XXXX Nordic Congress of Ophthalmology
24-28 August 2012, Paasitorni, Helsinki, Finland

NOK
40TH
2012
Helsinki

Abstracts

NOK 2012
Together with Baltic Eye Forum

Platinum Sponsor

Santen

Gold Sponsor

Alcon®

a Novartis company

Silver Sponsor

valon

multispot laser

Other Sponsors

BAUSCH + LOMB

See better. Live better.

HERMO PHARMA

Théa

Driving innovation

XXXX Nordic Congress of Ophthalmology
24-28 August 2012, Paasitorni, Helsinki, Finland

Abstracts

NOK 2012

Together with Baltic eye forum

Table of Contents

Oral Papers

FEMTOSECOND LASER AND OTHER NEW TECHNOLOGIES IN CORNEAL SURGERY

● Sa-Fi1-1

Femtosecond laser based small incision lenticule extraction for moderate and high myopia

Hjortdal, Jesper; Asp, Sven; Ivarsen, Anders; Vestergaard, Anders
Århus University Hospital, Århus, DENMARK

Purpose: ReLEx® smile is a keratorefractive procedure whereby a stromal lenticule is cut by a femtosecond laser and manually extracted through a peripheral corneal tunnel. The purpose of this quality control study is to present our initial clinical experience with ReLEx® smile for treatment of moderate and high myopia.
Methods: A total of 379 eyes (198 patients) were treated for myopia (spherical equivalent (SE) ranging from -13.13 to -1.63 D, mean -7.28 D) with ReLEx® smile and followed for 3 months. Uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), spherical equivalent (SE), proportion of eyes within ±0.5/1.0 D, loss/gain of lines of CDVA, patient satisfaction, and complications were registered.
Results: In total, 332 eyes completed the 3-month follow up. For eyes with emmetropia as target refraction, 83% had an UDVA of ≥20/25 (logMAR ≤0.1) at day 1 after surgery, increasing to 91% at 3 months. Nine eyes lost ≥2 lines of CDVA, and 42 eyes lost 1 line of CDVA. Loss of CDVA was primarily caused by interface scatter, and occurred mainly during treatment of the initial 100 eyes. Two eyes gained 2 lines, and 53 eyes gained 1 line of CDVA at the 3-month follow-up. Comparing attempted vs. achieved correction, the proportion of eyes within ±0.50 D was 77.1%, and 94.3% were within ±1.0 D. The difference in attempted vs. achieved SE correction was -0.13±0.49 D (range +1.50 to -1.88 D). Ninety-five percent of the patients would recommend refractive surgery to others.
Conclusions: ReLEx® smile is a flapless all-in-one femto-second laser refractive procedure. Refractive predictability, safety and patient satisfaction at 3 months seem equal to ReLEx® flex and FS-LASIK.

● Sa-Fi1-2

Femtosecond laser assisted intrastromal relaxing incisions in postkeratoplasty astigmatism

Wetterstrand, Olli; Holopainen, Juha; Krootila, Kari
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: The aim of this study was to investigate the effectiveness of intrastromal relaxing incisions and establish laser parameters in the Helsinki University Central Hospital.
Methods: This retrospective study included 33 eyes of 31 patients. All patients had regular topographic astigmatism after penetrating keratoplasty (mean, 9.84±4.17 D). Paired arcuate incisions were made intrastromally within the graft using 60 kHz femtosecond laser (IntraLase FS®, AMO). Anterior side cut angle was 90°, 120° or 150°. Follow-ups with clinical evaluation and topographic evaluation using anterior segment OCT were done at one day, 1-2 weeks, one month and three months postoperatively.
Results: Uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA) remained unchanged. Refractive cylinder decreased by 25.9±27.0% ($p<0.05$) at last f/u visit. Topographic anterior cylinder diminished by 35.0±29.9% ($p<0.05$) and topographic posterior cylinder by 25.6±39.8% ($p<0.05$). Stabilisation was seen 1 month postoperatively. The surgically induced astigmatism (SIA) was 6.03±4.70 D. Higher preoperative topographic cylinder values had higher SIA outcomes ($p<0.05$). Side cut angles 90° and 120° produced similar results. Not enough data was available with 150° for evaluation. None of the patients expressed discomfort during the f/u period and only a single complication was recorded (bulge of incision).
Conclusions: FS-laser assisted relaxing incisions diminished both topographic and refractive cylinder and SIA. All these indicate good effectiveness in reducing astigmatism. Intrastromal relaxing incisions seem to be an effective and patient friendly method to decrease postkeratoplasty regular astigmatism.

● Sa-Fi1-3

Are you satisfied with the algorithm – a beginners perspective of arcuate incisions after PKP

Lagali, Neil; Germundsson, Johan; Wihlmark, Ulf; Wihkmark, Thuba; Fagerholm, Per
University of Linköping, Linköping, SWEDEN

Purpose: To evaluate the initial algorithm used to reduce astigmatism in patients that have undergone PKP.
Methods: Nineteen patients that had undergone PKP were operated on with arcuate incisions with the femtosecond laser (IntraLase®). The mean age was 53.7 years (range, 20-78). The astigmatism value given was obtained at refraction. The mean astigmatism was 7.2 D (range, 2-11). There was a varying degree of irregularity in the astigmatism as revealed with the Javal-Schiøtz instrument or topography (Orbscan II®). The patients were followed for three months. In most cases the aim was to eliminate astigmatism altogether.
Results: The results after three months will be given numerically including vector analysis. Two complications, epithelial cysts and one wound abscess will be reported.
Conclusions The results will address the question: Are the algorithms satisfactory? Is it necessary to adjust them? How close to the ideal can we get?

● Sa-Fi1-4

Femtosecond laser assisted corneal transplantation

Linder, Matts; Krootila, Kari
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: Traditionally, penetrating keratoplasty (PKP) and lamellar keratoplasty (DALK) have been performed using a blade trephine to cut the donor and recipient cornea. Recently, femtosecond laser assisted keratoplasty has also become a viable option in terms of cost and availability. This allows for custom sculpting of the donor and recipient corneal edges, potentially allowing for increased wound strength as well as decreased postoperative astig-

matism. So far, however, data on the outcomes of laser assis-ted keratoplasty have not been thoroughly assessed.
Methods: Patients who had undergone laser assisted keratoplasty at the Department of Ophthalmology at the Helsinki University Central Hospital (HUCH) during 2009 to 2011 were selected for the study. As a control group patents operated during the same period by the same surgeons using conventional blade trephination were selected.
Results: Altogether 14 PKP (3 zig-zag, 10 top hat and 1 mush-room) and 7 DALK (6 zig-zag, 1 top hat) were identified from the patient records.
Conclusions: In a retrospective study we investigated the outcomes of femtosecond laser incisions compared to traditional blade trephination in penetrating and lamellar keratoplasty.

● Sa-Fi1-5

First results from Keraflex® microwave thermokeratoplasty treatment for keratoconus

Behndig, Anders; Beckman Rehnman, Jeannette; Lindén, Christina; Hallberg, Per
Umeå University, Umeå, SWEDEN

Summary: We here present the first results from keratoconus treatment with Keraflex® microwave thermokeratoplasty. In this treatment, a single low energy microwave pulse is delivered to the central cornea, forming a 4 mm/150 µm ring of stromal collagen shrinkage to flatten the cornea. The cornea is then treated with collagen cross-linking to preserve the new shape. Initially, a very pronounced flattening is seen, with some regression over the first months. Our results show decrease in K-values, myopia, astigmatism and in higher order aberrations of the cornea, with a corresponding increase in best spectacle corrected visual acuity. Optical coherence tomography verifies the treatment depth, and our measurements suggest preserved biomechanical properties of the treated cornea.

● Sa-Fi1-6

Role of Boston type I Keratoprosthesis in elimination of corneal blindness

Jasinskas, Vytautas; Rudalevicius, Paulius
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To evaluate impact of Boston type I keratoprosthesis (BKpro) in patients with corneal blindness.
Methods: BKpro type I consists of: the front plate and the stem, the back plate with a central hole and 8 holes, and the titanium locking ring. Type I Kpro is assembled incorporating a fresh corneal graft and is sutured to the host cornea. A soft contact lens is applied at the end of surgery. Four eyes with leucoma corneae (chemical and thermal burn, n=3; twice failed penetrating keratoplasty [bullous keratopathy], n=1) were operated.
Results: During a follow-up period of 24±8.9 months the implanted BKpro was in all cases covered by a contact lens. Prosthesis in the graft was water-tight. No external filtration was detected; the anterior chamber was of medium depth, even and transparent. Snellen visual acuities were 1.0, 0.4, 0.6, and 0.4. In one eye, intraocular pressure was elevated (palpatory) with medical therapy.
Conclusions: In our series (4 surgeries) preliminary clinical data are favourable (observation up to 30 months). In order to confirm the usefulness of practical application of BKro type I further observations and a higher number of patients are required.

● Sa-Fi1-7

Refractive outcome of ISCR implantation in keratoconus cases

Sirbiladze, Bella[1]; Dvali, Merab[2]; Tsintsadze, Nana[1]
[1]Eye Clinic "Akhali Mzera", Tbilisi, GEORGIA; [2]Tbilisi State Medical University, Tbilisi, GEORGIA

Purpose: To evaluate efficacy and stability of visual, refractive, corneal topographic and aberrometric outcomes using different types of intrastromal corneal implants in eyes with keratoconus aiming to improve functional data together with halting the progression of the disease.
Methods: The 1287 keratoconic eyes of 841 keratoconus patients (II-II stage) were treated with ISCR (Mediphacos, Ltd.) implantation with one or two segments according the special nomograms. Thirty-seven eyes of 26 patients with high astig-matism (range, 6-12 D) underwent short arm-length (90°) ISCR implantation. Pre- and postoperative examination included Snellen uncorrected (UDVA) and corrected (CDVA) distance visual acuity, manifest refraction, slit lamp biomicroscopy, fundus evaluation, ultrasound pachymetry, and corneal topography and aberrometry using Orbscan® system.
Results: Preoperative UCVA –0.1±0.08; BCVA –0.4±0.2; K-readings: 52.3±3.9 D (steep meridian), 47.2±3.4 D (flat meridian); PBFS –54.8±1.8; SE –6.9±3.6 D; astigmatism 5.4±1.5 D. Postoperative: UCVA –0.69±0.2; BCVA –0.8±0.2; K-readings: 46.8±3.4 D (steep meridian), 43.0±2.8 D (flat meridian); PBFS –51.0±1.9; SE –2.0±1.5 D; astigmatism 2.2±0.9 D.
Conclusions: ISCR implantation improves all main parameters of corneal topography; it flattens central optical zone, which results in increase of UCVA and remains stable over the follow-up period. The reduction in segment diameter seems to be of great importance for better and effective control of astigmatism. Having 4 arc-length options (90°, 120°, 160° and 210°) makes ISCRs more flexible in surgical planning and astigmatism control.

RPE AGING/DEGENERATION

● Sa-Sw1-1

Aging theories and AMD

Kauppinen, Anu
University of Eastern Finland, Kuopio, FINLAND

Summary: Aging is an inevitable process which has been associated with the pathogenesis of several diseases, such as age-related macular degeneration (AMD). Numerous theories have arisen for revealing the molecular mechanism of aging in cells. The outer retina is chronically exposed to oxidative stress which has been associated with the pathogenesis of many diseases including AMD. Oxidative stress can be seen both as a cause and a consequence of the degenerative process. The free radical theory suggests that reactive oxygen species (ROS) cause oxidative damage to cellular constituents. Since mitochondria are a major source of ROS, free radical theory is close to the rate-of-living theory which highlights the role of energy metabolism in aging. Together with cellular senescence, oxidative stress contributes to the formation of lipofuscin. Lipofuscin is a hallmark of aging in metabolically active, long-lived postmitotic cells which include cardiac muscle cells, neurons, and retinal pigment epithelial (RPE) cells. The formation of lipofuscin is also associated with AMD. Among other things, accumulated lipofuscin may disturb the interaction of lysosomal enzymes with autophagosomes. This fits well with the garbage-can hypothesis which states that autophagic capacity declines during aging leading to the accumulation of waste material within cells. Impaired autophagocytosis results also in the accumulation of damaged mitochondria which further induces oxidative stress. Constant oxidative stress disturbs the redox balance within cells which is concerned in the thiol redox hypothesis. Low-grade inflammation is another hallmark of aging, and mutually inducible with oxidative stress. Chronic age-related inflammation has been termed as inflammaging

● Sa-Sw1-2

Detrimental effect of oxidative stress in the pathogenesis of AMD

Blasiak, Janusz
University of Lodz, Lodz, POLAND

Summary: The main environmental and life-style risk factors in AMD are advanced age, oxidative stress, smoking, fat-rich diet and exposure to radiation. However, oxidative stress may be also related to aging, because it is associated with an increasing level of oxidative damage, cigarette smoke contains many strong oxidants, fat-rich diet increases the fat oxidative pathway, radiation may induce photo-oxidative stress and reactive oxygen species (ROS). Furthermore, the macula receives a high blood flow resulting in its high oxygen exposure. Several genetic factors have been reported to play a role in AMD pathogenesis and some of them can be related to cellular reaction to oxidative stress. Moreover, physiological studies on AMD pathogenesis point to ischemia, which can be associated with oxidative stress through the vascular changes. Therefore, oxidative stress may be involved in many aspects of AMD pathophysiology, but the exact mechanism underlying this involvement is not fully understood. We observed an increased extent of oxidative DNA damage in lymphocytes of AMD patients, their higher sensitivity to hydrogen peroxide- and UV-induced oxidative stress and their lower ability to repair oxidative DNA damage than in the controls. Altered homeostasis of iron in the retina may be reason to AMD development. We studied the association between AMD and polymorphisms of genes encoding proteins involved in iron homeostasis. Several associations between the occurrence of AMD and genotypes of several polymorphisms were observed. These associations often depended on the form of the disease and many environmental and life-style factors. The results we obtained suggest that the impaired efficacy of repair of oxidative damage to DNA and genetic variability in the components of iron homeostasis genes may contribute to oxidative stress associated with AMD.

● Sa-Sw1-3

How drusens are formed?

Kaarniranta, Kai
University of Eastern Finland, Kuopio, FINLAND

Summary: The pathogenesis of age-related macular degeneration (AMD) essentially involves chronic oxidative stress, increased accumulation of lipofuscin in retinal pigment epithelial (RPE) cells and extracellular drusen formation, as well as the presence of chronic inflammation. The capacity to prevent the accumulation of cellular cytotoxic protein aggregates is decreased in senescent cells which may evoke lipofuscin accumulation into lysosomes in postmitotic RPE cells. This presence of lipofuscin decreases lysosomal enzyme activity and impairs autophagic clearance of damaged proteins which should be removed from cells. Proteasomes are another crucial proteolytic machine which degrades especially cellular proteins damaged by oxidative stress. The cross-talk between lysosomes, autophagy and proteasomes in RPE cell protein aggregation, their role as a possible therapeutic target and their involvement in the pathogenesis of AMD is discussed.

● Sa-Sw1-4

Innate immunity in the pathogenesis of AMD

Meri, Seppo[1]; Puujalka, Emmi[1]; Tissari, Jorma[1]; Laine, Matti[1]; Kaarniranta, Kai[2]
[1]*University of Helsinki, Helsinki, FINLAND;* [2]*University of Kuopio, Kuopio, FINLAND*

Summary: The complement system is important both in defense against microbes and in the clean-up of apoptotic cells and immune complexes. Complement factor H dysfunction has been suggested to be associated with age-related macular degeneration (AMD). Fifty percent of AMD patients carry a Tyr402His variant in the SCR7 domain of factor H. This presentation will discuss the possible pathogenetic mechanisms of AMD. Our studies are based on fundamental structure-function analyses of factor H and other diseases related to its dysfunction (dense deposit disease and atypical hemolytic-uremic syndrome). By recognizing e.g. glycosaminoglycans, phospholipids and sialic acids factor H protects

basement membranes and cell surfaces against inappropriate complement damage. Factor H binds polyanions, C-reactive protein (CRP) and streptococcal M-proteins via its SCR7 domain. The interaction with CRP is affected in the Tyr402His variant of factor H. Also, interactions of this variant with oxidation products, like malondialdehyde, have been suggested to be abnormal in AMD. In tissue injury, complement, together with CRP, directs the phagocytosis of damaged structures. The role of CRP is to recruit factor H and promote phagocytosis by macrophages and pinocytosis by dendritic cells. We have set up an *in vitro* model by using a retinal pigment epithelium cell (RPE)-endothelial cell culture system. Proteomic analysis and mass spectrometry have been used for identification of proteins accumulating in RPE cells. Interestingly, we have identified a very strongly complement activating protein in the RPE cells. This protein is present in the drusen deposits of AMD patients. According to our results both complement activation and a failure of factor H to direct complement- and CRP-mediated phagocytosis lead to age-dependent accumulation of debris, clogging of the retinal Bruch's membrane and inflammation.

● Sa-Sw1-5

The influence of mesechymal stem cells in macular degeneration

Beliakouski, Pavel; Pozniak, Nikolai; Kovchel, Nikolai
Tractor Plant Medical Centre Minsk, Minsk, BELARUS

Purpose: To assess the effectiveness of mesenchymal stem cell (MSC) transplantation in treatment of macular degeneration and optic neuropathy.
Methods: Four eyes of patients were treated with transplantation of 3 m autologic MSCs per eye. The injections were performed into the subtenon space toward the posterior segment of the eyeball and followed by subsequent intravenous MSC injections calculated as 1m/kg of body weight. The clinical observation took from 4 to 8 months.
Results: No reliable changes in OCT data have been registered. A 10-30% (0.1-0.3) increase was registered in visual acuity. A marked decrease in the intensity of the central scotoma was registered in the visual field.
Conclusions: Autologous MSC transplantation is a safe and effective method in treatment of macular degeneration and optic neuropathy.

OPTIMISING SCREENING OF DIABETIC RETINOPATHY

● Sa-De1-1

Screening of diabetic retinopathy in Denmark

Sjølie, Anne Katrin
Odense Unievrsity Hospital, Odense, DENMARK

Summary: Denmark with 5.5 million inhabitants has an estimated 300,000 diabetic patients, approximately 90% type 2. All patients are recommended to undergo regular screening for diabetic retinopathy free of charge. About 80% are screened by practicing ophthalmologists, the rest at hospital screening clinics. Recommendation is fundus photography within 12 months from diagnosis of diabetes and thereafter every 1-2 years depending on the severity of retinopathy. It is estimated that about 5% of screened patients are referred to ophthalmologists, either for diabetic macular edema or proliferative or preproliferative retinopathy. Health authorities have supported the initiation of a national database for screening and treatment of diabetic retinopathy, DIABASE. The first partial report has been created from 2010. Challenges are uniform screening methods, call and recall of patients and reporting from all practiceing ophthalmologists in Denmark. The database will overview prevalence and progression of retinopathy, and visual loss in the years to come.

● Sa-De1-2

Diabetic retinopathy screening in Estonia requires improvement

Reigo, Veiko
East Tallinn Central Hospital, Tallinn, ESTONIA

Summary: Estonia has a population of 1.3 million people. There are 38,892 diagnosed diabetic patients, about 3,000 of them have type I. The estimated number of diabetic patients in Estonia is >70,000. There has been an attempt by a family doctor practice to start diabetic retinopathy screening with a digital fundus camera. They screened 200 patients last year. Screening was stopped because of funding problems and lack of support by health insurance system. There are ongoing negotiations to start this service again. Family doctors and endocrinologists are guided to refer diabetic patients once a year. Primary care ophthalmologists are screening diabetic patients annually, unless they are under the care of consultants. Referral to consultants happens if macular oedema, severe non-proliferative or proliferative state of diabetic retinopathy is present. Coverage of the population is uneven, being worse in peripheral areas. There are no common guidelines for diabetic retinopathy screening or treatment. We recommend to see patients: 0-30 years old – at least 3 years after diagnosis of diabetes, annually after that; 31 years and older – immediately after diagnosis of diabetes, annually after that; Pregnancy – before pregnancy, every 3rd month after that if diabetic retinopathy is present: mild – every 12 months; moderate every 6-12 months; severe – every 4 months; proliferative – every 2-4 months; macular oedema – every 2-4 months. We do not have a diabetes registry in Estonia. Communication between specialities is not effective enough. On its way is building of e-health care system, to get the data from different hospitals and primary eye care offices. Non-mydriatic fundus photography provides an effective mechanism for screening particularly for individuals in areas with poor access to eye care.

● Sa-De1-3

Individual risk assessment and information technology to optimise screening frequency for diabetic retinopathy

Stefánsson, E; Aspelund, T; Thorisdottir, O; Olafsdottir, E; Gudmundsdottir, A; Einarsdottir, AB; Mehlsen, J; Einarsson, S; Palsson, O; Einarsson, G; Bek, T
University of Iceland; Risk ehf, Reykjavik, ICELAND; Århus University Hospital, Århus, DENMARK

Purpose: The aim of this study was to reduce the frequency of diabetic eye-screening visits, while maintaining safety, by using information technology and individualised risk assessment to determine screening intervals.
Methods: A mathematical algorithm was created based on epidemiological data on risk factors for diabetic retinopathy. Through a website, the algorithm receives clinical data, including type and duration of diabetes, HbA_{1c} or mean blood glucose, blood pressure and the presence and grade of retinopathy. These data are used to calculate risk for sight-threatening retinopathy for each individual's worse eye over time. A risk margin is defined and the algorithm recommends the screening interval for each patient with standardised risk of developing sight-threatening retinopathy (STR) within the screening interval. We set the risk margin so that the same number of patients develops STR within the screening interval with either fixed annual screening or our individualised screening system. The database for diabetic retinopathy at the Department of Ophthalmology, Århus University Hospital, Denmark, was used to empirically test the efficacy of the algorithm. Clinical data exist for 5,199 patients for 20 years and this allows testing of the algorithm in a prospective manner.
Results: In the Danish diabetes database, the algorithm recommends screening intervals ranging from 6 to 60 months with a mean of 29 months. This is 59% fewer visits than with fixed annual screening. This amounts to 41 annual visits per 100 patients.
Conclusions: Information technology based on epidemiological data may facilitate individualised determination of screening intervals for diabetic eye disease. Empirical testing suggests that this approach may be less expensive than conventional annual screening, while not compromising safety. The algorithm determines individual risk and the screening interval is individually determined based on each person's risk profile. The algorithm has potential to save healthcare resources and patients' working hours by reducing the number of screening visits for an ever increasing number of diabetic patients in the world.

● Sa-De1-4

Diabetic retinopathy in Latvia

Radecka, Liga; Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Summary: In 2010 there were 3,884 type I and 68,013 type II registered diabetic patients in the Latvian Diabetes Register.

Ninety-three new cases of type I DM and 8,433 type II DM were included in the Register during year 2010. The diabetes guidelines were worked out by the Latvian Diabetic Association in 2007, according which each diabetic patient has to be checked by an ophthalmologist once a year. Colour photography of the fundi is highly recommended. Ophthalmologists are available in all regions of Latvia, laser treatment and vitreoretinal surgery is done in Riga, the capital of Latvia. Diabetic retinopathy is the most common complication of our diabetic patients. According the Diabetes Register data we had 3,229 patients (6.1%) with non-proliferative diabetic retinopathy and 735 patients (1.4%) with proliferative diabetic retinopathy in 2010. Of the diabetic patients, 157 (0.3%) were blind. To reduce the number of Latvian diabetic patients with proliferative diabetic retinopathy and blindness our wish is to perform fundus photography for all diabetic patients and add them to the Diabetes Register.

● Sa-De1-5

Diabetic retinopathy: current situation in Lithuania

Balciuniene, Vilma Jurate
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Summary: Population: 3.04 million in March 2012. Estimated number of people with diabetes: Type 1 diabetes - about 5,000 and type 2 - about 80,000. A description of systematic screening: Systematic (organised) DR screening in the country does not exist. National Guidelines of Diabetes Diagnosis and Treatment were approved by the Health Care Ministry recently (3 Mar 2012). In these guidelines it is stated that type 1 patients should be checked by an ophthalmologist 5 years after diagnosis of DM and type 2 patients immediately after diagnosis is made. Later the eyes should be checked regularly, but not less frequently than once per year. So GPs and diabetologists should be referring patients to ophthalmologists periodically, but some do not. Number of ophthalmologists: 300 (about 100 /million). Number of lasers available: 5 in governmental institutions and 2 in private clinics. Prevalence of diabetic retinopathy in type 1 DM – 54% NPDR, 18% PDR and 12% DME; in type 2 patients – 32% NPDR, 7.1% PDR and 4.7% DME (Institute of Endocrinology, Lithuanian University of Health Sciences data, 2008). Prevalence of common blindness: 0.5% of total population, in type 1 DM – 3.4% and in type 2 – 0.47%. Principal needs in developing a full national screening programme: 1. National type 2 diabetes register (which currently exists only in some regions); 2. More precise data on DR prevalence and diabetes related blindness; 3. National DR screening programme and DR guidelines approved by local health care authorities; 4. Closer co-operation between GPs, diabetologists and ophthalmologists. Top tips for success: rise awareness and information among public, patients and specialists; increase qualifications and expertise of medical personnel; use modern equipment.

● Sa-De1-6

Diabetes mellitus; retinopathy and screening in Norway

Fosmark, Dag
Oslo University Hospital, Oslo, NORWAY

Summary: An estimated 7.5% (375,000) of our population of 5 million has diabetes (Diabetes type 1 = 25,000 vs. Diabetes type 2 = 350,000, of which an estimated 50% is undiagnosed). A systematic/organised screening program for diabetic retinopathy has not been introduced, hence screening and follow-up may be random and may differ from place to place. Some clinics and ophthalmologists are more devoted in herding "their" diabetic patients, although there is no specific training for professionals and screening personnel. The access to lasers is fairly good, most lasers being localised to hospitals. No endocrinologist is currently involved in applying screening for diabetic retinopathy, and there are no organised joint meetings between diabetologists and ophthalmologists, except sporadic cooperative research. Since 2005, there has been little progress towards the Liverpool Declaration. Difficulties encountered in working towards achieving the essential components of effective screening may be due to: 1. Lack of a united ophthalmological society in this matter, especially when it comes to believing in the value of *centralized* screening, because many ophthalmologists work outside of hospitals. 2. Lack of professional interest in the topic may also be due to the medical complexity of diabetes, which might not be as appealing to surgeons who are used to quick results. 3. Pushy marketing of intravitreal anti-VEGF medication as the "harmless" treatment of choice for diabetic macular oedema, outdating laser. This may also make clinical interdisciplinary cooperation suffer, especially any kind of cooperation hitherto initiated by the ophthalmologist for optimizing a causal treatment/systemic approach. 4. Eternal closing down and merging of departments and hospitals at a speed eradicating already well functioning professional groups. 5. Political changes lacking long-term views

● Sa-De1-7

Swedish guidelines for diabetic retinopathy screening

Agardh, Elisabet
Skåne University Hospital Malmö, Malmö, SWEDEN

Summary: Swedish population: 9.5 million. Estimated number of people with diabetes: approximately 375,000. Current status of screening: Since 1993, we have had national consensus on regular photographic retinopathy screening with at most 2-year intervals for all diabetic patient groups, a consensus confirmed by the Swedish National Board of Health and Welfare in 1995. In 2010, the Swedish National Board of Health and Welfare changed their general recommendation for screening intervals from 2 to 3 years in subjects without retinopathy diagnosed with type 2 diabetes. The recommendation was based on previous estimates of the low risk for progression from no to sight-threatening retinopathy in this particular group in Liverpool (Younis *et al.* Lancet 2003). A Swedish prospective 3-year follow-up study supports that recommendation (Agardh and Tababat-Khani. Diabetes Care 2011). Coverage: Ophthalmological units generally report that the estimated retinopathy screening coverage of their diabetic population is

around 80%. Recommendations: Two-year intervals for all diabetic patient groups from 10 years of age in type 1 and from diabetes diagnosis in type 2 diabetes. The interval was recently increased to 3 years in type 2 diabetes subjects without retinopathy. Training: Sweden has a long tradition of diabetic retinopathy screening both in hospitals and smaller ophthalmological units. Trained ophthalmic nurses perform the grading procedures in many places. Regular training for professionals and personnel varies. Laser treatment is carried out both by residents and specialists. Difficulties: Access to trained professionals due to lack of residents and specialists trained and dedicated to treatment of diabetic retinopathy. Top tips for success: To engage health politicians.

● Sa-De1-8

Screening of diabetic retinopathy in Finland

Summanen, Paula
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: In Finland with 5.4 million inhabitants, 0.5 million diabetic patients - there are 40,000 patients with type 1 diabetes (T1D), more than 250,000 with known type 2 diabetes (T2D) and as many without diagnosis. National guidelines emphasising annual fundus examination of all diabetics according to the European recommendations were published in 1992. Fundus photography was emphasised as efficient for detecting diabetic retinopathy (DRP). Photographic screening, already done in some communities, became widely used despite economic recession in the early 90's. In the late 90's, 179 out of 455 (57%) communities used their own camera or shared one with neighbours. Present evidence based recommendation for screening, prevention and treatment of DRP and rehabilitation was published in 2006 and is currently being revised. Photographic screening is recommended from the age of 10 for those with childhood-onset and from the diagnosis with later onset T1D to be repeated every other year until DRP is detected and then annually. A 2-year interval for those with only a few microaneurysms outside the macula and risk factors under control provided that sensitive methods and adequate photographic fields ared used is under consideration. Screening of T2D-patients is started from the diagnosis. In case of no DRP, the interval is 3 years, of only mild changes outside the macula 2 years, and one year or less for more advanced changes. Primary grading is often done by nurse photographers. If media opacities or technical difficulties prevent fundus evaluation, patients are eligible to clinical ophthalmological evaluation in the public sector. Those under regular care of ophthalmologists should have documentation of DRP. Digital images taken in primary and secondary health care should be viewable in tertiary care - not yet the case in all parts of the country.

SPECIAL ASPECTS OF UVEITIS

● Sa-No1-1

Important aspects in the diagnostic work-up of primary intraocular lymphoma

Karma, Anni
University of Helsinki, Helsinki, FINLAND

Summary: Primary intraocular lymphoma (PIOL, or retinal lymphoma), classified as a diffuse large B-cell lymphoma, is a rare malignancy, which develops in an elderly patient. PIOL is a subset of central nervous system (CNS) lymphoma. Out of the PIOL patients, 65-90% develops CNS lymphoma and 20-25% of the CNS lymphoma patients develop retinal lymphoma. PIOL is a fatal disease because of an ultimate CNS involvement. The correct diagnosis is usually delayed because of minor ocular symptoms, difficulties in the differentiation of PIOL from many other uveitis entities as well as because of an often unsuccessful vitreous biopsy. In this presentation, based on the experience of 11 con-secutive patients diagnosed as having PIOL, the characteristic feat-ures of PIOL are clarified and our current technique to handle the vitreous sample is promoted.

● Sa-No1-2

Diagnosis of sarcoid uveitis

Alavesa, Mari
University of Turku, Turku, FINLAND

Summary: Sarcoidosis is a chronic multisystem granulomatous disease with an unknown etiology. A high proportion of sarcoid patients develop ocular changes, and bilateral granulomatous uveitis is a well known manifestation. The gold standard for the diagnosis of sarcoidosis is histopathological proof on biopsy tissue showing non-caseating granulomas. International Workshop on Ocular Sarcoidosis (IWOS) diagnostic criteria enable us to make the diagnosis of sarcoid uveitis without invasive investigations. This presentation introduces IWOS diagnostic criteria of ocular sarcoidosis.

● Sa-No1-3

Diagnosis and treatment of tuberculous uveitis

Saaren-Seppälä, Heikki
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Tuberculosis is a globally very common infection, several billion people have had contact with *Mycobacterium tuberculosis*. Even though there are approximately 3 million cases of active tuberculosis annually, most commonly it causes latent subclinical infection. Latent infection can cause ocular inflammation that behaves like autoimmune disease, and differentiating between infection and inflammation can sometimes be problematic. In infection, there are commonly wide anterior synechiae, vasculitis and chorioretinitis – autoimmune-mediated inflammation favours

more anterior locations. Prevention and treatment are briefly reviewed as is possible connection between tuberculosis and Eales' disease and serpiginous choroiditis.

● Sa-No1-4

Tubulointerstitial nephritis and uveitis syndrome in children - a prospective multicenter study

Saarela, Ville[1]; Nuutinen, Matti[1]; Ala-Houhala, Marja[2]; Arikoski, Pekka[3]; Rönnholm, Kai[4]; Jahnukainen, Timo[4]
[1]Oulu University Hospital, Oulu, FINLAND; [2]Tampere University Hospital, Tampere, FINLAND; [3]Kuopio University Hospital, Kuopio, FINLAND; [4]Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: The purpose of this study was to evaluate the incidence and characteristics of uveitis related to tubulointerstitial nephritis (TIN) in a prospective, multicenter trial.
Methods: Nineteen children with a biopsy-proven TIN were screened in the 5 university hospitals in Finland between 2008 and 2011. The patients were either treated with prednisolone or followed up without treatment. In addition to the nephrologic evaluations, the prospective follow-up included structured ophthalmological examinations at the onset of TIN and at 3 and 6 months after diagnosis.
Results: Eighty-four percent (16/19) of the patients had uveitis, 83% (5/6) in the non-treatment group and 82% (9/11) in the prednisolone-treated group. Two patients in the non-treatment group were changed to prednisolone group after 2 weeks. Both of them developed uveitis. Altogether, 3 patients developed uveitis during prednisolone treatment and 2 showed activation of uveitis despite the systemic corticosteroid. Fifty percent (8/16) of the patients with uveitis presented with no ocular symptoms and 88% (14/16) had a chronic course of uveitis. Two patients were diagnosed with uveitis prior to nephritis, in 7 patients the nephritis and uveitis were diagnosed within one week from each other and in 7 patients the uveitis developed 1-6 months after the diagnosis of TIN.
Conclusions: There was no statistically significant difference in the incidence of uveitis in TIN patients treated with prednisolone and followed-up without treatment. In the present study the incidence of uveitis associated with TIN was considerably higher than previously reported. Uveitis related to TIN may develop late and is often asymptomatic. The ophthalmologic follow-up of all TIN patients is warranted for at least 12 months with 3 month intervals.

● Sa-No1-5

Herpetic anterior uveitis

Jauhonen, Hanna-Mari
Kuopio University Hospital, Kuopio, FINLAND

Summary: Three viruses of the *Herpes viridae* family - *Herpes simplex* (HSV), *Varicella zoster* (VZV) and, most recently, cytomegalovirus (CMV) - have been emphasized as causes of acute, recurrent and chronic anterior uveitis (AU). All three may be associated with elevated intraocular pressure, patchy or sectoral iris atrophy, and keratic precipitates (KPs). HSV-AU tends to be more common among people under age 60 years, while VZV-AU is more common among older individuals. Both are typically unilateral, can be associated with acute ocular hypertension and may occur with or without corneal involvement. VZV is often associated with decreased corneal sensation. Fine, stellate and diffusely distributed KPs or large, central and greasy KPs are suggestive of herpetic etiology. History of HSV infections on the lips or genitals helps diagnostics but is not always present, while VZV-AU patients typically have a history of ipsilateral zoster dermatitis. HSV-AU can be treated with oral acyclovir combined with topical corticosteroid and dilating drops. VZV is treated with oral acyclovir, valaciclovir or famciclovir combined to topical corticosteroid and dilating drops. CMV has most recently been implicated in AU and it may present as acute, recurrent or chronic disease. Distinguishing characteristics may be unique nummular KPs, endothelial cell decompensation with sectoral iris atrophy or pupillary changes. Eyes with CMV-AU have no corneal scars, no posterior synechiae and no flare or fibrin. Most patients respond to treatment with oral ganciclovir, valganciclovir or valacyclovir. Diagnosis of viral AU is clinical but can be confirmed by detecting viral DNA with PCR from aqueous samples. Herpetic AU can have serious visual complications including glaucoma and necrotizing retinitis (ARN, PORN and CMV retinitis) so all patients with herpetic uveitis should be examined for these complications.

BALTIC OPHTHALMOLOGY

● Sa-Ic1-1

Lithuanian ophthalmology - what can we do for our patients?

Jasinskas, Vytautas
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Summary: First written record about ophthalmology in Lithuania comes from the XVII Century. However, the real pioneer and father of modern ophthalmology in Lithuania was professor Petras Avizonis (1875-1939) who founded the Eye Clinic in the University of Vytautas Magnus in 1922. During the Soviet regimen, ophthalmology was not a "priority" branch of medicine. Nevertheless, bright personalities such as Professor E. Daktaravicienė, Docents A. Valentinienė and M. Tornau (all from Kaunas), as well as Dr. M. Horodniciene and Docent K. Sukarevičius (from Vilnius) managed to promote clinical, educational and scientific ophthalmology. The skilful and highly diplomatic management of Prof. Daktaravičienė was invaluable in making it possible to build a separate Eye Clinic. The Clinic was established in 1976 under the structure of the Kaunas Institute of Medicine. After regaining the independence of Lithuania in 1990, this Clinic provided a good basis and it remains the leading ophthalmic unit in the country for patients receiving treatment, for students in training and for research as well. Starting from this time, Lithuanian ophthalmologists had free access to western ophthalmology, got an excellent chance to achieve latest news in the field and cooperate with western colleagues. A new era in ophthalmology started.

● Sa-Ic1-2

Ophthalmology in Latvia

Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Purpose: To report about ophthalmology in Latvia (year 2011).
Methods: A survey by phone was conducted about most important surgical procedures in ophthalmology.
Results: There are 256 ophthalmologists in Latvia of whom 46 are performing surgery. Of these 46 ophthalmic surgeons, 42 are performing cataract surgery, 7 vitreoretinal surgery, 4 corneal transplantation, and 6 refractive surgery. During 2011, a total of 10,969 cataract surgeries were performed in Latvia. The waiting list for cataract surgery paid by government is approximately one year. Extraocular surgeries for retinal detachment numbered 146, pars plana vitrectomies for retinal detachment 265, pars plana vitrectomies for complications of diabetes mellitus 112, surgeries for intraocular injury 136, surgeries for endophthalmitis 3. There are no waiting lists for vitreoretinal surgery.
Conclusions: The main problem for ophthalmology in Latvia is deficit of many surgical resources.

