

Plenary 1 – Cataract

11 June 2006, Sunday, 0830-0850 Hrs
Hall 603, Level 6

PL101
EVOLUTION IN ULTRASOUND BASED LENS REMOVAL

Richard Mackool, USA

There have been significant recent advances in ultrasound technology, the ability to reduce incision size, and indeed our understanding of the mechanisms of ultrasound-based lens removal. Torsional lens technology has eliminated lens chatter and thereby greatly improved the efficiency of lens removal (and especially dense lens removal). While greatly reducing the possibility of thermal injury, this permits the use of smaller incisions that do not leak during surgery, as well as reduced diameter infusion sleeves and phacoemulsification needles that remain efficient at relatively modest flow and vacuum levels.

The controversial subject of cavitation vs mechanical lens removal has received impressive evidence supporting the view that cavitation is of no value to the phacoemulsification process. The clinical significance of these findings will be discussed.

Plenary 2 – Refractive

11 June 2006, Sunday, 1130-1150 Hrs
Hall 603, Level 6

PL102
THE NEXT FRONTIER – TECHNOLOGIES TO ENHANCE LASIK SAFETY, EFFICACY AND OUTCOMES BY BETTER DIAGNOSTIC, CONTROLLING SURGICALLY INDUCED SPHERICAL ABERRATION AND COMPENSATING FOR BIODYNAMIC EFFECTS

Thomas Neuhann, Germany

Latest developments in refractive technology in hardware as well as in software will support surgeons to improve the clinical outcome to the next level. Online diagnostics during the laser ablation will deliver a higher safety and efficacy level for the treatments. The new B&L eye tracker system will include intra-operative rotational eye tracking. This enables the platform now to compensate eye movements during excimer laser ablation in 4 dimensions. With the integration of the Optical Low Coherence technology the flap thickness can be measured easily without direct contact. Moreover the ablation of the cornea is monitored during the treatment.

The already known tissue saving procedure is combined with the bio-dynamic approach to provide aspheric ablations, which address the surgically induced spherical aberration. The next generation of algorithms will incorporate in addition the wavefront

information. The future diagnostic instrument will integrate corneal topography and overall wavefront measurement at one alignment axis and one single exam. This will open the possibility to integrate topography and wavefront information into the next generation of algorithms.

A short overview and introduction into the mentioned technology is given. Our clinical experience shows that the utilisation of these new technologies improves the safety and efficacy of the refractive treatments.

Plenary 2 – Oculoplastics

11 June 2006, Sunday, 1150-1210 Hrs
Hall 603, Level 6

PL103
RETHINKING PERIORBITAL REJUVENATION – THE ROLE OF VOLUME

Robert Goldberg, USA

We describe a paradigm for facial aging that is based on identification of periorbital hollows. Facial aging has a number of components. Deflation and descent probably each play a role in facial aging, and it is difficult to diagnose in any given patient which mechanism is more important. Gravitational descent does not account for all of the aging changes and in fact, may have a less important role than was traditionally ascribed. There may be no practical advantage to separating deflation from descent. For example, in lower periorbital rejuvenation, lifting procedures that elevate the cheek fat into the periorbital hollows are effective, as are volume procedures such as implants or filling with hyaluronic acid gel or fat. If lifting helps a patient whose problem is really volume, and if volume augmentation helps a patient with descent, we have been successful in both cases. The value of the paradigm of filling periorbital hollows is that it allows a minimally invasive approach that can be very effective in rejuvenating the periorbital region, whether or not it addresses the actual anatomic aging change. It does not burn bridges for open surgery, but by allowing many patients to avoid going to the operating room, can form the backbone of a minimally invasive approach that decreases risk and downtime and is very attractive to today's patients.

Plenary 2 – Allied Health

11 June 2006, Sunday, 1210-1230 Hrs
Hall 603, Level 6

PL104

CLINICAL MEASUREMENT OF VISUAL ACUITY – PAST, PRESENT AND FUTURE

Ian Bailey, USA

Since Snellen introduced his letter chart in 1865, visual acuity has been the primary visual function used to assess the health and function of the eye. For a century, there were numerous modifications to the shapes and designs of the letters and symbols, the progression of size and the arrangement of the optotypes on the charts.

Thirty years ago, the principle of standardizing the test task was introduced. Having the same number of optotypes in each row, between-letter and between-rows spacings proportional to letter size, choosing optotypes of similar difficulty and a constant-ratio size progression all combine so that size remains the only significant variable from one row to the next. The Bailey-Lovie chart design with Sloan letters as the optotypes, known best as the ETDRS chart, has become the gold standard for clinical research, and is gradually becoming more widely used by clinicians.

