTOR® +2.5 D IOL, the newest member of the AcrySof® IQ IOL family, delivers more sharp distance vision. It can be recommended for patients with distant dominant lifestyles who desire the opportunity for decreased spectacle dependence.

In this presentation, the optical characteristics and clinical features of the families of the AcrySof® IQ ReSTOR® IOL will be outlined.

Commercial Relationships: Kazuno Negishi, Alcon Japan Ltd. (R)

541: AS6-2

Clinical outcomes of a diffractive multifocal toric intraocular lens, a diffractive multifocal intraocular lens with low addition power, and combined implantation of multifocal intraocular lens with different addition powers

Speaker: Ken Hayashi¹

1. Hayashi Eye Hospital, Fukuoka, Japan.

Purpose: Clinical outcomes of 1) a diffractive multifocal intraocular lens (IOL) with toric components, 2) a distance-dominant diffractive multifocal IOL with low addition power (+2.5 diopers [D]), and 3) combined implantation of diffractive multifocal IOL with different near addition powers in each eye will be presented. The purposes of this presentation were the following three: 1) to compare visual and refractive outcomes between patients with multifocal toric IOLs and those with monofocal toric IOLs, 2) to compare monocular and binocular visual function between eyes with a diffractive multifocal IOL with +2.5D addition power and eyes with a monofocal IOL, and 3) to compare binocular visual function between patients implanted with diffractive multifocal IOLs of different addition powers in each eye or patients implanted with the same multifocal IOLs in both eyes.

Methods: 1) Sixty-six eyes of 33 patients scheduled for implantation of diffractive multifocal toric IOLs (Alcon ReSTOR® Toric; SND1T) with preoperative corneal astigmatism between 0.75 diopter (D) and 2.82D, and 66 eyes of 33 age-matched patients scheduled for implantation of monofocal toric IOLs (SN6AT) with the same astigmatic range were recruited for the study of the multifocal toric IOL. 2) 64 eyes of 32 patients scheduled for implantation of a distance-dominant diffractive multifocal IOL with a +2.5D addition power (ReSTOR® +2.5D, SV25T0), and 64 eyes of 32 age-matched patients scheduled for implantation of a monofocal IOL (SN60WF) were recruited for the study of the multifocal IOL with +2.5D addition power. 3) 35 patients undergoing implantation of diffractive multifocal IOLs with +3.0D near addition power (SN6AD1) implanted in the dominant eye and a multifocal IOL with +4.0D power (SN60D3) implanted in the nondominant eye (combined implantation group), and 35 patients undergoing bilateral implantation of the same multifocal IOL (SN6AD1) in both eyes (same IOL group) were enrolled in the study of combined implantation of the multifocal IOLs with different addition power. At 3 months postoperatively, uncorrected or corrected VA from far to near distances was measured all-distance vision tester (Kowa AS-15), contrast VA and that in the presence of a glare source (glare VA) under photopic and mesopic lighting conditions was measured using the contrast sensitivity accurate tester (Menicon CAT-2000). Refractive outcomes, stereoacuity, spectacle independency, and patient satisfaction were also examined.

Results: 1) In comparison between the multifocal toric

IOL and monofocal toric IOL, the mean refractive astigmatism decreased to $0.71 \pm 0.32\text{D}$ in the multifocal-toric group and $0.74 \pm 0.41\text{D}$ in the monofocal-toric group. For monocular and binocular VA, mean uncorrected or corrected near VA at 0.3 m and intermediate VA at 0.5 m were significantly better in the multifocal-toric group than in the monofocal-toric group ($P \leq 0.0011$), while uncorrected or corrected VA at other distances was similar between groups, except for VA at 1.0 m. Binocular photopic and mesopic contrast VA at high to moderate contrasts did not differ significantly between groups, but that at low contrasts was worse in the multifocal-toric group ($P \leq 0.0429$).