● Sa-Ic1-3

Ophthalmology in Estonia

Pauklin, Mikk
Tartu University Hospital, Tartu, ESTONIA

Summary: There is just one medical faculty in Estonia, the medical faculty of Tartu University. It was founded together with the University in 1632 by the Swedish king Gustav II Adolf. Ophthalmology has been taught in Tartu as a part of general surgery since 1806. A separate eye clinic was founded in 1868. Today, almost every ophthalmologist working in Estonia has finished the medical faculty of Tartu University. The duration of residency is 3 years and each year 3-4 residents start at the beginning of September. Every second year, one resident of ophthalmic surgery starts their 5-year residency. Today, about 125 ophthalmologists work in Estonia, most of them in the two larger centres. The largest centre is the Eye Clinic of the East Tallinn Central Hospital that covers the northern 2/3 of Estonia and is also the centre for ophthalmic oncology in the Baltic states. The second largest centre is the Eye Clinic of the Tartu University Hospital that covers the southern 1/3 Estonia. Besides these two centres, several smaller clinics and private practices/outpatient clinics exist. In Estonia, there is just one national Health Insurance Fund and most of the people have a health insurance. It covers almost everything except refractive surgery, cosmetic surgery and certain procedures and drugs like intravitreal anti-VEGF injections. Patients do not need an accompanying letter from their general practitioner to visit an ophthalmologist. As patients often prefer to visit the two largest centers, this results in long waiting lists in these centres.

KEYNOTE PLENARY 1: PREVENTION OF AMD

● Sa-Fi2-1

Introduction

Immonen, Ilkka
Helsinki University Central Hospital, Helsinki, Finland

● Sa-Fi2-2

Can AMD be prevented?

Seddon, Johanna M.
Tufts University School of Medicine, New England, USA

BIOGRAPHY

Johanna M. Seddon, MD, ScM, is Director, Ophthalmic Epidemiology & Genetics Service and Professor of Ophthalmology at the Tufts University School of Medicine. She is a pioneer in nutritional research in age-related macular degeneration and cataract, as well as in the field of ophthalmic epidemiology and genetics. For more than 20 years, Prof. Seddon has received National Institute of Health (NIH) grants on epidemiologic, biologic, and genetic biomarkers for macular degeneration, and has made original contributions in these areas. She has been the vice-president and trustee of the Association for Research and Vision in Ophthalmology (ARVO), serves on scientific advisory boards for macular degeneration foundations, and has received several awards including the inaugural Maurice F. Rabb, Jr. Award from Prevent Blindness America, for dedication and contributions to prevention and treatment of age-related macular degeneration.

PANEL: VITREORETINAL TREATMENT PRACTISES

● Sa-Fi3-1

Introduction

Immonen, Ilkka
Helsinki University Central Hospital, Helsinki, Finland

● Sa-Fi3-2

Panel discussion

Bragadottir, Ragnheidu[1]; Kvanta, Anders[2];Crafoord, Sven[3]; Gudmundsson Johann[2];Reigo Veiko[4]
[1]Oslo University Hospital, Oslo, NORWAY; [2]Karolinska Institutet, Stockholm, SWEDEN; [3]Örebro University, Örebro, Sweden, SWEDEN; [4]East Tallinn Central Hospital, Tallinn, ESTONIA

AUTOIMMUNE AND INFECTIOUS DISEASES OF THE CORNEA

● Sa-Sw3-1

Peripheral hypertrophic subepithelial corneal degeneration: characterisation, treatment and association with HLA genes

Järventausta, Petri[1]; Holopainen, Juha[1]; Timo, Tervo[1]; Waldir, Neira Zalentein[1]; Paakkanen, Riitta[2]; Wennerström, Annika[2]; Seppänen, Mikko[3]; Lokki, Marja-Liisa[2]

[1]Helsinki University Central Hospital/Ophthalmology, Helsinki, FINLAND; [2]University of Helsinki, Helsinki, FINLAND; [3]Helsinki University Central Hospital/Medicine, FINLAND

Purpose: To evaluate the efficacy of phototherapeutic (PTK) or manual keratectomy in treating irregular astigmatism caused by peripheral hypertrophic subepithelial corneal degeneration (PHSD) and to study the possible underlying immunological risk factors.
Methods: Comparative case series. Fourteen PHSD patients were enrolled. Immunological risk factors between patients and a control group comprising 150 individuals were compared prospectively. Patients (14 eyes) with diagnosed PHSD were treated with superficial keratectomy with or without the assistance of PTK (VisX S4®; Santa Ana, CA). Thirteen patients were subjected to analysis of HLA genes, complement C4 gene numbers, and total plasma immunoglobulin levels. Results were compared between patients and controls.
Results: The mean preoperative best spectacle corrected visual acuity (BCVA) was 0.2±0.2 (logMAR scale range, 0-0.7) and 0.1±0.2 (range, 0-0.6) postoperatively. The mean preoperative astigmatism decreased significantly from 3.7±2.0 D (range, 1.2-8.2) to 2.1±1.4 (range, 0.6-5.0, p=0.01) based on CT. The HLA-B*44 allele and the ancestral haplotype (AH) 8.1 were found significantly more often in PHSD patients than in controls (both p=0.03). No difference in the C4 genes was found.
Conclusions: Astigmatism secondary to PHSD can be effectively treated with keratectomy. Peeling of the fibrotic tissue reduced astigmatism and improved visual performance. We suggest that HLA-B*44 allele and AH 8.1 haplotype are predisposing immunological factors for the development of PHSD. The consequent disruption/alteration of the limbal barrier may lead to corneal peripheral fibrous formation inducing astigmatism.

● Sa-Sw3-2

Non-allergic eosinophilic conjunctivitis (NAEC) - a new old disease?

Kari, Osmo[1]; Saari, Matti[2]
[1]University of Helsinki, Helsinki, FINLAND; [2]University of Turku, Turku, FINLAND

Purpose: Eosinophils are common inflammatory cells both in allergic and non-allergic eye diseases. They are stimulated by lymphocyte and especially mast cell-derived mediators and remain in the tissue mainly as perivascular cells. Non-allergic eosinophilic conjunctivitis (NAEC) is a new entity which may be analogous to non-allergic eosinophilic rhinitis and non-allergic eosinophilic asthma. Patients with NAEC are characterised by chronic, non-infectious conjunctivitis, no blepharitis, at least 1+ eosinophilia (1-10 eosinophils/specimen) in conjunctival brush cytology, no history of atopic sensitisation or eczema, and negative skin-prick tests to common environmental allergens and normal serum IgE. NAEC affects mainly middle-aged or older people, with a predominance of women. The symptoms of NAEC include itching, tearing, redness, and mild discharge. The patients often have dry eye.
Methods: We studied cytological, biopsy and tear fluid differences between patients with atopic conjunctivitis and NAEC.
Results: In biopsies ICAM1-1 expression in conjunctival epithelium was strongest in atopic patients and almost non-detectable in patients with NAEC and in normal controls. The subepithelial conjunctiva showed ICAM-1 expression in all groups, most in NAEC and least in the control group. VCAM-1 expression was similar in all groups. T cells CD4+ and CD8+, B cells/CD20+, macrophages/CD36+, NK-cells/CD56+ and neutrophils/CD15+ showed differences when compared to those of the controls and atopics. The patients with NAEC showed EG1 and EG2 positive eosinophils but clearly less than atopics. In the patients with NAEC there were differences in tear fluid concentrations of GIIAPLA2 and MMP-8 when compared to the controls.
Conclusions: The results indicate that NAEC is an own entity separate from atopic conjunctivitis.

● Sa-Sw3-3

Safety and efficacy of tacrolimus ointment in the long-term use for atopic blepharoconjunctivitis

Kiiski, Ville; Remitz, Anita; Reitamo, Sakari; Peltonen, Sirje; Mandelin, Johanna; Kari, Osmo
Helsinki University Central Hospital/Skin and Allergy Hospital, FINLAND

Purpose: Atopic blepharoconjunctivitis (ABC) is the most common ocular complication of atopic dermatitis. Topical corticosteroids have been the treatment of choice but long-term use causes adverse effects like cataract, elevation of intraocular pressure and skin atrophy. Topical calcineurin inhibitor (TCI) tacrolimus has shown good efficacy and safety in treatment of atopic dermatitis.
Methods: In the Helsinki Skin and Allergy Hospital TCIs pimecrolimus and tacrolimus have been used for 10 years as the first treatment of choice for ABC. We reviewed patients followed by ophthalmologists between 2001 and 2011, total number of patients being 338. For 33 patients the main treatment of blepharitis was pimecrolimus cream, for 297 tacrolimus ointment. The mean follow-up time for efficacy was 1.5 years (range, 0.1-9.7) and for malignancies 5.8 years (range, 0.2-11.0).
Results: Treatment response rates in blepharitis and conjunctivitis were 79% and 55% with pimecrolimus and 90% and 80% with tacrolimus, respectively. Odds ratios for treatment response with tacrolimus were 2.37 (95% CI. 0.90-6.22) for blepharitis and 2.34 (95% CI, 1.02-5.40) for conjunctivitis, compared with pimecrolimus. Mean intraocular pressure decreased 0.5-0.6 mmHg in both groups. No treatment-induced changes were noticed in vision, cornea or lens. No malignancies of the eye, eyelids or periorbital skin or any other serious adverse effects were observed.
Conclusions: In long-term use TCIs have a better adverse effect profile than corticosteroids. Tacrolimus seems more effective and

better tolerated than pimecrolimus. It is effective in both blepharitis and conjunctivitis and has a favourable effect on intraocular pressure. Based on our experiences and data, tacrolimus 0.03% ointment should be the first treatment of choice in atopic blepharoconjunctivitis.

● Sa-Sw3-4

Corneal involvement in atopic keratoconjunctivitis

Nivenius, Emma
St Erik's Eye Hospital, Stockholm, SWEDEN

Summary: Atopic keratoconjunctivitis (AKC) is an ocular inflammatory condition associated with atopic dermatitis. AKC is classified as ocular allergy but with features quite different from common seasonal allergic conjunctivitis. The clinical picture includes eyelid eczema, blepharitis, conjunctivitis, and some degree of keratitis. The condition is chronic and normally starts in young adulthood with periods of exacerbations during the following decades. All patients with AKC exhibit corneal affection at some point and most patients have lifelong corneal signs. Usually, superficial punctate keratitis is first seen in the lower part of the cornea. Larger erosions, sterile infiltrates, corneal plaques and scarring may follow. Neovascularization from limbus is seen in severe and long-standing disease. AKC patients are also prone to develop infectious keratitis. In addition changes in corneal curvature with high-grade astigmatism and keratoconus are more common than in the general population. In patients with atopic dermatitis and AKC an altered skin and conjunctival flora is seen, with a predominance of *Staphylococcus aureus* colonization. This altered colonization has lately been discussed to continuously fuel the inflammation through the endogenous immune response. Antibodies to *Staphylococcus aureus* superantigens have been found in tears in AKC, possibly indicating a relation to disease via adaptive mechanisms. Increased numbers of eosinophils are typically found in AKC and toxic proteins released by eosinophils are believed to be critically involved in the keratopathy. Also abnormal mucin levels in tears have been found associated with corneal damage.

● Sa-Sw3-5

Treatment of vision threatening *Pseudomonas aeruginosa* infectious keratitis with combined corneal cross-linking and human amniotic membrane transplant

Mattila, Jaakko; Korsbäck, Anna; Krootila, Kari; Holopainen, Juha
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: Bacterial keratitis has the potential to cause corneal perforation and endophthalmitis in a relatively short period of time and can ultimately lead to serious visual impairment and loss of the affected eye. *Pseudomonas aeruginosa* (PA) is the leading cause of vision threatening keratitis and the most common pathogen in contact lens associated keratitis and so PA is a major cause of visual impairment in the young adult population. Corneal cross-linking (CXL) has been used successfully in the treatment of keratitis including some cases of keratitis with corneal melts. The antibacterial effect of CXL against PA has been shown on PA cultures on agar plates. Amniotic membrane transplantation (AMT) is used in ocular surface reconstruction and treatment of various corneal disorders including bacterial, parasitic and fungal keratitis. Transplanted amniotic membrane (AM) promotes corneal epithelialisation, inhibits corneal fibrosis and has anti-inflammatory, antiangiogenic, antimicrobial and antiviral properties.
Methods: We present the retrospective analysis of treatment results on vision threatening PA keratitis treated with combined CXL and AMT in Helsinki University Central Hospital Cornea service between 2009 and 2012.
Results: No eyes were lost and the visual acuity improved in all cases with mostly good or very good visual acuity outcome. We also present the data on experimental PA keratitis treated with CXL. We cultured PA on bovine cornea and present a direct bactericidal effect of CXL on PA.
Conclusions: Combined CXL and AMT is a promising treatment option for serious vision threatening PA keratitis. Both treatment modalities have their independent antibacterial properties that reinforce each other.

LATE DISLOCATION OF IOL IN THE BAG

● Sa-De3-1

Introduction

Krootila, Kari
Helsinki UniversityCentral Hospital, Helsinki, FINLAND

● Sa-De3-2

Late dislocated IOLs

Stenevi, Ulf
University of Gothenburg, Gothenburg, SWEDEN

Summary: New surgical techniques mean new surgical complications. Dropped nucleus and late dislocated IOLs are two such complications related to phacoemulsification. "Phaco" gradually replaced planned extra capsular cataract extraction, ECCE, over a number of years. From 1998-2001 this transition was completed and all patients and all cataracts were done by phaco. A few years later late dislocated IOLs appeared as a new complication requiring surgery one more time. In 2011, a total of 94,500 cataract operations were performed in Sweden and at the same time 550 late dislocated IOLs were re-operated. The time course for these two surgeries will be described as well as the risk factors for late dislocated IOL apart from phacoemulsification.

● Sa-De3-3

State of affairs in Finland

Korsbäck, Anna
Helsinki UniversityCentral Hospital, Helsinki, FINLAND

● Sa-De3-4

Late in-the-bag intraocular lens dislocation

Drolsum, Liv
University of Oslo/Oslo University Hospital, Oslo, NORWAY

Purpose: To identify patients with late in-the-bag-IOL dislocation in our department and describe our preferred surgical techniques.
Methods: Data from the medical records of patients with late PC-IOL dislocation from 2004 until 2012 were gathered.
Results: Exfolation syndrome was the predisposing condition in most cases, and IOL dislocation in these eyes will especially be discussed. Parametres including the interval between original and secondary surgery and the increasing number of cases during the years will be presented and discussed. Different surgical techniques during the time period will be compared, and our current preferred surgical technique in subluxated and totally dislocated IOL-capsular complex will be described.
Conclusions: The frequency of late in-the-bag-IOL dislocation is increasing, especially in patients with exfoliation syndrome. The dislocation can be managed either by IOL exchange or repositioning. The results after surgery are promising.

● Sa-De3-5

Round table 1: Why is this happening now?

Drolsum, Liv[1], Haaga, Marko[2]; Sundelin, Staffan[3]
[1]University of Oslo/Oslo University Hospital, Oslo, NORWAY;
[2]Central Hospital of Päijät-Häme, Lahti, FINLAND;
[3]Linköping University Hospital, Linköping, SWEDEN

● Sa-De3-6

Round table 1: This is how I do it!

Drolsum, Liv[1], Haaga, Marko[2]; Sundelin, Staffan[3]
[1]University of Oslo/Oslo University Hospital, Oslo, NORWAY;
[2]Central Hospital of Päijät-Häme, Lahti, FINLAND;
[3]Linköping University Hospital, Linköping, SWEDEN

UVEITIS IN CHILDHOOD

● Sa-No3-1

Childhood uveitis

Edelsten, Clive
Nuffield Hospital, Ipswich, UNITED KINGDOM

● Sa-No3-2

Complications of paediatric uveitis: a 10-year follow-up

Lindahl, Päivi
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Chronic uveitis in children is a challenging disease. Corticosteroids were the mainstay of treatment for a long time but advances in the understanding of the mechanisms of autoimmune diseases has led to new therapeutic options. TNF-alpha inhibitors were first approved for use in rheumatic diseases but there is growing evidence of their efficacy in inflammatory eye diseases, also in children. Of children with chronic uveitis, 10-12% becomes visually impaired because of complications of the disease. These include cataract, glaucoma and cystoid macular edema. Whether complications can be avoided by early diagnosis and aggressive treatment remains to be studied. Presentation will give the data and results of a 10-year follow-up of 10 paediatric uveitis patients who were diagnosed early and treated aggressively with methotrexate or methotrexate and infliximab.

● Sa-No3-3

Surgical treatment of glaucoma secondary to chronic childhood uveitis

Lindbohm, Nina
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Glaucoma is a common complication of chronic childhood uveitis, occurring in up to 40-50% of patients with uveitis associated with juvenile idiopathic arthritis. The rise in intraocular pressure is usually secondary to the chronic inflammation, or to the longstanding use of corticosteroid eye drops. Intraocular pressure may be controlled with topical medication, but a large proportion of the patients need surgical treatment. During years 1993-2012, we have treated 52 eyes of 39 patients with glaucoma secondary to chronic childhood anterior uveitis needing surgical treatment for their glaucoma. Overall, 72 operations were performed in these eyes including mostly trabeculectomies and drainage implant operations. Follow-up data from these eyes will be discussed and two case reports presented.

● Sa-No3-4

Intravitreal treatment of uveitis

Kotaniemi, Kaisu; Immonen, Ilkka; Lindahl, Päivi
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: Early and aggressive treatment with immunosuppressive drugs often in combination with biologic drugs has improved the prognosis of chronic uveitis. In treatment resistant cases the most common reason for the decrease of visual acuity is CME. Intravitreal corticosteroid injection has a short effect. The effect of dexamethasone implants is estimated to last for 3-6 months. In some cases VEGF inhibitors have been tried.
Methods: In this study, 8 patients with longstanding endogenous uveitis and treatment resistant CME are described.
Results: One patient had MS, all the others JIA-associated uveitis. Retisert® (a fluorochinolone acetonide intravitreal implant) was implanted in altogether 9 eyes with favourable results; CME resoved in all cases and visual acuity improved markedly. Half of the patients had secondary glaucoma and all the treated eyes had undergone cataract surgery.
Conclusions: Retisert® is an important option in cases with treatment resistant uveitis and CME.

● Sa-No3-5

Future aspects in the treatment of uveitis

Zierhut, Manfred
University of Tübingen, Tübingen, GERMANY

Summary: Even taking into account that we nowadays have numerous drugs available for uveitis, there are still unmet medical needs, which will be shortly discussed. This presentation will introduce to 1. Old strategies in a new suite, *e.g.* present an update about the development of the selective glucocorticosteroid receptor antagonists (SEGRA) and monoclonal antibodies for topical and intravitreal application, followed by 2. Treatment of anti-inflammatory disorders, resulting in cytokine blocking agents like anti-IL-1 monoclonal antibodies, and finally introduce to 3. New control parameters for uveitis like regulatory T-cells.

UPDATE ON ORBITAL PROCESSES

● Sa-Ic3-1

Cellulitis - how to treat

Uusitalo, Marita
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: This talk will update your information on symptoms, the commonest causes and the current medical treatment recommendations of orbital cellulitis. Treatment of orbital abscesses will also be included.

● Sa-Ic3-2

Orbital inflammation

Setälä, Kirsi
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Idiopathic orbital inflammatory syndrome (OIS), also called orbital pseudotumor, often presents with ocular motility abnormalities, optic neuropathy, or both. When the orbit is inflamed you should try to find the origin of inflammation. In some cases you are not able to identify the cause and in these cases the term idiopathic orbital inflammatory syndrome is used. You must remember that the diagnosis of OIS is a diagnosis of exclusion. Depending on the focus of inflammation, OIS can be named, *e.g.* myositis (causing painful diplopia), dacryoadenitis, or optic perineuritis. Tolosa-Hunt syndrome means that the inflammation affects the orbital apex, the cavernous sinus, or both. History is very important. Neuroimaging, preferably MRI, is almost mandatory. In clear-cut idiopathic OIS, treatment with steroids usually results in a rapid resolution. In ambiguous cases a trial of antibiotics can be considered. Infectious orbitis can carry grave consequences if misdiagnosed. The presence of sinusitis or an abscess strongly suggests an infectious origin. A systemic evaluation and biopsy should be considered in atypical, refractory, or recurrent cases.

● Sa-Ic3-3

Orbital decompression for thyroid associated ophthalmopathy

Sahlin, Sven
Södersjukhuset, Stockholm, SWEDEN

Summary: The results and complications in a series of 176 patients treated with orbital decompression are presented. The goals of surgery are cosmetic rehabilitation, decreasing corneal exposure symptoms, relief of optic nerve compression, orbital congestion and chronic pain. Possible complications include infraorbital nerve affection, diplopia, optic nerve damage, oscillopsia and sinusitis.

● Sa-Ic3-4

When to biopsy

Leivo, Tiina
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: An update of the main steps of evaluation of orbital lesions will be presented. The great majority of orbital masses require biopsy before treatment. The specific cases, where lesions require complete excision without biopsy or where the indication for biopsy is controversial will be covered. Short case presentations will be included.

● Sa-Ic3-5

Orbital tumours and space occupying lesions

Prause, Jan Ulrik
University of Copenhagen, Copenhagen, DENMARK

Summary: Graves' orbitopathy is the most frequent space occupying lesion of the orbit followed by neoplasia. When dealing with lesions of the orbit, age of the patient is an important diagnostic guide. In children, below 5 years of age, inflammatory processes and dermoid cysts are the most frequent, while malignant tumours like rhabdomyosarcoma are very rare, however, presenting like inflammatory lesions. In children above 5 years of age, the spectrum of tumours is expanded to include lymphangioma and optic nerve glioma as the most important. In adults, inflammations are still frequent. The spectrum of tumours now includes cavernous haemangioma, cysts, meningioma, malignant lymphoma and metastases. The typical lesions are presented both from a clinical and a histopathological view.

EPIDEMIOLOGY AND GENETIC PATHWAYS IN THE PATHOGENESIS OF AMD

● Sa-Fi4-1

Pathways of AMD pathogenesis

Seddon, Johanna M.
Tufts University School of Medicine, New England, USA

● Sa-Fi4-2

Factors affecting the prevalence of AMD, the Reykjavík experience and other studies

Jonasson, Fridbert
University of Iceland, Reykjavik, ICELAND

Purpose: To establish risk factors for age related macular degeneration.
Methods: Over the last 15 years we have both conducted two longitudinal epidemiological studies using random samples of older population in Reykjavík as well as a genetic study based on clinical cases. We have used fundus photographs, clinical examination, magnetic resonance imaging of eye and brain, genome wide linkage and association studies and questionnaires.
Results: We have established several risk factors including among others age, smoking and genetic profiles. We have also examined association of AMD and microbleedings in the brain, systemic disease, diet and medication, where some results are more uncertain.
Conclusions: In most but not all instances our findings are in line with similar studies in other white populations. Findings that differ may require a large meta-analysis for more conclusive results.

● Sa-Fi4-3

Precursors of age-related macular degeneration: associations with physical activity, obesity and plasma lipids in the Inter99 Eye Study

Munch, Inger Christine[1]; Linneberg, Allan[2]; Larsen, Michael[3]
[1]*Copenhagen University Hospital, Roskilde, DENMARK;* [2]*Research Centre for Prevention and Health, The Capital Region of Denmark, DENMARK;* [3]*Glostrup Hospital, Glostrup, DENMARK*

Purpose: To investigate associations of small hard macular drusen and larger macular drusen with obesity-related risk factors in a population study.
Methods: Cross-sectional population-based study of 970 subjects aged 30-60 years characterised by anthropometric measurements, blood samples, and a standardised oral glucose tolerance test. Physical activity was assessed by questionnaire. Digital greyscale fundus photographs were recorded in red-free illumination and graded for the presence of drusen.
Results: Macular drusen >63µm were present in 14.4% of subjects and were associated with the level of physical activity, the age- and sex adjusted odds ratio being 0.33 (95% CI, 0.14-0.82, p=0.017) for participants who were physically active more than 7 h/week compared with participants with a sedentary life-style active 0-2 h/week. Macular drusen >63µm were also associated with higher total plasma cholesterol (p=0.018), and with greater waist circumference in men (p=0.014), and with higher plasma triglycerides in women (p=0.011). Small hard drusen numbering 20 or more per eye were present in 13.9% of subjects and were associated with lower levels of plasma HDL cholesterol (p=0.037) but not with physical activity or waist circumference when adjusting for age, sex and macular drusen >63µm.
Conclusions: Modifiable obesity-related risk factors were associated with early signs of age-related macular degeneration (AMD) and precursors of AMD. Small hard macular drusen being associated with low plasma HDL cholesterol has not previously been described.

● Sa-Fi4-4

Alveolar bone loss associates with age-related macular degeneration in males

Karesvuo, Petteri[1]; Gursoy, Ulvi[2]; Pussinen, Pirkko[2]; Suominen, Anna[2]; Huumonen, Sisko[2]; Vesti, Eija[1]; Könönen, Eija[2]
[1]*Turku University Central Hospital, Turku, FINLAND;* [2]*Institute of Dentistry, Helsinki, FINLAND*

Purpose: The aim was to examine the relation of selected systemic and oral health parameters and the salivary presence of 6 periodontal pathogens to age-related macular degeneration (AMD).
Methods: The present cross-sectional study includes data on 1,751 subjects (age ≥30 years). General health information was obtained by questionnaires and interviews, including self-reported diagnosis of AMD, as well as by the general and oral health examination, including panoramic radiography and laboratory analyses. Fifty-four subjects with degenerative fundus changes formed the AMD group, other 1,697 formed the non-AMD group. Pearson's Chi-square and ANOVA tests were used for comparisons of categorical parameters and continuous parameters between the subject groups, respectively. A logistic regression analysis was performed to study the association of AMD with alveolar bone loss and the number of teeth by controlling for the age, diabetic status, systolic blood pressure, education, and smoking, and further for the carriage of salivary bacteria.
Results: Advanced age, systolic blood pressure, and diabetes were associated with AMD (p<0.001), while the carriage rates of the examined periodontal pathogens were not. In the whole study population, the subjects with AMD had fewer teeth (p<0.001) and more alveolar bone loss (p=0.004) compared to non-AMD subjects. In a logistic regression model adjusted for age, smoking, and diabetes, alveolar bone loss was associated with AMD in males with an OR of 4.3 (95% CI, 1.3-14.6, p=0.013).
Conclusions: In this population-based health survey, alveolar bone loss is independently associated with AMD in males.

● Sa-Fi4-5

Himalayan eye camps and prevalance of common eye disorders in high altitude Himalaya mountain

Biswas, Kaushick
Kanchanjangha Eye Centre, Kanchanjangha, INDIA

Purpose: To evaluate the common eye disorders in high altitude Himalaya.
Methods: Twenty-one eye camps were held starting from 1000 meters to 4000 meters in different remote Himalayan mountain villages. Visual acuity, anterior segment evaluation and indirect ophthalmoscopy were done in an age-related macular degeneration (AMD) study.
Results: A total of 5,150 patients were examined. Significant cataract was found in 1,380 patients, trachoma in 82 patients, corneal opacity in 109 patients, pterygium in 92 patients, congenital glaucoma in 12 patients, vascular retinopathy in 14 patients, and optic atrophy in 138 patients. AMD was found in only 7% of patients aged above 65 years.
Conclusions: Prevalance of AMD and vascular retinopathy is very low in high altitude Himalayan mountain population

NEW TECHNOLOGIES IN CATARACT SURGERY

● Sa-De4-1

Results of femtosecond laser assisted cataract surgery, indication and patient selection

Nagy, Zoltan
Semmelweis University, Budapest, HUNGARY

Purpose: To examine the results of femtosecond laser cataract surgery and to find out the indication, relative and absolute contra-indications.
Methods: The setting was the Department of Ophthalmology, Semmelweis University, Budapest, Hungary. Altogether 100 eyes of 100 patients were included into the study and another 100 eyes were treated with traditional phacoemulsification, this group served as a control. The eyes were treated with the Alcon-LenSx® femtolaser (Alcon-LensX Inc. Aliso Viejo, USA, CA). A 4.9 mm central capsulorhexis, femto-fragmentation of the crystalline lens (with hard cataract) or liquefaction (in eyes with soft nucleus) and a 2.3 mm peripheral corneal wound were performed. Results of refraction, posterior chamber lens (PCL) centration, quality of vision, change in higher order aberration (HOA), pre- and post-operative endothelial cell count and postoperative cystoid macular edema (CME) were analysed.
Results:: In all parameters a statistically significant difference was found in favour of the femtolaser treated group. In the femtolaser treated group 51% less phacoemulsfication energy was required and the effective phaco time reduced also by 43%. Postoperative refraction, centration of PCL was better, quality of vision regarding Strehl ration and MTF (modulation transfer function), HOA values, especially vertical coma and vertical tilt were significantly lower compared to traditional phaco. Corneal volume stress index and postoperative endothelial cell count and postoperative CME also showed better results in eyes treated with the femtolaser.
Conclusions: Femtolaser cataract surgery was found to be safe and effective; results are superior to traditional phacoemulsification regarding PCL centration, phaco energy, time, HOAs and quality of vision. Safety was found to be also better with postoperative endothelial cell count and CME.

● Sa-De4-2

Laser assisted cataract surgery with LenSx® femtosecond laser: comparative study of conventional versus laser assisted cataract surgery

Gundersen, Kjell Gunnar
Privatsykehuset Haugesund, Haugesund, NORWAY

Purpose: To study and evaluate clinical results and variability of two different surgical techniques.
Methods: Setting was a private single surgeon clinic. Design was a retrospective, randomised, comparative study. Sixty eyes of 30 cataract patients will be enrolled into this study. Each study subject will have simultaneous bilateral cataract surgery performed. At random, one eye using LenSx® femtosecond laser, the other using conventional surgical technique. Selection criteria: 1) Significant cataract (LOCCS scale) 2) No prior intraocular surgery. Protocol:

I) Preoperative biometry using Lenstar® biometry 3) Uneventful surgery. Recording of total phaco energy 3) Clinical assessment at day 1, week 1, month 1 & 3. 4) Questionnaire distributed after implantation surgery a. General rate of satisfaction b. Difference in satisfaction between eyes Main outcomes: c. Surgical "knife to knife"-time d. Phaco energy e. Efficacy & safety (UCVA & BCVA) f. Refractive predictability (MSE & DFE) g. Surgical induced astigmatism h. Capsulorhexis shape, size and centration.
Results: Clinical results including efficacy, safety and predictability from all pre- and postoperative visits will be shown. Variability of the studied parameters will be highlighted.
Conclusions: Cataract surgery has undergone a tremendous development during the last decade. Better instrumentation and surgical technique havr significantly improved the clinical outcomes of this type of surgery. To improve the clinical outcomes even further the key factors will be to standardise the procedure as much as possible. The introduction of laser assisted cataract surgery has the potential to achieve this kind of standardisation. We hope to show a statistically significant reduction in phaco energy and a reduced variability and improved accuracy and precision with the introduction of femtosecond laser assisted cataract surgery.

● Sa-De4-4

Characteristics of the next-generation dual-optic accommodating IOL (AIOL)

Marques, Eduardo[1]; Kasthurirangan, Sanjeev[2]; Evans, Scott[2]
[1]Hospital da Cruz Vermelha, Lisboa, PORTUGAL; [2]Abbott Medical Optics, UNITED STATES

Purpose: An optical design that mimics the increase in the negative spherical aberration with natural accommodation was optically modelled and incorporated into the lens design of the next generation dual-optic AIOL (Synchrony® Vu). Optical performance of the test IOL was compared to the progenitor IOL. Our purpose was to determine if an optic profile could be developed and incorporated into a Synchrony® test IOL to enhance negative spherical aberration (SA) and improve the depth of focus (DOF).
Methods: Optical modeling of the human eye with a Synchrony® IOL was performed using the Zemax® software. The modulation transfer function (MTF) and DOF were compared in an ISO model between the test and the progenitor IOLs.
Results: When compared to the original Synchrony® IOL, the test IOL showed a 1 D increase in the DOF under photopic conditions. Under mesopic conditions, there was an improvement in the MTF.
Conclusions: The optical design of the next generation dual-optic AIOL enhances negative spherical aberration and improves the depth of focus while preserving the optical quality of the lens.

● Sa-De4-5

Toric multifocal IOLs in cataract surgery

Uusitalo, Raimo
Helsinki Eye Hospital, Helsinki, FINLAND

Purpose: To evaluate the outcome of implantation of toric diffractive multifocal intraocular lenses (IOL) for patients with refractive error including mild to high astigmatism.
Methods: Fifteen patients had phacoemulsification lens extraction and implantation of ReSTOR® Toric or AT-Lisa® Toric multifocal IOL in both eyes. Visual acuity, refraction, spectacle independence, undesired visual symptoms and patient satisfaction were analysed 1 month to 16 months postoperatively.
Results: An uncorrected near visual acuity of 0.4 or better was achieved in 100% eyes with 0.9 or better visual acuity for distance in more than 90% of cases. Spectacle independence was 85% Visual disturbances were minimal with only 2 patients complaining of mild glare or halos at night.
Conclusions: Implantation of toric multifocal IOLs provide good uncorrected near and far visual acuities without complaints of severe glare or halos, leading to high spectacle independence and high patient satisfaction levels.

NEW PERSPECTIVES IN ROP

● Sa-No4-1

Experiences and consequences of national population based studies on ROP in Sweden

Holmström, Gerd
University of Uppsala, Uppsala, SWEDEN

Purpose: ROP is one of the few causes of childhood blindness, which in many cases is preventable. Screening for retinopathy of prematurity (ROP) is therefore extremely important, to identify treatment requiring ROP. National screening programs are available in many countries and must take into account the local organisation, the quality of health and neonatal care, and also the socioeconomic circumstances of the society. Such programs should preferably be based on population studies of the country *per se*.
Methods: In Sweden, several population-based studies on various aspects on ROP have been performed during the last decades.
Results: Based on these studies we have been able to modify the screening criteria from less than 33 weeks of gestation to less then 32 weeks at birth. A recent national study on extremely preterm infants with a gestational age of less than 27 weeks, made it possible to postpone the first examination a few weeks. A web-based national register (SWEDROP) for ROP-screening was initiated in late 2006, with the purpose to evaluate and possibly modify our national guidelines for screening. Today around 4,000 infants are registered in SWEDROP and the register has coverage of more than 90% of infants born before 32 weeks of gestation in Sweden. Data on infants born 2008 to 2009 have been analysed and the results have further implications on screening program for ROP in Sweden.
Conclusions: National population-based studies are extremely helpful when designing and improving guidelines for ROP screening. They must, however, be repeated, since neonatal care is continuously improving and possibly affecting the incidence and course of ROP.

● Sa-No4-2

Basic mechanisms of angiogenesis with special reference to retinopathy of prematurity

Kvanta, Anders
Karolinska Institutet, Stockholm, SWEDEN

Summary: Pathologic angiogenesis is a hallmark of advanced retinopathy of prematurity (ROP). Tissue hypoxia is the classic initiator of angiogenesis and ROP is a typical example of this. Vascular endothelial growth factor (VEGF) stands out as a regulator of particular importance of angiogenesis and its role in ROP is well established. There are however several other key molecules that act in concert with or independent of VEGF. This presentation will cover the basic principles of hypoxia-dependent angiogenesis and also highlight the specific roles of some of the main regulatory molecules.

● Sa-No4-3

Experience with bevacizumab monotherapy as therapy for retinopathy of prematurity Stage 3+

Mintz-Hittner, Helen
University of Texas Health Science Center-Houston Medical School, Houston, UNITED STATES

Introduction: Understanding timing of the pathogenesis of ROP and the mechanism of action of bevacizumab against Vascular Endothelial Growth Factor (VEGF) is essential to any ophthalmologist wanting to utilize anti-VEGF therapy for ROP.
Evidence for efficacy of bevacizumab: Animal models, case reports, case series, and a randomized clinical trial all provide guidance into the administration, necessary follow-up, potential advantages over conventional laser therapy, and appearance of final outcomes.
Potential local adverse outcomes of bevacizumab: Adverse outcomes associated with administration of an anti-VEGF drug before VEGF increases (ROP Stages 1 and 2) or after VEGF decreases (ROP Stages 4 and 5) late recurrence, potential endophthalmitis, lens trauma or dislocation, and retinal tears or detachment will be emphasized – and the prevention of these events – will be discussed.
Potential systemic adverse outcomes of bevacizumab: Mortality, and morbidity involving the brain, lung, kidney, bone, etc. will be discussed in relation to development and pharmacokinetics.
Conclusions and necessary continued research: It is important to continue to study 1) ocular outcomes including visual acuity and macular structure, visual fields and potential for late retinal detachment, motility, refractive outcomes, etc. to determine both short term and long term efficacy; and 2) appropriate drug (or combination of drugs), dose (single or sliding scale), refined timing of administration and follow-up, and pharmacokinetics in the blood and resulting tissue levels of potentially affected organs to determine both short term and long term safety.

DISEASES OF THE LACRIMAL GLAND

● Sa-Ic4-1

Epidemiology of lacrimal gland diseases in Denmark over 30 years

Heegaard, Steffen
Eye Pathology Institute/ Copenhagen University Hospital, University of Copenhagen, Copenhagen,DENMARK

● Sa-Ic4-2

Neoplastic and non-neoplastic lesions of the lacrimal gland: biopsy and treatment

Sahlin, Sven
Södersjukhuset, Stockholm, SWEDEN

● Sa-Ic4-3

Adenoid cystic carcinoma

von Holstein, Sarah Linéa
University of Copenhagen, Copenhagen, DENMARK

● Sa-Ic4-4

Malignant lymphoma of the lacrimal gland: a nation-based study

Heegaard, Steffen[1]; Rasmussen, Peter K.[1]; Ralfkiaer, Elisabeth[2]; Prause, Jan Ulrik[1]; Sjö, Lene D.[2]; Siersma, Volkert D.[3]; Toft, Peter B.[4]
[1]Eye Pathology Institute, University of Copenhagen, Copenhagen, DENMARK; [2]Copenhagen University Hospital, Copenhagen, DENMARK; [3]Institute of Public Health, University of Copenhagen, Copenhagen, DENMARK; [4]University of Copenhagen, Glostrup Hospital, Glostrup, DENMARK

Purpose: To characterise the clinicopathological features of lacrimal gland lymphoma.
Methods: All cases of lacrimal gland lymphoma between 1975 and 2009 were retrieved from The Danish Registry of Pathology. Histological specimens were re-evaluated using a panel of monoclonal antibodies. Clinical files were collected.
Results: Twenty-seven patients with lacrimal gland lymphoma were identified. Eight of the patients were males, 19 were females, and the median age was 69 years (range, 43-87). The distribution of lymphoma subtypes were: extranodal marginal zone lymphoma 37% (10/27), follicular lymphoma 19% (5), diffuse large B-cell lymphoma 15% (4), mantle cell lymphoma 11% (3), chronic lymphocytic leukaemia/small lymphatic lymphoma 7% (2) and unclassified B-cell lymphoma 11% (3). Twenty-two patients (81%) presented with Stage I/II lymphoma. One patient (4%) had Stage III lymphoma and 4 patients (15%) presented with Stage IV lymphoma. Patients with Stage I/II lymphoma were treated with: radiotherapy (67%), chemotherapy (14%), chemotherapy plus radiotherapy (5%) and surgery (14%). Patients presenting with Stage III/IV lymphoma were treated with chemotherapy alone. Complete remission was observed in 85% of the patients, although 43% of these had a relapse, independent of subtype, stage or treatment. The 5-year overall survival rate was 70%.
Conclusions: Malignant lymphoma of the lacrimal gland is relatively rare and is mostly prevalent in elderly females. The distribution of lacrimal gland lymphoma subtypes resembles that of lymphoma subtypes of the salivary glands. The majority of lacrimal gland lymphomas are low-grade and the prognosis is relatively good.