This design enables scoring in LogMAR or VAR units and giving credit for every letter read correctly. This is better than row-by-row scoring, because it provides more accurate and reliable measurements and more sensitivity for detecting changes or differences. Such scoring allows systematic quantification of the effects of luminance, contrast or disability glare. Charts with this design give better prediction of performance when viewing distance or magnification is changed. There is a need to have consistent rules for research or clinical measurements procedures. Patients should be able to read all optotypes at the largest size and none at the smallest size. Also, guessing and stopping rules are necessary.

Electronic displays offer great promise for providing better control of luminance and contrast. Computerized presentation and scoring of visual acuity tests improve consistency and allow on-line estimation of measurement reliability. However, pixellation of computer displays imposes limitations on the size ranges over which a 5-letter task can be presented. A size range going to 6/60 would require a 16 megapixel 120 cm screen, so currently, two or more screens or substantial variations in test distance are needed.

Visual acuity will remain the most important clinical test of vision, and computerized displays and procedures will evolve gradually.

Plenary 3 – Medical Retina

12 June 2006, Monday, 1045-1105 Hrs
Hall 603, Level 6

PL105

CURRENT STRATEGIES IN ANTI-ANGIOGENESIS THERAPY

Ursula Schmidt-Erfurth, Austria

Elucidating the biological pathways involved in choroidal neovascularization (CNV) pathogenesis will continue to reveal new therapeutic targets. Photodynamic therapy with verteporfin — the current standard of care for treating predominantly classic CNV due to age-related macular degeneration (AMD) and certain minimally classic and occult CNV lesions — effectively occludes existing lesions, thereby safely reducing the risk of vision loss. However, CNV leakage frequently persists or recurs, often requiring further treatment. Research has also demonstrated that verteporfin therapy upregulates vascular endothelial growth factor (VEGF) expression, which, in turn, stimulates vascular exudation and neovascularization. Therefore, a logical approach to optimally treat CNV is to use adjunctive therapy that complements verteporfin therapy. Anti-VEGF inhibitors, such as pegaptanib (Macugen) and the investigational ranibizumab (Lucentis) prevent VEGF-induced leakage, choriocapillary damage, and exudation from the lesion. Another investigational compound, anecortave acetate (Retaane), is an angiostatic cortisone without any antiinflammatory effects, but which down-regulates expression of the extracellular proteases needed for endothelial cell extravasation during neovascularization. Other approaches in earlier stages of development include use of a soluble decoy receptor targeted against the VEGF receptor (VEGF Trap); post-transcriptional gene silencing by small interfering RNA fragments targeted against the VEGF receptor gene (RNA interference); and gene therapy, using viral vectors containing the VEGF receptor, and the anti-angiogenic proteins angiostatin, endostatin, and PEDF, to control angiogenesis. Results from randomized trials of these agents, as monotherapy or in combination with verteporfin therapy, will improve our ability to successfully manage CNV and prevent or reduce vision loss.

Plenary 3 – Surgical Retina

12 June 2006, Monday, 1105-1125 Hrs
Hall 603, Level 6

PL106
HOW NON-INVASIVE WILL MINIMALLY INVASIVE VITRECTOMY BE?

Yasuo Tano, Japan

Nuclear sclerosis inevitably develops after successful vitrectomy in elderly patient. We have been performing 20G, 23G or more recently 25G non-vitrectomizing vitreous surgeries in idiopathic epimacular proliferation (EMP) to prevent postoperative nuclear sclerosis. Surgical techniques of 25G non-vitrectomizing vitrectomy will be discussed. We evaluated 32 EMP patients (63 ± 6 years old) treated with non-vitrectomizing vitrectomy after a follow-up period of more than 3 years. Visual acuity, refractive error, slit-lamp biomicroscopy, and Scheimpflug photographs were assessed preoperatively and postoperatively to evaluate changes in the degree of lens opacification. Quantitative analysis of the nuclear sclerosis was performed by densitometry with Scheimpflug photographs. We evaluated these measurements by comparing statistically the preoperative and postoperative difference between both eyes (data from operative eye minus that from fellow eye). There was no significant difference in the progression of nuclear sclerosis or degree of myopic shift between the operated and fellow eyes during the follow-up period (46 ± 10 months). The average preoperative and postoperative refractive errors in the treated eyes were 0.0 ± 2.5 diopters (D) and 0.3 ± 2.5 D, respectively and in fellow eyes 0.3 ± 2.1 D and 0.5 ± 2.1 D, respectively; the average difference in the refractive errors between both eyes were 0.2 ± 0.8 D preoperatively and -0.2 ± 0.8 D postoperatively ($p=0.799$, Mann-Whitney Rank sum test). The average postoperative nuclear density values by Scheimpflug photography were 76 ± 14 nuclear density units (NDUs) in the operated eyes and 76 ± 14 NDUs in the fellow eyes. Non-vitrectomizing vitreous surgery prevented the development of nuclear sclerosis based on refractive errors and Scheimpflug photography for longer than 3 years postoperatively.