2) In comparison between multifocal IOL with +2.5D addition and monofocal IOL, mean monocular or binocular uncorrected and distance-corrected near VA at 0.3 m and intermediate VA at 0.5 m were significantly better in the multifocal group than the monofocal group ($P \leq 0.0412$). VA at other distances did not differ significantly between groups. Photopic and mesopic contrast VA and glare VA, and ocular and internal optic higher-order aberrations were similar between groups. The percentage of patients who reported glare symptoms did not differ significantly between groups, while the percentage of patients who reported halo symptoms was greater in the multifocal group ($P = 0.0009$).

3) In comparison between combined implantation of multifocal IOLs with +3D and +4D addition powers and bilateral implantation of the same IOL with +3D addition, mean binocular uncorrected or corrected near VA at 0.3 m was significantly better in the combined implantation group than in the same IOL group ($P \leq 0.0066$). Binocular uncorrected and distance-corrected VA at other distances was similar. Binocular uncorrected near of 20/25 or better was achieved in 77.1% of patients in the Combined implantation group and 45.7% in the same IOL group ($P = 0.0144$). Binocular contrast and glare VA, and stereoacuity did not significantly differ between groups. Spectacle independence and patient satisfaction with near vision were significantly better in the combined implantation group ($P \leq 0.0195$).

Conclusions: 1) A diffractive multifocal toric IOL decreased the refractive astigmatism to an acceptable range for multifocal IOLs in eyes with moderate corneal astigmatism, and provided useful VA of 20/25 or better at any distance and significantly better near and intermediate VA than a monofocal toric IOL. 2) A distance-dominant diffractive multifocal IOL with +2.5D near addition power provided useful VA at all distances, especially at intermediate distances. Contrast sensitivity with and without glare, optical quality, and glare symptom with the multifocal IOL with +2.5D addition were comparable between the multifocal and monofocal IOLs, although halo symptoms were more prominent with the multifocal IOL. 3) Combined implantation of diffractive multifocal IOLs with different addition powers provided a better binocular VA curve and spectacle independence than bilateral implantation of the same multifocal IOLs, without compromising contrast sensitivity and stereopsis.

Commercial Relationships: Ken Hayashi, Alcon Japan Ltd (F)

Morning Seminar 1**New Technology for DRY EYE Diagnosis****Sponsored by Kowa Company, Ltd.****Organizers**

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo, Japan

Shigeru Kinoshita

Kyoto Prefectural University of Medicine, Kyoto, Kyoto, Japan

187: MS1-1**Functional visual acuity technology for dry eye****Speaker: Minako Kaido**¹

1. Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan.

The 2007 International Dry Eye Workshop Epidemiology Subcommittee recommended inclusion of an item on visual function in the definition of dry eye—including fluctuation of vision or transient blurred vision—to capture the effect of ocular surface dryness on visual function and assist in defining a clinically meaningful situation. The presence of visual deterioration in dry eyes compared with normal eyes has been shown in recent studies. The stability and regularity of the ocular surface are thought to be the major factors to form clear visual images.

Standard visual acuity testing measures instantaneous visual acuity has been traditionally accepted for assessing the visual function; however, standard testing may have limitations to assess the quality of vision. There are several visual function assessment methods, such as contrast sensitivity, corneal topography, glare test and wavefront sensor.

Functional visual acuity measurement system (Kowa, Tokyo, Japan) has been developed to assess the quality of an individual's visual acuity. It is the device is to examine the change in visual acuity over time and to evaluate dynamic visual function changes relating with tear film. It has been reported that functional visual acuity is decreased in dry eye patients despite them exhibiting normal visual acuity by standard visual acuity testing. I would like to introduce the device of functional visual acuity measurement system and present the patterns of visual changes over time due to the different types of dry eye.

Commercial Relationships: Minako Kaido, None**365: MS1-2****Tear Film Oriented Diagnosis (TFOD) for Dry Eye****Speaker: Norihiko Yokoi**¹

1. Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kamigyo, Kyoto, Japan.