UPDATE ON UVEAL MELANOMA

● Su-Fi1-1

What is new in uveal melanoma in 2012

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Recent epidemiological studies on the incidence of and mortality from uveal melanoma (UM) across continents suggest that UM will develop in 6,700 to 7,100 persons in the world annually, mostly in Europe and North America. The incidence depends also on latitude. Mortality from UM slightly exceeds 50% and is probably uniform around the world. one may thus estimate that 3,300 to 3,500 people currently die of it annually. The number dying of UM will increase moderately because the world population is growing and additionally aging in developed countries. One the other hand, population growth in Asia and Africa has made retinoblastoma recently more common than UM, and this trend will continue. The challenges lie in improving early diagnostics and developing treatments for metastatic UM. Diagnostics of small melanocytic tumours are enhanced by autofluorescence and optical coherence tomographic imaging, and by a slowly increasing trend toward intraocular biopsies. Empirical data also suggest that if a UM is treated before it is more than 6 mm by diameter, risk of metastasis is very low. Multiple ligation probe amplification type of genetic analysis or gene expression profiling can now predict development of metastases with high accuracy, and the 7th edition of the Tumor, Node, Metastasis classification provides good estimates of the risk of metastasis if no tissue sample is available. Conservative treatments of the primary tumour are continuously developing, but little headway has been made with management of metastases. Empirical data suggest that magnetic resonance imaging is superior to computed tomography in imaging metastatic UM. Many authors have hoped for devel-oping targeted liver interventions for disseminated UM, but often relapses develop outside the liver.

● Su-Fi1-2

Detection and time to treatment of uveal melanomas in the UK: an evaluation of 2384 patients

Damato, Erika; Damato, Bertil E
Liverpool Ocular Oncology Centre, Liverpool, UNITED KINGDOM

Purpose: To determine mode of detection of uveal melanoma and time to treatment in the United Kingdom.
Methods: A questionnaire was completed with every new patient and the results correlated with clinical features and treatment.
Results: The referral process was initiated by an optometrist, family doctor or ophthalmologist in 68.0%, 18.2% and 13.8% of patients, respectively. On referral, 30.2% of patients were asymptomatic. Twenty-three percent of patients reported that their tumour was initially missed. These patients tended to have a more advance tumour when they reached our centre. The time from referral to treatment had a median of 49 days, exceeding six months in 19.8% of patients. This delay was longer in patients who reported that their tumour was missed (median, 92 vs. 40 days: Mann-Whitney $p<0.001$). Ophthalmologists delayed the referral process by more that six months in 10.9% of patients. Primary enucleation was performed in 33.3% of patients and was more likely in those who reported that their tumour was missed (44.8% vs. 29.8%, Chi-square $p<0.001$).
Conclusions: Many patients with uveal melanoma experience long delays in treatment because their tumour was missed or misdiagnosed. Such patients tend to have a more advanced tumour by the time they reach an oncology centre and are more likely to require enucleation.

● Su-Fi1-3

Brachytherapy with a 10 mm ruthenium plaque for small choroidal melanomas

Salkola, Susanna; Heikkonen, Jorma; Eskelin, Sebastian; Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To assess tumour control and complications after plaque brachytherapy with a 10 mm ruthenium plaque for small posterior choroidal melanomas.
Methods: In 1998-2009, forty-five choroidal melanomas were scheduled for irradiation with the 10 mm Ru-CCX plaque. The median height and LBD were 1.9 mm (range, 0.4-5.2) and 7.0 mm (range, 3.3-9.6), respectively. All tumours were T1aN0M0, Stage I (7th edition; 11 were T2, 6th edition). Median distance was 3.0 mm (range, 0-7.5) from the optic disk and 2.0 mm (range, 0-8.5) from the foveola. The anterior margin was posterior to the equator for all except one. Median dose was 116 Gy (range, 80-194) to apex and 327 Gy (range, 201-824) to base.
Results: Four marginal recurrences developed a median of 1.4 years (range, 0.6-3.0) after irradiation; two were also vertical (apical and basal dose was 126-129 Gy and 266-324 Gy, respectively; median distance from disk 1.4 mm; range, 0.4-3.8). Kaplan-Meier recurrence rate was 10% (95% CI, 4-24) by 5 years. No metastases developed. Six patients, one with a prior recurrence, died a median of 4.2 years (range, 0.28-8.6) after treatment; 5-year all-cause mortality was 12% (95% CI 5-29). Regarding complications, 50% (95% CI, 32-66) were free of any maculopathy and 97% (95% CI, 80-100) were free or optic neuropathy by 5 years. Mean visual acuity was 0.8 at diagnosis and 0.63 at 5 years, based on logMAR.
Conclusions: The results compare favourably with a recurrence rate of approximately 0.25 by 5 years after transpupillary thermotherapy (TTT) for tumours of similar size and location.

● Su-Fi1-4

Comparison of transvitreal methods for biopsy

Eide, Nils; Bærland, Thomas Pedersen; Haaland, Therese K; Faber, Rowan T
Oslo University Hospital HF, Oslo, NORWAY

Purpose: To compare different methods of biopsy sampling because a pathological diagnosis is mandatory in selecting the correct treatment of intraocular tumours.

Methods: We performed transvitreal biopsy with two different techniques during the same operation in eight cases where the diagnosis was problematic. The techniques were either FNAB and vitrectomy sampling or FNAB and forceps sampling. The information obtained was compared.
Results: We obtained a diagnosis in 7 of eight cases, 6 malignant (4 uveal melanomas and 2 lymphoma) and 1 benign. In three of them the results were the same with both methods, in one case only the forceps gave a diagnosis and in 3 cases we only got information using FNAB. In one case where FNAB and forceps was used the sample showed benign cells but was too scanty to establish a reliable diagnosis.
Conclusions: The material harvested with forceps was more abundant. However, a diagnosis was more frequently obtained with FNAB, only one case was negative with this technique. A forceps/vitrectomy biopsy is more challenging technically and the risk for seeding in the vitreous is probably higher than with FNAB.

● Su-Fi1-5

Uveal melanoma among children and adolescents

Al-Jamal, Rana'a; Kivelä, Tero
University of Helsinki, Helsinki, FINLAND

Purpose: To report about uveal melanoma (UM) before the age of 25 years in Finland, a high incidence region for this cancer.
Methods: A population-based study identified 24 patients (0.3%), aged between 13 and 24 years at diagnosis, treated in our hospital in 1963-2006. They were divided in two groups, the first consisted of 11 patients (9 females, 2 males) enucleated before 1997. The second was treated by irradiation after 1991, consisting of 11 patients (9 females, 2 males). Two other patients underwent local resection (male and female).
Results: Tumour height was 4-11 mm (mean, 7) in the first and 4.4-13.7 mm (mean, 8.5) in the second group and largest basal diameter ranged from 5-16 mm (mean, 10) and 2.5- 21 mm (mean, 15), respectively. Four patients died, 3 of UM (after 4, 12 and 21 years). All were female with spindle tumours. In the second group, 2 females died of UM (after 3 and 4 years).
Conclusions: UM is rarely seen among young children and adolescents. In this small series, females outnumbered males.

● Su-Sw1-1

Rapid Fire:
Fifty years of soft contact lenses: life and impact of prof. Otto Wichterle

Scholtz, Sibylle; Auffarth, Gerd U
University of Heidelberg, Heidelberg, GERMANY

Purpose: Prof. Otto Wichterle was one of the most important pioneers of modern soft contact lens industry; his work has made a significant impact on the ophthalmic world. Fifty years ago, in 1961, Wichterle produced the first soft contact lenses. Due to his work, nowadays millions of people around the world enjoy comfortable vision correction with soft contact lenses. This poster honours Wichterle's scientific achievements.
Methods: Our poster is based on an intensive literature research of current and historic literature via PubMed, Google Scholar and Google in order to document the life and to evaluate the scientific impact of Wichterle's work.
Results: Our poster gives an overview of life and the impact on ophthalmology by the Czechoslovakian chemist prof. Otto Wichterle born in 1913. The most important steps in the development of soft contact lenses will be shown and the impact on the visual correction of millions of people with refractive errors will be discussed. Today contact lenses gain more and more importance again when the visual function needs to be improved while suffering from complications after refractive surgery.
Conclusions: Prof. Otto Wichterle was an outstanding man of honour and a remarkable scientist. His vision of life without glasses became reality by his tenacity and exceptional commitment to science, even under adverse conditions for which he was not responsible. Due to his attainment of creating soft, hydrophilic contact lenses, millions of people suffering from refractive errors have been able to achieve natural vision again. From Prague around the world - in only 50 years Otto Wichterle's invention conquered the globe!

● Su-Sw1-2

The use of soft contact lenses, saturated with moxifloxacin and levofloxacin, for the preoperative prophylaxis of intraocular infections

Boiko, Ernest; Fokina, Diana; Reituzov, Vladimir
Military Medical Academy, RUSSIAN FEDERATION

Purpose: To assess the possibility of SCL, saturated with fluoroquinolones, used for the preoperative prophylaxis. Prevention of intraocular infections during surgery in a hospital is an important problem in ophthalmology. Introducing modern high-tech eye microsurgery has not reduced the frequency of endophthalmitis. The use of soft contact lenses (SCL), saturated with fluoroquinolones, has been shown to be more effective in preoperative prophylaxis than the use of instillations. There are many papers in scientific literature where the minimum inhibitory concentration of topical moxifloxacin 0.5% is achieved. However, according to the literature, ionic SCL, saturated with moxifloxacin, has never been investigated.
Methods: In this clinical trial, 41 patients having cataract surgery were investigated. In Group A (n=20) 1-Day Acuvue®, saturated with moxifloxacin solution 0.16% (Avelox®), in Group B (n=21) 1-Day Acuvue®, saturated with levofloxacin solution 0.5% (Tavanic®), were used before phacoemulsification. The antibiotic concentration in aqueous aliquots was determined using spectrofluorometry (Hitachi).
Results: The average concentrations of moxifloxacin and levofloxacin in aqueous humour were 18.0±2.0 μg/ml in Group A and 9.0±1.2 μg/ml in Group B, respectively ($p<0.05$). The minimum inhibitory and therapeutic concentrations were both achieved.
Conclusions: 1. Soft contact lens is an effective drug delivery method. 2. Ionic hydrogel soft contact lenses, saturated with moxifloxacin and levofloxacin, provide a therapeutic antibiotic concentration in aqueous humour for not less than 4.5 hours. 3. Moxifloxacin penetration achieved significantly higher aqueous concentrations in aqueous humour than levofloxacin.

● Su-Sw1-3

The serpent spectacle: a model for human contact lenses?

Da Silva, Mari-Ann[1,2]; Bertelsen, Mads1; Heegaard, Steffen[2]
[1]Copenhagen Zoo, Copenhagen DENMARK; [2]University of Copenhagen, Copenhagen, DENMARK

Purpose: Snakes have a so-called spectacle overlaying the cornea. This spectacle is in many ways similar to contact lenses. The goal of this study was to describe the morphology of the serpent spectacle in order to correlate findings with the contact lens system.
Methods: The eyes of 62 snakes of 17 different species belonging to 4 different families were processed routinely for light and electron microscopy. Datasets were statistically analysed.
Results: The serpent spectacle consists of 3 layers: the outer epithelium, stroma and inner epithelium. The outer epithelial layers vary according to shedding phase, whereas the thickness of the stroma varies according to species. A transition zone at the rim of the spectacle is characterized by a change in the basal cells of the outer epithelium and a less structured organisation of the stroma. The stroma is composed of layers of superimposed fibrils extending across the width of the spectacle. Each layer of fibrils changes its orientation, but always lies parallel to the spectacle surface giving the stroma a striated appearance. The fibrils measure 0.03 μm in diameter and are organised in a lattice with an equidistant separation of 0.02-0.03 μm. The inner epithelium is a single layer of flat cells with microvilli and pinocytotic vesicles. Between the spectacle and the eye globe is a narrow subspectacular space containing fluid from the Harderian gland.
Conclusions: The spectacle covers the entire anterior surface of the eye globe and has a uniform appearance in all snakes examined. The spectacle could have the potential to be used as a model for human contact lenses.

● Su-Sw1-4

Acute iatrogenic damage to the ocular surface and anterior segment of the eye

Asoklis, Rimvydas
Vilnius University, Faculty of Medicine, Vilnius, LITHUANIA

Purpose: To present selected clinical cases of iatrogenic damage to the ocular surface and anterior segment of the eye.
Methods: Five patients with sight threatening conditions because of iatrogenic eye damage were treated in Vilnius University Hospital. In Case 1 – Instead of BSS, 0.5% alcohol based chlorhexidine was injected in anterior chamber at the initial stage of cataract surgery. In Case 2 – A 33-year-old man with lately diagnosed acantamoebic keratitis of the left eye used topical anaesthetic prescribed by an ophthalmologist for temporary pain relief for 2 weeks. In Case 3 – A general surgeon not licensed for ophthalmology practice operated on a 44-year-old male with a chalazion of the superior lid of the left eye. In Case 4 – A 29-year-old man used for 2 months constantly topical anaesthetic after a corneal foreign body removal of the left eye, prescribed by an ophthalmologist. In Case 5 – A 49 –year-old patient underwent an eyelid, conjunctival and corneal burn of the right eye with compresses of 70% alcohol calendula tincture, administered by an ophthalmologist.
Results: Low rate of successful treatment was observed. In case 1, sight of the right eye was lost. In case 2, the left eye developed a partial atrophy. Case 3 showed best results and previous visual acuity was restored. Case 4 did not show up after the treatment. Case 5 recovered within 2 weeks with conventional eye burn treatment.
Conclusions: 1. Surgery and instrumentation protocols have to be clearly described and strictly followed. 2. Constant inspection of the operating theatre performed by qualified senior medical staff and administration is obligatory. 3. Patient history data should be collected with high precision.

● Su-Sw1-5

Autologous serum eye drops

Pauklin, Mikk
Tartu University Hospital, Tartu, ESTONIA

Summary: Serum is the liquid part of blood that can be easily separated after coagulation. It contains different growth factors in a relatively high concentration and its composition is rather similar to that of tears. Eye drops produced from diluted autologous serum enhance epithelial and nerve regeneration and have also lubricating properties. Therefore, these drops have been used for the therapy of a number of ocular surface diseases including severe dry eye syndrome, neurotrophic keratopathy, persistent and recurrent erosions. Serum eye drops have also been used during the postoperative period after ocular surface surgery (limbal stem cell transplantation, keratoplasty, refractive surgery, etc) to support regeneration. The main steps to produce these drops include peripheral phlebotomy to acquire enough blood, the separation of serum, dilution of serum to an adequate dilution (20% in most cases), production of sterile aliquots and different tests to ensure safety of the drops. A wider use of the serum eye drops is limited by the need to produce individual drops for each patient, the limited storage time, the relatively labor-intensive production process and the fact that most insurance companies do not cover the cost of autologous serum eye drops.

● Su-Sw1-6

Results of silicagel dried amniotic membrane transplantation in various corneal pathologies in Armenia

Hambardzumyan, Ani
Ophthalmologic Center after SV Malayan, Yerevan, ARMENIA

Purpose: To evaluate the efficacy of silicagel dried amniotic membrane recently investigated in Armenia, transplanted in various corneal pathologies.
Methods: Amniotic membrane is obtained from prospective donors undergoing Caesarean section, who are negative for communicable diseases including HIV, hepatitis B and C and syphilis. The placenta is cleaned with balanced salt solution containing a cocktail of antibiotics under sterile conditions. The amnion is separated from the chorion by blunt dissection. The separated membranes are cut in different sizes and placed in a plastic can with silicagel granules at the bottom. This study included 9 patients with recalcitrant herpetic keratitis, 17 patients with corneal perforation from different causes, 2 patients with *Candida* keratitis, 1 patient with ICC, 4 patients with descemetocele of different causes, 1 patient with scleral melt after pterygium surgery, 1 patient with band keratopathy, 3 patients with persistent epithelial defect caused by chemical burn, 1 patient with suture abscess, 1 patient with persistent epithelial defect resulting from CIN removal surgery, 2 patients with sterile ulcer observed in rheumatoid arthritis, 1 patient with spheroidal degeneration, 1 patient with *Acanthameoba* keratitis, and 4 patients with bacterial keratitis. All patients received medical therapeutic treatment for 1.5-2 months before undergoing amniotic membrane transplantation.
Results: Almost in all eyes quick recovery time was noted, stromal edema resolved in 3 weeks, epithelial healing was improved, irritation and pain quickly subsided. Three patients with herpetic keratitis required repeated AM transplantation.
Conclusions: Amniotic membrane is a useful treatment option.

POSSIBILITIES AND LIMITATIONS OF MODERN DIAGNOSTIC TOOLS OF FUNDUS LESIONS IN DIABETIC PATIENTS

● Su-De1-1

Optical coherence tomography (OCT)

Eriksson,Urban
St Erik's Eye Hospital, Stockholm, SWEDEN

● Su-De1-2

Microperimetry and early diabetic retinopathy

Nilsson, Maria
Karolinska Institutet, Stockholm, SWEDEN

Summary: Microperimetry (MP) is often associated with the possibility to see the retina in real time during examination and to be able to project a light stimulus on a selected retinal location. The scanning laser ophthalmoscope (SLO) was the first technique to allow mapping of the retinal function in relation to an exact retinal location. With the latest MP technique, it is also possible to retest an exact retinal location since the use of an eye tracking system makes it independent of fixation. Stimulus size and intensity are adjustable, but most commonly Goldmann stimuli size III is used. The Rarebit Fovea Test (RFT) evaluates the foveal function by the use of very small bright stimuli and therefore this technique could also be associated with microperimetry. Since the RFT stimuli are adjusted to the size of the receptive fields in the tested area it has the potential of detecting subtle defects and to reveal small gaps in the retinal matrix. Clinical studies using MP and optical coherence tomography in patients with diabetes mellitus (DM) have shown decreased retinal function and structural changes before any visible vascular changes in the retina are detectable. These results support the idea of seeing diabetic retinopathy (DR) not only as a consequence of microvascular changes but also as a consequence of neurodegenerative changes, and DR was recently described as a neurovascular disorder. Better understanding of the neurodegenerative process involved in DR is of importance for the development of new therapeutic targets, and neuroprotective strategies are currently being discussed. Microperimetry, with the use of small stimuli, has the potential of becoming an important instrument for evaluation and follow-up of new treatment modalities aiming to delay or prevent vascular changes in patients with DM.

● Su-De1-3

Retinal oximetry in diabetic retinopathy, age related macular degeneration, retinal vein occlusion and glaucoma

Stefánsson, Einar; Ólafsdóttir, Ólöf Birna; Geirsdóttir, Ásbjörg; Scheving, Thorunn; Kristjansdottir, J. Valgerdur; Harðarson, Sveinn Hákon
University of Iceland, Reykjavík, ICELAND

Purpose: To image oxygen metabolism of the retina and gain insight into metabolic O_2 physiology in health and ischemic retinal disease.
Methods: We developed a spectrophotometric retinal oximeter based on a fundus camera. We tested repeatability and accuracy of O_2 saturation measurements in retinal blood vessels and the response to O_2 breathing and illumination. Retinal vessel O_2 saturation was compared between healthy subjects and patients with diabetic retinopathy, age related macular degeneration (AMD), retinal vein occlusion and glaucoma.
Results: In healthy individuals O_2 saturation is 92.2% (SD 3.7, n=120) in retinal arterioles and 55.6% (SD 6.3) in venules. O_2 saturation rises significantly when subjects breathe 100% O_2. Switching from light to dark raises O_2 saturation in retinal vessels. Statistically significant differences are found in O_2 saturation in retinal vessels between healthy subjects and each of the eye diseases mentioned above. In diabetic retinopathy and AMD retinal venular O_2 saturation is higher than in healthy subjects. In CRVO hypoxia is seen in retinal venules and hypoxia is variable in both CRVO and BRVO. Venular O_2 saturation is higher in glaucoma patients than in normal subjects and increases with worsening visual field.
Conclusions: Spectrophotometric retinal oximetry is a reliable and safe approach to retinal metabolic imaging. The technique confirms in humans earlier studies on oxygen physiology in the retina of experimental animals. Retinal O_2 metabolism is affected in diabetic retinopathy, AMD, glaucoma and retinal vein occlusions. These findings may help explain the pathophysiology of these ischemic diseases, and aid in diagnosis and measurement of progression.

● Su-No1-1

Clinical performance of Synchrony® Vu dual-optic accommodating IOL (AIOL)

Marques, Eduardo[1]; Peris-Martinez, Cristina[2]; Buteyn, Anne[3]
[1]Hospital da Cruz Vermelha, Lisboa, PORTUGAL; [2]2Fundación Oftalmológica del Mediterráneo, Valencia, SPAIN; [3]Abbott Medical Optics, UNITED STATES

Purpose: The next generation dual-optic AIOL (Synchrony® Vu) has an optic profile that mimics the crystalline lens' increase in negative spherical aberration with accommodation. Visual performance was assessed 6 months post surgery in patients bilaterally implanted with Synchrony® Vu. The purpose of this study was to evaluate visual outcomes of patients bilaterally implanted with the Synchrony® Vu AIOL.
Methods: Uncorrected (UC) and distance-corrected (DC) binocular visual acuities (VA) were measured at 4 m, 0.8 m and 0.4 m with the ETDRS chart in 18 patients, 4-6 months post surgery. Both glare and no glare mesopic contrast sensitivity (CS) was tested in 38 eyes using the Optec® 6500 system. Results: Mean spherical equivalent was -0.58±0.54 D with 84.6% of eyes within ±1.0 D of target refraction. At 4 m and 0.8 m, 20/25 or better UCVA was achieved by 94.4% and 77.8% of patients, respectively. Seventy-two percent of patients achieved 20/32 or better UCVA and DCVA at 0.4 m. CS was within normal limits.
Conclusions: The dual-optic Synchrony® Vu AIOL provides good distance, intermediate and near VAs without sacrificing the quality of vision.

● Su-No1-2

Lentis® M+ IOL for refractive lens exchange (RLE): quantitative and qualitative analysis of toric and non-toric multifocal IOL (6 months follow-up)

Gundersen, Kjell Gunnar
Privatsykehuset Haugesund, Haugesund, NORWAY

Purpose: To study and compare clinical performance of toric and non-toric Lentis® M+ IOLs.
Methods: Retrospective, observational and comparative study. 87 eyes of 44 subjects were enrolled into this study. Fifty eyes of 25 subjects received non-toric Lentis® M+ lenses and 37 eyes and 19 subjects received toric Lentis® M+ lenses. Selection criterion for toric IOL was a corneal astigmatism larger than 1.25 D. Protocol: 1) Preoperative biometry with IOL Master® or Lenstar® 2) Uneventful surgery 3) Clinical assessment at day 1, week 1 & 6, month 3 & 6. 4) Questionnaire distributed 6 months after implantation surgery Main outcomes at 6 months: 1) Efficacy and safety (UCVA & BCVA) 2) Predictability (MSE & DFE) 3) Subjective response to qualitative questionnaire.
Results: UCVA improved from 0.68±0.34 to 0.98±0.14 at 6 months postoperatively for toric implants and from 0.69±0.25 to 0.99±0.20 for non-toric implants. BCVA improved from 0.91±0.26 to 1.04±0.16 at 6 months postoperatively for toric implants and from 0.99±0.23 to 1.07±0.0.2 for non-toric implants. Predictability was excellent in both groups. Defocus equivalent (DFE) was reduced from -0.11±3.21 to 0.00±0.35 in the toric group and from 0.46±2.35 to -0.11±0.66 in the non-toric group. The response rate of patient questionnaire was high (95.6%), and patient satisfaction was very high in both groups.
Conclusions: Lentis® M+ is a relatively new intraocular lens to treat both ametropia and presbyopia. Statistical analysis up to 6 months postoperatively showed these lenses, both the toric and the non toric to be safe, effective and predictable. Patient response showed a high rate of staisfaction, both for distance and near vision. Complications were rare and non-serious. A few case reports will be shown and discussed. Comparissons to ReSTOR® diffractive IOL will be made.

● Su-No1-3

Multifocal IOLs for RLE

Uusitalo, Raimo
Helsinki Eye Hospital, Helsinki, FINLAND

Purpose: To evaluate the outcome of implantation of the diffractive multifocal intraocular lens (IOL).
Methods: Twenty patients had phacoemulsification lens extraction and implantation of ReSTOR® or AT-Lisa® multifocal IOL in both eyes. Visual acuity, refraction, spectacle independence, undesired visual symptoms and patient satisfaction were analysed 1 month up to 18 months postoperatively.
Results: An uncorrected near visual acuity of 0.4 or better was achieved in 100% eyes with 0.8 or better visual acuity for distance in 90% of cases. Spectacle independence was 80%. Visual disturbances were minimal with only 3 patients complaining of mild glare or halos at night. Conclusion: Implantation of multifocal IOLs provide good uncorrected near and far visual acuities without complaints of severe glare or halos, leading to high spectacle independence and high patient satisfaction levels.

● Su-No1-4

Managing patient expectations with different multifocal IOLs

Rudalevicius, Paulius; Jasinskas, Vytautas
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: Evaluate functional results after bilateral M-flex®, ReSTOR® and TECNIS® multifocal intraocular lense (IOL) implantation.
Methods: Patients with age-related cataract who had potential visual acuity of 0.3 logMAR or better on clinical assessment were involved. Phacoemulsification through clear corneal incision was completed and multifocal IOL was implanted. We enrolled 50 patients into this study. Patients were assigned to three different groups: bilateral implantation with M-flex (n=30), bilateral implantation with ReSTOR® (n=8), bilateral implantation with TECNIS® (n=12). Follow up continued up to one year. ETDRS visual acuity, keratometry and biomicroscopy were evaluated. Questionnaire about the visual side effects and satisfaction was filled.
Results: Postoperatively all groups showed good uncorrected distance and near visual acuity (logMAR). M-flex® group

UCDVA=-0.08 (range, -0.22 to 0.26), UCNVA=0.20 (range, -0.06 to0.60). ReSTOR® group UCDVA=0.04 (range, -0.06 to 0.14), UCNVA=0.22 (range, 0.00 to 0.50). TECNIS® group UCDVA=-0.04 (range, 0.0 to 0.60), UCNVA=0.20 (range, 0.0 to 0.60). Patients complained about halo around lights at night time: n=16 (M-flex® group), n=2 (ReSTOR® group) and n=4 (TECNIS® group). All patients were satisfied with achieved result.

Conclusions: M-flex®, ReSTOR® and TECNIS® multifocal IOLs provided good refractive results. Comparing the 3 groups, no significant differences were found for distance and near visual acuity. All patients were satisfied with the visual outcome subjectively.

OCULOPLASTICS FROM A TO Z

● Su-Ic1-1

Surgical management of orbital cavernous haemangioma

Klett, Artur
ITK Eye Clinic, Tallinn, ESTONIA

Purpose: Cavernous haemangioma is the most common vascular tumor of the orbit. Since the advent of good imaging techniques such as CT or MRI, this tumor often is being discovered as coincidental finding when it is small and asymptomatic. In this case the management is just periodic observation. But in this presentation we would like to share our experiences with management of larger orbital haemangiomas using different surgical approaches.
Methods: We present a series of 3 patients with diagnosis of orbital cavernous haemangioma. In 3 cases, 3 different surgical approaches were performed: lateral, coronal and infraorbital.
Results: In all cases tumor was totally removed: Infraorbital surgery was performed by the ophthalmic surgeon only, lateral osteotomy in cooperation with maxillofacial surgeon and coronal approach in cooperation with neurosurgeon.
Conclusions: Orbital lesion management benefits from a multidisciplinary and individualised approach.

● Su-Ic1-2

Traumatic case analyses of canalicular laceration in Pauls Stradins Clinical University Hospital (years 2009-2011)

Skitecka, Jekaterina; Zivicka, Irina; Laganovska, Guna
Pauls Stradins Clinical University Hospital, Riga, LATVIA

Purpose:: To analyse preventing of post-traumatic epiphora using surgical repair of canalicular laceration by silicone ring intubation in a series of patients treated over a 2 year period (2009-2011) in Pauls Stradins Clinical University Hospital.
Methods: Retrospective, non-comparative, consecutive case series of 13 patients with traumatic eyelid injuries associated with canalicular laceration who underwent surgical repair using the silicone ring intubation were included. Demographic information, type and duration of injury, associated ocular injuries, duration of follow-up were analysed.
Results: Thirteen patients (8 males and 5 females) were examined and treated. Average patient age was 45 years (range, 19-74). There were 11 lower canalicular lacerations and 2 lower and upper canalicular lacerations. Causes of injury included violent accident (4 patients), household accident (4 patients), dog bite (2 patients), traffic accident (1 patient), job-related accident (1 patient), and cow attack (1 patient). Average duration of injury before presentation to authors' clinic was 1.6 days (85% of patients). Two patients turned to our clinic after 150 and 180 days. These two cases are excluded from descriptive statistics and are considered an anomaly. Silicone ring was removed at a mean of 6 months. Associated ocular injuries were orbital fracture (2 patients), choroidal detachment (1 patient), and ocular contusion (5 patients). An anatomically readapted lacrimal system was found in 12 of the 13 cases.
Conclusions: Using the silicone ring intubation method for restoration of canalicular laceration provides good functional results. Canalicular laceration needs urgent primary surgical repair with silicone ring intubation.

● Su-Ic1-3

Management of orbital volume deficiencies using autologous dermis–fat graft

Klett, Artur
ITK Eye Clinic, Tallinn, ESTONIA

Purpose: To evaluate our results in treating the orbital volumn deficiency in postenucleation syndrome patients using autologous dermis–fat graft.
Methods: Since 2002, 42 patients with postenucleation socket syndrome were treated using this technique. The average period after enucleation was 5.5 years. In all patients the primary enucleation was performed with hydroxyapatite–silicone implantation.
Results: In all cases a dermis–fat graft was taken from the paraumbilicar area. In 38 cases acceptable cosmetical results were achieved. There were no complications such as rejection or orbital inflamation. In 3 cases we were needed to perform the upper lid ptosis procedure.
Conclusions: This technique should be considered because of good cosmetical results and minimal complication rate due to the use of autologous material. The best point is that this technique does not leave an ugly scar on the body different from dermis–fat grafts taken as part of the earlier methods.

● Su-Ic1-4

Congenital anophthalmia: a case report

Dobrõdnjova, Olga; Klett, Artur
East-Tallinn Central Hospital, Tallinn, ESTONIA

Purpose: Congenital anophthalmia is a rare congenital eye anomaly in which the eye is absent as the result of a deficiency in the development of the primary optic vesicle. Anophthalmia has an incidence of 0.18–0.4/10,000 births. Absence of an eye can affect the maturation of the soft tissues and bony structures surrounding the affected orbit. A child with congenital anophthalmia is a great challenge for an ophthalmologist as this condition leads to cosmetic and physiological problems in affected children. Today there are different treatment options for congenital anophthalmia. The goal of the therapies used is to stimulate soft tissue and bony development. We present a case report of a child with congenital anophthalmia who was treated with hydrogel expander at the East-Tallinn Central Hospital.
Methods: A child with unilateral congenital anophthalmia was treated with hydrogel expander at the age of 2 weeks. Thereafter the orbital cavity was repeatedly dilated with acrylic shells. The patient received his first ocular prosthesis at the age of 2 years.
Results: At the moment the patient is 5 years old and he has undergone 13 surgeries aimed at improving cosmesis of the affected orbit.

Conclusions: Treatment of congenital anophthalmia with hydrogel expander is an effective method in providing good cosmetic outcome and periocular symmetry.

● Su-Ic1-5

Spontaneous healing after excision of basal cell carcinoma in cases with medially located tumour

Klett, Artur
ITK Eye Clinic, Tallinn, ESTONIA

Purpose: It is often difficult to reconstruct the excised area using different methods for skin transplantations and at the same time to achieve a good cosmetic outcome. One way to achieve a good cosmetic result is to give an opportunity to the defect for spontaneous healing of the excised area without any replacement of tissue.
Methods: Four female patients (51, 62, 72 and 80 years old) with different locations of basal cell carcinoma where treated. The spontaneous healing of the postoperative defect was photographically documented 2 weeks, 2 months and 2 years after treatment.
Results: In all cases quite good cosmetic results were achieved as an average 6 weeks after the surgical excision of the tumor. There were no tumor relapses during 3-3.5 years after treatment.
Conclusions: This simple way should be considered in selected cases when the tumor is located in the medial area. In our experiences cosmetic results in most cases are even better.

● Su-Ic1-6

Congenital upper and lower lid entropion

Rebane, Reili; Klett, Artur
East Tallinn Central Hospital, Tallinn, ESTONIA

Summary: Congenital entropion is an extremely rare disorder. Congenital lower lid entropion is usually caused by improper development of the retractor aponeurosis insertion into the inferior border of the tarsal plate. Symptoms are trichiasis, irritation of the globe, corneal scarring and ulceration. Differential diagnosis of lower lid entropion includes epiblepharon, which refers to an inturning of eyelashes in the presence of a normal eyelid position. Congenital entropiun correction procedures include mucocutaneous skin-muscle resection and plication procedures. Reattachment or advancement of the lower lid retractors to the inferior tarsal border and anterior lamellar repositioning is also done. In upper lid with a tarsal kink: resection of the kink with anterior lamellar transposition and tightening is the treatment of choice. The treatment must start with corneal protection to prevent corneal scarring, infection and amblyopia.

● Su-Ic1-7

Ocular surface reconstruction after conjunctival and limbal tumor excision

Asoklis, Rimvydas[1]; Kaziauskiene, Aiste[1]; Butkiene, Laura[2]; Makselis, Almantas[2]; Petroska, Donatas[3]; Pajaujis, Mykolas[2]; Juodkaite, Grazina[1]
[1]Vilnius University, Vilnius, LITHUANIA; [2]Vilnius University Hospital, Santariskiu klinikos/Center of Eye Diseases, Vilnius, LITHUANIA; [3]Vilnius University Hospital Santariskiu Klinikos/National Center of Pathology, Vilnius, LITHUANIA

Purpose: To report clinical results of patients treated by preserved human amniotic membrane and corneal graft transplantation following the removal of conjunctival and limbal tumours.
Methods: Retrospective, non-comparative, interventional case series of 9 patients (9 eyes) who underwent amniotic membrane transplantation after removal of conjunctival and limbal tumours with lesion-free margins and 3 patients (3 eyes) after limbal dermoid excision and lamellar corneal graft transplantation.
Results: The excised tumours were histopathologically examined and included 2 squamous cell carcinomas, 2 papillomas, 5 naevi and 3 limbal choristomas. No surgical or early postoperative complications were observed. All eyes demonstrated a smooth ocular surface except one with a clinically insignificant symblepharon. In one case, a recurrence of conjunctival papilloma was diagnosed after 3 years of follow-up. No corneal graft rejections were observed in the limbal dermoid group.
Conclusions: Amniotic membrane transplantation is an effective method of ocular surface reconstruction following conjunctival and limbal tumour excision. Lamellar corneal graft transplantation can guarantee good functional and cosmetic effect after limbal dermoid excision. However, time for the surgery should be decided depending on the general health of the child and size of the tumour.

● Su-Ic1-8

Ocular dirofilariasis: a case report

Villemson, Maarja; Klett, Artur
Tallinn Central Hospital, Tallinn, ESTONIA

Purpose: A rare occurrence of ocular palpebral dirofilariasis is reported. It is the first case reported in this region.
Methods: A 43-year-old woman without systemic symptoms presented with a 7-week history of a small painless mass localized in the nasal part of the lower eyelid.
Results: Surgical removal was carried out in the outpatient clinic. The live worm removed from lower lid subcutaneous space was identified as *Dirofilaria repens*. The identification was made on the basis of microscopic examination and histopathology. After surgical removal, symptoms resolved promptly with no ocular or systemic recurrences over a year of follow-up.
Conclusions: Surgical removal of the worm was both a diagnostic and a therapeutic procedure with a good clinical outcome.

KEYNOTE PLENARY 2: PREVENTION OF GLAUCOMA

● Su-Fi2-1

Introduction

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, Finland

● Su-Fi2-2

How to prevent glaucoma?

Ritch, Robert
New York Eye and Ear Infirmary, New York, USA

BIOGRAPHY

Robert Ritch, MD, PhD is Professor of Ophthalmology, New York Medical College, and Chief of Glaucoma Service and Surgeon Director, New York Eye and Ear Infirmary, New York, NY, USA. Prof. Ritch received his B.A. cum laude from Harvard College and an M.A. in cell biology from Harvard University. He received his M.D. from Albert Einstein School of Medicine and, after a residency in Ophthalmology at Mount Sinai School of Medicine, he received fellowships in glaucoma from the Heed Foundation and the National Institutes of Health. He is a member of more than 35 scientific and medical societies. Dr. Ritch has been President of the Ophthalmic Laser Surgical Society, the New York Glaucoma Society, the Section on Ophthalmology of the New York Academy of Medicine, and the New York Society for Clinical Ophthalmology. He serves on numerous medical and scientific advisory and editorial boards and is a member of the Glaucoma Research Society, the Steering Committee of the World Glaucoma Association, the Advisory Board of Helen Keller International, and the Board of Governors of the International Society for Imaging in the Eye. Dr. Ritch has co-authored or edited nine textbooks and over 1500 medical and scientific papers, book chapters, articles and abstracts. He has presented nearly 700 lectures worldwide, including 31 named lectures. In 1985, he founded the Glaucoma Foundation and has served as Secretary, Medical Director, and Chairman of the Scientific Advisory Board. He also co-founded the New York Glaucoma Research Institute, a not-for-profit foundation to sponsor clinical research in glaucoma, the alt.support.glaucoma Internet newsgroup, the New York Glaucoma Support and Education Group, and the Association of International Glaucoma Patient Organizations. He was one of the three organisers of the first annual World Glaucoma Day in 2008. He was co-founder of the Ophthalmic Laser Surgical Society, the New York Glaucoma Society, and the Lindberg Society, an international organization dedicated to the eradication of exfoliation syndrome; the ARVO Host-a-Research Program, the ARVO U.S.-Russia Ophthalmology Task Force, and the von Graefe Society, an international organisation dedicated to the study of risk factors for glaucoma other than intraocular pressure.