Plenary 3 – Neuro-ophthalmology

12 June 2006, Monday, 1125-1145 Hrs
Hall 603, Level 6

PL107
CONGENITAL OPTIC DISC – DYSPLASIAS AND ANOMALIES

Joel Glaser, USA

Disc Hypoplasia
Isolated: Relative, Marked
Associated with Brain Defects
Dysversions and Crescents
Colobomas
Pits
Disc Elevation: Drusen (Hyaline Bodies)
Vascular Anomalies
Isolated
Associated Systemic Complexes
Hamartomatous Syndromes

Plenary 3 – Cornea

12 June 2006, Monday, 1145-1205 Hrs
Hall 603, Level 6

PL108
CORNEAL TRANSPLANTATION FOR THE NEW MILLENNIUM – BACK TO THE FUTURE?

Donald Tan, Singapore

Corneal transplantation is one of the most frequently performed, and successful forms of organ transplantation today. While lamellar keratoplasty was the main procedure performed during the first half of the last century, it is penetrating keratoplasty which has been the dominant procedure in the second half of the last century, but the tide is now turning, and we are beginning to go “back to the future”, as new techniques of lamellar transplantation are being evaluated.

Several long-term corneal transplant registries, mainly in the West, are now in existence. The Singapore Corneal Transplant Study (SCTS) was initiated at the Singapore National Eye Centre in 1991, and SCTS now represents the only large, long-term Asian corneal transplant database in existence. SCTS consists of over 1300 corneal transplants spanning a period of 15 years (1991-2006), and detailed analysis to ascertain risk factors for graft success and failure are underway. The overall success rate of corneal transplants are equivalent to the best results in the West, with 1 year graft survival of 91%.

Recent advances in transplantation surgery are now enhancing success rates. A clear shift to lamellar keratoplasty (LKP)

procedures has occurred over the last decade, and one in five transplants performed at our centre are now lamellar keratoplasty procedures. Modern indications include anterior stromal and posterior stromal/descemet's replacement, the salvage of refractive surgery disasters, and tectonic and therapeutic indications, and analysis of our SCTS data confirms enhanced graft survival and success in LKP procedures as compared to penetrating keratoplasty (PKP). New surgical techniques of lamellar surgery include total anterior stromal replacement (Deep Lamellar Keratoplasty – DLKP), microkeratome-assisted anterior and posterior lamellar surgery, and the recent advent of new femtosecond lasers with enhanced surgical precision, leading to enhancement of refractive and visual results. New developments in lamellar keratoplasty are transforming the surgical field of corneal transplantation, and will lead to enhanced visual and long-term success in the alleviation of corneal blindness.

Plenary 3 – Uveitis

12 June 2006, Monday, 1205-1225 Hrs
Hall 603, Level 6

PL109

IMMUNOSUPPRESSION – AN EXPANDING FRONTIER

Robert Nussenblatt, USA

We have seen a major shift in the treatment of ocular inflammatory disease. These approaches have been sparked by a better understanding of underlying mechanisms leading to disease. In addition, the further elucidation of the mechanisms of other ocular disorders strongly suggests an important role for the immune system as well. This includes both age related macular degeneration and the ocular complications of diabetes. The possibility of a significant immune component to disease expression opens up new possibilities for treatment which was not contemplated in the recent past. This presentation will evaluate some of these newer findings.

Plenary 4 – International Ophthalmology

13 June 2006, Tuesday, 1120 – 1140 Hrs
Hall 603, Level 6

PL110

THE BURDEN OF EYE DISEASE IN US LATINOS – ARE WE ON THE BRINK OF AN EPIDEMIC?