Tear film (TF) stability differs greatly between normal eyes and cases of dry eye. In dry eye patients, the TF is unstable and easily broken-up, thus resulting in ocular surface epithelial damage that leads to discomfort and visual impairment. Hence, the clinical diagnosis and treatment of TF instability is important, as that instability is considered a core mechanism of dry eye. Recently, topical eye-drop therapy for dry eye has greatly advanced in Japan due to the availability of new eye-drop medications that can facilitate mucin and aqueous production from the conjunctiva and enhance TF stability via the supplementation of those necessary components. As a result, the Dry Eye Society of Japan has recently produced a new concept for topical dry eye therapy termed 'Tear Film Oriented Therapy' (TFOT), in which dry eye is treated via TF stabilization through supplementation with components lacking on the ocular surface. However, to successfully perform TFOT, a 'Tear Film Oriented Diagnosis' (TFOD) is necessary. TFOD aims to determine which ocular-surface component is defective and indicate the most effective topical treatment for TF stabilization. When performing TFOD, paying attention to the relationship between TF formation and breakup on the cornea is very helpful, as at least 5 types of breakup have been identified. Those 5 types can clearly be observed by use of a DR-1TM video-interferometer (Kowa, Tokyo, Japan), which enables TF dynamics and breakup to be investigated non-invasively. Moreover, the DR-1TM can be used to observe the TF lipid layer, which is essential for the diagnosis of meibomian gland dysfunction. In this presentation, the concept of TFOD by use of the DR-1TM will be introduced.

Commercial Relationships: Norihiko Yokoi, Kowa (P)

Morning Seminar 2

Lessons from Dry Eye Survey

Sponsored by Otsuka Pharmaceutical Co., Ltd.

Organizer

Kazuo Tsubota

Keio University School of Medicine, Shinjuku, Tokyo, Japan

364: MS2-1

Lessons from Dry Eye Survey The Impact of Dry Eye Disease on Taxi Drivers: The Tokyo Study

Speaker: Motoko Kawashima¹

1. Department of Ophthalmology, Keio University School of Medicine, Shinjuku, Tokyo, Japan.

Dry eye disease (DED) is recognized as a growing public health problem. There is increasing evidence that DED is a major cause of visual disturbance, which degrades the quality of everyday life and can impact health status. The precorneal tear film plays an important role in ocular optical quality since it is the most anterior refractive surface of the eye. We recently revealed that instability of the tear film introduces functional visual acuity changes that contribute to a decrease in the quality of vision.

In 2013, we conducted a cross-sectional survey among the employees who work as a taxi driver at a company in Tokyo, Japan (N = 445; the Tokyo Study). DED was assessed according to the Japanese Dry Eye diagnostic criteria, and patients were categorized into "definite DED," "probable DED," or "non-DED" groups based on the results of DED examinations, including the Schirmer's test, fluorescein and lissamine green staining, tear film break-up time (BUT), and a questionnaire assessing symptoms.

In this session, I will review the prevalence of and factors associated with DED and the impact of DED on taxi drivers, including visual function. Also, I will introduce the results on the intervention part of DED participants among the taxi drivers from the Tokyo study.

Commercial Relationships: Motoko Kawashima, Otsuka Pharmaceutical Co.,Ltd (F)

Support: F: Otsuka Pharmaceutical Co.,Ltd

Clinical Trail: UMIN000014799

188: MS2-2

Tear-Film Breakup Patterns Surveyed among Taxi Drivers: The Tokyo Study

Speaker: Norihiko Yokoi¹

1. Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kamigyo, Kyoto, Japan.