VIDEO SESSION

● Su-Fi3-1

Experience with 27-gauge instruments in vitreoretinal surgery

Crafoord, Sven[1]; Jadidi Gili, Nasser[2]
[1]Örebro University, Örebro, Sweden, SWEDEN; [2] Örebro University Hospital, SWEDEN

Summary: Sutureless vitrectomy with use of 25- or 23-gauge instruments has become common in vitreoretinal surgery this last decade. An ongoing debate whether 25-gauge or 23-gauge technique is superior takes place on almost all retina meetings. Various studies and case reports discuss the pros and cons of these techniques. The initial problems with increased instrument flexibility and low fluid flow have been adjusted. Today the increased risk of ocular hypotony and endophthalmitis is of great concern to all surgeons. The rational behind using even smaller sclerotomies such as 27-gauge is to decrease or prevent hypotony and endophthalmitis as well as to minimise the surgically induced inflammation and, possibly, also cataract development. Oshima *et al.* 2010 demonstrated a case series of 31 eyes which underwent 27-gauge vitrectomies without any complications. With improved illumination, visualisation, instrument equipment and magnification the chances of achieving good anatomical as well as functional results increases. The 27-gauge surgery will be demonstrated by video and the technique will be discussed.

● Su-Fi3-2

Microincision cataract surgery and vitrectomy

Haaga, Marko
Central Hospital of Päijät-Häme, Lahti, FINLAND

● Su-Fi3-3

IOL subluxation, transscleral fixation

Oskala, Pertti
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: A simplified suture refixation technique for dropped rigid PMMA and three-piece foldable acrylic IOLs is presented with a modification for foldable one-piece acrylic IOLs.

● Su-Fi3-4

Traumatic epiretinal membrane in a young patient

Gudmundsson, Johann
Karolinska Institutet, Stockholm, SWEDEN

● Su-Fi3-5

Incisional transretinal biopsies for the detection of malignancy in clinically indeterminate choroidal tumours

Kvanta, Anders; Berglin, Lennart; Seregard, Stefan
Karolinska Institutet, Stockholm, SWEDEN

Purpose: Many techniques are available for choroidal biopsies of indeterminate tumour-like lesions. Nevertheless data on diagnostic sensitivity and specificity are scarce. We evaluated an invasive procedure designed to maximise diagnostic accuracy in patients harbouring a potentially malignant choroidal tumour.
Methods: We undertook a retrospective chart review of the diagnostic accuracy and complications following 43 incisional transretinal biopsies of choroidal tumours in 41 consecutive patients. Briefly, the procedure included a para plana vitrectomy approach with retinotomy followed by incisional choroidal biopsy using a diamond knife, endolaser photocoagulation surrounding the retinotomy and a vitreous tamponade using expanding gas. Patients were followed for a median of 2 years (range, 1-8) after biopsy.
Results: There were 18 women and 23 men with a median age of 66 years (range, 31-91). Although 37 patients experienced no major complications after biopsy, 3 patients had progression of a retinal detachment present before the time of biopsy and one patient had detachment developing after biopsy. Only one of the patients with progressive retinal detachment had malignant disease. By histopathologic examination, choroidal melanoma was detected in 51% (22/43) and metastatic disease in 14% (6/43) of biopsies. The sensitivity and specificity to detect malignant disease was 96% and 100%, respectively. Non-malignant disease included choroidal neovascularisation, nodular scleritis and choroidal granuloma and only half of these (7/15) were reliably diagnosed by biopsy usually because of insufficient tissue.
Conclusions: Incisional transretinal biopsy is an excellent technique to detect malignant disease in choroidal tumours. For patients with biopsy-proven malignant disease it has few significant complications. However, this technique is far less accurate for benign tumour-like lesions and complications are more frequent, particularly when retinal detachment is present at the time of biopsy.

● Su-Fi3-6

23-gauge surgery in proliferative diabetic retinopathy and the indications for combining the vitrectomy with lens removal

Bragadottir, Ragnheidur
Oslo University Hospital, Oslo, NORWAY

Summary: A retrospective evaluation of 123 cases of 23-gauge vitrectomies in proliferative diabetic retinopathy during a 4-year period showed that 10% of the eyes had to be reoperated due to persistent or recurrent vitreous haemorrhage. At the time of the initial surgery, 77% of the eyes were phakic, of which 50% had some degree of cataract. Only 6 vitrectomies were combined with cataract removal and IOL implantation. The anatomic success of the surgery was 97% and vision was stabilised or improved in 94% of cases. Those eyes that needed reoperation due to postoperative haemorrhage were mostly of younger patients with clear lenses (13/15 eyes). They have often the anterior hyaloid attached to the

lens and probably this is a contributing factor for rebleeding. In addition to the clearing of the media and the reattachment of the detached retina, the vitreoretinal surgery can stabilise the proliferative process itself. The removal of the vitreous improves the oxygenation of the ischemic retina and the membrane removal prevents the progression of neovascular proliferation as the scaffold for vascular growth is removed. Panretinal photocoagulation can be completed during the surgery. The main complication after vitreoretinal surgery in proliferative diabetic retinopathy is postoperative vitreous haemorrhage. Proliferative diabetic retinopathy continues to be the most demanding task for the vitreoretinal surgeon but with improved instrumentations and surgical technique, surgical complications can be minimised. This should lower the threshold for vitreoretinal surgery and patients should be treated earlier and in a less advanced stage of the disease. The presence of the lens prevents the complete removal of the anterior vitreous. If reoperation for recurrent haemorrhage is needed, phacovitrectomy should therefore be considered.

ANTERIOR SEGMENT IMAGING

● Su-Sw3-1

What can we diagnose with corneal confocal microscopy?

Vesaluoma, Minna; Hau, Scott
Moorfields Eye Hospital, London, UNITED KINGDOM

Summary: The aim of this presentation is to show the potential and limitations of corneal confocal microscopy as a diagnostic tool for corneal diseases without going into technical details. A collection of patient cases and confocal microscopic images, especially those of atypical microbial infections, such as *Acanthamoeba* and fungal keratitis, will be shown. The clinical suspicion of either of these two infections is the most common indication for confocal microscopy at Moorfields Eye Hospital, although the golden standards for making the diagnosis are still culture and histology. Additionally some other clinically interesting and relevant patient cases will be presented. The audience has an opportunity to test their own diagnostic skills throughout the presentation.

● Su-Sw3-2

Rapid Fire:
Morphologic investigation of the limbal stem cell niche in aniridia by *in vivo* confocal microscopy

Lagali, Neil[1]; Eden, Ulla[1]; Utheim, Tor Paaske[2]; Chen, Xiangjun[2]; Riise, Ruth[2]; Dellby, Anette[1]; Fagerholm, Per[1]
[1]Linköping University, Linköping, SWEDEN; [2]University of Oslo, Oslo, NORWAY

Purpose: To document the *in vivo* morphology of the corneal limbal stem cell niche in patients with varying degrees of aniridic keratopathy.
Methods: Thirty subjects were examined and consisted of patients with aniridia and unaffected family members. The grade of aniridic keratopathy, limbal involvement, and transparency were assessed by slit lamp biomicroscopy, and the limbal palisades region of the cornea was examined in all subjects (bilaterally where possible) by laser-scanning *in vivo* confocal microscopy.
Results: In patients with the most severe stages of aniridic keratopathy, the limbal stem cell niche was completely absent and replaced by blood vessels, inflammatory cells and tissue with a conjunctival phenotype. In those with milder keratopathy and clear corneas, limbal palisades were altered to varying degrees, with some corneas appearing morphologically normal. In corneas with mild keratopathy, *in vivo* image montages revealed varying patterns of palisade ridges and focal stromal projections, and surprisingly, similar patterns were observed in some unaffected relatives. The density and distribution of ridges and focal stromal projections in the limbal palisades region appears to be complex and varying, for as yet unknown reasons. Some of these structures also appear to be redundant, as a possible protection mechanism.
Conclusions: Correlation between limbal palisade morphology and severity of keratopathy was present and could be used as a prognostic or early screening tool and as a possible indicator of the potential for adverse reaction of the cornea to therapeutic ocular interventions.

● Su-Sw3-3

Anterior segment optical coherence tomography in congenital corneal opacities

Majander, Anna; Lindahl, Päivi; Vasara, Kristiina; Krootila, Kari
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: We evaluated the clinical usefulness of the anterior segment optical coherence tomography (AS-OCT) in diagnosis and follow-up of children with congenital corneal opacities.
Methods: Seven consecutive patients with bilateral congenital corneal opacity, aged between 2 days to 2.5 years, were studied. Anterior segment structures and corneal thicknesses, the type and severity of the congenital corneal opacity were evaluated based on the findings in AS-OCT.
Results: Thirteen of the 14 eyes could be imaged using AS-OCT. Three distinct phenotypes were found. Three patients with iridocorneal adhesions were deduced to have type 1 Peters' anomaly, and 2 patients with lenticulocorneal adhesions type 2 Peters' anomaly. Two youngest patients had features of sclerocornea and congenital anterior staphyloma.
Conclusions: AS-OCT proved to be a valuable method in the diagnosis and follow-up of patients with congenital corneal opacities. As a fast and non-contact technique, it was applicable even to neonates. It allowed early characterisation of the type and the extent of the anterior segment disorder without anaesthesia.

● Su-Sw3-4

Epithelial thickness and structure in COMET patients

Wowra, Bogumil[1]; Dobrowolski, Dariusz[1]; Orzechowska Wylegala, Boguslawa[2]; Wylegala, Edward[1]
[1]District Railway Hospital, Katowice, POLAND; [2]Medical University of Silesia, Katowice, POLAND

Purpose: To evaluate corneal epithelial structure and thickness after COMET procedure.
Methods: Thirty-two patients underwent COMET procedure. The subjects were 21 women and 11 men, in 6 patients the surgery was bilateral. Indications were corneal burns and aniridia related LSCD. Follow-up was at least 6 months. Analysed data included OCT assisted epithelial thickness measurement and structure assessment by confocal microscopy.
Results: Mean epithelial thickness performed in 5 different points was 45.2±12.9 µm in successful cases, and 82.1±47.8 µm in failed cases with recurrent conjunctival ingrowth. Confoscan® analysis confirmed regular structure of restored epithelium of oral mucosal origin, and vascular structure of the reconjuctivalisation was recognised on the scans (21.2%). Conclusion: Analysis of epithelial structure and thickness by these methods could be useful in postoperative care of COMET patients.

TREATMENT OF DIABETIC RETINOPATHY - OLD AND NEW

● Su-De3-1

Laser treatment of diabetic macular edema

Agardh, Elisabet
Skåne University Hospital Malmö, Malmö, SWEDEN

Summary: Although more than 25 years have passed since laser coagulation was established for diabetic macular edema by the Early Treatment Diabetic Retinopathy Study (ETDRS) research group, it remains the gold treatment standard for clinically significant macular edema in terms of focal or diffuse leakage, or both. The laser beam is absorbed in haemoglobin in the leaking aneurysms or in melanin in the pigment epithelium resulting in an increased temperature, which also harms the adjacent neurons. Thus, there is a delicate balance between beneficial and harmful effects, *i.e.* sealing the leakage with subsequent absorption of fluid, lipids and lipoproteins, and scarring. Cases to illustrate successful outcome as well as complications of laser treatment will be presented.

● Su-De3-2

Sustained benefit from ranibizumab for diabetic macular edema: a prospective study

Epstein, David[1]; von Wendt, Gunvor[1]; Kalm, Helle[2]; Eriksson, Urban[2]
[1]Karolinska Institutet, Stockholm, SWEDEN; [2]St Erik's Eye' Hospital, Stockholm, SWEDEN

Purpose: To evaluate the efficacy of intraocular injections with ranibizumab in patients with macular edema (ME) secondary to diabetes mellitus (DM).
Methods: Prospective case series. Participants were 112 patients with ME secondary to DM. All patients initially received three monthly injections of ranibizumab. Reinjection was given at the first follow up visit if the central retinal thickness (CRT) had decreased by at least 10%. At subsequent visits a reinjection was given if the CRT had decreased by at least 10% and the best corrected visual acuity (BCVA) had improved by at least 5 letters. Adjuvant focal laser could be given at any point. The primary outcome measure was the mean change in BCVA. Secondary outcome measures were the proportion of patients gaining at least 5 respectively 10 letters, the mean change in CRT and the number of injections given.
Results: The patients were followed up for an average of 9 months (range, 3-15). The BCVA improved by 5.8 letters after the first 3 injections and by 6.4 letters at the last visit ($p<0.05$). At the end of follow up 62/112 (55.4%) patients had gained ≥5 letters and 39/112 (34.8%) patients had gained ≥10 letters ($p<0.05$). The mean CRT decreased from 465 µm at baseline to 327 µm after 3 injections and 341 µm at the end of follow up ($p<0.05$). The patients received on average 4.0 injections (range, 3-7) during the follow up period. There were no events of endophthalmitis, retinal tear or retinal detachment during the study period. No serious non-ocular adverse events were reported.
Conclusions: Intraocular injections of ranibizumab given initially as three monthly injections and with consequent reinjections improve visual acuity rapidly and sustainably and reduce ME significantly.

● Su-De3-3

Scatter photocoagulation: pros and cons with old and new laser equipments

Summanen, Paula
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Scatter photocoagulation effectively causes regression of new vessels (NVs) in proliferative diabetic retinopathy (PDR) and thus prevents fibrovascular proliferations from growing and from causing vitreous haemorrhages and traction to the retina. While large xenon arc photocoagulation burns were effective, they caused significantly more visual field loss than argon laser burns and were abandoned. Since 1970's argon laser burns of 0.2-0.5 mm, 0.2 sec, 800-1,000 spots per session and up to 4,000 per eye (52% of retinal area) for panretinal photocoagulation (PRP) have been indicated for severe PDR, sectoral and "under and around" treatment for local NVs. For severe non-proliferative DR, scatter treatment for vaso-occlusion areas is beneficial in preventing NVs. Recently, scanning lasers which allow 2x2 up to 5x5 burns with duration of only 20-30 ms to be performed in patterns instead of single consecutive burns, have made it possible to deliver more burns within a significantly shorter time and with less pain. High number of laser burns and still active PDR has recently occurred, however. One reason may be the smaller spot size and the fact that in contrast to the previous laser scars which tended to enlarge (negative near the macula, but not necessarily in the periphery), the present ones do not, which affects the long-term area covered. Up to date definitions for effective PRP are needed so as to prevent severe visual loss e.g. from neovascular glaucoma still threatening young type 1 diabetics with poor glycemic control. Retreatment is more painful and time consuming than the primary one.

● Su-De3-4

Indications and results of vitreoretinal surgery in proliferative diabetic retinopathy

Crafoord, Sven
Örebro University, Örebro, SWEDEN

Summary: In the diabetic eye both the retina and the vitreous is affected. When the retina suffers from ischemia, a consequent neovascualarisation process is starting, resulting in a cascade of inflow of vascular growth factors. The ingrowth of new vessels starts the process eventually leading to haemorrhage and the development of fibrovascular tissue, later leading to retinal traction. At the same time non-enzymatic glycation of vitreous proteins and collagen is taking place in the vitreous (Sebag 1992, 1998). The shrinkage of the vitreous further enhances the traction on the retina. The neovascularisation is much more extensive in eyes with attached vitreous compared to eyes with a posterior vitreous detachment (Tagawa 1986). Much of the vitreoretinal surgery in the diabetic eye is focused on removing the condensed

vitreous and blood clot and relieving the traction on the retina. In the same time after removal of the vitreous a continuous flow of aqueous will permanently change and increase the retinal oxygenation. The modern surgical technique with improved illumination, visualisation, instrumentation and magnification raises the chances of achieving good anatomical as well as functional results. The vitreoretinal techniques will be demonstrated and illustrated and the results will be discussed.

ASTIGMATISM CORRECTION

● Su-No3-2

Comparison of AcrySof® Toric and aspheric AcrySof® Toric in treating astigmatism'

Linnola, Reijo
PlusHealth Oy, Seinäjoki, FINLAND

Purpose: To compare AcrySof® Toric and the aspheric AcrySof® Toric in treating astigmatism.
Methods: A clinical follow-up study of 23 first AcrySof® Toric IOL operated eyes was done in 2009 when these IOLs first became available in Finland. Aspheric AcrySof® Toric became available in Finland in November 2011. A similar clinical follow-up study was done to compare aspheric toric IOL performance with the previous one.
Results: The mean best uncorrected visual acuity (UCVA) with AcrySof® Toric was 0.8 and the residual astigmatism was 0.326 D. With aspheric AcrySof® Toric the mean UCVA was 0.82 and the residual astigmatism was 0.192 D in the first 30 operated eyes.
Conclusions: Visual acuity results with AcrySof® Toric and Aspheric AcrySof® Toric were similar, good UCVA was achieved in both groups. Less residual astigmatism was noticed in the Aspheric Acrysof® Toric IOL group, most probably due to larger cylinder correction possibilities available (1-4 D in corneal power).

● Su-No3-3

Visual outcomes of aspheric toric IOL to treat astigmatism during cataract surgery

Assaf, Ahmed
Ain Shams University, Cairo, EGYPT

Purpose: To compare the outcomes of Tecnis® toric intraocular lens (IOL) with Tecnis® monofocal IOL combined with peripheral clear corneal incision in patients with pre-existing corneal astigmatism and undergoing cataract surgery.
Methods: Recruited in this study were patients with age-related cataract and corneal astigmatism between 1.0 and 2.5 D without other ocular pathology. Tecnis® toric IOL was assigned in group A while patients in group B received Tecnis® monofocal IOL. Peripheral clear corneal incision was performed to treat astigmatism by conclusion of cataract surgery in eyes in group B. Both groups were age matched. Follow-up examinations scheduled at 3 weeks and 3 months postoperatively. Study parameters included postoperative uncorrected distance visual acuity (UDVA), residual postoperative corneal astigmatism, and predictability and stability of astigmatic correction in both groups. Patient satisfaction and dry eye symptoms were monitored.
Results: A total of 44 eyes were included in this study. Each group comprised 22 eyes. No statistically significant difference between the two groups as regards preoperative corneal astigmatism were found. Preliminary results showed that UDVA was significantly superior in group A. Residual refractive astigmatism was significantly higher in group B. Dry eye symptoms and patient discomfort was significantly higher in group B.
Conclusions: To be discussed after completion of the study.

● Su-No3-4

A comparative study of correction of moderate-to-high astigmatism by PRK and LASIK

Neira, Waldir; Tervo, Timo; Holopainen, Juha
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To evaluate and compare the stability, effectiveness and safety of photorefractive keratectomy (PRK) and laser assisted *in situ* keratomileusis (LASIK) in the treatment of moderate-to-high myopic astigmatism.
Methods: Retrospective follow-up study of 44 eyes treated with PRK and 30 eyes treated with LASIK, which were subjected to excimer refractive surgery to correct myopic astigmatism >2.0 D in a private eye care centre (Silmäkeskus Laser, Helsinki, Finland). Follow-up data were available at 6 and 12 months. Laser ablations were done with the excimer laser (NIDEK® EC-5000, Nidek Technologies, Gamagory, Japan; VISX® 20/20, VISX Star, VISX Star2 and VISX Star S4; Santa Ana, CA). Non-vector and vector analysis were performed at each visit.
Results: Postoperatively, best corrected visual acuity (BCVA) ≤0.0 (logMAR scale) was obtained in 79% and 83% of the eyes at 6 months, and in 82% and 90% of the eyes at 12 months after PRK and LASIK, respectively. Two or more lines of BCVA were lost in 9% and 3% of eyes at 12 months after PRK and LASIK, respectively. Postoperatively, at 12 months SE within ±0.50 was obtained in 57% after PRK and in 80% after LASIK. Both procedures showed undercorrection of the intended astigmatism. Vector analysis revealed no differences between PRK and LASIK. Comparative postoperative analysis showed that BCVA after LASIK was superior over PRK. No differences were found in other parameters.
Conclusions: Postoperative results for astigmatic patients were not as precise as myopic corrections. LASIK was superior in visual outcomes compared to PRK. Both procedures tended to under correct the astigmatism component. Postoperatively around 30% and 20% of eyes after PRK and LASIK, respectively, still need to wear spectacle after astigmatic correction.

● Su-No3-5

Corneal incision morphology and surgically induced astigmatism after transversal phacoemulsification through 2.2 mm corneal incision using 21-gauge

Assaf, Ahmed
Ain Shams University, Cairo, EGYPT

Purpose: To evaluate and compare the corneal incision morphology and surgically induced astigmatism (SIA) occurring after transversal phacoemulsification through 2.2 mm corneal incision using 21-gauge and 20-gauge phaco tips.
Methods: Prospective randomized contralateral comparative study including 64 consecutive cataract eyes (N3-4 according to LOCSIII grading system) of 32 patients ranging in age from 55 to 73 years and undergoing cataract surgery through a 2.2 mm corneal incision at 135º. Transversal continuous ultrasound mode was used in all cases. Two different phaco tips were used for the right and left eye randomly and according to this two groups were clearly differentiated: group I including eyes undergoing phacoemulsification using the 20-gauge phaco tip (32 eyes), and group II including eyes undergoing phacoemulsification using the 21-gauge phaco tip (32 eyes).

Results: No statistically significant differences were detected between groups in UST (p=0.78) and APP (p=0.21). Neither preoperative nor postoperative statistically significant differences were detected between groups in mean keratometry (preoperative, p=0.95; postoperative, p=0.89) and the magnitude of corneal astigmatism (preoperative, p=0.89; postoperative, p=0.82). Mean postoperative magnitude of SIA was significantly higher in group I compared to group II (0.40±0.14 *vs.* 0.29±0.10, p=0.01). Regarding corneal incision morphology, epithelial gapping was observed in 6.3% and 9.3% of eyes in groups I and II, respectively (p=0.64). Endothelial gapping was observed in 15.6% and 3.1% of eyes in groups I and II, respectively (p=0.09).
Conclusions: Phacoemulsification with the 21-gauge phaco tip allows a better control of corneal astigmatism than the procedure with the 20-gauge tip, maintaining an excellent morphology of the corneal incision.

● Su-No3-6

Preoperative Lenstar® (LS 900) biometry for toric IOL calculation: clinical outcome after 3 months follow-up

Gundersen, Kjell Gunnar
Privatsykehuset Haugesund, Haugesund, NORWAY

Purpose: To study accuracy and precision of toric IOL implantations based on Lenstar® (LS900) biometry.
Methods: Prospective and observational study. Fifty eyes of 31 subjects were enrolled into this study. Protocol: 1) Preoperative biometry with Lenstar® (LS 900) biometry 2) Alcon AcrySof® Calculator calculation for optimal AcrySof® IQ Toric lenses (SN6AT3 to T7) 3) Uneventful surgery 4) Clinical assessment at day 1, month 1, 3 & 6. 5) Postoperative Lenstar® biometry at month 1, 3 & 6. Main outcomes: I) Efficacy and safety UCVA BCVA 2) Predictability (MSE and DFE) 3) Surgical induced astigmatism
Results: Preoperative sphere ranged from –9 to +4.5 D. Preoperative keratometric cylinder from -3.75 to – 1.25 D and refractive cylinder from –4.5 to 0 D. After 1 month, 93.5% of eyes had a MSE within ±0.5 D, improving to 96.1% after 3 months. All eyes (100%) ended up with a postoperative cylinder less than -1 D after 3 months, with less than –0.5 D in 65.8% of eyes. UCVA was >20/40 in all eyes. 78.4% had UCVA >20/25 and 57% >20/20 after 3 months. Ninety percent of eyes had UCVA within one line of BCVA at 3 months after surgery.
Conclusions: Implanting toric IOL in eyes with significant keratometric astigmatism makes sense both for patients and surgeons, even though including toric IOLs as a standard treatment option in a busy clinical practice challenges effective patient logistics. Introducing Lenstar® (LS 900) as a single instrument for preoperative biometry turned out to be a very effective procedure. Precise and accurate information of pre-existing astigmatism was achieved in one quick setting and was used for all later calculations. The clinical performance of toric lens implantion after Lenstar® biometry was excellent. Compared to earlier studies, Lenstar® biometry performed equal to or better than manual keratometry (Schiøtz-Javal).

LINDBERG SYMPOSIUM

● Su-Ic3-1

Opening: The legacy of John G. Lindberg

Tarkkanen, Ahti
University of Helsinki, Helsinki, FINLAND

● Su-Ic3-2

Clinical findings of exfoliation syndrome: the obvious and the not so obvious

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

● Su-Ic3-3

The genetics of exfoliation syndrome: the world after *LOXL1*

Jonasson, Fridbert
University of Iceland, Reykjavik, ICELAND

● Su-Ic3-4

Prevalence of exfoliation syndrome in Estonia

Kaljurand, Kuldar; Teesalu, Pait
Eye Hospital of University of Tartu, Tartu, ESTONIA

Purpose: The aim of this study was to estimate the prevalence of exfoliation syndrome (EXS) in Estonia.
Methods: Seven hundred sixty-six residents, representing the demographical situation, from the city of Tartu, Estonia were chosen by random sampling from Estonian Population Database, and invited to participate in this study. Each patient underwent careful slit-lamp examination including applanation tonometry before and after pupil dilatation. Presence of EXS was confirmed after mydriasis as typical white-greyish fluffy material on the anterior lens surface, and on the pupillary border as well on the corneal endothelium.
Results: Altogether 424 subjects, 277 female and 147 male, participated in this study. Their median age was 70 years (70 years for females and 71 years for males). The overall prevalence of EXS among the study participants in one or both eyes was 25.5% (25.2% in males and 25.6% in females). Intraocular pressure measured before and after dilatation was significantly higher in the EXS group. Glaucoma was significantly more frequent in the EXS group than non-EXS group, 35.7% and 11.3%, respectively. Fifty percent of all glaucoma patients had exfoliation glaucoma. The prevalence of cataract was 57.0% in the EXS group compared to 39.5% in the non-EXS group (p=0.002). We did find similar prevalence of systemic diseases in both groups for both genders. There was no difference between the two groups in visual acuity.
Conclusions: In this population-based, cross-sectional study, EXS was found to be frequent in Estonia. EXS was a risk factor for glaucoma and cataract formation.

● Su-Ic3-5

Update on the systemic manifestations of exfoliation syndrome

Ritch, Robert
New York Eye and Ear Infirmary, New York, USA

● Su-Ic3-6

Managing exfoliation glaucoma

Vesti, Eija
Turku University Central Hospital, Turku, FINLAND

TREATMENT OF AMD: HOW HAVE WE COME HERE, WHAT IS NEXT?

● Su-Fi4-1

Review of the major wet-AMD studies, what do they tell us?

Immonen, Ilkka
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: From MPS via VIP and TAP to the Marina and Anchor and other 'maritime' studies and further to the 'mountain' and VIEW-studies, the large multicenter studies have formed the guidelines for our treatment practices in wet AMD. The restrictions of these studies include inclusion criteria that do not allow the whole spectrum of AMD to be evaluated, and a study duration that is shorter than the real-life need for treatment. Several questions are still left unanswered by these studies. These include: for how long do patients benefit from anti-VEGF treatment, when can the treatment be discontinued, and what is the relation between a response to treatment and the OCT outcome. These aspects of the available information will be reviewed.

● Su-Fi4-2

Avastin® vs. on-label medications, the CATT, IVAN and Lucas studies

Berg, Karina
Oslo University Hospital, NORWAY

Summary: The introduction of anti-VEGF treatment for intravitreal use has made it possible to provide effective treatment for patients diagnosed with wet AMD (age-related macular degeneration). Avastin® (bevacizumab) was used as an off-label treatment for intravitreal use before Lucentis® (ranibizumab) reached market. A remarkable difference in cost, coupled with a similarity in clinical effect, has led to a continued extensive use of Avastin® worldwide. Large randomized clinical trials were initiated in order to compare the medications with regard to efficacy and safety. CATT (USA) has published 2-year results. IVAN (UK) presented 1-year results at the ARVO meeting in Florida, May 2012. LUCAS (Norway) has just completed enrollment with one-year results expected next year.

● Su-Fi4-3

The final challenge: dry AMD

Munch, Inger Christine
Glostrup Hospital, Glostrup, DENMARK

Summary: Age-related macular degeneration is the leading cause of blindness in Denmark and in most other industrialised countries in people over the age of 65 years. The disease progresses from early AMD with small or a few medium-sized drusen through intermediate AMD with larger drusen to advanced AMD with geographic atrophy or choroidal neovascularisation. Pharmaceutical inhibitors of vascular endothelial growth factor have revolutionised the management of wet AMD and appear to be responsible for recent decreases in legal blindness attributable to AMD. Nevertheless, AMD remains the largest single cause of legal blindness in Denmark and VEGF-inhibitors do not address the fundamental disease process, which is dry AMD. Currently, no medical or surgical intervention is available for dry AMD. While AREDS-formula nutritional supplements containing antioxidants and zinc have gained some popularity, the most powerful intervention may be reduction of smoking and obesity, diet modification and increasing exercise. A large number of investigational therapies for dry AMD are in early clinical trials. Treatment strategies mostly target one of three major pathways: 1) reduction of oxidative stress by antioxidant therapy, 2) prevention of photoreceptor and RPE loss by neuroprotection, reduction of toxic by-product accumulation, and modulation of the visual cycle and 3) suppression of inflammation.

● Su-Fi4-4

User-centric design of medical applications: developing electronic application utility for follow-up of wet macular degeneration

Korhonen, Timo O
Aalto University, Espoo, FINLAND

Summary: In the wet AMD, abnormal blood vessels (choroidal neovascularisation, CNV) grow under the retina and macula resulting in bleeding and fluid leakage causing the macula to bulge or lift up. This can distort or finally destroy macular vision. The first way to treat wet AMD was to seal retinal leaking vessels with a laser. The earliest treatment was laser photocoagulation that was followed by photodynamic therapy (PDT) where a light-activated drug is injected intravenously. PDT does not cure the sickness but hinders its worsening by patching the leaking vessels. Later a protein was located in the eye which accelerates development of blood vessels called vascular endothelial growth factor (VEGF). Drugs were developed to inhibit VEGF operation. Presently three types of VEGF inhibitors are in use. All are given by intraocular injection. In this paper we consider development of a user friendly medical record to follow-up treatment of wet AMD including use of VEGF inhibitors and laser treatments. A systematic user-centered design process is described that is realised together with ICT experts and doctors. We will underline especially ways to solve challenges relating to multidisciplinary communication of all parties involved. The developed application tracks macular condition and medical treatments and can display them in a user friendly fashion. Data searches can be done for a dedicated patient or over all patient histories. Modern ICT offers also several ways to process and represent the collected data such that significant development trends are easy to recognise and follow. Information feedback structures for health care personnel and patients are also investigated that should be used to ensure continuous quality of care.

DRY EYE: FROM LAB TO CLINICAL PRACTICE

● Su-Sw4-1

Biomarkers in dry eye

Beuerman, Roger
Singapore Eye Research Institute, SINGAPORE

● Su-Sw4-2

Hyperosmolarity induced lipid changes in human corneal epithelial cells

Robciuc, Alexandra[1]; Hyötyläinen, Tuulia[2]; Jauhiainen, Matti[3]; Holopainen, Juha[1]

[1]*University of Helsinki, Helsinki, FINLAND;* [2]*VTT Technical Research Centre of Finland, Espoo, FINLAND;* [3]*National Institute for Health and Welfare and Institute for Molecular Medicine Helsinki, FINLAND*

Purpose: Hyperosmolarity (HO) imposes a remarkable stress on membranes. Cells have evolved numerous response mechanisms, especially in tissues in direct contact with the external environment. Our efforts were focused on revealing stress induced lipid changes that precede the inflammatory cytokine response.
Methods: We used non-targeted liquid chromatography-mass spectrometry analysis to detect lipid variations in human corneal epithelial cells exposed to increasing osmolarity.
Results: The lipidomic analysis showed significant and systematic changes in the lipid profile, which were highly correlated with sodium concentrations in the growth media. Ceramides and triglycerides (TGs) were the most responsive lipid classes, with gradual increases of up to 2- and 3-folds, respectively, when compared with cells incubated in normosmolar medium. The source of ceramide proved to be sphingomyelin (SM) hydrolysis and neutral sphingomyelinase 2 (NSM2) activity showed a 2-fold increase one hour after HO stress, while transcription increased 3 times. Ceramide production was not accompanied by its conversion to sphingosine-1-phosphate. TG accumulation was complemented by decreased TG-lipolysis and was shown to be highly dependent on ceramide production and calcium-independent phospholipase A2 (iPLA2) activity.
Conclusions: Both NSM2 and iPLA2 activity regulate IL-8 secretion as part of the cytokine response to the HO stress. In HCE cells diglyceride acyltransferase 1 was responsible for the TG synthesis but the enzyme activity had no effect on cytokine secretion. Hence, NSM2 and iPLA2 play key roles in the cellular response to hyperosmolar stress and their activity regulates both cytokine secretion and lipid droplet formation.

● Su-Sw4-3

Evaporation rate of artificial tear fluid

Rantamäki, Antti; Holopainen, Juha
University of Helsinki, Helsinki, FINLAND

Purpose: The function of the tear film lipid layer remains partly unknown. The main functions are believed to be the reduction of surface tension and the evaporation resistance of water from the ocular surface. Little evidence has been shown in support for the latter. Here we have studied the evaporation resistance of differing artificial lipid layer compositions in near-physiological temperatures.
Methods: The evaporation rates were measured in a thermostated Langmuir trough. The temperature of the subphase, depending on the lipid composition, varied between 34-37°C. The Langmuir device was placed into a cabinet having a constant flow of filtered and dried air. The surface pressure of the air-water interface was measured to assess the lipid layer packing density. The lipid layers composed of one to four lipid species including polar egg-yolk PC (PC), non-polar lipids cholesteryl ester (CE), triglyceride mixture (TG), and wax ester (WE). The evaporation rate was based on the evaporated mass of the subphase.
Results: The evaporation rate from clean air-water interface was 298±3 µL/min. In same conditions pure WE at the air-water interface produced an evaporation rate of 230±9 µL/min. This evaporation resistance was maintained when WE was mixed with 10% of PC (1:9 PC/WE). However, the evaporation resistance was lost with increasing proportion of PC. Lipid mixtures additionally containing CE and TGs did not resist evaporation.
Conclusions: WEs seem to be the key component in resisting tear fluid evaporation. Due to their poor spreading and viscoelastic properties, they need to be accompanied by polar lipids in order to form a stable layer at the air-water interface. Our data suggests that the evaporation resistance is highly dependent on the qualitative and quantitative composition of the layer.

● Su-Sw4-4

The preservative polyquaternium-1 increases cytoxicity and NF-κB linked inflammation in human corneal epithelial cells

Kaarniranta, Kai[1]; Paimela, Tuomas[1]; Ryhänen, Tuomas[1]; Kauppinen, Anu[1]; Marttila, Liisa[2]; Salminen, Antero[1]
[1]*University of Eastern Finland, Kuopio, FINLAND;* [2]*Kuopio University Hospital, Kuopio, FINLAND*

Purpose: The aim of this study was to compare the cytotoxic and inflammatory effects of the preservative polyquaternium-1 (PQ-1) containing Travatan® (travoprost 0.004%) and Systane® Ultra eye drops with benzalkonium chloride (BAK) alone or BAK-preserved Xalatan® (0.005% latanoprost) eye drops in HCE-2 human corneal epithelial cell culture.
Methods: HCE-2 cells were exposed to the commercial eye drops Travatan®, Systane® Ultra, Xalatan® and the preservative BAK. Cell viability was determined using colorimetric MTT (3-(4,5-dimethyldiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay and by release of lactate dehydrogenase (LDH). Cellular proliferation was analysed using a colorimetric cell based assay. Induction of apoptosis was measured using a colorimetric caspase-3 assay kit.

DNA binding of the nuclear transcription factor (NF)-κB, and productions of the proinflammatory cytokines IL-6 and IL-8 were determined using an ELISA method.
Results: Cell viability, as measured by the MTT assay, declined by up to 50% after exposure to Travatan® or Systane® Ultra solutions which contain 0.001% PQ-1. BAK at 0.02% rather than at 0.001% concentration evoked total cell death signs on HCE-2 cells. In addition, cell membrane permeability, as measured by LDH release, was elevated by 6-fold with Travatan® and by a maximum 3-fold with Systane® Ultra. Interestingly, Travatan® and Systane® Ultra activated NF-κB and elevated the secretion of inflammation markers IL-6 by 3 to 8-fold and IL-8 by 1.5 to 3.5-fold, respectively, as analysed with ELISA.
Conclusions: Eye drops containing PQ-1 evoke cytotoxicity and enhance the NF-κB driven inflammation reaction in cultured HCE-2 cells. Our results indicate that these harmful effects of ocular solutions preserved with PQ-1 should be further evaluated *in vitro* and *in vivo*.

● Su-Sw4-5

Nutrition and dry eye

Setälä, Niko
Central Hospital of Central Finland, Jyväskylä, FINLAND

Summary: Dry eye syndrome (DES) is a common condition associated with ocular inflammation and discomfort. The risk of dry eye is increased especially in women and in older age, and is affected by several external factors including contact lens wear and certain medications. Published studies suggest that intake of (n-3) fatty acids or oils, or both, rich in both γ-linolenic and linoleic acids beneficially affect DES. Deficiency of vitamin A may be a risk factor. Benefits of antioxidant supplementation have been reported. This presentation will discuss the nutritional aspects in the prevention of DES. The role of oral sea buckthorn (SB) oil, containing (n-3) and (n-6) fatty acids and antioxidants is described in detail: In parallel, double-blind, placebo-controlled study the SB oil reduced both the osmolarity of tear fluid and symptoms of DES. The results indicate that the positive effects of nutrition on DES are not solely mediated through direct effects on the tear film fatty acids. Carotenoids and tocopherols in the oil or eicosanoids produced from the fatty acids of the oil may have a positive effect on inflammation and differentiation of the Meibomian gland cells.

● Su-De4-1

Rapid Fire:
The EU Medical Devices Legislation in Diabetic Retinopathy Screening

Forsvik, Heikki; Voipio, Ville; Lamminen, Johanna
Tampere University of Technology, Tampere, FINLAND

Purpose: The objective is to find out how the EU legislation over medical devices affects the diabetic retinopathy screening by fundus imaging when there are multiple organisations participating in the process.
Methods: The study is carried out as a literature review. The main literature consists of the relevant EU directives and different official and semi-official guidelines of their application. These regulatory documents are reflected onto the workflow of fundus imaging and image interpretation in diabetic retinopathy screening to find out how the medical directive should be taken into account in this task.
Results: Technically, diabetic retinopathy screening is a three-step process: the image is acquired with a fundus camera, stored into a data storage, and finally viewed and possibly processed. In addition to these steps the image is transferred over various data transfer paths. The fundus camera system seems to be a medical device governed by the directives. The situation with software is complicated; the medical device classification of a computer program depends on the intended use of the program. So, the legal status of storage software, image processing software, and the viewing station is ambiguous. Especially the image processing part is complicated as the image processing changes the original image.
Conclusions: The EU medical devices legislation has been extended in 2010 to cover software intended for diagnostic or therapeutic purposes. The practical implications of the legislation are still partly unclear, and in the case of diabetic retinopathy screening it is difficult to define which parts of the process the directives cover. However, finding the answers to these questions will help to improve the technical quality of fundus imaging.