Rohit Varma, USA

Latinos are the fastest-growing minority in the US, projected to constitute over 24% of the population by 2050, so it is important to gather basic information on the prevalence of eye disease in this

population. The Los Angeles Latino Eye Study (LALES) is a population-based ophthalmologic survey of adult Latinos in the Los Angeles metropolitan area. The LALES population consists of residents in six census tracts in La Puente, California, ≥ 40 years old and of self-identified Latino ethnicity. Eligible residents were interviewed at home and examined in the clinic. Participants received a comprehensive standardized eye examination at the Local Eye Examination Center in La Puente, including visual acuity (VA), refraction, slit-lamp examination with LOCS II lens opacity grading, dilated fundus examination, intraocular pressure, visual fields, and ocular biometry. Height, weight, blood pressure, serum glucose and glycosylated hemoglobin were also assessed. An ophthalmologist examined the patients and utilizing all collected data, determined the causes of visual impairment and blindness. Latinos were noted to have high prevalences of Visual impairment, diabetic retinopathy, glaucoma and early macular degeneration. A majority of all persons with eye disease were previously undiagnosed. Extrapolating these data over the next two to five decades, high proportions of Latinos will have visually impairing eye disease that will require a targeted effort if one is to reduce the burden in this fastest growing minority group in the U.S.

Plenary 4 – Glaucoma

13 June 2006, Tuesday, 1140-1200 Hrs
Hall 603, Level 6

PL111

WOUND HEALING MODIFICATION – HOW FAR HAVE WE COME?

Peng Khaw, UK

Recent clinical trials provide strong evidence that pressures in the low teens are associated with minimal progression. In our recent More Flow study no patient who had pressures less than 14 mm Hg on all visits experienced glaucomatous progression over a period up to 8 years.

The major determinant of the long term pressure after surgery is the scarring response of the eye. In this lecture I will review the latest advances in the prevention of scarring after surgery which include:

- New anti-inflammatory agents including novel nanomolecules which inhibit inflammation without steroidal side effects (Nature Biotechnology 2004)
- Better techniques of applying antimetabolites which dramatically reduce complications associated with these agents
- The role of growth factors particularly transforming growth factor beta and new agents to neutralise these growth factors including the new human antibody (TrabioR) which is now completing large scale international trials
- Inhibitors of matrixmetalloproteinases which prevent tissue contraction

- Gene therapy to insert molecules which are associated with cell cycle arrest
- The new concept of long term inhibition of scarring.

For detailed handouts see wound healing glaucoma today:
Available at: <http://www.ucl.ac.uk/loo/research/khawlibrary.htm>

parietal lobe function with time. Patients with these disorders need an understanding of their deficits and a structured positive approach to their rehabilitation.

Plenary 4 – Paediatrics

13 June 2006, Tuesday, 1200-1220 Hrs

Hall 603, Level 6

PL112

COGNITIVE VISION, ITS DISORDERS AND DIFFERENTIAL DIAGNOSIS IN ADULTS AND CHILDREN

Gordon Dutton, UK

As ophthalmologists we need a basic model of how the higher visual system works and its common disorders. This presentation aims to provide an outline of such a model. Our ability to survey a visual scene, locate and recognise an object of interest, move towards it and pick it up, recruits a number of complex cognitive higher visual pathways, all of which are susceptible to damage. The visual map in the mind needs to be co-located with reality and is primarily plotted by the posterior parietal lobes, which interact with the frontal lobes to choose the object of interest. Neck and extraocular muscle proprioceptors are probably responsible for maintaining this co-location when the head and eyes move with respect to the body, and synchronous input from both eyes is needed for correct localisation of moving targets. Recognition of what is being looked at is brought about by comparing the visual input with the 'image libraries' in the temporal lobes. Once an object is recognised, its choice is mediated by parietal and frontal lobe tissue. The parietal lobes determine the visual coordinates and plan the visually guided movement of the limbs to pick it up, and the frontal lobes participate in making the choice. The connection between the occipital lobes and the parietal lobes is known as the dorsal stream, and the connection between the occipital lobes and the temporal lobes, comprises the ventral stream. Both disorders of neck and extraocular muscle proprioception, and disorders leading to asynchronous input along the two optic nerves are 'peripheral' causes of impaired visually guided movement, while bilateral damage to the parietal lobes can result in central impairment of visually guided movement, or optic ataxia. Damage to the temporal lobes can result in impaired recognition, problems with route finding and poor visual memory. Spontaneous activity in the temporal lobes can result in formed visual hallucinations, in patients with impaired central visual function, particularly the elderly. Deficits in cognitive visual function can occur in different combinations in both children and adults depending on the nature and distribution of the underlying brain damage. In young children the potential for recovery can lead to significant improvement in