In our recent study, we found that tear-film breakup patterns can be classified into one of five patterns that we termed as follows: 1) Spot (S) break, Area (A) break, Line (L) break, Dimple (D) break, and Random (R) break. With the exclusion of A break, those breakup patterns may constitute the so-called short breakup time (BUT)-type dry eye (DE). Short BUT-type DE was first reported by Toda and associates in 1995, and it is characterized by relatively severe symptoms, normal reflex tear secretion, and minimal ocular surface damage, yet the BUT is abnormal and shorter. In recent years, attention is increasingly focused on this DE subtype, as it may comprise the majority of DE cases. In this survey, and as our first trial, 445 taxi drivers [male: 440, female: 5, mean age: 58 ± 8 (SD) years] who drove their cars daily for work were examined in regard to what types of DE and what types of breakup pattern existed in those subjects. Each subject completed a questionnaire about subjective symptoms of DE and underwent DE testing including tear-film BUT (TBUT) and classification of breakup patterns, an ocular-surface epithelial damage staining score, and the Schirmer 1 test, followed by a DE diagnosis based on the Japanese diagnostic criteria for DE. Our results showed that prior to beginning their work day driving a taxi, definite DE was diagnosed in 17 subjects (3.8%), probable DE including short BUT-type DE in 249 subjects (56%), other types of probable DE in 52 subjects (11.7%), and non-DE in 127 subjects (28.5%). As for the tear-film breakup patterns, we found that in short BUT-type DE, D break (65.5%) was the most common, followed by R break (27.7%) and S break (4.4%). In this presentation, a general overview of short BUT-type DE will be introduced, as well as the possible importance and implication of breakup patterns in the analysis of DE based on the findings of this survey.

Commercial Relationships: Norihiko Yokoi, None

Morning Seminar 3

Japanese Cedar Pollinosis - Ocular Symptoms and Quality of Life -

Sponsored by Santen Pharmaceutical Co., Ltd.

Organizer

Atsuki Fukushima

Kochi Medical School, Nankoku, Kochi, Japan

542: MS3-1

A Quality of Life Questionnaire for Japanese Allergic Conjunctival Disease

Speaker: Kazumi Fukagawa^{1,2}

1. Ryogoku Eye Clinic, Tokyo, Japan. 2. Ophthalmology, Keio Univ. School of Med., Tokyo, Japan.

Study Group: Japanese Ocular Allergology Society

Japanese cedar pollinosis, a form of hay fever caused by pollen of the *Cryptomeria japonica* being especially prevalent in spring, causes intense ocular symptoms such as itching and red eye. The number of patients suffering from this disease is increasing, being one of the major public health problems in Japan.

It is well known that hay fever has strong impact on the Quality of Life (QOL) of the patients. We established a disease specific QOL questionnaire for Japanese allergic conjunctival disease (Japanese allergic conjunctival disease QOL questionnaire : JACQLQ). QOL scores were correlated with eye itching, eye irritation and tearing. Face scores were correlated with eye itching, eye irritation and eye redness. Treatment with 0.025% levocabastine hydrochloride ophthalmic solution and/or 0.1% fluorometholone improved these scores. The JACQLQ is a useful tool for assessing disease specific QOL in allergic conjunctival disease.

Commercial Relationships: Kazumi Fukagawa, SANTEN (F)

543: MS3-2

Treatment of Allergic Conjunctivitis in Consideration for QOL

Speaker: Jun Shoji¹

1. Department of Ophthalmology,, Nihon University School of Medicine, Itabashi, Tokyo, Japan.

Treatment of Allergic diseases can be divided into two groups depending on presence of the pharmacotherapy, and is named generally with self-care and medical care, respectively.

The purpose of self-care is to avoid pollen exposure. For example, during the pollen season, patients who wear contact lenses are recommended to discontinue the use of those lenses for self-care. In addition, wearing goggles and masks are also recommended. The appropriate self-care is thought to improve patient's quality of life (QOL).

The first option for medical care is anti-allergic eye drops. The pre-seasonal treatment with an anti-allergic eye drop reduces symptoms of the seasonal allergic conjunctivitis during the pollen season. Furthermore, the allergic conjunctivitis patients with severe symptoms receive the combined therapy with anti-allergic and steroid eye drops. The selection of the pharmacotherapy depending on severity of allergic conjunctivitis is critical for QOL improvement.

The treatment strategy of the allergic conjunctivitis should be decided in consideration of QOL in addition to the severity of symptoms and objective findings. In this seminar, I would like to talk about the optimal treatment of allergic conjunctivitis in terms of QOL.

Commercial Relationships: Jun Shoji, None