● Su-De4-2

Rapid Fire:
Hypoxia stimulates the synthesis and release of brain natriuretic peptide (BNP) in RPE cells

Arjamaa, Olli[1]; Kaarniranta, Kai[2]; Nikinmaa, Mikko[1]; Aaltonen, Vesa[1]
[1]*University of Turku, Turku, FINLAND;* [2]*University of Eastern Finland, Kuopio, FINLAND*

Purpose: The blood flow and the oxygen availability of retina are modulated by locally produced peptides which also can change the function of neurons. The natriuretic peptide system has been isolated and characterised in human retina and these peptides localise in RPE cells. A high concentration of natriuretic peptides has been previously measured from the vitreous of patients suffering of PDR. However, the stimulus to which the natriuretic peptide system responds in PDR has remained unknown.
Methods: We hypothesised that hypoxic conditions will increase the release of BNP from human RPE cell culture. RPE cells were exposed to hypoxia for several hours. Samples were collected at time intervals and analysed for BNP peptide and for BNP mRNA. The parallel measurement of VEGF served as a positive control.
Results: In hypoxic conditions RPE cells secreted statistically significant amounts of BNP. These findings characterise for the first time a stimulus for the natriuretic peptide system in retina and explain previous clinical results.
Conclusions: The measurement of natriuretic peptides in the vitreous may guide the treatment of the intraocular diseases in which the retina is suffering from hypoxia.

● Su-De4-3

Ang-2 upregulation correlates with increased levels of MMP-9, VEGF, EPO and TGFβ1 in diabetic eyes undergoing vitrectomy

Loukovaara, Sirpa[1]; Robciuc, Alexandra[2]; Holopainen, Juha[1]; Lehti, Kaisa[3]; Liinamaa, Johanna[4]; Keski-Oja, Jorma[5]; Immonen, Ilkka[1]
[1]*University of Helsinki/Ophthalmology, Helsinki, FINLAND;* [2]*National Institute of Health and Welfare, Institute for Molecular Medicine, Helsinki, FINLAND;* [3]*University of Helsinki, Molecular Cancer Biology, Helsinki, FINLAND;* [4]*University of Oulu, Oulu, FINLAND;* [5]*University of Helsinki, Molecular Cancer Biology, Helsinki, FINLAND*

Purpose: Angiogenesis in diabetic retinopathy (DR) is a multifactorial process reguleted by hypoxia-induced growth factors and inflammatory cytokines. In addition to the angiogenic switch, the proteolytic processing and altered synthesis of the extracellular matrix (ECM) are critical steps in this disease. This study was performed to evaluate the levels of matrix metalloproteinase 2 and 9 (MMP-2 and 9), angiopoietin-1 and 2 (Ang-1 and 2), vascular endothelial growth factor (VEGF), erythropoietin (EPO) and transforming growth factor-β1 (totalTGFβ1) in vitreous of diabetic eyes undergoing vitrectomy compared to control eyes operated due to macular hole or pucker.
Methods: Prospective consecutive controlled observational study performed in the unit of vitreoretinal surgery in Finland during the years 2006-2008. Vitreous samples were collected before the start of the conventional 3-ppp vitrectomy. Vitreous MMP-2 and 9, Ang-1 and 2, VEGF, EPO and TGFβ1 concentrations were measured from 69 patients with Type 1 or 2 diabetes and 40 controls.
Results: Comparison of eyes with DR with controls revealed that the mean vitreous concentrations of proMMP-2 ($p=0.0015$), totalMMP-2 ($p=0.0011$), proMMP-9 ($p=0.00001$), totalMMP-9 ($p<0.00001$), Ang-2 ($p<0.00001$), VEGF ($p<0.00001$), EPO ($p<0.00001$) and totalTGFβ1 ($p=0.000026$) were significantly higher in the former group. A multivariate logistic regression analysis suggested intravitreal Ang-2 concentration being the key marker of PDR ($p=0.00025$; OR=1507.9).
Conclusions: The main new finding is that the intravitreal concentrations of Ang-2 correlated significantly with MMP-9, VEGF, EPO and TGFβ1 levels in diabetic eyes undergoing vitrectomy. Thus, these factors could promote retinal angiogenesis synergistically.

● Su-De4-4

Efficacy of preoperative intravitreal bevacizumab injection prior to proliferative diabetic retinopathy surgery

Biswas, Kaushick
Kanchanjangha Eye Centre, Kanchanjangha, INDIA

Purpose: To study efficacy of preoperative intravitreal bevacizumab injection prior to proliferative diabetic retinopathy surgery.
Methods: Intravitreal bevacizumab (Avastin®) 1.25 mg was injected in patients presenting with PDR with vitreous haemorrhage. Avastin was injected 7 days or 5 days or 3 days prior to surgery in each group of 11 patients.
Results: Only 11% of patients in the 3-days group had an intraoperative bleeding compared to 14% and 21% in the 5-days and 7-days group. Postoperative vitreous haemorrhage within the first 2 weeks was also significantly less in the 3-days group, which was only 14%.
Conclusions: Maximum benefit from preoperative Avastin injection can be obtained if injected 3 days prior to surgery.

● Su-De4-5

All New Diabetics in Skåne, eye complications (ANDISec): prevalence of diabetic retinopathy among newly diagnosed diabetics in Malmö during 2008-2011

Dorkhan, Mozhgan; Groop, Leif; Gustavsson, Carin
Department of Clinical Sciences Malmö/Lund University, Malmö, SWEDEN

Purpose: Diabetic retinopathy (DR) is a leading cause of visual impairment in people of working age, but actual prevalence and incidence figures reported are varying. In Skåne county of Sweden the regional program ANDIS involving all hospitals and primary care centers is screening all newly diagnosed diabetics for individual risk factors. The prevalence and incidence of DR is assessed in ANDISec. Data on the Malmö cohort is presented.
Methods: Nine hundred sixty-seven subjects attended the Department of Ophthalmology in Malmö, 536 men (55.4%) and 431 women (44.6%), for routine fundus photography screening for DR in 2008-2011. The global retinopathy scale with 5 steps (no, mild, moderate, severe and proliferative DR) was used for grading. Median age was 58 years. 38 (3.9%) subjects had type 1, 596 (61.6%) type 2, 74 (7.7%) LADA and 12 (1.2%) secondary diabetes. Of all subjects, 594 (61.4%) originated from Sweden, while 126 (13%) originated from Eastern Europe, 101(10.4%) from the Middle East, 42 (4.3%) from the rest of the European Union and 21 (2.2%) from Africa.
Results: In this study, 829 subjects (85.7%) had no DR, 81 (8.4%) had mild, 50 (5.2%) had moderate and 7 (0.7%) had severe DR at baseline. Eleven eyes (1%) had diabetic macular edema warranting treatment. DR prevalence was higher in type 2 diabetic than in type 1 diabetic and LADA subjects (p=0.01-0.04). There were no differences between subjects coming from Scandinavia or other regions. Two hundred five subjects attended a second visit to the ophthalmic department in Malmö. Out of these, 148 (72.2%) had no DR, 22 (10.7%) had mild, 28 (13.7%) moderate, 7 (3.4%) severe and none had proliferative DR.
Conclusions: Diabetes treatment, ophthalmological intervention possibilities and population demographics in Sweden change continuously. In ANDISec we aim to present modern data on DR and to identify risk factors in order to individualize screening intervals and care.

● Su-De4-6

Fluocinolone acetonide (FAc) intravitreal implants improve visual acuity in chronic diabetic macular edema (DME) for up to 36 months

Dempe, Christian; Scholl, Stefan; Augustin, Albert
The Karlsruhe Clinic, Karlsruhe, GERMANY

Purpose: To evaluate the efficacy and safety of a FAc intravitreal implant in patients with DME and to determine a subgroup with the most favorable benefit/risk.
Methods: The phase 3 Fluocinolone Acetonide in Diabetic Macular Edema (FAME) study consisted of 2 randomised, prospective, double-masked, sham-controlled, multicenter, parallel-group trials. Patients with at least 1 prior macular laser treatment (n=956) were randomised to 0.2 µg/d FAc (n=376), 0.5 µg/d FAc (n=395) or sham control (n=185). All patients were eligible for rescue laser therapy at the discretion of the masked investigator after week 6 and could receive additional randomised study treatment after 12 months upon meeting prespecified criteria. Prespecified subgroups including patients with chronic DME (≥3 years at baseline) were analysed for efficacy and safety.
Results: Significantly more patients experienced a ≥15-letter improvement in BCVA at month 24 with 0.2 µg/d FAc (28.7%) vs control (16.2%; p=0.002). The 0.2-µg/d dose was also superior to control at month 36 (28.7% *vs.* 18.9%, p=0.018). By month 36, 71.4% and 74.4% of patients in the control and 0.2-µg/d groups, respectively, required only 1 study treatment. Mean excess centerpoint thickness decreased in all groups. In the subgroup of patients with chronic DME, 34.0% of patients receiving 0.2 µg/d FAc experienced a ≥15-letter BCVA improvement vs 13.4% of controls (p<0.001) at month 36. Cataract surgery was performed in 80.0% of phakic patients receiving 0.2 µg/d FAc and 27.3% of phakic controls by month 36. Intraocular pressure-lowering surgery was performed on 4.8% of 0.2 µg/d FAc patients and 0.5% of control patients.
Conclusion: FAc implants led to sustained improvement in BCVA (up to 36 months), with a low rate of incisional procedures required for elevated IOP. The greatest benefit/risk was seen in patients with chronic DME.

● Su-De4-7

Improving visual prognosis of the diabetic patients during past 30 years based on the data of the Finnish Register of Visual Impairment

Summanen, Paula[1]; Ojamo, Matti[2]; Rudanko, Sirkka-Liisa[2]; Laatikainen, Leila[2]; Uusitalo, Hannu[2,3]
[1]Helsinki University Central Hospital, Helsinki, FINLAND; [2]The Finnish Register of Visual Impairment, The National Institute for Health and Welfare, Helsinki, FINLAND; [3]University of Tampere, Tampere, FINLAND

Purpose: The Finnish Register of Visual Impairment is a national register regulated by the Act and Decree on National Personal Records kept under the Health Care System. Health care providers are, under this Act, responsible for forwarding to the Register information on persons with visual impairment (VI). In order to track the changes in VI due to diabetic retinopathy (DR) during the past 30 years, this Register was statistically analysed.
Methods: Statistical analysis of the visually impaired persons in the Register (n=42,626 of which 16,747 are alive) in Finland (population 5.3 million) was performed in three 10-year cohorts. Information on the age at the time of VI, the severity of the VI and the mean age at death was collected. VI is determined on the basis of WHO definition. WHO classes 3-5 are regarded as blind. VI due to proliferative (PDR) and non-proliferative (NPDR) DR was analysed separately.
Results: Data on 4,087 patients whose primary cause for VI was registered as DR were analysed. The median age at the time of notification of VI for the three cohorts was 39, 62 and 59 years in the PDR group and 71, 73 and 73 in the NPDR group, respectively. The corresponding proportion of blind persons was 42%, 22% and 15% in the PDR group and 10%, 9% and 4% in the NPDR group. The age of death in the three cohorts was 54, 72 and 68 years in PDR group and 76, 79 and 78 years in the NPDR group, respectively.
Conclusions: There has been a significant change in the profile of VI in the PDR group, characterised by increased age at the time of VI notification, the severity of VI and the prolonged life expectancy, most evident between the first and the second 10-year cohorts. The profile of VI caused by NPDR has changed only modestly.

CATARACT IN COMPLICATED SITUATIONS

● Su-No4-1

Results of combined cataract and glaucoma surgery

Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Purpose: To analyse outcomes of combined cataract and glaucoma surgery.
Methods: Surgical procedures in combined cataract and glaucoma surgery in 7 patients using the Express® implant were analysed. Patients were observed during 6 months post surgery.
Results: Mean intraocular pressure 1 month after surgery was 18 mmHg, 3 months after surgery 17 mmHg, and 6 months after surgery 15 mmHg. Two patients started to use additional topical medication 1 month after surgery.
Conclusions: Combined cataract and glaucoma surgery with the Express® implant is one option in treatment of glaucoma patients.

● Su-No4-2

Influence of stage of lens subluxation on surgery time

Vanags, Juris; Sproģis, Ēriks; Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Purpose: Subluxated lenses are characterised by weak or absent zonules. Surgery times for these cases are dependent on the stage of subluxation. Surgery time evaluation for different stages of lens subluxation was undertaken.
Methods: Twenty-two patients (22 eyes) of different stages of subluxation were operated. Stages of subluxation were defined as: stage I: lens in pupillary region, no lens margin visible, stage II: lens margin visible no more than 1/3 of pupillary region, stage III: lens margin visible no more than 1/2 of pupillary region, stage IV: lens margin more than 1/2 of pupillary region or luxated in the vitreous. Stage IV patients were excluded. Before the surgery biomicroscopy, VA and anterior part photography were performed. During operation iris or capsular hooks were used for capsular and bag support. For bag stability and tension capsular tension rings (CTR; for stage I and partially for stage II subluxation) and CTR with fixation arms (Cionni; for partially stage II and stage III) were used. Times of surgery were measured.
Results: Stage I lens subluxations were diagnosed in 9 patients, Stage II in 12 patients, and stage III in 1 patient. All patients were operated by means of phacoemulsification. CTRs were implanted in 14 patients, Cionni rings in 8 patients. Mean time for operation was 48 min (range, 25-120), mean time for stage I was 37 min (range, 25-60), for stage II 51 min (range, 40-90), and for stage III 120 min (1 case). Mean time for CTR patients was 38.5 min (range, 25-60), for Cionni ring 65 min (range, 40-120).
Conclusions: Mean surgery time differs among stages of lens subluxation, being shorter in stage I subluxation and in cases when CTR is implanted. Surgery of subluxated lenses is time consuming. To plan the surgery schedule each case requires thorough evaluation.

● Su-No4-3

Strange cataracts, corneal and vitreoretinal lesions: surprising diagnosis

Valeina, Sandra[1]; Krumina, Zita[1]; Depetiene, Svetlana[2]
[1]Children's University Hospital, Riga, LATVIA; [2]Stradini University Hospital, Riga, LATVIA

Purpose: Physical child abuse was first described in 1860. On the year 1962 the term "battered child syndrome" was introduced by Kempe. A variety of ocular injuries have been recognised as common in non-accidental injury to children, including periorbital haematoma, eyelid laceration, subconjunctival haemorrhage, subluxated or dislocated lens, cataracts, glaucoma, anterior chamber angle regression, iridodialysis, retinal dialysis or detachment, intraocular haemorrhage, optic atrophy and papilloedema (reviewed by Kaplan and Morris). This paper displays distinctive, bilateral, corneal, iris and lens injuries which were misinterpreted long term.
Methods: A clinical case study of a dynamic biomicroscopic digital photography of the cornea and anterior segment, anterior optical coherence tomography of the cornea and anterior segment, and ultrasonography.
Results: The patient had a variety of eye problems in different time periods from 1.5 until 12 years, which in context with neurological problems – hypotony, seizures, speech delay and a family history of two children who had died - gave an impression of mitochondrial pathology. Eye symptoms were as follows: corneal stromal and endothelial damage, iris damage, cataracts, secondary uveitis and secondary retinal detachment. After exclusion of multiple different potential diseases, non-accidental eye injury by stabbing the eyes with a needle was suspected. Biomicroscopic digital photography of the cornea and the anterior optical coherence tomography of the eyes showed evidence of intentional child abuse.
Conclusions: By facing uncertain functional and organic lesions of different systems of the eyes and other body parts, as one of the etiological factors physical child abuse should be excluded.

● Su-No4-4

The effect of cataract surgery on retinal thickness in diabetic retinopathy patients

Kire, Ieva; Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Purpose: To study the effect of phacoemulsification on the course of retinal thickness in diabetic patients with and without preoperative diabetic retinopathy.
Methods: This study comprised 30 patients; 10 diabetics, who had no clinically detectable diabetic retinopathy preoperatively, 5 patients with well controlled proliferative diabetic retinopathy (post LPC) and 3 patients with severe proliferative retinopathy (with macular edema) formed a study group and 12 non-diabetics were included as the control group. Phacoemulsification surgery was performed in all patients. The patients were clinically assessed with OCT Spectralis® examination preoperatively and postoperatively at 1 month.

Results: In patient group with non-proliferative diabetic retinopathy macular thickness preoperatively was comparable with postoperative values and varied from -8 µm to +10 µm. In patient group with well controlled proliferative diabetic retinopathy (post LPC) macular thickness preoperatively resembled postoperative values and varied between -12 µm and +8 µm. In patient group with severe proliferative diabetic retinopathy and macular edema preoperatively, postoperative macular thickness increased +55 µm to +953 µm. In the control group, macular thickness preoperatively was comparable with postoperative values and varied from -7 µm to +11 µm.
Conclusions: We can expect similar induced retinal thickness changes in diabetics without retinopathy and with well controlled proliferative diabetic retinopathy as in non-diabetics after uneventful cataract surgery. If the patient has severe proliferative diabetic retinopathy and macular edema, then we can expect an increase in retinal thickness.

● Su-No4-5

Late complication after cataract surgery: UGH syndrome

Kuzmiene, Loreta; Miliauskaite, Lina; Miliauskas, Arunas
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Summary: Uveitis-glaucoma-hyphaema (UGH) syndrome was more commonly recognised during the early years of intraocular lens implantation. The syndrome has been associated with anterior chamber and posterior chamber intraocular implants, as well as iris supported lenses. This syndrome results from poor intraocular lens positioning, leading to mechanical irritation of neighbouring structures including the iridocorneal angle, iris and ciliary body, and it is characterised by recurrent episodes of anterior chamber inflammation, increased intraocular pressure, microhyphaemas, and blurry vision. In many cases it can be managed by medications, but usually it requires surgical intervention. The purpose of this paper is to describe a case of UGH syndrome as a late complication after cataract surgery, which occurred 17 years after ECCE and Krasnov-Pivovarov Saturn type IOL implantation into the posterior chamber. Incorrect IOL positioning can be the cause of UGH syndrome even decades after the surgery. Elimination of the causative agent is usually necessary for the management of this condition.

● Su-No4-6

Exercise and quality of work in comparison with the Eyesi® cataract simulator

Laganovska, Guna; Zemitis, Arturs
PSKUS, Riga, LATVIA

Purpose: With the introduction of new technologies such as the Eyesi® cataract simulator, the clinic started wondering, what use it can be to the improvement of skills in both doctors and residents in training. Therefore, we used a simulator to test how well it aids the development based on training of one skill and training of overall skills, established in the training process.
Methods: There were two different training groups, each consisting of experienced physicians and residents. Afterwards the people were assigned into two groups. The first consisted of 7 people (2 certified physicians, 5 residents), and the second of 8 people (3 certified physicians, 4 residents). The first group performed only the capsulorhexis exercises and did work with phacoemulsification training program. The second group was trying to pass all the training programs and finally do the capsulorhexis and phacoemulsification exercises. At the end of the study, each group was evaluated.
Results: In spite of the performance gap between subjects in the two exercises both groups performed the training equally well. The group which did only the two exercises worked more devotedly with the phacoemulsification learning machine. In all the tasks, either pre-working group noted greater confidence in taking up these exercises. The more time was spent working with the machine; it in turn improved their hand-microscope coordination.
Conclusion: Although cataract surgery simulator is a new and as yet unexplored technology, its use opens up many different types of training possibilities, which make it useful. It reduces the breadth of the experience gap between experienced and recently graduated doctors.

PAEDIATRIC CORNEA: WHEN TO PERFORM KERATOPLASTY FOR A CHILD?

● Su-Ic4-1

PKP in children in Sweden from 1996-2011

Fagerholm, Per
University of Linköping, Linköping, SWEDEN

Summary: In the Swedish National Corneal register, founded in 1995, a total of 157 corneal grafts were registered in patients between birth and 18 years old, during the years 1996 to 2012. Of these patients, 17 were between 0 and 8 years old. The indications under 8 years varied whereas keratoconus dominated in the children grafted between the age of 8 and 18 years. Surgery was performed in 8 centers. Indications and outcome will be presented.

● Su-Ic4-2

Clinical results of 40 years of paediatric keratoplasty in a single university eye clinic

Hjortdal, Jesper; Gregersen, Maria; Nielsen, Kim; Ehlers, Niels
Århus University Hospital, Århus, DENMARK

Purpose: Paediatric keratoplasty is rarely performed due to the infrequency of severe corneal disorders in childhood and because requirements for frequent follow-up and variable clinical results. In order to evaluate the indications for paediatric keratoplasty and to assess the outcome of paediatric keratoplasty, we have reviewed all keratoplasty procedures in children performed in our clinic since 1971.
Methods: Since keratoplasty was started in the department, a register over donors and recipients has been continuously updated. During the period 1 January 1971 to 31 December 2011, more than 4,000 keratoplasties were performed. In 73 keratoplasty procedures, the recipient was 17 years of age or younger (average age 11 years, youngest age 7 months). The patient files of the paediatric patients undergoing keratoplasty were collected and all patients were invited for a follow-up visit. Preoperative variables (diagnosis, main cause for surgery), perioperative variables (type of keratoplasty, additional procedures), and postoperative variables (time of complications including graft rejection episodes, cause of graft failure, re-graft, additional surgical procedures) were recorded.
Results: The diagnosis of the patients was mainly keratoconus, injury, and stromal herpetic keratitis, and the main indication for surgery was improvement of vision. At the time of abstract submission, further data collection is under way.
Conclusions: Keratoconus was the most common diagnosis for paediatric keratoplasty and the main indication was improvement of visual acuity. Further details on graft survival and visual outcome after paediatric keratoplasty will be presented at the meeting.

● Su-Ic4-3

Paediatric kerotoplasties in Bergen 1961-2012

Høvding, Gunnar
Haukeland University Hospital, Bergen, NORWAY

Summary: The records of paediatric keratoplasties done at the University Eye Clinic in Bergen since the clinic opened in 1961 have been reviewed. The indications for surgery, techniques and results will be presented, with special emphasis on the youngest patients and the postoperative problems often encountered in this group.

● Su-Ic4-4

Indications and outcome of keratoplasties in children in Helsinki University Eye Hospital during 1968-2011

Majander, Anna; Krootila, Kari
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: Retrospective study of the patients aged 16 years or younger undergoing keratoplasty in Helsinki University Central Hospital during 1968-2011.
Methods: Patients were collected from the graft and surgery databases. The following measures were evaluated: diagnosis, preoperative status, age at the time of surgery, surgical technique, complications, follow-up time, and the final outcome. The final outcome was determined by the visual acuity, and by the graft survival and clarity.
Results: Forty-eight keratoplasties, 5 of them regrafts, were performed in 44 eyes during this time period for children aged between 4.5 months to 16 years, mean 10.3±4.6 years. Two thirds of the patients were males. Five major categories of indications were injuries, corneal dystrophies, keratoconus, congenital corneal opacity, and acquired corneal opacity due to another ocular disease. Eleven grafts (22%) developed primary failure, and three grafts (6%) rejection. Twenty-four grafts (50%) were clear or nearly clear with mild or local opacities, at the end of the follow-up ranging from 5 months to 29 years (mean, 8.4). Nine eyes (19%) obtained visual acuity ≥0.4, and 11 (22%) eyes obtained 0.1-0.3. Two eyes were lost after grafting, one having primarily severe injury and an intraocular foreign body, the other with congenital corneal opacity and congenital aphakia.
Conclusions: Poor epithelium was the most frequent finding in eyes with poor outcome. This was due to probably insufficient limbal stem cell function in eyes with chemical and combustion injuries, Steven-Johnson syndrome and aniridia, or due to dry eye. Congenital corneal opacity was another indication with poor graft survival. In contrast, grafting in keratoconus and in corneal dystrophies yielded clear grafts in 72%, and visual acuity ≥0.4 in 44% of the eyes as the final outcome.

AAO SYMPOSIUM: GLAUCOMA AND PREVENTIVE OPHTHALMOLOGY: THE GLAUCOMA PARADOX

● Mo-Fi1-1

Introduction

Maul, Eugenio J
Pontificia Universidad Catolica de Chile, Santiago, Chile

● Mo-Fi1-2

Prevalence and rate of undiagnosed glaucoma. Which is the severity of undiagnosed glaucoma?

Jonasson, Fridbert
University of Iceland, Reykjavik, ICELAND

Summary: Advanced open angle glaucoma is relatively easy to diagnose while early open angle glaucoma (OAG) may be difficult to recognise. Population studies suggest that up to 50% of persons on glaucoma treatment do not have glaucoma and up to 50% of glaucoma patients in a given population go undiagnosed. Although OAG is essentially a bilateral disease, one eye is commonly more severly affected than the other. In the Reykjavík Eye Study, those with undiagnosed glaucoma had mostly normal tension glaucoma (approx. 80%), they did not have exfoliation syndrome and were minimally to moderately affected in the worse eye and less or not affected in the better eye.

● Mo-Fi1-3

Screening for open angle glaucoma: are we ready for massive screening? or should it be focused on high risk patients?

Maul, Eugenio J
Pontificia Universidad Catolica de Chile, Santiago, Chile

Summary: Primary open angle glaucoma, an asymptomatic disease and important public health problem with severe consequences on vision specific health and quality of life, has been considered the ideal for massive screening and detection of early disease in the hope of improved clinical outcomes. However, efficiency of screening has been elusive to tests both functional and structural. Tests with high sensitivity and specificity in the clinical environment have shown a low performance in community surveys, among others, due to spectrum bias and further complicated by the low positive predictive power of tests for a disease with a low prevalence such as glaucoma. Screening for early disease detects patients with apparently no visual limitations who see no clear benefit of treatment for what they may consider a non-threatening condition. In summary, screening for early disease at the public health level is not recommended at this time and justifies redirectioning detection of glaucoma to those at higher risk such as persons with a family history for glaucoma, of latinamerican origin, of African origin or with advancing age. Also, priority should be given to detect patients at risk of severe visual loss. An education program of the community should transmit an effective message calling to attend for periodic examination of those at higher risk for glaucoma or blindness.

● Mo-Fi1-4

Angle closure glaucoma: its importance as a cause of blindness, and specific prevention strategies

Congdon, Nathan G
Wilmer Eye Institute, Baltimore, Maryland, USA

Summary: Though angle-closure glaucoma remains less common than the open-angle variety of the disease throughout most of the world, work by Foster and others has demonstrated that the risk of blindness at the time of diagnosis is 3-4 times higher for angle-closure. Thus, as a cause of blindness, angle closure remains highly significant. Potential screening strategies and current progress in research on the efficacy of these strategies will be discussed.

● Mo-Fi1-5

Impact of resource utilisation in glaucoma care

Tuulonen, Anja
Tampere University Hospitay, Tampere, Finland

● Mo-Fi1-6

Prevention of glaucoma blindness in a setting of limited resources

Congdon, Nathan G
Wilmer Eye Institute, Baltimore, Maryland, USA

Summary: Glaucoma is the world's leading cause of irreversible blindness. A number of population-based studies have demonstrated that no test or combination of tests produces a high sensitivity in detection of disease at an acceptable specificity. For this reason, population-based screening for glaucoma has not been recommended as cost-effective even in developed-world settings. However, in the developing world, especially in rural areas, there is little benefit to screening for the early stages of glaucoma, as surgery carries potentially unacceptable risks to vision, and chronic topical medication use is often not practical. Strategies aimed at detecting potentially blinding glaucoma with acceptable level of sensitivity and specificity may in fact be practical in areas of limited resources. Various possible approaches to this problem will be reviewed.

CENTRAL RETINAL VEIN OCCLUSION: POSSIBILITIES OF PREVENTING LOSS OF VISION AND THE EYE

● Mo-Sw1-1

Long-term benefit from bevacizumab for macular edema in central retinal vein occlusion: twelve-month results of a prospective study

Epstein, David; Algvere, Peep; von Wendt, Gunvor; Seregard, Stefan; Kvanta, Anders
[1]St Erik's Eye Hospital/Karolinska Institutet, Stockholm, SWEDEN

Purpose: To evaluate the efficacy of intraocular injections with bevacizumab over 12 months in patients with macular edema (ME) secondary to central retinal vein occlusion (CRVO).
Methods: A prospective study including a randomised 6 month, sham injection-controlled, double-masked clinical trial followed by a 6 month open-label extension. Participants: Sixty patients with ME secondary to CRVO. At baseline, patients were randomised 1:1 to receive intraocular injections of bevacizumab or sham injections every 6 weeks for 6 months. From month 6 onward all patients received intraocular injections of bevacizumab every 6 weeks for 6 months. The primary outcome measure was the proportion of patients gaining at least 15 letters at 12 months. Secondary outcome measures included mean change from baseline best corrected visual acuity (BCVA), foveal thickness and neovascular glaucoma.
Results: At the end of follow-up 18/30 (60.0%) patients in the bevacizumab/bevacizumab (bz/bz) group had gained ≥15 letters compared with 10/30 (33.3%) patients in the sham/bevacizumab (sh/bz) group ($p<0.05$). The BCVA improved by 16.0 letters at 12 months in the bz/bz group compared with 4.6 letters in the sh/bz group ($p<0.05$). Patients >70 years had a significantly worse outcome when receiving delayed treatment losing 1.4 letters in the sh/bz group compared with a gain of 14.0 letters in the bz/bz group ($p=0.003$). The mean decrease in central retinal thickness (CRT) was 435 µm in the bz/bz group compared with 404 µm in the sh/bz group (p=NS). No patient developed iris rubeosis during the 6 month open-label extension period. No serious non-ocular adverse events were reported.
Conclusions: Intraocular injections of bevacizumab given every 6 weeks for 12 months improve visual acuity and reduce ME significantly. Patients receiving delayed treatment have a limited visual improvement.

● Mo-Sw1-2

Intravitreal steroids: injections and implants in treatment of CRVO

Larsen, Michael
Glostrup Hospital, Glostrup, Denmark

● Mo-Sw1-3

Diagnosis and management of thrombophilia: principles of antithrombotic treatment

Lassila, Riitta
Helsinki University Central Hospital, Helsinki, FINLAND

Thrombophilia indicates increased risk of venous thromboembolism and in young individuals associates also with arterial thrombosis and severe idiopathic complications. Thrombotic tendency is usually enhanced with traditional risk factors, such as family and personal history of prior thrombosis, cigarette smoking, advanced age, diabetes, obesity, hypertension, hyperlipidemia, hormonal therapies, surgery, inflammation and cancer. Also, haematological disorders of myeloproliferative diseases (elevated platelet and erythrocyte counts), complement activation associated diseases (*e.g.* paroxysmal nocturnal hemoglobinuria) and vasculitis are all engaged with pathological thrombus formation. If these clinical features occur they indicate laboratory testing of thrombophilia. Central retinal vein occlusion is according to literature associated with the thrombophilic conditions in 20-40% of the cases. This is 2-4-fold relative to their prevalence in the general population. Thrombophilias include inherited and acquired conditions. The most frequent ones are FV Leiden and resistance to activated protein C, prothrombin mutation G20210A, phospholipid antibody syndrome and high (>200%) levels of coagulation factor FVIII. Deficiencies of antithrombin, protein C and protein S are rarer. If these conditions are confirmed by laboratory studies, they call for tailored antithrombotic therapy. Of the clinical conditions hyperglycemia, hypertension and hyperlipidemia need careful attention. Statin therapy reduces the risk of venous thrombosis overall. Acetylsalicylic acid is the drug of choice if cardiovascular risk factors are present. However, the role of anticoagulants is important in association with acute thrombosis and especially in thrombophilia. Heparins are of particular interest. Prospective outcome studies are urgently needed and call for interaction between haematologists and ophthalmologists.

● Mo-Sw1-4

How to proceed when rubeosis iridis or neovascular glaucoma is detected in a patient with central retinal vein occlusion?

Raivio, Virpi; Puska, Päivi; Summanen, Paula
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Ophthalmological examination of a patient with central retinal vein occlusion includes best corrected visual acuity, biomicroscopy, gonioscopy and dilated fundus examination. When neovascularisation (NV) of the anterior segment (iris and chamber angle), posterior segment (optic disc and retina), or both, is detected, start panretinal photocoagulation (PRP) extending up to the ora serrata. If angiogenesis remains active after full PRP, or if vitreous haemorrhage or cataract has hindered PRP, transscleral cryocoagulation to the anterior retina is recommended. One to two rows of cryo applications (Mira® Ophthalmic Cryo CR 4000, Waltham, MA, USA) are applied to the retina immediately posterior to the ora serrata avoiding under indirect ophthalmoscopic control the 3 and 9 o'clock positions. Each application is interrupted at the earliest sign of retinal blanching. In eyes with

insufficient media clarity for visual control, the applications are placed at a distance of 7-8 mm measured from the limbus with an application time of 5-7 s. In case of high intraocular pressure (IOP) under maximal tolerated medication, 810 nm diode laser cyclophotocoagulation (CPC) with the G-Probe® (Iris Medical IQ 810, Iridex Co, Mountain View, CA) is performed prior to the cryo to 180° of the pars plicata. The power used is 600 mW resulting in a total energy of 4.8 J/application, respectively, with an exposure time of 8 s per application. CPC may be repeated with little risk for hypotony if 90° of the pars plicata is left untreated. In case of aggressive anterior or posterior segment NV, adjuvant intravitreal anti-VEGF agents can be considered. The aim of the treatments is to control angiogenesis, prevent total closure of the anterior chamber, and control the IOP thus protecting the remaining visual function and cosmesis and avoiding enucleation.

REFRACTIVE SURGERY

● Mo-De1-1

Swedish experiences with the EUREQUO refractive outcome registry

Koivula, Annemari
St Erik's Eye Hospital, Stockholm, SWEDEN

Purpose: A European Registry for Quality Outcomes in Cataract & Refractive Surgery (EUREQUO) was instituted in 2008 with the purpose of improving treatment and standards of care for cataract and refractive surgery. The purpose with this presentation is to give our refractive outcome results from EUROQUO compared to the total refractive database in Europe.
Methods: Since 2010 our refractive procedures are registered in EUROQUO refractive outcome registry. Data are collected by using web-based forms preoperatively, 4 months after intraocular refractive surgery and 6 months after excimer laser treatment. Our data are compared to pan-European results since there is no other clinic participating in Sweden.
Results: By March 2012, we had registered 49% of RLE, 56% of ICL and 11% of LASEK procedures of the total refractive datasets collected across Europe in EUROQUO refractive database. In our clinic, the follow-up of RLE was completed in 95%, ICL in 100% and LASEK in 60% of cases. Outcome results will be presented.
Conclusions: The system is a valuable way to increase quality of the refractive surgery. However, several centres would be needed to register their data. This would increase the possibility for comparison and help to find out trends in refractive surgery.

● Mo-De1-2

AcrySof® Cachet phakic intraocular lens for moderate and high myopia

Krootila, Kari; Eskelin, Sebastian
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: AcrySof® Cachet is an angle supported anterior chamber phakic intraocular lens for correction of moderate and high myopia. The present study was made to investigate effectiveness and safety of AcrySof® Cachet in correction of myopia at the Helsinki University Central Hospital, Helsinki, Finland.
Methods: Prospective study of 22 eyes of 12 patients (9 female and 3 male). The age of the patients was 38±7 years. All operations were done using topical 2% lidocain jelly anaesthesia. The follow-ups were done at 1 day, 1 month, 3 months (18 eyes) and 1 year (12 eyes).
Results: Preoperative best corrected visual acuity (BCVA) was 0.74±0.2, spherical equivalent (SE) -11.6±2.9 D and endothelial cell counts 2851±205 cells/mm^2. Postoperatively uncorrected visual acuity (UCVA), and 0.5 or more was achieved by 73% and 83% of eyes at 3 months and 1 year, respectively. At 3 months 59% of eyes were within ±0.5 D of target refraction and 88% within ±1.0 D, and the corresponding figures were 42% and 83% at 1 year, respectively. The refraction was stable over the f/u period. Four eyes (22%) at 3 months and one eye (8%) at 1 year lost 1 line in BCVA. All others remained the same or improved in BCVA.

Conclusions: AcrySof® Cachet is a good alternative for corneal refractive surgery in moderate and high myopia with minimal invasive surgery requiring no iridotomies and only one wound.

● Mo-De1-3

Implantable collamer lens (ICL)/ phakic refractive lens (PRL) implantation for medical reasons

Koivula, Annemari
St. Erik's Eye Hospital, Stockholm, SWEDEN

Purpose: To evaluate surgical outcomes and adverse events associated with phakic intraocular lens (PIOL) implantation for correction of high bilateral ametropia in patients with neurobehavioral disorder who were spectacle noncompliant and unsuited to contact lens wear.
Methods: Setting was St Erik's Eye Hospital, Stockholm, Sweden. Retrospective follow-up of 6 myopic eyes with a mean spherical equivalent (SE) of -10.0 D and 6 hyperopic eyes with a mean SE of +5.15 D. The PIOL power was based on objective refraction using retinoscopy. All surgeries were performed bilaterally and under general anaesthesia.
Results: In all cases the patient improved in social interactions and in physical activities. No cataract formation or pupillary block was observed.
Conclusions: Implantation of PIOL for correction of myopia or hyperopia is a valuable way to increase quality of life in patients with neurobehavioral disorder and spectacle non-compliance.

● Mo-De1-4

How to use the VCH-1 corneal hydrometer during LASIK surgery to reduce retreatment rate and improve patient satisfaction

Patel, Sudi; Alio, Jorge
Vissum/Institute of Ophthalmology, Alicante, SPAIN

Purpose: To determine 1) the influence of patient age (years) and corneal stromal refractive index (RI) on the difference between predicted and actual post-op refractive error (δRx) following laser in situ keratomileusis (LASIK), 2) if the precision of the predicted outcome could be improved by considering patient age and refractive index.
Methods: Uneventful LASIK was performed in 133 eyes of 133 consecutive non-randomised patients. Flaps were created using a mechanical microkeratome (Moria2®). The refractive index of the stromal bed (RI) was measured using an objective Abbe refractometer (VCH-1) after lifting the flap and before photoablation. Refraction data were obtained at 1, 3 and 6 months post-op.
Results: The mean (±SD, median, range) age (x), RI and applied correction values were 33.4 (±9.49, 33, 18-65), 1.368 (±0.006, 1.369, 1.352-1.390) and -2.43D (±3.36, -2.50, -13.50 to +5.50). Reporting the key findings, 1) Multiple linear regression revealed significant correlations between δRx, RI & age at 1month (δRx = 2.315-0.021x-1.106RI, F=3.647, r=0.254, p=0.029, n=109) and 3 months (δRx = 11.820-0.023x-7.976RI, F=3.392, r=0.261, p=0.022, n=106), 2) Correlation between the actual and calculated post-op spherical refraction improved from r= -0.178 (p=0.064, n=75) to -0.418 (p<0.001) after considering the true RI at 6 months post-op.
Conclusions: The predicted outcome of LASIK can be improved by inputting the refractive index of the individual corneal stroma. Unexpected outcomes (>0.5D) of LASIK could be avoided and patient satisfaction improved by considering patient age, the RI and adjusting the applied correction accordingly.

● Mo-De1-5

Anterior segment OCT in post-LASIK ectasia patients

Ahvenainen, Joona; Krootila, Kari; Holopainen, Juha
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To assess the use of anterior segment OCT in evaluating post-LASIK ectasia patients.
Methods: Tomey® SS-1000 anterior segment OCT was used to evaluate post-LASIK ectasia patients prior to further corneal surgery. Thickness of the flap and the residual stroma were measured along horizontal and vertical meridians in a total of 10 points. Average thicknesses of flap and stroma were calculated for the center of cornea, for 1 mm diameter and 2 mm diameter. Anterior segment OCT was used to create tomographic data for preoperative evaluation and was used in follow-up after treatment for post-LASIK ectasia.
Results: Out of 10 post-LASIK ectasia patients imagined with OCT, 5 met the inclusion criteria of no corneal surgery between LASIK surgery and imaging. One patient had bilateral condition, 4 others were unilateral. For analysis of flap and residual stromal thicknesses the right eye of bilateral ectasias was selected. Time between the LASIK surgery and imaging varied from 22 to 116 months. Still, in all 5 corneas borders of the LASIK flap were detectible within both horizontal and vertical meridians. Flap thickness was smallest in the centre (145±21µm) and increased little towards 1mm diameter (171±35µm). At 2 mm diameter the flap thickness was (160±36µm).
Conclusions: Anterior segment OCT can be used as a tool to evaluate prior to treatment and follow after treatment of post-LASIK ectasia patients. Within post-LASIK ectasia patients, the corneal flap configuration appears to be similar to usual microkeratome created LASIK flap configuration, thinner at the centre and thicker towards periphery.

RETINAL DETACHMENT AND OCULAR TRAUMA

● Mo-No1-1

Primary retinal detachment surgery: results of Paul Stradina Clinical University Hospital vitreoretinal surgery for February 2011 to January 2012

Zagars, Viesturs; Laganovska, Guna; Redecka, Liga; Vanags, Juris
Riga Stradina University, Riga, LATVIA

Purpose: To report results of Paul Stradina Clinical University Hospital vitreoretinal surgery for February 2011 to January 2012 regarding primary retinal detachment surgery.
Methods: Total primary surgical procedures numbered 180 and secondary surgical procedures 20.
Results: Group 1: scleral buckling using silicon sponge fixed on Mersilene with cryotherapy with or without subretinal fluid drainage, total 74 patients. 1a: Localized scleral buckles with 360° fixating 3 mm silicon band, total 44 patients. 1b. 360° encircling sponge buckle, total 31. Group 2: Vitrectomy surgery using 20-gauge and endolaser with or without IOL exchange, total 93 patients. 2a: Vitrectomy and endolaser with air exchange, total 3 patients. 2b: Vitrectomy and endolaser with gas exchange, total 45 patients. 2c: Vitrectomy and endolaser with silicon infusion, total 45. Group 3: Combined surgery: scleral buckling with vitrectomy, total 12 patients. Group 4: Reoperated due to redetachment of retina during the study period, 20 patients. The highest reoperation rate was do to failure of gas retinopexy in 14 patients, following 360° encircling scleral buckling in 4 patients and localised scleral buckle in 2 patients.
Conclusions: Radial silicon sponge with encircling band and primary vitrectomy with gas or silicon oil tamponade were equally common and frequent surgeries for primary retinal detachment.

● Mo-No1-2

Late results of macular structure after retinal detachment surgery

Jurjane, Maruta[1]; Laganovska, Guna[2]
[1]Riga Stradins University, Riga, LATVIA; [2]P Stradins Clinical University Hospital, Riga, LATVIA

Purpose: To determine the structure of the macula after extra-ocular retinal detachment surgery.
Methods: Patients who repeatedly turned up for control visits after retinal detachment surgery with extraocular approach in P.Stradins Clinical university hospital in period from November to December 2011, were examined for visual acuity, ophthalmoscopy, and retinal optical coherence tomography. Age, sex and the number of surgeries were analysed.
Results: Nineteen patients (23 eyes) underwent extraocular retinal detachment surgery; 10 (52.6%) males and 9 (47.4%) females. Patient were 40 to 79 years old (mean, 60.8). In 19 (82.6%) eyes surgery was performed one time, in 3 (13.0%) eyes 2 times, and in 1 eye (4.4%) more than two times. Follow-up period from the surgery to last review was 1-13 years (mean, 6.8). VA after surgery CF or less in 1 eye (4.3%), <0.1 in 14 eyes (60.9%), and ≥0.1 in 8 eyes (34.8%). OCT of macula: in 11 eyes (47.8%) there was no pathology, but in 12 eyes (52.2%) changes in macula developed. Macular changes were epiretinal membrane in 7 eyes (58.4%), cystic macular oedema in 2 eyes (16.7%), thick RPE layer in 1 eye (8.3%), parafoveolar atrophic foci in 1 eye (8.3%), and lamellar rupture in 1 eye (8.3%).
Conclusions: More than half of patients develop macular changes as a late complication after surgery. Prevalent is epiretinal membrane. These changes affect visual acuity, which in most of the patients was <0.1. Macular changes more often affect patients after the age of 60 years. These changes do not correlate with the number of surgeries and period, or how long ago these surgeries were made.

● Mo-No1-3

Endophthalmitis after severe ocular injury at the Eye Clinic, Kaunas University of Health Sciences

Puodziuviene, Edita; Kusleika, Saulius
Kaunas University of Health Sciences, Kaunas, LITHUANIA

Purpose: To evaluate functional and anatomical outcomes of end-ophthalmitis after open globe injury.
Methods: Prospective study of 31 cases of posttraumatic endoph-thalmitis is presented.
Results: The incidence of posttraumatic endophthalmitis in open globe injuries was 4.8%. The incidence of endophthalmitis among intraocular foreign body injuries was 4.3%. Intraocular foreign body injury was the most common type for posttraumatic endophthalmitis development (61.3%, 19/31) out of all cases. This severe complication was not so common in patients with penetrating wounds (35.5%, 11/31) and globe ruptures (3.2%, 1/31). No cases were diagnosed in the perforating injury group. Initial poor visual acuity (VA 0-0.02) was observed in 80.6% after a 6 month follow-up, or in 56.5% of all cases. Good visual outcome (VA≥0.5) was observed in 17.4% of eyes, whereas good initial visual acuity was present only in 3.2% of all cases. Primary enucleation was performed for 19.4% (6/31) of all cases.
Conclusions: Prompt vitrectomy with systemic, intravitreal and topical antibiotics offers better prognosis, but visual and anatomical outcomes still remain unsatisfactory.

● Mo-No1-4

Fireworks related eye injuries

Radecka, Liga; Laganovska, Guna
Riga Stradins University, Riga, LATVIA

Purpose: To describe and analyse the clinical spectrum and severity of eye injuries from fireworks.
Methods: A retrospective study of medical records. We included all patiens who were admitted to P. Stradins Clinical University Hospital, Riga, with eye injuries from fireworks during the period the 1st of January, 2007 untill the 1st of January 2011.
Results: Ten patients were admitted to the hospital with serious fireworks related eye injuries. All 10 were males with a mean age of 25 years (range, 17-35). Their visual acuity was from light perception to 0.05. Sll of them had severe ocular contusion with

haemorrhages in anterior chamber, vitreous body and retina. Four patients had lens subluxation and 5 had traumatic cataracts, ocular hypertension. Three patients had orbital fracture, and four had a choroidal rupture. Pars plana vitrectomy was performed in 3 cases due to lens subluxation. The final visual acuity after one year ranged from 0.005 with eccentric fixation to 0.4. In all cases, there were severe subretinal fibrosis and atrophy of retinal pigment epithelium in the macular region.
Conclusions: Fireworks related ocular injuries are severe and often cause permanent reduction in visual acuity. Visual outcome mainly depends on the involvement of the posterior segment of the eye.

● Mo-No1-5

The characteristics of eye injury patients consulted in the ophthalmology clinic of Pauls Stradins Clinical University Hospital

Zaharova, Jekaterina; Laganovska, Guna
Pauls Stradins Clinical University Hospital, Riga, LATVIA

Purpose: To analyse the causes and risk factors for eye injury.
Methods: Retrospective analysis of 382 outpatients with eye injuries presenting at the Ophthalmology Clinic was performed from 11/2010 to 1/2011. Altogether, data of 331 patients were taken from the outpatient eye injury register and analysed for sex, age, place of residence and diagnosis. Fifty-one patients had their data collected from their medical records.
Results: Altogether 330 (86.4%) males and 52 (13.6%) females were analysed. There were 361 (94.5%) patients with a single-eye injury and 21 (5.5%) with bilateral injury. The age structure was 16-84 years. Fifty-five percent were from Riga, 5.7% from Jurmala, 14.9% from Riga's regions, and 23.8% other towns. In men, the most common diagnosis was a foreign body (56.8%), corneal erosion (25.9%), contusion (10.3%), chemical burn (2.9%), conjunctival wound (1.6%), thermal burn (1.2%), and electro-ophthalmia (1.2%). In women, corneal erosion was more common (55.3%), contusion (23.7%), burns (15.8%), and foreign body (5.3%). About 51 patients (13.4%), more thorough information was obtained. Of them, 47.1% sustained work-related injury, 41.2% household injuries, 11.8% criminal injuries. Twenty-four patients sustained work-related injury by working with circular saw without goggles: corneal foreign bodies. Three patients got upper eyelid foreign bodies as a household injury. Fifteen patients got corneal erosions, also a household injury, three patients were traumatised by a fir branch, 3 with working tools, and in case of 9 patients the traumatic agent is unknown. Three patients got conjunctival chemical burns with mascara, a household injury. Six got conjunctival and corneal burns because of exposure to tear gas due to a criminal injury.
Conclusions: Risk factors are: age, male sex, residence in the capital, not compliant with safety regulations and sanitary hygienic norms.

● Mo-No1-6

Penetrating eye injuries with intraocular foreign bodies

Radecka, Liga; Laganovska, Guna; Vanags, Juris; Freiberga, Anete
Riga Stradins University, Riga, LATVIA

Purpose: To describe and analyse penetrating eye injuries associated with intraocular retention of a foreign body (IOFB).
Methods: A retrospective study of medical records. We included patiens who were admitted to P.Stradins Clinical University Hospital, Riga with IOFBs injuries during the year 2011.
Results: There were 33 serious penetrating eye injuries in 2011. From them 14 cases (42%) were with IOFBs. All 14 were male patients with a mean age of 37 years (range, 22-60). Their visual acuity at the time of admission ranged from zero/light perception to 0.8. In all cases, primary surgery was done during the 1st day after admission to the hospital. In 13 cases, the foreign body was metallic, but in one case it was glass. In 11 cases (79%) the IOFB was removed during the primary repair using a magnet, 5 of which required a secondary intervention during the next 2 weeks – a pars plana vitrectomy due to endophthalmitis -1 case, a retinal detachment or traumatic cataract – 4 cases. In 2 cases we performed primary pars plana vitrectomy due to retinal detachment and endophthalmitis, but in one case a primary enucleation due to very severe injury. Visual acuity one week after surgery was from hand motion to 0.8.
Conclusions: The primary repair of penetrating eye injury has to be done as soon as possible. The type of primary intervention depends on severity of injury, material of foreign body and endophthalmitis.

VASCULAR ANOMALIES OF THE ORBIT AND EYE IN CHILDREN

● Mo-Ic1-1

Vascular anomalies: classification and diagnosis

Salminen, Päivi
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Most teams specialised in vascular anomalies (VA) follow the International Society for the Study of Vascular Anomalies (ISSVA) classification. It divides VAs into vascular tumors and malformations: tumors grow by endothelial hyperplasia and malformations are localized defects of vascular morphogenesis. Infantile haemangioma (IH) is the most common benign neoplasm of childhood. One third is visible at birth. Typically it appears postnatally around 2-4 weeks, grows rapidly and regresses slowly. IH has female predominance and occurs anywhere in the body. Congenital haemangiomas (CH) are fully grown at birth and are divided into rapidly involuting CH (RICH, involutes in months) and non-involuting CH (NICH, does not regress at all). They have an equal sex distribution and a similar predilection for locations: the head or limbs near a joint. GLUT1 staining is positive in IH throughout its life cycle, whereas it is negative in CH. Vascular malformations are divided according to the vasculature they affect: capillary, venous, arterial, lymphatic or combined malformations. They persist throughout life and might grow *e.g.* during puberty and pregnancy. Experienced clinicians can make the diagnosis of most VAs based on clinical history and examination. However, VA can mimic each other and the diagnosis can be difficult even in specialised centers. Diagnostic imaging includes primarily ultrasonography and Doppler, but biopsy, MRI, lymphoscintigraphy, CT and angiography are used when necessary. Inaccurate diagnosis is associated with an increased risk of erroneous treatment. "Haemangioma" is commonly misused to describe any type of VA and was used incorrectly in 71% of English language publications in Pub Med in 2009. Diagnosis and treatment of patients with VA might require combined skills and knowledge of an interdisciplinary team to provide the necessary diagnostic and therapeutic services these patients might need.

● Mo-Ic1-2

Propranolol treatment of periocular infantile haemangioma

Lindahl, Päivi; Majander, Anna; Vasara, Kristiina
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Infantile haemangiomas (IH) are the most common congenital vascular tumours in the periocular region. Despite their self-limiting course, infantile orbital and eyelid haemangiomas can cause visual impairment by occlusion of optic axis or induction of significant astigmatism. Propranolol has recently been reported to be an effective and safe treatment. Since 2008 a total of 12 children with vision-threatening periocular IH have been treated with propranolol in the Helsinki University Central Hospital. Our multidisciplinary approach, treatment protocol and experience on treatment efficacy and safety will be presented.

● Mo-Ic1-3

The incidence of ocular complications in children with facial naevus flammeus in the Helsinki University Central Hospital in 2006-2011

Kulmala, Maarit
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: Naevus flammeus *i.e.* port-wine stain is a vascular anomaly consisting of superficial and deep dilated capillaries. Naevus flammeus is permanent unlike are cutaneous haemangiomas. Naevus flammeus can be a solitary finding or part of a syndrome such as certain phakomatoses (Sturge-Weber or Klippel-Trènaunay syndrome). Phakomatoses are neurocutaneus syndromes affecting the central nervous system, eye and skin. Glaucoma is the most often seen ocular complication of naevus flammeus. Approximately 60% of glaucoma cases are diagnosed in early infancy, before the age of 2 years. In that case, the mechanism is thought to be similar to congenital glaucoma, with the primary problem in the trabecular meshwork. If the glaucoma is diagnosed later, usually in adolescence, the mechanism is postulated to be elevated venous pressure.
Methods: This analysis consists of 27 paediatric patients with facial naevus flammeus diagnosed during 2006-2011 in the Helsinki University Central Hospital.
Results: Sturge-Weber syndrome was diagnosed in 6 patients, Klippel-Trènaunay syndrome in 2 and the remaining patients had simple naevus flammeus without syndromatic involvement. Glaucoma was diagnosed in 6 of the 27 patients. Diagnosis was made in 5 of 6 cases before the age of 2 months, and in only one patient at the age 8 years. This patient's glaucoma differs from the others in that it was the only one treated solely with medication. The other 5 patients underwent surgery within 2 months after diagnosis, and 4 of 5 needed anti-glaucoma medications postoperatively. Two patients had especially severe glaucoma, and several surgeries have been performed. Trabeculectomy (with mitomycin C) was the primary operation. Additionally, one of the patients had a choroidal haemangioma treated with PDT.
Conclusions: Most cases seen by us belonged to the early-onset glaucoma category.

● Mo-Ic1-4

Anterior uveitis in a 7-year old boy after alexandrite laser treatment of naevus flammeus.

Niinimäki, Paula
University of Helsinki, Helsinki, FINLAND

Purpose: Pulsed dye laser treatment is standard treatment of naevus flammeus, *i.e.* port wine stain. Naevus flammeus is a congenital vascular anomaly of the superficial and deeper capillaries. Sometimes when it has darker pigment, pulsed dye laser is non-effective and other treatment modalities need to be used, *e.g.* alexandrite laser.
Methods: Our patient is a 7-year old boy who has naevus flammeus from the nasal spine to the left upper eye lid. Since the age of 4 years, he has had pulsed dye laser treatment for his naevus flammeus. He has also been under regular controls by an ophthalmologist in order to rule out glaucoma, a known complic-

ation of the naevus flammeus. No changes were found during these visits.
Results: Due to darkening of the naevus flammeus, alexandrite laser was used for treatment of the left upper eye lid and the nasal spine for the first time. A few hours after the laser treatment, the left eye turned red and the patient complained of pain and blurred vision. A prompt ophthalmologic examination revealed an anterior uveitis, cells in the anterior chamber and pigmented cells, as well as a malposition of the iris pigment epithelium. This happened despite the operator being an experienced specialist and shielding the eye carefully with a metallic eye cover.
Conclusions: Alexandrite laser is highly absorbed by melanin and the anterior uveitis is suspected to be a complication of the laser treatment near the eye. However, the exact mechanism of this incident is unclear, as the eye was covered and the laser beam was only pointed at the neavus flammeus area under the eye brow and at the nasal spine.

● Mo-Ic1-5

Vascular anomalies of the retina and brain from abnormal telomere maintenance (mutated *CTC1*)

Kivelä, Tero[1]; Lindahl, Päivi[2]; Polvi, Anne[3]; Immonen, Ilkka[2]; Majander, Anne[2]; Mäkitie, Outi[2]; Pihko, Helena[2]; Lehesjoki, Anna-Elina[3]; Linnankivi, Tarja[2]
[1]Helsinki University Central Hospital/Ophthalmology, Helsinki, FINLAND; [2]Helsinki University Central Hospital/Paediatrics, Helsinki, FINLAND; [3]Folkhälsan Institute of Genetics, Helsinki, FINLAND

Purpose: To describe a range of retinal vascular abnormalities in 6 Finnish patients with cerebroretinal microangiopathy with calcifications and cysts (CRMCC). These patients also frequently have an intestinal microangiopathy.
Methods: An observational case series of genotyped children imaged with RetCam®. The children (5 girls, 1 boy) were born prematurely on gestational week 30-39 and were small for date with birth weights 770-2170 g. Four are alive at age 4-22 years and two have died at age 6 and 18 years.
Results: Two presented with bilateral, asymmetric Coats' reaction at age 7 and 11 months. The more advanced eye had an exudative retinal detachment (RD). Three children had retinal angiomas without any exudation, accompanied with preretinal and vitreous bleedings, and abnormally running circular vascular loops at age 2-11 months. In two of the latter, traction RD developed. Regard-less of the phenotype, the retina peripheral to the vascular anomalies was avascular but without ROP. One patient did not have any clinically visible vascular anomalies. All had cerebral angiopathy. Patients with retinal changes shared c.1994T>G [p.Val665Gly] mutation of conserved telomere maintenance complex 1 (*CTC1*), three with c.2831delC [p.Pro944Leufs*7] and one with c.3583C>T [p.Arg1195*] and c.3425_3426delTCinsAT [p.Leu1142His]. The genotype did not predict the phenotype. The patient without retinal vascular changes had c.680C>T [p.Ala227Val] with c.2831delC [p.Pro944Leufs*7]. Other patients with this combination have had retinal changes from early childhood.
Conclusions: It is important to appreciate that CRMCC, also known as Coats plus syndrome, can present with retinal phenotypes other than Coats' reaction, and that a minority may not have any visible retinal abnormalities. The angiomas seen in 3 of 5 children are a finding which calls for neuroimaging to identify brain cysts and calcifications which characterize CRMCC.

KEYNOTE PLENARY 3: CORNEAL GRAFTING

● Mo-Fi2-1

Introduction

Krootila, Kari
Helsinki University Central Hospital, Helsinki, FINLAND

● Mo-Fi2-2

Biosynthetic corneas to substitute human donor corneas

Fagerholm, Per; Grifffith, May; Lagali, Neil
University of Linköping, Linköping, SWEDEN

Summary: The purpose of the talk is to describe the development and to evaluate biosynthetic corneas as substitutes for corneal grafts in human corneas. HRC III collagen-based biosynthetic matrices cross-linked with watersoluble carbodiimids were in a Phase I study implanted in 10 patients and followed for 3 years. A deep lamellar implant technique was used. Visual acuity was acceptable following contact lens fitting. Keratocytes invaded the cell free matrices as revealed by *in vivo* confocal microscopy. Reinnervation was as good as after penetrating keratoplasty. Tear production was always good and sensitivity (Bonnet-Cochet) improved with increasing reinnervation. Epithelialisation was satisfactory with the exception of some suture-induced defects which caused opacifications in some of the grafts. None of the operated eyes have been regrafted after 4 years. Negative events occurred during the first 2 months and seemed to be related to increased inflammation. The use of overlying sutures was not ideal. For the Phase II study a change in the suture technique, use of amniotic membrane and a more robust material (15% collagen) was suggested, and this concept has been evaluated now for 9 months, in minipigs and it seems to work. Part of the porcine 12 month results will be reported.

BIOGRAPHY

Per Fagerholm is Professor of Ophthalmology, Linköping University, Institution for Clinical and Experimental Medicine, and is also working at the Center for Integrated Regenerative Medicine (IGEN). His scientific work covers clinical, basic and experimental research. The main areas are characterisation of hereditary diseases, especially those of the cornea by using modern methods, analysis of results of exmier laser and corneal collagen cross-linking treatments, angiogenesis, and development and evaluation of biosynthetic materials to replace human corneal grafits. He graduated as a medical doctor in 1987 from the Karolinska Insitute, Stockholm, and undertook postdoctoral research in 1981-1982 in the Massachusetts Eye & Ear Infirmary, Harvard Medical School, Boston. He became a Docent in Medical Physics in 1981 and later a Docent in Ophthalmology in 1983. In 1984-2000, he worked as an ophthalmologist and a Reader in Ophthalmology in the St Erik's Eye Hospital, Stockholm. He became Asociate Professor in 1998 and a Full Professor in 1999. Since year 2000, he has been the Professor and Chair of the Department of Ophthalmology, Linköping University Hospital.

ACTA HONORARY LECTURE AND GOLD MEDAL

● Mo-Fi2-3

Introduction

Stefánsson E, Prause, Jan
Acta Ophthalmologica Foundation and Board, DENMARK

● Mo-Fi2-4

Medical treatment of glaucoma: past, present and future

Alm, Albert
University of Uppsala, SWEDEN

BIOGRAPHY

Dr. Albert Alm is Professor Emeritus of the Department of Ophthalmology, University of Uppsala, Uppsala, Sweden. Among his other achievements, in close collaboration with the Uppsala company Pharmacia Ophthalmics, later part of Novartis, he directed the clinical development of latanoprost, the first molecule in an entirely new generation of drugs for reduction of intraocular pressure, a group which now is usually the first drug of choice in most parts of the world because of the sparse side effects and high efficay of prostaglandin analogs in lowering the intraocular pressure.

DIABETES AND DIABETIC RETINOPATHY – PREVENTION OF DIABETES

● Mo-Fi3-1

Type 1 diabetes in the Nordic countries and worldwide: present state and possibilities for prevention

Knip, Mikael
University of Helsinki/Paediatrics, Helsinki, FINLAND

● Mo-Fi3-2

Lessons from the genetics of type 2 diabetes

Laakso, Markku
University of Eastern Finland, Kuopio, FINLAND

Summary: Type 2 diabetes is a strongly inherited disease. Both impaired insulin secretion and insulin resistance, two main pathophysiological mechanisms leading to type 2 diabetes, have a significant genetic component. There are currently >50 chromosomal loci that increase the risk of type 2 diabetes. For the majority of the single nucleotide polymorphisms (SNPs) the functionality has not been proven yet, and it is possible that the causal variants are not the SNPs reported but are located at varying distances from the 'real' functional variant. However, these studies demonstrate that a large number of type 2 diabetes risk SNPs are close to genes expressed highly in the pancreas, and several of these SNPs have been shown to be associated with reduced beta-cell dysfunction in non-diabetic subjects. Only a few SNPs have been associated with insulin resistance (including *PPARG2*, *IRS1*). We recently found (Kilpeläinen T, *et al.* Nat Genet, 2011) that a variant near *IRS1* was associated with less body fat and an unhealthy profile of cholesterol and glucose levels. Thus, an *IRS1* gene variant which decreases body fat mass can be harmful, given the fact that the variant lowers only the subcutaneous fat tissue but not visceral fat tissue. Our recent efforts include investigation of new genes implicated in insulin resistance by accounting for differences in BMI, and potential interaction between BMI and genetic variants. This approach has resulted in the identification of several new loci for insulin resistance. Exome and genome-wide sequencing and large scale studies aiming to investigate the interaction between gene variants and lifestyle/environmental factors will substantially increase our knowledge on gene-gene and gene-lifestyle interactions that are determining the 'epidemic' of type 2 diabetes world-wide.

● Mo-Fi3-3

Possibilities to prevent type 2 diabetes: experience from the Finnish Diabetes Prevention Study DPS

Lindström, Jaana
National Institute for Health and Welfare, Helsinki, FINLAND

Summary: The potential to prevent type 2 diabetes in high-risk individuals by lifestyle intervention has been firmly established by several randomised controlled trials, including the Finnish Diabetes Prevention Study DPS. Furthermore, lifestyle interventions lasting for a limited time period seem to have a long-lasting carry-over effect on diabetes incidence. Successful diabetes prevention trials, even when conducted within differing cultures and ethnic groups, share several common features. They have had a strong focus on increased physical activity (minimum 2.5 hours per week) and dietary modification (increased whole grain, fibre, vegetables and fruit, reduced total and saturated fat, sugar and refined grain). Weight reduction among overweight participants has been an important goal. However, reduction in diabetes incidence has been achieved also independently of weight reduction. The interventions have also utilised behaviour modification techniques such as motivational interviewing, self-monitoring, and individualised short and long-term goals. Frequent and multiple contacts and continuity of the intervention seem to be important. Furthermore, intervention focusing on several lifestyle components simultaneously appears to have the best effect. The effect of preventive lifestyle interventions on diabetic complications, most importantly cardiovascular diseases, has not yet been firmly established. Longer follow-up will be needed before we can say whether prevention or postponing diabetes also prevents cardiovascular disease morbidity and mortality.

● Mo-Fi3-4

Baltic Sea diet for optimising nutrition

Schwab, Ursula
University of Eastern Finland, Kuopio, FINLAND

Summary: There is increasing interest on dietary patterns instead of single nutrients or foods. The Mediterranean diet has been widely known for years. There are several studies reporting the beneficial effects of the Mediterranean diet on serum lipid profile, blood pressure, oxidative stress, inflammation and risk of type 2 diabetes. In some studies, it has also been shown to prevent obesity. The Baltic Sea diet or a Healthy Nordic diet was launched in order to emphasise the food items generally used in the Nordic countries, *i.e.* roots, cabbages, onions, berries, certain fruits, fish, whole grain cereals, fat free and low fat dairy products, and rapeseed oil. In the study of Adamsson *et al.* (2011) the Healthy Nordic diet was shown to be beneficial in terms of serum lipid profile. In two Finnish studies, a favourable effect of serum lipid profile, composition of serum lipids, glucose metabolism and inflammation was found (Lankinen *et al.* 2011, de Mello Laaksonen *et al.* 2011). A health promoting diet can be composed of commonly used local foods in Nordic countries. This might also increase the feasibility of adopting the health promoting diet, since local foods are familiar to people as well as usually reasonably priced. These factors are of significance in promoting a health promoting diet at the population level.

EYE BANKING IN THE NORDIC COUNTRIES

● Mo-Sw3-1

Eye banking in Denmark

Nielsen, Kim
Århus University Hospital, Århus, DENMARK

Summary: The Danish Cornea Bank has been through a longer process in writing standard operating procedures (SOP), designing new laboratories, and establishing a web of procurement centres since 2006. The initiatives will be discussed in detail.

● Mo-Sw3-2

Eye banking in Sweden

Ek, Stefan
Sahlgrenska University Hospital, Gothenburg, SWEDEN

● Mo-Sw3-3

Eye banking in Norway

Slettedal, Jon Klokk
Oslo University Hospital, Oslo, NORWAY

● Mo-Sw3-4

Current problems in eye banking in Finland

Holopainen, Juha
Helsinki Univesity Central Hospital, Helsinki, FINLAND

● Mo-Sw3-5

Regea and Eye banking in Finland

● Mo-Sw3-6

Risk factors for donor cornea contamination: retrospective analysis of 4,546 procured corneas in a single eye bank

Fricke, Otto; Linke, Stephan J.; Eddy, Mau-Thek; Richard, Gisbert; Hellwinkel, Olaf J. C.
University Medical Center Hamburg Eppendorf, GERMANY

Purpose: Microbiological contamination is a common cause for elimination of organ-cultured donor corneas. The aim of the present study was to analyse contamination rates and to identify risk factors for contamination.
Methods: Retrospectively, the contamination rates of 4,565 organ-cultured corneas and the causative species were studied. The impact of gender, age, death to explantation interval (DEI), explantation technique, cause of death and mean monthly temperature on contamination rate was analysed.
Results: The median annual contamination rate was 5.3% (range, 3-19). Most contaminations were of fungal origin (61.9%) with the highest prevalence of *Candida* species (45%). Bacterial contaminations were dominated by *Staphylococcus* spp. (12.8%). Gender, donor age and mean monthly temperature had no statistically significant influence on the contamination rate. The median DEI of contaminated corneas (44 hours) was longer than that of sterile corneas (39 hours; $p<0.001$; $n = 4,437$). Cardiopulmonary failure was associated with the highest contamination rate (13.6%) of all death causes. The switch from whole globe to *in situ* excision was followed by a temporary increase in contamination rate (from 12.5% to 19.4%). Conclusion: Although the genesis of donor cornea contamination seems to be multifactorial, resident species from physiological skin flora are main contaminants indicating that the donor corpses could be be the main source of microbiological contamination. A change in explantation technique was followed by an increase of the contamination rate.

● Mo-Sw3-7

Round table discussion

Nielsen, Kim[1]; Ek, Stefan[2]; Slettedal, Jon Klok[3];Holopainen, Juha[4]; Fricke, Otto[5]

[1]Århus University Hospital, Århus, DENMARK; [2]Sahlgrenska University Hospital, Gothenburg, SWEDEN;[3]Oslo University Hospital, Oslo, NORWAY; [4]Helsinki Univesity Central Hospital, Helsinki, FINLAND; [5]University Medical Center Hamburg Eppendorf, GERMANY

CATARACT SURGERY IN THE NORDIC COUNTRIES: INDICATIONS, REFERRAL ROUTES, PRODUCERS, ECONOMICS AND FUTURE TRENDS

● Mo-De3-1

Panel

Heger, Hilde[1]; Kjaerbo, Hadi[2]; Læssøe, Michael[3]; Leivo,Tiina[4]; Setälä, Niko[5]; Skjodt, Karen[6]; Behndig, Anders[7]
[1]Oslo University Hospital, Oslo, NORWAY; [2]Roskilde Hospital, Roskiolde, DENMARK; [4]Helsinki University Central Hospital, Helsinki, FINLAND; [5]Central Hospital of Central Finland, Jyväskylä, FINLAND; [6]Fredriksberg Eye Hospital, Fredriksberg, DENMARK; [7] Umeå University, Umeå, SWEDEN

Summary: This symposium will include country-specific presentations followed by a roundtable discussion. The data will be derived from national guidelines, various databases and questionnaires. Where national data is not available, regional or hospital-specific data will be used. Guidelines on indications for cataract surgery and referral routes will be presented. The organisation of supply, including the mix of public and private delivery, will be covered. Analysis of the economic implications of current practices, including financial structures and legal arrangements, for instance for allocating the costs of treatment to the patient and to the community, as well as surgeons' fees, will be presented. The frequency of cost-cutting and high-cost practices, i.e. simultaneous bilateral surgery, same-day surgery and premium lenses will be covered. Future trends in organising the cataract surgery supply and methods for coping with increasing demand will be discussed.

GLAUCOMA MANAGEMENT ISSUES

● Mo-No3-1

Haemodynamic parameters as predictors in glaucoma progression

Januleviciene, Ingrida[1]; Ehrlich, Rita[2]; Siesky, Brent[2]; Harris, Alon[2]
[1]Lithuanian University of Health Sciences, Kaunas, LITHUANIA; [2]Glaucoma Research and Diagnostic Center, Indiana University School of Medicine, Indianapolis, UNITED STATES

Purpose: To evaluate haemodynamic parameters as possible predictors for glaucoma progression.
Methods: An 18 month randomised, double masked cohort study including 30 treated open-angle glaucoma patients was performed. Intraocular pressure (IOP), arterial blood pressure (BP), ocular and diastolic perfusion pressures (OPP, DPP), colour Doppler imaging, pulsatile ocular blood flow analysis, scanning laser polarimetry and Humphrey® visual field evaluations were included.
Results: Glaucoma progression was identified in 13 eyes (21.7%): 4 eyes (6.7%) exhibiting structural changes, 1 eye (1.7%) with perimetric changes, and 8 (13.3%) showing both perimetric and structural changes. There were no statistically significant differences in IOP between progressing and stable glaucoma patients. Progressing glaucoma patients had higher OA RI, lower SPCA-EDV ($p<0.05$; *t*-test), and decreased pulse volume by 2.68 (SD 0.61) µl ($p=0.0001$; *t*-test) as compared to stable glaucoma patients at the 18 month visit. Progressing patients had higher nerve fiber index, lower systolic BP, OPP and DPP.
Conclusions: Structural changes consistent with glaucoma progression correlate with non-IOP dependent risk factors.

● Mo-No3-2

ANP – atrial natriuretic peptide concentration differences in aqueous humour and plasma in open-angle glaucoma patients compared with cataract patients

Baumane, Kristine[1]; Ranka, Renate[2]; Laganovska, Guna[1]
[1]Riga Stradins University, Riga, LATVIA; [2]Latvian Biomedical Research and Study Centre, Riga, LATVIA

Purpose: To determine proANP (atrial natriuretic peptide) concentration differences in aqueous humour and blood plasma in open angle glaucoma and cataract patients.
Methods: ProANP level was determined by commercially available enzyme immunoassay- ELISA method (Biomedica GmbH). Aqueous humour was collected during glaucoma filtration and cataract surgeries from 61 glaucoma and 23 cataract patients.
Results: Average blood plasma proANP level was approximately similar in both groups: respectively 7.06±0.51 nmol/l in glaucoma patients and 5.76±0.68 nmol/l in cataract patients ($p=0.17$): however, proANP level in aqueous humour was 0.520±0.119 nmol/ml in glaucoma patients and 0.099±0.035 nmol/ml in cataract patients group ($p=0.035$). Protein concentration in aqueous humour was similar in both groups, *i.e.* 7.24 and 7.27 mg/ml, respectively, what indicates that observed differences of proANP concentration between groups were not due to admixture of plasma and aqueous humour during collection of the samples.
Conclusions: ProANP concentration differences in patients with open-angle glaucoma and cataract is considered to be statistically significant. These differences could be explained either by compensatory reactions of relevant eye tissues, caused by elevated intraocular pressure when proANP in aqueous humour is produced preferentially in glaucoma patients, or by degenerative changes causing repression of production of proANP in cataract patients.

● Mo-No3-3

Ocular surface problems in current glaucoma management

Januleviciene, Ingrida
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To evaluate the influence of glaucoma diagnosis and treatment on patients' quality of life.
Methods: Tear osmolarity (TearLab® Osmolarity System, San Diego, CA), corneal fluorescein staining, tear film break-up time (BUT) and subjective discomfort by the Ocular Surface Symptoms in Glaucoma Scale, Ocular Surface Disease Index and VF-14 questionnaires were evaluated in 30 glaucoma patients.
Results: All glaucoma subjects showed higher than average tear osmolarity level, decreased BUT and increased corneal fluorescein staining. Sixty percent of patients expressed mild to moderate ocular surface complains most or part of the time. Glaucoma patients had difficulties reading small print, seeing street or store signs, and attending sports. Complains recognising people, doing handwork, writing checks and playing table games were less prominent. Watching TV and cooking were statistically significantly easier for glaucoma patients as compared to age-matched cataract and age-related macular degeneration patients.
Conclusions: It is important to rethink glaucoma management in order to improve patients' quality of life.

● Mo-No3-4

Application of Molteno and Ahmed shunts in refractory glaucoma

Siaudvytyte, Lina; Jasinskas, Vytautas
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To report the long term results of application of Molteno and Ahmed shunts in glaucomas refractory to conventional treatments.
Methods: A retrospective study about glaucoma filtering surgeries with drainage devices was performed in 19 eyes of 14 patients (mean age, 30.2 [SD 19.4] years) between 2003 and 2011. Intraocular pressure (IOP), visual acuity (VA), postoperative complications and the number of glaucoma medications were evaluated. The follow-up period was 2.5 (SD 1.9) years.
Results: After Ahmed valve (N=13) implantation, the IOP was statistically significantly reduced from baseline ($p<0.05$), accordingly 47.2% at 1 month postoperatively, 50.3% after 6 months, 56.3% after 1 year and 56% at latest follow-up visit. After Molteno shunt (N=6), the IOP was reduced 68.4% at 1 month postoperatively, 70.4% after 6 months, 64.2% after 1 year and 72.7% at the latest visit ($p<0.05$). After both surgeries, VA did not

significantly change as compared to baseline ($p>0.05$). The mean number of glaucoma medications was reduced 57.1% in the Ahmed ($p<0.05$) and 23.5% in Molteno group ($p>0.05$). However 69.2% patients in the Ahmed and 83.3% patients in the Molteno group needed antiglaucoma therapy after surgery. A review of the postoperative complications related to Ahmed shunt revealed 3 cases of hypotony, 1 conjunctival sore, 1 irregular placement of valve tube in anterior chamber, 4 cases of pain that led to removal of the shunt within 2 eyes. Accordingly after Molteno implantation: 3 hypotony (2 of them with choroidal detachment), 1 irregular placement of implant tube in anterior chamber, 1 hypertension due to a blood clot, 1 painful eye that led to enucleation.
Conclusions: Glaucoma drainage devices as alternatives to routine glaucoma surgeries are helpful tools to control IOP but postoperative complications are still common.

● Mo-No3-5

Canaloplasty as an integral part of glaucoma surgery procedure

Jasinskas, Vytautas
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To evaluate Schlemm‘s canal surgery as a diagnostic and therapeutic tool simultaneously.
Methods: Prospective examination (intraocular pressure [IOP], number of medications [nm], fluorescein canalography [FlC]) of 5 eyes with medical therapy and uncompensated open-angle glaucoma prior to and after canaloplasty. Schlemm’s canal (SchC) was filled with fluorescein before insertion of a 10-0 Prolene suture and filling with Healon® GV. Fluorescein penetration via scleral collectors was evaluated under a fluorescence filter (Zeiss, Lumera® 700).
Results: Mean age of the patients was 55.8 (SD 5.89) years. Before surgery, mean IOP was 36.4 (SD 10.3) mmHg, nm 2.2 (SD 1.3). FlC revealed SchC and a circular pericorneal (~1mm) deep scleral plexus with single Ascher‘s vein filling. Three months after surgery, mean IOP was 13.4 (SD 3.01) mmHg, and nm 1.2 (SD 1.64).
Conclusions: Schlemm‘s canalography with fluorescein is a promising procedure to improve outcomes of canaloplasty.

UPDATE ON OCULAR TUMOURS

● Mo-Ic3-1

Verteporfin photodynamic therapy of six eyes with retinal capillary haemangioma: a critical review

Eide, Nils
Oslo University Hospital HF, Oslo, NORWAY

Summary: We report the clinical aspects and criteria for different treatment modalities in a rare clinical entity to illustrate the dilemmas that confronted us in the follow-up of one of our von Hippel-Lindau (vHL) patients. An article by Sachdeva *et al.* was published in Acta Ophthalmol 2010:88:e334-e340. Their material included 6 eyes of 5 patients with retinal capillary haemangiomas (RCH; 3 juxtapapillary [JP] and 3 extrapapillary [EP]) who received 1-3 sessions of standard PDT therapy upon developing progressive, vision-threatening complications. Half of the eyes required retreatment. Our patient with bilateral affection has been followed-up since the age of 9 years in 1999. The diagnosis was confirmed with genetic testing. The clinical findings, work-up, treatment decisions and results of intervention are described. The PDT resulted in regression or stabilisation of the volume of the tumours, improvement of lipid exudation and diminished subretinal fluid. Epiretinal membrane worsened in 4 and required surgery in half of the eyes following PDT. Stabilisation or improvement of visual acuity was obtained in only 50%. The follow-up was from 8 to 32 months (median, 18) after treatment. Our experience was not good with a partial effect in the most affected eye and severe complications in the asymptomatic eye. A growing JP-RCH represents a challenge. No single modality in the treatment of this visually threatening lesion has been established. The proximity to the optic disc and major vessels poses an additional risk. All options have drawbacks and limited success. This was confirmed in this small case series with a short follow-up. Some authorities recommend postponing treatment. However, this may risk missing the optimal therapeutic window. Untreated these lesions may lead to severe, permanent visual loss. The number of cases treated using PDT is not sufficient to evaluate the efficacy of this modality.

● Mo-Ic3-2

An important paper in ocular oncology not to be missed: a critical review

Seregard, Stefan
St Erik's Eye Hospital, Stockholm, SWEDEN

● Mo-Ic3-3

An important paper in ocular oncology not to be missed: a critical review

Heegaard, Steffen
University of Copenhagen, Copenhagen, DENMARK

● Mo-Ic3-4

Germline *BAP1* mutation predisposes to uveal melanoma, lung adenocarcinoma, meningioma, and other cancers: a critical review

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Reference: Abdel-Rahman MH, Pilarski R, Cebulla CM, Massengill JB, Christopher BN, Boru G, Hovland P, Davidorf FH in J Med Genet 2011;48(12):856-9.
Purpose: To investigate the potential contribution of germline sequence alterations in the *BAP1* gene in uveal melanoma (UM) patients with possible predisposition to hereditary cancer.
Methods: A total of 53 unrelated UM patients with high risk for hereditary cancer and five additional family members of one proband were studied. Mutational screening was carried out by direct sequencing.
Results: Of 53 UM patients studied, a single patient was identified with a germline *BAP1* truncating mutation, c.799C>T (p.Q267X) which segregated in several family members and was associated with UM and other cancers. Biallelic inactivation of *BAP1* and decreased *BAP1* expression were identified in the UM, lung adenocarcinoma and meningioma tumours from three family members with this germline *BAP1* mutation.
Author Conclusions: This study reports a novel hereditary cancer syndrome caused by a germline *BAP1* mutation that predisposes patients to UM, lung carcinoma, meningioma, and possibly other cancers. The results indicate that *BAP1* is the candidate gene in only a small subset of hereditary UM, suggesting the contribution of other candidate genes.
Comment: In addition to being mutated in some families, in which UM and several other rare cancers occur with apparently low penetrance, *BAP1* mutations are now implicated in metastasis of non-familial uveal melanomas as well (Harbour *et al.* Science 2010;330:1410-3). Thus, in addition to genetic profiling and tumour chromosome studies, determining germline *BAP1* mutations can be prognostically helpful (Njauw *et al.* PLoS One. 2012; 7:e35295) even in non-familial cases.

PREVENTION OF DIABETIC RETINOPATHY – TARGETS AND TOOLS OF GOOD DIABETES CARE

● Mo-Fi4-1

Hyperglycemia as a risk factor for diabetic retinopathy

Agardh, Elisabet
Skåne University Hospital Malmö, Malmö, SWEDEN

Summary: Hyperglycemia is a major risk factor predicting development and progression of diabetic retinopathy. The Diabetes Control and Complications trial (DCCT) clearly demonstrated that intensive metabolic control significantly reduces both incidence and progression of diabetic retinopathy in type 1 diabetic subjects and later population-based studies have shown that the incidence of retinopathy, including proliferative changes, is indeed declining in type 1 diabetes. In type 2 diabetes, intensive metabolic control is much more difficult to achieve and efforts have only modest effects on microvascular complications including severe diabetic retinopathy, as shown in the United Kingdom Prospective Diabetes Study (UKPDS). Thus, in order to prevent development and progression of diabetic retinopathy, efforts to achieve good metabolic control must be combined with other systemic treatment approaches, particularly in type 2 diabetes.

● Mo-Fi4-2

Hypertension as a risk factor for diabetic retinopathy

Sjølie, Anne Katrin
Odense Unievrsity Hospital, Odense, DENMARK

● Mo-Fi4-3

Dyslipidemia and diabetic retinopathy

Summanen, Paula
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: The role of dyslipidemia in the occurrence and progression of diabetic retinopathy (DRP) has been less clear than that of poor glycemic control or elevated blood pressure. However, in some epidemiological studies dyslipidemia has been shown to be a risk factor of DRP. In patients with type 1 diabetes in the DCCT/EDIC cohort, the severity of DRP was positively associated with triglycerides (TG) and small low density lipoproteins (LDL) and negatively with high density lipoproteins (HDL). In ETDRS study elevated total serum cholesterol or LDL was associated with presence and development of retinal hard exudates which increased the risk of losing visual acuity independent of the extent of macular edema. Early preliminary studies with fibrate treatment demonstrated reduction in macular lipid exudates as do recent case reports with statin treatment. Mechanisms of statins and fenofibrate include regulation of retinal endothelial cell migration and survival. Furthermore, fenofibrate has been shown to improve endothelial function and reduce arterial stiffnes. Recently a favourable effect of lipid-lowering therapy on DRP in patients with type 2 diabetes has been seen in the FIELD and ACCORD-eye study. In the FIELD Ophthalmology Substudy, a beneficial effect of fenofibrate on a composite endpoint was seen in patients with pre-existing DRP, and in the main study the need for initial laser treatment was reduced. In the ACCORD-eye study, treatment with simvastatin and fenofibrate reduced the rate of progression of DRP compared to simvastatin alone, 6.5% vs. 10.2%. Fenofibrates mainly reduce TG and modestly increase HDL as was seen in the ACCORD study without effect on LDL. In conclusion: In addition to poor glycemic control and elevated blood pressure, dyslipidemia is an important risk factor in the development and progression of DR and needs to be taken care of effectively.

● Mo-Fi4-4

Children and adolescents with type 1 diabetes

Miettinen, Päivi
University of Helsinki/Paediatrics, Helsinki, FINLAND

● Mo-Fi4-5

Treatment of adult persons with type 1 diabetes in Finland

Ilanne-Parikka, Pirjo
Finnish Diabetes Association, Tampere, FINLAND

Summary: Persons with new type 1 diabetes are mainly treated at internal medicine outpatient clinics for the first years and then followed by a diabetes nurse and a primary care physician. A regimen based on multiple daily insulin injections is the primary treatment mode. With the aid of blood glucose measurements, the patient is taught the relationship between mealtime bolus dose and carbohydrate intake. The general target for the HbA_{1c} level is 6.5-7.5% (48-58 mmol/mol) without episodes of significant hypoglycemia, for blood pressure ≤130/85 mmHg and for LDL cholesterol ≤2.5 mmol/l. Screening for retino-, nefro- and neuropathy is usually done once a year. Type 1 diabetes is a disease which requires care on a 24/7 basis. Optimal results are based on sufficient guidance as well as continuity of care, the acceptance of the disease as a part of one's own life, reasonable self-monitoring and actions taken according to the measurements as well as shared, neutral and patient-empowering problem solving. If good glycemic control is not achieved or maintained the patient can be referred back to the local outpatient clinic and glucose sensor monitoring and insulin pump therapy is considered. The Diabetes Centre, owned by the Finnish Diabetes Association in Tampere, offers education and rehabilitation courses with psychosocial support and skills enhancement. The programs are based on therapeutic patient education (www.desg.org) experiences and the standards of the Social Insurance Institution of Finland. Local diabetes associations offer peer support and educational activities. The glucose control levels in persons with type 1 diabetes in Finland are inadequate, especially among adolescents and young adults. However, register-based studies show that the number of those with severe visual impairment, renal insufficiency or cardiovascular diseases has decreased.

● Mo-Fi4-6

Patients with type 2 diabetes

Yki-Järvinen, Hannele
Helsinki University Central Hospital/Internal medicine, Helsinki, FINLAND

● Mo-Fi4-7

Psychosocial considerations in diabetes prevention and care: do they matter?

Nuutinen, Helena
Finnish Diabetes Association, Tampere, FINLAND

Summary: It is common in the public discussion that diabetes prevention and care are justified by physical functioning, duration of life and economy. It is important for society that people stay healthy. Psychology is often asked to help motivation. The question seems to be how to motivate individuals to take care of their health. If we expand the discussion from mere health to quality of life, we are concerned with psychological and social matters in a larger, salutogenic, context. In addition to intra-psychological processes, we are also concerned with transactional processes between individuals and society. It has been reported in many studies that psychosocial factors, for example psychosocial stress and lack of sleep, have a significant role in the course and the progression of many diseases. In many cases, changing the living environment is more effective than trying to motivate individuals to change their behaviour. It has also been shown that although the complications correlate strongly with quality of life, information on risks alone may have multiple and not entirely desirable effects on behaviour. Psychological and social factors play a major role in the processes of behavioural change. It is also possible that the burgeoning debate about the responsibility of individuals for their own health may contribute the stigma of the disease and adverse affects on well-being. We should also debate the well-being and values of communities and societies. The question of motivation can also be formulated: is life worth living? What are the salutogenic, psychological and social processes which produce well-being and good quality of life? What is needed, if psychosocial needs, such as the need of individual experience to be heard and validated, and the need to be valuable in the community, are to be taken seriously in health communic-ation and in health care development?

CLINICAL MANAGEMENT OF RETINITIS PIGMENTOSA AND RELATED DISEASES

● Mo-Sw4-1

Artificial retina: clinical applications

Peters, Tobias
University of Tübingen, Tübingen, GERMANY

● Mo-Sw4-2

Artificial retina: patient's view

Terho, Miikka
FINLAND

● Mo-Sw4-3

Discussion

● Mo-Sw4-4

Genetics of retinitis pigmentosa

Anttonen, Anna-Kaisa
University of Helsinki/Genetics, Helsinki, FINLAND

● Mo-Sw4-5

Prospects for therapy for inherited retinal dystrophies

Moore, Anthony
University College London, UNITED KINGDOM

The inherited retinal dystrophies are a clinically and genetically heterogeneous group of disorders which have a final common pathway of photoreceptor cell death. For the most part these disorders are not amenable to treatment. Over the last decade there have been major advances in our understanding of these disorders; many of the causative genes have been identified and studies of gene function and the development of animal models of disease have revealed a great deal about the mechanisms of photoreceptor dysfunction and cell death. This has led to novel therapeutic approaches. Gene replacement therapy, the use of biological growth factors, dietary supplementation, and cell replacement therapies are effective in rescuing retinal function in animal models of retinal dystrophy. This has led to optimism that similar strategies may be used to treat human retinal disease. Clinicians need to identify which genetic mutations are responsible for retinal disease in their patients and to carefully study the retinal phenotype and natural history of disease to select which disorders may be suitable for trials of novel therapies. This talk will describe current management of patients with retinitis pigmentosa and discuss the different approaches to therapy that are the subject of current clinical trials

● Mo-De4-1

Rapid Fire:
Cataract, cataract surgery and keratopathy in patients with congenital aniridia

Eden, Ulla[1]; Lagali, Neil[1]; Utheim, Tor Paske[2]; Riise, Ruth[3]; Fagerholm, Per[1]

[1]University of Linköping, Linköping, SWEDEN; [2]Oslo University Hospital, Oslo, NORWAY; [3]Norwegian Association for the Blind and Partially Sighted, Oslo, NORWAY

Purpose: To establish what type of cataract is predominant in aniridia and to describe at what age cataract surgery is performed, and to assess the outcome of cataract surgery and to what extent surgical procedures influence the keratopathy.
Methods: Fifty-four eyes with aniridia in Norway were examined in 2012 and out of them 32 eyes had been examined also earlier, in 2004. Visual acuity, corneal sensitivity, tear quantity and quality (tear film break-up time, BUT) was assessed. Slit lamp examination was supplemented by digital photographs. Anterior segment optical coherence tomography, ultrasound pachymetry and *in vivo* confocal microscopy were employed in the second examin-ation.
Results: All but two of the patients had cataract or had undergone cataract surgery. Posterior and sometimes anterior polar cataract was the predominant feature, later combined with superficial posterior zonular opacifications. The youngest patient with cataract was only 2 years old. Fifty percent of the eyes had undergone intraocular surgery. Out of the 9 patients with increasing keratopathy, intraocular surgery had been performed in 4 eyes. In 3 patients, intraocular surgery had been done in just one eye, however, keratopathy did not appear to worsen due to surgery. All eyes in the group with severe keratopathy had decreased BUT and 50% in the group with mild keratopathy.had it as well. In 60% of the eyes with severe keratopathy, the corneal sensitivity was decreased compared to one of the eyes with mild keratopathy.
Conclusions: Polar lens opacifications were common and cataract developed very early in life. Factors that may predict the progression of keratopathy are decreased BUT, corneal sensitivity and ocular surface disorders. The influence of cataract and glaucoma surgery on aniridic keratopathy will be reported.

● Mo-De4-2

Nordic web based quality control of paediatric cataract surgery: a five-year follow-up

Nyström, Alf[1]; Haargaard, Birgitte[2]; Magnusson, Gunilla[1]; Rosensvärd, Annika[3]; Tornqvist, Kristina[4]; Lundström, Mats[5]
[1]University of Gothenburg, Gothenburg, SWEDEN; [2]University of Copenhagen, Copenhagen, DENMARK; [3]St Erik's Eye Hospital, Stockholm, SWEDEN; [4]University of Lund, Lund, SWEDEN; [5]Eyenet Sweden, Karlskrona, SWEDEN

Purpose: To report on a Nordic national collaboration with the aim of improving paediatric cataract care and to present preliminary results.
Methods: Data from Barnkataraktregistret (Child cataract register), a web based register of cataract operations in children is used. The participating clinics have access to their own results together with the results of the total database on-line at any time.
Results: The register has up to date (February 2012) 349 registered cataract operations of 253 children, newborn to 8 years of age. A total of 132 patients have at least one registered follow-up at 1, 2, 5 or 10 years of age, 60 had two and 5 had three follow-ups. In the presently followed-up patients the visual acuity at 2 years of age was 0.2 (decimal, median) and at 5 years 0.32 (decimal, median) Sixteen of 45 eyes (36%) had acuity 0.5 or better. Statistic information is easier to interpret when the data is complete but up to now the numbers give a hint to what to come. Among the 132 patients secondary glaucoma is recorded in 35 patients (49 eyes). Out of these half had their cataract operation before one month of age. The surgical procedures used were trabeculotomy 16 eyes, trabecelectomy+mitomycin 15 eyes, vitrectomy 2 eyes and other procedure in 19 eyes. Visual axis opacification occurred in 56 eyes of 48 patients. Different surgical procedures were used: YAG laser 7 treatments, discision 42 treatments and vitrectomy 12 treatments.
Conclusions: The web based register "Child cataract register" gives the participating clinics updated results on line. It provides state of the art numbers and will contribute to the quality of treatment in child cataract care.

● Mo-De4-3

MicroRNA and mRNA gene expression signature identifies miR-200 family as potential regulator of epithelial–mesenchymal transition in primary pterygium

Engelsvold, David Hugo[1]; Utheim, Tor[2]; Olstad, Ole K[2]; Lyberg, Torstein[2]; Gonzalez, Pedro[3]; Dartt, Darlene A.[4]; Raeder, Sten[5]
[1]Stavanger University Hospital, Stavanger, NORWAY; [2]Oslo University Hospital, Oslo, NORWAY; [3]Duke University School of Medicine, Durham, NC, UNITED STATES; [4]Harvard Medical School, Boston, MA, UNITED STATES; [5]University of Bergen/Stavanger University Hospital/ Synslaser Kirurgi, Oslo, NORWAY

Purpose: MicroRNAs (miRNAs) are small, single stranded RNAs that bind to mRNA resulting in regulation of gene expression and biological functions. The purpose of the study was to obtain a global expression profile of miRNA and mRNA in human primary pterygium.
Methods: Human primary nasal pterygium and normal superotemporal bulbar conjunctiva of the same eye were collected in the context of conventional excision of pterygium with autotransplantation of conjunctiva. Affymetrix® GeneChip miRNA 2.0 Array and Affymetrix® GeneChip Human Gene 1.0 ST Array were used to investigate the miRNA and mRNA transcriptome of the pterygia and conjunctival tissues. Quantitative-PCR was used to validate key molecules.
Results: Twenty-five miRNAs were significantly differentially expressed by at least 2 fold (FDR<10%) in human primary pterygium samples relative to normal conjunctiva. Of 25 miRNAs, 14 (56%) were upregulated, whereas 11 of 25 (44%) were downregulated. Euclidean unsupervised hierarchical clustering detected a concerted downregulation of members of a specific miR-family and miR-29. The molecular and cellular functions that were most significant to the miRNA data sets were cellular development, cellular growth

and proliferation, and cellular movement. A downregulation of several members of a specific miR-family and upregulation of matrix-related structural genes support the proposed hypothesis of epithelial mesenchymal transition (EMT) in pterygium.
Conclusions: This study represents the first integrated analysis of human primary pterygium miRNA and mRNA expression profiles. We identified several differentially expressed miRNAs that potentially target networks of genes and signaling pathways that may be involved in epithelial mesenchymal transition (EMT), fibrosis, and neovascularisation.

PIONEERS OF NORDIC OPHTHALMOLOGY

● Mo-No3-1

Allvar Gullstrand and the Nobel Prize

Alm, Albert
Uppsala University Hospital, Uppsala, SWEDEN

Summary: Allvar Gullstrand became the first professor in ophthalmology in Uppsala (1894) and the first Swede to receive the Nobel Prize in Physiology or Medicine (1911). He studied medicine in Uppsala, Vienna and Stockholm. During his studies in Vienna he became interested in the optics of the eye. This became the topic of his thesis "Bidrag till astigmatismens teori". His research straddled two disciplines, medicine and physics, and he came to spend the rest of his extremely productive life in this research area. With a strenuous working schedule he combined clinical work with teaching and research and he became one of the leading Swedish ophthalmologists at the end of the 19th century. In 1894, at the age of 32 years, he was invited to become the first professor of ophthalmology in Uppsala. He was among the initiators of the Swedish Ophthalmological Society in 1908 and became the first chairman. His research on the optics of the eye received several awards including the Graefe Memorial Medal in 1927 and the century medal in Gold from the Swedish Society of Medicine in 1909. On his 60th birthday the Society established the Gullstrand medal in gold to be given every 10 years. In 1911 he received the Nobel Prize. He was in fact offered the prize in two categories, Physics and Physiology or Medicine, but preferred the latter. His Nobel lecture had the title "How I found the mechanism of intracapsular accommodation". Two years later, in 1914 he was offered and accepted a position as research professor in physiological and physical optics at Uppsala University. He was a member of the medical section of the Swedish Academy of Science since 1905 but transferred to the Nobel Committee for physics in 1911, becoming its president in 1922. His studies in optics had many practical consequences and his name is now linked in many ways to clinical ophthalmology; the use of the term dioptres in physiological optics, the schematic eyes and several instruments such as the aspheric Gullstrand lens, the slit-lamp and the reflex-free opthalmoscope. His work is still much respected and he was inducted into the Ophthalmology Hall of Fame of The American Society of Cataract and Refractive Surgery in 2008.

● Mo-No3-2

Jannik Bjerrum (1851-1920)

Norn, Mogens
University of Copenhagen, Copenhagen, DENMARK

Summary: Bjerrum was born in Skjærbæk, South Jutland = North Schleswig. His Danish nationality and feelings are discussed. He created the first eye clinic in the Municipal Hospital, Copenhagen. Later he became co-chairman in professor Grut's eye clinic. In 1896-1910 he succeeded Grut as professor at the University of Copenhagen, Denmark. He was editor of the Nordic Ophthalmological Journal; the first president of the Copenhagen Ophthalmological Society (DOS), etc. He was at that time a modern, great scientist. He produced and discussed not only case histories, but he had a great material in his MD thesis: Concerning sense of form (distinction angle) and light (meaning contrast sense and dark vision). He wanted to distinguish between different parts of the vision sense with different old methods (Snellen, Masson disc) and methods modified or developed by himself (Snellen gray 1-5, etc) to find the anatomic and pathologic site of the lesions. He found that contrast sense diminished in optic atrophy and dark vision diminished in chorioretinitis. "Accidentally I found the arcuate paracentral scotoma in glaucoma", as he modestly described his fundamental discovery, based on his modifications of the bow perimeter: The campimetry, "enlarging" the relevant area 3-6 times. In 1889 he developed his glaucoma theories, still relevant, based on his 16 case histories. Surgery and eye tension are discussed in 1909 (great iridectomy, sclerotomy a.m. Holth, T 1-3). Bjerrum demonstrated his water filled spectacles in 1902 on a patient with keratoconus. His scientific works inspired younger colleagues (Tscherning, Rønne). Bjerrum was modest, shy, without mimic, talked with half closed eyes, but he was also lovable and honest according to C.Lottrup A. 1951.

● Mo-No3-3

Hjalmar Schiøtz: not only the father of tonometry

Odberg, Tor
Sykehuset Innlandet, Brumunddal, NORWAY

Summary: Hjalmar Schiøtz (1850-1927) published his first paper on a new tonometer in 1905. Before that time, the intraocular pressure was determined mainly by help of digital palpation. The Schiøtz tonometer soon won world wide reputation, and he continued working out new models until his death. It was used universally for about 50 years, until it was replaced by the applanation tonometer of Goldmann. In addition to a lot of other inventions (an ophthalmometer, an ophthalmoscope, a self-registering perimeter to name a few), he was the first in Europe to introduce aseptic treatment, in 1881. He was a skilled surgeon, doing refractive surgery as early as in 1882. Last, but not least, he was a true humanist, being respected by his colleagues and loved by his patients.

● Mo-No3-4

Arvo Oksala: pioneer of diagnostic ultrasound

Salminen, Lotta
University of Tampere, Tampere, FINLAND

Professor Arvo Oksala (1920-1993), Head of Ophthalmology of Turku University Hospital (1961-1985) was pioneer of diagnostic ultrasound in Finland and one of the earliest and most well-known ultrasound pioneers in the world. This career started at Eye Department of Central Hospital of Central Finland with Professor (hc) Antti Lehtinen, physicist at Valmet/Metso conglomerate. Use of high-frequency ultrasound and design of equipment for non-destructive testing of welds and castings were described by Firestone (US Patent, 1942). In 1956 Mundt and Hughes (Ultrasonics in ocular diagnosis, Am J Ophthalmol 41:488,1956) first reported the use of A-scan ultrasonography in ophthalmology,

followed by Oksala and Lehtinen (Diagnostics of detachment of the retina by means of ultrasound, Acta Ophthal 35:461,1957 and Diagnostic value of ultrasonics in ophthalmology, Ophthalmologica 134: 387,1957). Between 1958 and 1964 Oksala published a series of papers which laid important foundations for the ultrasonic diagnosis and measurement in eye diseases with the use of A- and B-Scan ultrasonography, developed by Baum and Greenwood (Arch Ophthal 60:263,1958). After pioneering investigations the use of A-scan and B-Scan ultrasonography was taken up by many workers in USA and especially Europe where Oksala and his team in Turku presented about 50 basic and clinical articles on ultrasound in ophthalmology and promoted its standardisation by founding Societas Internationalis Pro Diagnostica Ultrasonica in Ophthalmologia, and acting as its President. In addition to Finnish recognitions Arvo Oksala was honoured by DOG with Honorary membership, Theodor Axenfeld Prize, KKK Lundsgaard Medal, Anders Jahre Prize and Herman Wacker Prize. SIDUO XXIV meets in Sao Paulo, in 2012.

● Mo-No3-5

Ögonläkaren Hansen, pilot during the Finnish war 1941-1944

Norn, Mogens
University of Copenhagen, Copenhagen, DENMARK

FREE PAPERS: UVEAL MELANOMA - CLINICAL AND EXPERIMENTAL

● Mo-Ic4-1

Brachytherpay for uveal melanoma during pregnancy

Al-Jamal, Rana'a; Kivelä, Tero
University of Helsinki, Helsinki, FINLAND

Purpose: To report the outcome of brachytherapy for uveal melanoma during pregnancy.
Methods: Case reports of two Caucasian females aged 21 and 26 years, who presented during their 15th and 22nd week of gestation with choroidal melanoma, respectively. B-scan ultrasonography showed a choroidal melanoma 8.5 and 10.1 mm in height and 12.3 and 14.1 mm in largest diameter, respectively, there was no extension behind the eye. Each patient was given iodine brachytherapy 80 and 70 Gy in 138 and 266 hours, respectively.
Results: The foetal dose in the first case was estimated to be about 1-2 mSv by the National Radiation Safety Authority. In the second case the plaque was irradiating directly away from the foetus and the foetal dose was close to nil. The first patient delivered a full-term normal baby, and the other patient delivered twins. Both choroidal melanomas responded well and one year after treatment the lesion height was 5.8 mm and 4.6 mm, respectively. However, both patients later developed liver metastasis and one subsequently has died of progressive disease. No local tumor recurrence has taken place.
Conclusion: Brachytherapy of selected tumors is safe to the foetus, provided that calculation of the foetal dose is done.

● Mo-Ic4-2

Comparison of MLPA, miRNA- and mRNA expression profiling on metastatic and non-metastatic uveal melanoma and the prediction of survival

Larsen, Ann-Cathrine[1]; Holst, Line[2]; Kaczkowski, Bogumil[3]; Andersen, Morten Tolstrup[4]; Manfé, Valentina[2]; Kiilgaard, Jens Folke[4]; Kolko, Miriam[1]; Winther, Ole[3]; Prause, Jan Ulrik[1]; Gniadecki, Robert[2]; Heegaard, Steffen[1]
[1]University of Copenhagen, Copenhagen, DENMARK; [2]Bispebjerg Hospital, Copenhagen, DENMARK; [3]Biotech Research and Innovation Centre, University of Copenhagen, Copenhagen, DENMARK; [4]Copenhagen University Hospital, Copenhagen, DENMARK

Purpose: Results of multiplex ligation-dependent probe amplification (MLPA), messengerRNA (mRNA) and microRNA (miR) expression profiling on uveal melanomas (UM) was compared with survival.
Methods: Archived sections of Danish enucleated eyes from 1986-2009 were collected, and DNA and RNA were extracted.
Results: Samples were divided into 18 metastatic and 18 non-metastatic tumours and clinicopathological data of the 36 UM were investigated. MLPA showed a poor prognosis when chromosome 1p loss (p=0.025) occurred. MiR analysis showed no expression changes between the groups. MRNA expression analysis showed a significant downregulation of ceruloplasmin in metastatic UM (p=0.01) and was associated with a poor survival.
Conclusions: Downregulation of the ceruloplasmin gene, not previously described in UM, might be a specific prognosticator and a new diagnostic tool.

● Mo-Ic4-3

Transscleral optical spectroscopy of uveal melanoma

Krohn, Jørgen[1]; Svenmarker, Pontus[2]; Xu, Can T.[2]; Mørk, Sverre J.[3]; Andersson-Engels, Stefan[2]
[1]University of Bergen, Bergen, NORWAY; [2]Lund University, Lund, SWEDEN; [3]Haukeland University Hospital, Bergen, NORWAY

Purpose: To investigate the feasibility of using transscleral optical spectroscopy to analyse normal and tumour-infiltrated areas of enucleated human eyes, and to characterise the spectral properties of uveal melanomas in relation to their morphological features.
Methods: Nine consecutive eyes enucleated for uveal melanoma were examined by transscleral spectroscopy, covering the wavelength range from 400 to 1,100 nm. By using a fiberoptic probe that exerted a fixed pressure on the scleral surface, multiple measurements were alternately performed over the uveal melanoma and on normal areas of each eye. Thereafter, the eyes were processed for histological and immunohistochemical analyses. Comparisons between spectral and morphological parameters were performed by Spearman's rank correlation coefficient and unpaired *t*-test.
Results: The average reflection intensity obtained from the normal side of the eyes was higher than that from the tumours. The spectral imprint of haemoglobin was lower and that of water was considerably stronger when compared to the tumour side. The diffuse reflection spectra from the melanomas showed a strong correlation with the degree of tumour pigmentation (Spearman's rho = –0.87, $p<0.0001$), and a somewhat weaker correlation was observed between the amount of haemoglobin-related absorption and the density of intratumoural blood vessels (Spearman's rho = –0.25, p=0.023). The mean diffuse reflection intensity obtained from the spindle cell melanomas was significantly higher than that from the mixed and epithelioid cell melanomas ($p<0.0001$).
Conclusions: Although future *in vivo* studies are required, these results suggest that transscleral optical spectroscopy is a feasible method for identification and morphological assessment of human choroidal tumours.

● Mo-Ic4-4

Tumour regression after brachytherapy for uveal melanoma: lack of association with survival

Mamunur Rashid, Mohammed; Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: It has been proposed that a rapid regression of a uveal melanoma (UM) after irradiation is associated with poor survival. We provide initial survival data of a consecutive series of patients based on tumour regression after brachytherapy.
Methods: A retrospective, observational study of 191 consecutive patients with choroidal and ciliary body melanoma who had

images available at diagnosis, 3, 6 and 12 months. All were treated with iodine or ruthenium brachytherapy in 2000-2008 and imaged with Innovative Imaging I^3 ultrasound. Tumour height and cross-sectional area were measured with Olympus DP-Soft® from original digital images. Time to metastasis was analysed with the Kaplan-Meier method.

Results: At 12 months, a reduction in the height vs. area of the tumor of 0-25%, 26-50%, 50-75% and 75-100% was achieved in 35%, 47%, 17% and 2% of patients vs. 25%, 51%, 17% and 6% of patients, respectively. The 5-year survival of these four groups did not differ significantly (P=0.44 *vs*. 0.88; log rank test for trend). Correspondingly, a 25% reduction in the height *vs.* area took place within 3, 6 or 12 months or later in 30%, 24%, 12% and 35% of patients *vs.* 35%, 26%, 15% and 25% of patients. Again, the 5-year survival did not differ significantly (P=0.44 *vs.* 0.29). The same was true for a 50% reduction (P=0.66 *vs.* 0.65).

Conclusions: Neither the reduction achieved within the first 12 months nor the time in which 25% (or 50%) reduction was achieved was associated with time to metastasis in our consecutive series.

● Tu-Fi1-1

Anti-VEGF treatment results in retinal vein occlusions in the East Tallinn Central Hospital Eye Clinic

Reigo, Veiko; Rebane, Reili; Rebrov, Margarita; Paul, Anne-Liis
East Tallinn Central Hospital, Tallinn, ESTONIA

Purpose::Retinal vein occlusion (RVO) is a common retinal vascular disease. The treatment of branch retinal vein occlusion (BRVO) and central retinal vein occlusion (CRVO) has changed since intraocular anti-VEGF treatment came into clinical practice. In the East Tallinn Central Hospital Eye Clinic first intravitreal Avastin® injections were made in 2006. The main aim of this retrospective study is to evaluate the 3-year visual outcome after the treatment of RVO using anti-VEGF alone or in combination with argon laser treatment. Macular thickness changes after anti-VEGF injections were viewed. According to clinical symptoms and FAG records, ischemic component in RVO is also recorded.
Methods: Retrospective, consecutive case series of patients with diagnosis of central retinal vein occlusion (CRVO) or branch retinal vein occlusion (BRVO) who received anti-VEGF as one of the treatment options. Medical records were reviewed from 2007 and 2008. A questionnaire concerning medical history was developed, reviewed and analysed.
Results: This analysis is based on 13 patients with BRVO and 22 with CRVO who returned questionnaires.
Conclusions: A prospective clinical study to evaluate therapeutic options and their effectiveness for CRVO and BRVO treatment seem necessary in order to set up treatment guidelines in our hospital.

● Tu-Fi1-2

Results of anti-VEGF therapy in patients with central retinal vein occlusion

Morkane, Katrine; Laganovska, Guna; Elksnis, Eriks
Riga Stradins University, Riga, LATVIA

Purpose: To compare and report the efficacy of intravitreal injections with anti-VEGF therapy (with bevacizumab 0.05 ml) for patients with CRVO.
Methods: There were included 27 patients (27 eyes) with CRVO and macular edema. For 14 of them the therapy was started early, up to 2 months after CRVO (1st group), for the other 13 the therapy was dilatory, later than 2 months after CRVO (2nd group). The following examinations were performed for all patients: visual acuity test (with the ETDRS scale), measurement of central retinal thickness (done with OCT Spectralis®). During the therapy each patient received 3 pars plana intravitreal injections with bevacizumab 0.05 ml.
Results: Reduction of macular edema thickness for all 27 patients was found. In total, 20 patients gained vision (13 in 1st group, 7 in 2nd group), in 4 patients vision remained the same (all from 2nd group) and 2 patients had a decrease of vision (1 in 1st and 1 in 2nd group). The average best corrected visual acuity before treatment in group no.1 was 0.213 and in group no.2 it was 0.23. After therapy, the average best corrected visual acuity in group no.1 is 0.683 and in group no.2 it is 0.31. The average central retinal thickness in 1st group before therapy was 628.36 μm and in 2nd group 395.15 μm. After therapy, the corresponding thickness in 1st group was 204.79 μm and in 2nd group 227.15 μm. The average increase of visual acuity in 1st group was: +4.64 and in 2nd group +0.69.
Conclusions: 1) Reduction of macular edema for all patients in group no.1 was found which correlates with gained letters on ETDRS scale. In group no.2 reduction of macular edema is similar, but the improvement of visual acuity is about 7x less. 2) It is important to begin the treatment as soon as possible (up to 2 months) to preserve good visual acuity.

● Tu-Fi1-3

Reduced fluence photodynamic therapy for chronic central serous chorioretinopathy

Balciuniene, Jurate; Miniauskiene, Goda
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To evaluate safety and efficacy of reduced fluence photodynamic therapy (RFPDT) for chronic central serous chorioretinopathy (CSCR).
Methods: Seven eyes of 7 patients with symptomatic chronic CSCR underwent RFPDT using 6 mg/m² verteporfin and reduced fluence PDT (25 mJ/cm²). Fundus fluorescein angiography was done in all cases prior to PDT. Serial OCT was performed before PDT, 1month and 3 months after PDT. The best corrected visual acuity (BCVA) and OCT central macular thickness (CMT) were compared.
Results: After 3 months of RFPDT, the mean BCVA had improved. All eyes had complete resolution of SRF and the mean CMT reduced. One eye with subretinal fibrin had a delayed reabsorption of fluid after RFPDT. Pigment epithelial detachment (PED) persisted in 1 eye. There was no case with acute vision loss or any other adverse event due to PFPDT.
Conclusions: Reduced fluence PDT appears to be a safe and effective treatment option for patients with chronic CSCR.

● Tu-Fi1-4

Simultaneous and separate time bilateral intravitreal injection for patients with neovascular AMD and poor baseline visual acuity

Cimbalas, Andrius; Svalbonaite, Egle; Levinaite, Gintare; Asoklis, Rimvydas
Vilnius University Faculty of Medicine, Vilnius, LITHUANIA

Purpose: To evaluate side effects in patients undergoing bilateral intravitreal bevacizumab injections simultaneously or separately and to compare the differences of visual acuity.
Methods: A retrospective case-control study. Patients with neovascular AMD who received bevacizumab injections in both eyes simultaneously were compared with patients who received injections in both eyes separately. The occurrence of adverse events was compared between simultaneous and separate time groups. The outcomes of treatment of worse-seeing eyes were compared. The

best corrected visual acuity (BCVA) was measured with a Snellen chart.
Results: Fifty-four patients (90 eyes) with mean age 79 years (range, 54-92). Thirty-six patients (72 eyes) received bilateral simultaneous bevacizumab injections and they were divided into 2 groups: study group 1 for the eye with the higher BCVA at baseline and study group 2 for the contralateral eye with the lower BCVA. The control group included 18 patients (18 eyes) who received bilateral bevacizumab injections separately into the eyes with the lower BCVA at baseline. The follow-up was 19.1 months (range, 6-44). The patients of 1-2 study groups received an average of 2.5 injections per patient (range,1-10), control group 3.2 injections (range, 1-6). Initial BCVA of the worse seeing eye in the separate treatment group was 0.11 vs. final 0.11 and initial BCVA in the simultaneous treatment group was 0.12 vs. final 0.14. Results are not statistically significant. A single case of endophthalmitis was seen in the separate time bilateral group. No systemic side effects were detected.
Conclusions: Bilateral, same-day injections of intravitreal bevacizumab did not increase the rate of adverse events. Simultaneous bevacizumab injections help to save visual acuity of worse-seeing eye.

● Tu-Fi1-5

Photodynamic therapy for symptomatic circumscribed choroidal haemangioma

Balciuniene, Jurate
Lithuanian University of Health Sciences, Kaunas, LITHUANIA

Purpose: To describe the clinical findings in 4 eyes with symptomatic circumscribed choroidal haemangioma before and after treatment with photodynamic therapy.
Methods: Four patients with posteriorly located choroidal haemangiomas accompanied by serous detachments of the sensory retina extending to the macula were treated with photodynamic therapy using a diode laser (689 nm) and the sensitising dye verteporfin. The tumors were studied with ultrasonography, OCT, fluorescein and indocyanine green angiography before PDT and at follow-up visit.
Results: Following photodynamic therapy, the serous retinal detachments resolved, and the choroidal haemangiomas regressed within 3 to 6 months. The visual acuity improved. The tumours have not recurred at follow-up visits from 3 to 18 months.
Conclusions: Photodynamic therapy seems to be effective in the management of symptomatic circumscribed choroidal haemangioma. Following photodynamic therapy, the choroidal haemangiomas in 4 eyes were no longer measurable by ultrasonography, and the accompanying serous detachments resolved with improvement in the central visual acuity.

● Tu-Fi1-6

Rare hereditary chorioretinal dystrophies: choroideremia and gyrate atrophy - case reports

Tein, Pille
Univwersity of Tartu, Tartu,ESTONIA

● Tu-De1-1

Deep sclerectomy and trabeculotomy for the treatment of congenital glaucoma of a premature ROP child

Tein, Pille; Eerme, Katrin; Geršman, Maire
Tallinn Central Hospital, Eye Clinic, Tallinn, ESTONIA

Purpose: To evaluate the outcome, efficacy and safety of deep sclerectomy with trabeculotomy and ROP treatment for a premature child with congenital glaucoma.
Methods: The patient was born on the 24th gestational week, birth weight 620 g. On the 40th gestational week stage 3 ROP with Plus disease was diagnosed in both eyes and argon laser treatment was performed. Then the difference of disc cupping was also noticed. The intraocular pressure (IOP) measured preoperatively under anaesthesia was 36 mmHg RE, 31 mmHg LE with topical medications. Deep sclerectomy with trabeculotomy on the left eye (age 9 months) and on the right eye (age 10 months) was performed. Pre- and postoperative IOP, mean corneal diameter and corneal status, axial length, gonioscopy and imaging of optic disc with RetCam® were performed.
Results: During a follow-up period of 18 months after operations the IOP remained normal. Postoperative IOP was 12 mmHg, RE, 17 mmHg, LE, and 18 months later (at the age of 2 years 3 months) it was 12 mmHg, RE, 11 mmHg, LE. Stabilisation of disc cupping and ocular axial length has been achieved without additional glaucoma surgery or medications. ROP regressed with good anatomical outcome and cycloplegic refraction is hypermetropic. Hyphaema was an early postoperative complication which resorbed in a week.
Conclusions: For the patient with congenital glaucoma, the combination of deep sclerectomy with trabeculotomy is effective and provides reasonable control of IOP with few postoperative complications and need for additional medications. It is sufficiently predictable to consider such a surgical treatment in primary congenital glaucoma as the first choice.

● Tu-De1-2

The effect of deep sclerectomy in primary open-angle and exfoliation glaucoma

Suominen, Sakari[1]; Harju, Mika[1]; Vesti, Eija[2]
[1]University of Helsinki, Helsinki, FINLAND; [2]University of Turku, Turku, FINLAND

Purpose: To study the effect of deep sclerectomy (DS) in primary open-angle glaucoma (POAG) and exfoliation glaucoma (ExG).
Methods: We retrospectively analysed intraocular pressure (IOP) lowering effect of DS in 177 consecutive eyes. Eyes were operated between 2004 and 2006. Eyes were divided into two groups according to glaucoma subtype: POAG (96 eyes) and ExG (81 eyes). Patient follow-up was at least one year.
Results: In POAG group the mean (±SD) IOP decreased from 22.5±5.2 mmHg preoperatively to 15.6±5.7 mmHg .Qualified success was reached in 92% of eyes. Preoperatively all eyes had topical glaucoma medication and postoperatively 55% were without medication. YAG laser goniopuncture (GP) was performed in 64% of eyes. In ExG group IOP decreased from 25.6±6.4 mmHg preoperatively to 16.1±7.5 mmHg post-operatively. Qualified success was reached in 85% of eyes. Preoperatively 99% of eyes had topical medication and postoperatively 50% were without medication. GP was performed in 83% of eyes. Decrease in IOP was statistically significant in both groups ($p<0.001$). Postoperative IOP was not statistically different between POAG and ExG groups.
Conclusions: Deep sclerectomy is effective in reducing IOP in POAG and ExG subgroups. GP was more commonly performed in ExG eyes.

● Tu-De1-3

Positive pixel count algorithm application in ophthalmic pathology of glaucoma surgery

Paulavièienë, Rasa[1]; Asoklis, Rimvydas[1,2]; Petroska, Donatas[3]; Pajausis, Mykolas[1]; Levinaite, Gintare[2]
[1]Vilnius University Hospital Santariskiu Klinikos/Center of Eye Diseases, Vilnius, LITHUANIA; [2]Vilnius University/Faculty of Medicine, Vilnius, LITHUANIA; [3]State Center of Pathology; Vilnius University, Faculty of Medicine, Vilnius, LITHUANIA;

Purpose: To analyse trabecular pigmentation after sinus trabeculectomy using semithin slices, optical microscopy and morphometry, and to compare findings with clinical data.
Methods: Ten glaucoma patients (10 eyes), 6 males and 4 females, underwent conventional sinustrabeculectomy. The trabecular specimens were prepared as semithin slices (stained with toluidin blue) and analysed using optical microscopy. Semithin virtual slides were made by ScanScope® and analysed with the Aperio® positive pixel count algorithm. Demographic, clinical and morphometric data were analysed using SAS® Enterprise Guide 4.2 statistic software.
Results: Correlation analyses of quantitative morphometric and clinical variables were not statistically significant: the probability coefficient between the nnumber of positive pigment pixels and pachymetry, highest IOP, patient age and glaucoma duration yielded $p>0.05$.
Conclusions: There was no statistic significance between morphometric and clinical variables. 2. Further studies of the trabecular tissue, using larger cohort are required

● Tu-De1-4

Reduction of ocular blood flow in exfoliation glaucoma after intraocular pressure reduction

Kurvinen, Leena[1]; Kytö, Janne P[1]; Summanen, Paula[1]; Vesti, Eija[2]; Harju, Mika[1]
[1]Helsinki University Central Hospital, FINLAND; [2]University of Turku, Turku, FINLAND

Purpose: To study blood flow after intraocular pressure (IOP) reduction in exfoliation glaucoma (ExG) and normal tension glaucoma (NTG).
Methods: Included were 17 patients with ExG and 20 with NTG to whom IOP reduction of 25% or more was achieved by deep

sclerectomy. Study eyes were examined before and three months after the operation. Retinal vessel diameters were evaluated with Retinal Vessel Analyzer® (RVA). Central retinal artery equivalent (CRAE), central retinal vein equivalent, and the artery/vein ratio (AVR) were calculated. Blood flow in the peripapillary retina was measured with Heidelberg Retina Flowmeter® (HRF). Automatic full field perfusion image analysis was used and mean flow, peak systolic flow (SF), and minimum diastolic flow were measured, and pulsation index calculated.
Results: After surgery, IOP decreased in ExG from 26 mmHg (range, 20-33) to 13 mmHg (range 5-17; p<0.001), and in NTG from 15 mmHg (range, 12-20) to 9 mmHg (range, 3-13; p<0.001). The preoperative CRAE (median, 169 µm, range, 135-216) and AVR (median, 0.92, range, 0.77-1.02) were higher in ExG as compared with NTG (median, 151 µm, range 112-184, p=0.008 and median, 0.83, range 0.64-0.95, p=0.043). After IOP reduction, both CRAE (median, 163 µm, range 115-198, p=0.028) and AVR (median, 0.89, range 0.68-0.99, p=0.035) were reduced in ExG. In NTG there were no changes in RVA parameters after IOP reduction. There were no statistically significant differences in HRF parameters between ExG and NTG eyes before or after IOP reduction. In ExG, SF was significantly reduced after the operation (274 arbitrary units [AU], range, 180-509 vs. 230 AU, range, 168-291; respectively; p=0.011). In NTG there was no change in flow.
Conclusions: We found larger retinal vessel diameter and higher ocular blood flow in ExG compared with NTG. Retinal vessel diameter and blood flow decreased in ExG after IOP reduction.

● Tu-De1-5

Red laser cyclophotocoagulation in the treatment of secondary glaucoma in eyes with uveal melanoma

Piirtola, Anni; Puska, Päivi; Kivelä, Tero
University of Helsinki, Helsinki, FINLAND

Purpose: To evaluate retrospectively the usefulness of the red diode and krypton laser for transscleral contact cyclophotocoagulation in the treatment of secondary glaucoma in eyes with uveal melanoma.
Methods: Twenty-seven eyes of 27 patients (mean age, 66 years; range, 33-85) with a uveal melanoma and secondary glaucoma were treated with transscleral 670 nm diode (40 treatments) and 647 nm krypton (5 treatments) laser cyclophotocoagulation (CPC); twenty-five eyes had been or were subsequently treated with brachytherapy. The energy used was 420 mW at the tip of the probe (exposure time, 10 s). Seventeen eyes were treated once, six eyes twice, and four eyes 3-6 times. The aim was to preserve vision in twenty-one patients and to relieve pain in six patients. Fourteen patients (52%) died during follow-up.
Results: With one or more CPCs, the intraocular pressure (IOP) decreased from a median of 40 mmHg at baseline to 28 mmHg at 12 months (n=18) and 23 mmHg at 24 months (n=10). Hypotony developed in six eyes. Before CPC, 12 eyes had a best corrected visual acuity of 20/400 or better. The number was 5 of 18 eyes at 12 months and 4 of 10 eyes at 24 months. Four eyes were removed. At the latest visit, 15 of 23 eyes had no light perception but were preserved. All patients whose aim of treatment was to relieve pain achieved pain relief.
Conclusions: Cyclophotocoagulation lowered IOP and the number of medications needed for secondary glaucoma in eyes with uveal melanoma, providing also pain relief.

● Tu-De1-6

The loss of retinal nerve fiber layer (RNFL) thickness in glaucoma patients treated with brimonidine

Smedowski, Adrian[1,2]; Wylegala, Edward[2]
[1]District Railway Hospital in Katowice, Katowice, POLAND[2]Medical University of Silesia, Silesia, POLAND

Purpose: To evaluate the loss of retinal nerve fiber layer thickness in glaucoma patients treated with brimonidine.
Methods: A retrospective analysis to assess the OCT-Glaucoma Module results (TD-OCT Stratus®; Carl Zeiss Meditec, Dublin, CA) from 1,800 patients from outpatients Ophthalmology Department, Railway Hospital Katowice, Poland, through the years 2006-2011. Among 1,800 patients, 130 who revealed a significant nerve fiber layer thickness reduction were selected. In 98 patients, the results of available visual fields, IOP and data of applied pharmacotherapy were completed. Fifty-three patients were treated with brimonidine, 45 patients with other drugs.
Results: In the analysed group of patients with diagnosis of glaucoma, 53 had properly controlled IOP without increase above 21 mmHg throughout the observation period, in 45 cases incidents of elevated IOP above 21 mmHg were observed. The results showed no statistically significant relationship between the use of brimonidine and loss of retinal nerve fiber layer thickness, the annual percentage rate of this loss, as well as the changes in visual field progression and the average values of IOP. In the study group, the incidence of IOP greater than 21 mmHg significantly affected RNFL thickness (p<0.03). Therefore, the group of patients without elevated IOP were analysed. In this group, we found a statistically significant relationship between the use of brimonidine preparations and the loss of RNFL thickness (p<0.01) and an annual rate of RNFL loss (p=0.01).
Conclusions: In the overall study group, brimonidine showed no protective effect on nerve fiber layer, in contrast to patients with well controlled IOP. The potentially neuroprotective effect of brimonidine depends on the occurrence of IOP.

FREE PAPERS: RETINA – DIAGNOSTICS AND THERAPEUTICS

● Tu-No1-1

Rapid Fire:
Bilateral progressive Coats-type exudative retinopathy in Usher syndrome type IIIA from c.528T>G *CLRN1* mutation

Täll, Martin; Lindahl, Päivi; Immonen, Ilkka; Loukovaara, Sirpa; Sankila, Eeva-Marja; Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To describe bilateral, progressive, Coats-type exudative retinopathy in a boy with Usher syndrome type IIIA.
Methods: An interventional case report.
Results: A 9-year-old boy with a hearing loss of medium severity diagnosed 4 years earlier developed nyctalopia and began to stumble on objects, leading to suspicion of a visual field defect. His visual acuity (VA) was 20/50, OD, and 20/40, OS, with no significant refractive error. The RPE was distinctly flecked. Dilated retinal vessels with a confluent accumulation of subretinal lipid were seen temporally, OD, and two similar smaller lesions without obvious vascular pathology, OS. The vitreous showed diffuse cellular or lipoid deposits. The ERG was close to isoelectric and Goldman visual fields were constricted. Two months later, vision had deteriorated 20/100 and the exudates extended to the macula, OD. He underwent bilateral peripheral cryocoagulation. Genetic testing uncovered the predominant Finnish c.528T>G homozygous mutation of *CLRN1* (clarin-1). During the next 8 months, exudates slowly regressed with vision improvement to 20/40, OD, but the telangiectasias appeared leading to extension of exudation to the macular area, OS. Twenty months after a second cryocoagulation, OS, the exudates remain regressed bilaterally with 20/40 vision, OD, and 20/30 vision, OS.
Conclusions: Bilateral Coats-like exudative retinopathy is well known from diverse types of retinitis pigmentosa and from Usher syndrome type II unrelated to *CLRN1*. It has not so far been reported in Usher syndrome type IIIA, which predominates in Finland, raising the possibility that other genes might contribute to the Coats phenotype.

● Tu-No1-2

Rapid Fire:
About risk factors for recurrence of retinal detachment after removal of silicone oil in the treatment of proliferative vitreo-retinopathy

Romanovska, Oksana; Sosnovsky, Sergey
Kirov Military Medical Academy, Kirov, RUSSIAN FEDERATION

Purpose: In most cases, vitreoretinal surgery for retinal detachment complicated by severe proliferative vitreoretinopathy ends with introduction of substitutes of the vitreous body. Of these, silicone oli holds the first place regarding tolerance and the physical and chemical properties. If it left in the vitreous chamber for more than 3 months, especially in the presence of complications, the question arises regarding its removal. However, in 30% of cases after removal of silicone oil, recurrent retinal detachment occurs. Our purpose was to study and analyse the risk factors that can lead to a recurrence of retinal detachment in face of silicone tamponade of the vitreous chamber.
Methods: Forty patients with silicone tamponade, operated for retinal detachment of different origins, complicated by proliferative vitreoterinopathy were observed. Preoperative and postoperative examination of all patients included visual acuity, perimetry, electroretinography (flicker ERG, 30 Hz), determiming threshold electrical sensitivity (ech), determination of lability, tonometry, biomicroscopic ophthalmoscopy. Times of observation were from 3 months to 3 years.
Results: The analysis of the major risk factors leading to relapse: these included fixed star folds on the surface of the retina, the presence of large holes in the retina with raised edges and a high risk of relapse, the presence of residual retinal detachment under silicone tamponade, the presence of progressive epiretinal fibrosis at the surface of the retina, and incomplete silicone tamponade in the vitreous chamber.
Conclusions: In patients with silicone tamponade of the vitreous chamber in treatment of severe retinal detachment, In the presence of risk factors the risk of recurrence is 70-85% after removal of silicone oil.

● Tu-No1-3

Diagnostic effectiveness of spectral domain optical coherence tomography

Saari, Jukka
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To evaluate the diagnostic effectiveness of spectral domain optical coherence tomography (OCT).
Methods: I did a prospective study on all 809 consecutive patients and 1,453 eyes examined in the Central Hospital of Central Finland with posterior segment OCT during one year (from December 18, 2008 to December 17, 2009). The images were taken with Spectralis® HRA+ OCT device (Heidelberg, Germany) in ART mode with 30 images averaged, and analysed by using the Heidelberg Eye Explorer® 1.6.2.0 software.
Results: The most frequent diagnostic groups were retinal diseases in 577 patients (71.3%), disorders of the optic nerve in 87 (10.8%), examination of the eyes and vision in 79 (9.8%), functional visual problems in 25 (3.1%), ocular tumours in 11 (1.4%) and vitreous disorders in 11 patients (1.4%). The most frequent retinal diseases were age-related macular degeneration in 231 patients and diabetic retinopathy in 113. OCT examination confirmed the diagnosis in 378 patients (46.7% of all examined cases), eliminated the suspected diagnosis in 254 (31.4%), changed the clinical diagnosis in 69 (8.5%), or provided no useful data in 108 patients (13.3%). In the group of retinal diseases, OCT examination confirmed the diagnosis in 335 patients (58.1%), eliminated the suspected diagnosis in 142 (24.6%), changed it in 60 (10.4%), and provided no useful data only in 40 patients (6.9%).
Conclusions: The results show that spectral domain OCT has a great effect on diagnostic quality confirming, eliminating or changing the diagnosis in 86% of all examined patients and in 93% of the patients with different retinal diseases.

● Tu-No1-4

Ultra-widefield autofluorescence imaging in the evaluation of RPE stress pattern and recovery after scleral buckling surgery for retinal detachment

Salvanos, Panagiotis; Navaratnam, Jesintha; Bragadottir, Ragnheidur; Moe, Morten C.
Oslo University Hospital, Oslo, NORWAY

Purpose: To investigate the stress pattern and functional recovery of the retinal pigment epithelium (RPE) after scleral buckling surgery.
Methods: A total of 45 eyes from 44 patients presenting with rhegmatogenous retinal detachment at Oslo University Hospital, from June to November 2011, were included in this study. Ultra-widefield autofluorescence pictures with Optomap® P200Tx were taken pre- and postoperatively. All patients were operated with 2.5mm cerclage, segmental buckle of 6-9 mm, cryopexy and the choice of drainage and air/gas endotamponade.
Results: The mean age of the patients was 58±12 years and male/female ratio was 28/17. Ratio macula on/off detachment was 19/26 and mean follow-up was 58±21 days. The effect of cryopexy could be monitored: in cases where little cryopexy was required, we could observe hyperfluorescence in the treated area (11%). In cases with more cryopexy, there was a central hypofluorescent area with a hyperfluorescent halo (51%), while in cases with extensive cryopexy, the extensive disruption of the RPE led to hypo-fluorescence (36%). Tightening of the cerclage was found to cause peripheral hyperfluorescent radial streaks (47%), whereas tightening of the segmental buckle induced distinct areas of hyperfluorescence in 58% of eyes. Residual subretinal fluid could be observed until complete resorption. Changes in central autofluorescence even months after successful reattachment were obvious in 96% after macula-off surgery, with 27% showing hyper-hypo-autofluorescent streaks. These changes were positively correlated with OCT pathology.
Conclusions: Ultra-widefield autofluorescence is a useful adjuvant tool for evaluating scleral buckling surgery outcome and RPE function.

● Tu-No1-5

Short-term postoperative non-supine positioning versus strict face-down positioning in macular hole surgery

Forsaa, Vegard[1]; Raeder, Sten[1]; Laila, Hashemi[1]; Krohn, Joergen[2]
[1]Stavanger University Hospital, Stavanger, NORWAY; [2]Haukeland University Hospital, Bergen, NORWAY

Purpose: To compare the efficacy of short-term non-supine positioning (NSP) and strict face-down positioning (FDP) in the repair of macular hole (MH).
Methods: We retrospectively reviewed all MH repairs over a 27-month period (2008-2010). Inclusion criteria were idiopathic full thickness stage 2-4 MH treated by a single surgeon with 23-gauge pars plana vitrectomy, internal limiting membrane peeling and gas tamponade, followed by postoperative short-term NSP (for 5 days) or strict FDP (for 3−4 days). NSP was achieved by fastening a tennis ball to the back of the nightshirt. Outcome measures were anatomical MH closure verified by optical coherence tomography and postoperative visual acuity.
Results: A total of 67 eyes (64 patients) met the inclusion criteria. The median follow-up period was 6.6 months (range, 4.7-19.8). The closure rates following a single operation were 30/33 (90.9%) in the FDP group, and 31/34 (91.2%) in the NSP group, respectively (p=0.97). The FDP group improved 2.9 ETDRS lines, and 23 eyes (69.7%) gained two or more ETDRS lines. The NSP group improved 2.7 ETDRS lines (p=1.00), and 25 eyes (73.5%) gained two or more ETDRS lines. The closure rates in the MH subgroup with diameters larger than 400 μm were 20/23 (87.0%) and 15/17 (88.2%) in the FDP group and the NSP group, respectively (p=0.96).
Conclusions: The study indicates that short-term NSP is equally effective as strict FDP in the repair of MH. Contrary to previous reports, even large MH did not seem to benefit from FDP.

● Tu-No1-6

Preventive circular buckling in open globe injury, II zone

Boiko, Ernest[1]; Shishkin, Michael[2]; Dolgikh, Victor[3]; Kulikov, Alexey[1]
[1]Medical Military Academy, RUSSIAN FEDERATION; [2]National Medical Surgical Center, RUSSIAN FEDERATION; [3]Center of Emergency and Radiation Medicine, RUSSIAN FEDERATION

Purpose: Posttraumatic proliferative vitreoretinopathy is one of the main causes of the significant decrease or loss of visual function in open globe injury (OGI) outcome. This is most important for OGI of II zone because of the development of abnormal changes in ciliary body and basal vitreous, since this results (in 71.8% of cases) in the most aggressive type of proliferative process - anterior proliferative vitreoretinopathy (APVR). How-ever, the issue of the advisability of circular buckling (CB) for prevention of APVR in OGI remains controversial. Our purpose was to study CB effect on long-term anatomical and functional outcomes in OGI, II zone treatment.
Methods: A prospective study of 102 patients with OGI located in II zone. The first group included 57 patients who underwent preventive CB in the course of vitreoretinal surgery (VRS). There was no preventive CB made in the second group of patients (45 patients). The efficacy of CB introduction in the VRS procedure was estimated according to a number of anatomical criteria and functional outcomes. The follow-up period ranged from 6 to 12 months.
Results: During postoperative period the first and second groups of patients were characterised, respectively, by: development of retinal detachment in 37.3% and 52.9% of cases; retinal detachment recurrence in 23.1% and 35.0%; partial eyeball atrophy in 5.3% and 9.5%; the necessity of reintervention in 22.8% and 44.4%. Visual acuity better than 0.05 was found in 90.3% of the patients of the first group and in 63.6% of the patients of the second group. Visual acuity less than 0.05 was detected in 9.7% of the patients of the first group and 36.4% of the patients of the second group.
Conclusions: The introduction of CP in the VRS procedure allows to decrease the rate of APVR development and to improve anatomical and functional outcomes of surgery in OGI, II zone.

● Tu-No1-7

Intravitreal bevasicumab injection in cases of Eales' disease with vitreous haemorrhage

Biswas, Kaushick
Sah Eye Hospital, Uttar Pradesh, India

Purpose: To evaluate intravitreal bevasicumab injection in cases of Eales' disease with vitreous haemorrhage.
Methods: Twelve patients with Eales' disease, aged between 20 and 30 years, all male, presenting with vitreous haemorrhage, were treated with a single dose of 1.25 mg of intravitreal bevacizumab (Avastin®) injection in the affected eye. Patients were selected according to study inclusion criteria like fresh haemorrhage, no tractional detachment, etc.
Results: Nine out of 12 patients had a dramatic resolution of vitreous haemorrhage within 3 weeks of injection with a return of visual acuity to 6/12 or better. Details of each case will be presented.
Conclusions: Intravitreal Avastin® injection was found to be a very usuful and promising treatment modality in cases of Eales' disease with vitreous haemorrhage.

EOPS 50 YEARS: CLINICAL OPHTHALMIC PATHOLOGY

● Tu-Ic1-1

Follicular lymphoma of the lacrimal gland

Heegaard, Steffen
University of Copenhagen, Copenhagen, DENMARK

Summary: A 65-year-old woman had noticed a "bag under the right eye" one year before developing a distinct swelling around this eye with proptosis and displacement downward and medially. The clinical and pathological features will be described and discussed.

● Tu-Ic1-2

Bilateral cloudy corneae in a boy with systemic disease

Seregard, Stefan
St Erik's Eye Hospital, Stockholm, SWEDEN

Summary: A 10-year-old Iraqi boy with consanquineous parents was referred for bilaterally hazy corneae, coarse facial features, restriction of joint movements and cardiomyopathy. The clinical and pathological features will be described and discussed.

● Tu-Ic1-3

A stretchy cornea: staphyloma of the anterior segment

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: A newly born babay was found to have one eye smaller and the other larger than average, the latter eye developing a bulging cornea which eventually protruded from the palpebral aperture. The clinical and pathological features will be described and discussed.

● Tu-Ic1-4

Bilateral fusarium panophthalmitis

Prause, Jan Ulrik
University of Copenhagen, Copenhagen, DENMARK

Summary: A 56-year-old woman had multiple infections during the next few months after receiving a liver transplant and eventually developed a severe endophthalmitis first in the left and then in the right eye. The clinical and pathological features will be described and discussed.

IC3D PLENARY: CORNEAL DYSTROPHIES

● Tu-Fi2-1

Introduction

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

● Tu-Fi2-2

Corneal dystrophies - boring, intriguing and funny peculiar aspects: the IC3D classification and where it is leading

Møller, Hans Ulrik
Viborg Hospital, Århus, DENMARK

Summary: Corneal dystrophies are rare Mendelian inherited conditions, which exhibit bilateral and usually symmetrical corneal changes. The term dystrophy - derived from the Greek words dys (wrong/difficult) and trophe (nourishment) was first used 150 years ago for a group of entities clearly not of traumatic or infectious origin. They were then believed to be due to poor nerve supply or nourishment – hence the name. Most entities later proved to be genetic in origin, but the word dystrophy stuck to this group of diseases. Nomenclature and classification used to be difficult because of controversies about the phenotype definitions; many authors could not even agree on proper names. Most ophthalmologists do not like studying - let alone diagnosing - corneal dystrophies as the literature has been a mess. The new classification aimed to set the record straight a few years back, the International Committee for Classification of Corneal Dystrophies (IC3D) devised this novel classification system for the corneal dystrophies which included genetic, clinical and histopathologic information as well as slit lamp photos of 25 corneal dystrophies. This new system is user-friendly and upgradeable and the paper can be retrieved on the website *www.corneasociety.org/ic3d* and from PubMed: Weiss JS, Moller HU, Lisch W et al. IC3D classification of the corneal dystrophies. Cornea 2008, Suppl 2:1-42.

LIPIDS, ATHEROSCLEROSIS AND OCULAR EVENTS – PREVENTION AND TREATMENT OF FURTHER VASCULAR EVENTS

● Tu-Fi3-1

Prevention and treatment of atherosclerosis

Taskinen, Marja-Riitta
Helsinki University Central Hospital, Helsinki, FINLAND'

Summary: The impact of CVD worldwide is enormous. According to WHO statistics CVD represents the number one cause of death globally accounting for almost one-third of all mortality. The current explosion in CVD is due to the ongoing epidemic of metabolic diseases particularly Type 2 diabetes. Vascular disease is a complex and multifactorial process and its clinical forms are expressed in diverse foci including also vascular beds in retina. Modifiable risk factors include blood pressure, dyslipidemias, in particular LDL cholesterol, Type 2 diabetes and non-modifiable factors such as age and gender. LDL is recommended as the primary target for treatment to reduce CVD risk. The data from large meta-analyses of several trials have confirmed the dose-dependent reduction in CVD with LDL-C lowering. The guidelines recommend modulating the intensity of LDL-C lowering according to the level of total CV risk; the target being <1.8 mmol/l or at least 50% relative reduction in LDL-C at very high risk subjects. To achieve low LDL-C goals statins are the first-line drugs but can be combined with other drugs to achieve additional lowering of LDL cholesterol if needed. However, even LDL-C is at goal the majority of subjects with cardiometabolic risk factors remain at high residual risk. The elevation of triglyceride (>1.7 mmol/l) and/or low HDL chol (<1.0 mmolL) should trigger consideration to further reduce CV risk. Non-HDL-C should be considered as a secondary treatment target in combined hyperlipidemia, diabetes, the Mets or CKD. The first step should be lifestyle intervention. The treatment decisions should take into account relevant safety concerns.

● Tu-Fi3-2

Atherosclerosis and the eye

Summanen, Paula
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: While general retinal arteriolosclerosis is common and plays a crucial role in the pathogenesis of branch and central retinal vein occlusion, the importance of retinal atherosclerosis is unclear. However, atherosclerosis of the internal carotid artery (ICA) causes acute and chronic ocular morbidity. Clinical picture varies whether the plaque is stable or instable, the former becoming important when significantly narrow ICA, the latter is independent on size. Amaurosis fugax, ocular transient ischemic attack (TIA) is a sudden black or white out and lasts up to 10 minutes. Emboli threatening central nervous system are suspected and the patients referred to neurological unit. If monocular sudden visual loss remains, occlusion of the ophthalmic or the central retinal artery (CRA) is suspected. The annual incidence of CRAO is 8.5/1 million. The mean age of the patients is 60 years, 2 out of 3 are males. Massage the eye on the way to the ophthalmic unit (if no trauma or surgery) where paracentesis is done with <4 hour history and patients are referred to the neurological unit. In 2 out of 3 patients the embolus is from ICA, the heart being another source. Asymptomatic Hollenhorst plaques justify non-urgent referral to neurological unit. Advanced ICA atherosclerosis impairs ocular circulation and leads to ocular ischemic syndrome (OIS) causing dull pain (ocular angina), anterior chamber flare without cells, iris atrophy and neovascularisation on the anterior and posterior segment. Midperipheral retinal haemorrhages are typical to OIS. Carotid Doppler ultrasound should be done without delay to find out if surgery is indicated. The annual incidence of OIS is 7.5 cases/million. The mean age of the patients is 65 years, it is twice as common in males than females and bilateral in every fifth patient. Panretinal photocoagulation is needed to stop angiogenesis and prevent complications.

● Tu-Fi3-3

Neurological work-up of a patient with sudden monocular visual loss due to TIA or retinal central artery occlusion

Rantanen, Kirsi
Helsinki University Central Hospital/Neurology, Helsinki, FINLAND

Summary: A transient ischemic attack (TIA) is an important predictor of stroke and nearly third of stroke patients do report a preceding TIA. The distinction between TIA and stroke has become less important in recent years due to the fact that many TIAs actually are minor strokes and on the other hand the same preventive approaches are applicable to both. There is no doubt that progress has been made in the care of TIA patients. Many hospitals offer rapid access neurovascular clinics or see acute TIA patients at the A&E polyclinics. There is better availability of brain and carotid imaging and improvements in the symptom-to-carotid - surgery times. The stroke risk early after TIA seems to be smaller if the patient is examined acutely in specialist stroke services compared to out-patients treatment in the primary health care. Should all TIA patients be urgently evaluated? Yes, because any TIA, whether amaurosis fugax or hemiparesis, may be due to significant arterial stenosis or cardiac embolism, which should be detected and treated. A full neurological work-up should consist of at least CT brain imaging, chest X-ray, blood tests, ECG and carotid artery imaging prefererably within the first hours after the attack. After the examinations all patients are eligible to rapid secondary prevention with antithrombotic agents, BP lowering and cholesterol lowering medication. In the USA, a cohort of 2,800 patients was followed up for a year in order to assess adherence and nearly a third had discontinued some of the medications during the first year. We should be able to offer 24/7 neurological service for acute TIA patients in order to rapidly find patients with major carotid stenosis or atrial fibrillation and then encourage rigorous secondary prevention after evaluation of all vascular risk factors.

● Tu-Fi3-4

Carotid artery endarterectomy: when, how and what results?

Vikatmaa, Pirkka
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: Embolic material from atherosclerotic lesions in the carotid arteries is one of the main aetiological factors for ischaemic stroke. According to a large body of evidence, carotid endarterectomy (CEA) can prevent strokes, provided that appropriate inclusion criteria and high-quality perioperative treatment methods are utilised with low complication rates. If a carotid lesion sends an embolus, it may cause different transient or permanent symptoms depending on the artery it occludes. All neurological, potentially ischaemic symptoms should be evaluated on an emergency basis. It is not uncommon that a small debris from an ICA lesion finds its way to the first branch, the ophthalmic artery and further to the retinal arteries, causing ipsilateral monocular transient visual loss, amaurosis fugax. An embolus may also cause permanent total or partial visual loss, an ocular infarction. These ocular symptoms should be seen as risk factors for stroke similar to transient ischaemic attacks (TIA) or minor strokes and prompt investigations should be undertaken. If carotid stenosis is found and the lesions and patient are considered for operation, the operation should be performed with minimal delay. Ocular ischemic syndrome (OIS) is a chronic condition that mostly results from severe carotid artery stenosis (>90%), with a 5-year mortality rate of about 40%. Carotid artery stenosis compromises laminar retinal artery flow and results in disturbed flow patterns, hypoperfusion, hypoxia, and ischemia of highly metabolically active retinal tissues. OIS is associated with carotid artery stenosis from 20% to 100% in the reported series. However, there is insufficient evidence to draw definite conclusions about whether surgery is beneficial in these cases or not.

MANAGING WET AMD IN THE CLINICAL SETTING

● Tu-Sw3-1

Overview: Treatment strategies available today for managing wet AMD

Seregard, Stefan
St Erik's Eye Hospital, Stockholm, SWEDEN

● Tu-Sw3-2

Practical treatment of exudative age-related macular degeneration in Iceland

Geirsdottir, Asbjorg[1]; Jonsson, Oskar[2]; Thorisdottir, Sigridur[2]; Helgadottir, Gudleif[2]; Jonasson, Fridbert[1]; Stefánsson, Einar[1]; Sigurdsson, Haraldur[1]
[1]University of Iceland/Landspítali University Hospital, Reykjavik, ICELAND; [2]Landspítali University Hospital, Reykjavik, ICELAND

Purpose: To evaluate the practical aspects of treatment with antibodies against vascular endothelial growth factor (anti-VEGF) for exudative age-related macular degeneration (AMD) in Iceland, a population of 320,000.
Methods: Retrospective study of all exudative AMD patients in Iceland who received intravitreal injections of anti-VEGF; ranibizumab (from March 7th 2007 to February 28th 2010) or bevacizumab (from March 1st 2010 to April 30th 2012). Anti-VEGF treatment was initiated if there were signs of new exudative AMD lesions in the macula or recent disease progression. Our treatment protocol consisted of a loading dose of three-monthly injections followed by control exam after 4-6 weeks. If treatment was continued, three monthly injections were repeated but if paused, a modified 'extend and treat' protocol was followed.
Results: Anti-VEGF treatments for exudative AMD have increased rapidly in Iceland. In 2007, there were on average 65 injections per month but so far this year the number is 245 injections per month. The anti-VEGF treatment system in our clinic works quite well with the residents taking care of the injections and the consultants taking care of the examinations and the treatment decision making. The waiting time for the first exam has become greater than before with the increasing demand and is now usually 2-3 weeks, but never more than 4 weeks. The waiting time for the first injection is always less than a week.
Conclusions: There is a continuous rise in the need for anti-VEGF treatment among patients with exudative AMD. Our modified 'extend and treat' protocol with the three loading doses for each round of treatment has worked fairly well in our clinic apart from the longer waiting time for the primary examination. However, further increased treatment load with the aging population will call for an adjustment of our treatment system.

● Tu-Sw3-3

Practical treatment of exudative age-related macular degeneration in Sweden

Eriksson,Urban
St Erik's Eye Hospital, Stockholm, SWEDEN

● Tu-Sw3-4

Practical treatment of exudative age-related macular degeneration in Norway

Berg, Karina
Oslo University Hospital, NORWAY

● Tu-Sw3-5

Practical treatment of exudative age-related macular degeneration in Denmark

Larsen, Michael
University of Copenhagen, Copenhagen, DENMARK

● Tu-Sw3-6

Practical treatment of exudative age-related macular degeneration in Helsinki, Finland

Tommila, Petri
Helsinki University Central Hospital, Helsinki, FINLAND

Summary: The section of Medical Retina in the Department of Ophthalmology, Helsinki University Central Hospital, is responsible for the treatment of exudative age-related macular degeneration (AMD) of a population of 1.5 million. The incidence of new cases would be estimated 750 annually. To get eyes with progressive exudative AMD treated 9,000 anti-VEGF injections will be done this year. The injection protocol will follow the modified PRN-schedule with 5 injections at start from 4 to 6 weeks apart. Three more injections will be given if neuroepithelial detachment (NED) still exists, central retinal thickness (CRT) has increased more than 50 µm or a new subretinal haemorrhage can be found. Otherwise follow-up is started every 4 weeks for 2 years. Retreatment will be started if CRT will increase 50 µm, NED or subretinal haemorrhage will appear again. Retreatment will be carried out with a series of 3 new injections. The treatment will be stopped if visual acuity will progressively decrease to level 0.05 or less. Development of subfoveal fibrosis usually makes treatment useless. Waiting time for the first visit should not be more than two weeks. Angiography will be done with first clinical exam together with optical coherence tomography (OCT). The first injection should be given during the first visit when indicated. The control visits include VA examination and OCT. The Medical Retina Unit in Helsinki comprises of four doctors and four nurses. The clinical exams and injections are done by the residents and the seniors. OCT exams are done by nurses. Part of the injections and follow-up visits is outsourced to one private eye hospital. Bevacizumab is mostly used for injections. When the risk of cardiovascular accid-

ents is considered high enough ranibizumab is preferred. Pre-operative antibiotic prophylacsis is not used.

● Tu-Sw3-7

Panel discussion

Tommila, Petri[1]; Berg, Karina[2]; Eriksson,Urban[3]; Geirsdottir, Asbjorg[4]; Larsen, Michael[5]
[1]Helsinki University Central Hospital, Helsinki, FINLAND;
[2] Oslo University Hospital, NORWAY; [3]St. Erik's Eye Hospital, Stockholm, SWEDEN; [4]University of Iceland/Landspítali University Hospital, Reykjavik, ICELAND;[5]University of Copenhagen, Copenhagen, DENMARK

● Tu-No3-1

Aquaporins 6-12 in the human eye

Tran, Thuy Linh[1]; Bek, Toke[2]; Holm, Lars[1]; la Cour, Morten[1]; Nielsen, Søren[2]; Prause, Jan Ulrik[1]; Rojek, Aleksandra[2]; Hamann, Steffen[1]; Heegaard, Steffen[1]
[1]University of Copenhagen, Copenhagen, DENMARK; [2]Århus University, Århus, DENMARK

Purpose: Aquaporins (AQPs) are widely expressed and have diverse distribution patterns in the eye. AQPs 0–5 have been localised at the cellular level in human eyes. We investigated the presence of the more recently discovered AQPs 6–12 in the human eye.
Methods: RT-PCR was performed on fresh tissue from two human eyes divided into the cornea, corneal limbus, ciliary body and iris, lens, choroid, optic nerve, retina and sclera. Each structure was examined to detect the mRNA of AQPs 6–12. Fifteen human eyes were examined using immunohistochemical and immunofluorescence techniques to determine the topographical localisation of AQPs 6–12.
Results: mRNA transcripts of AQP7, AQP9 and AQP11 were found in the ciliary body, corneo-limbal tissue, optic nerve, retina and sclera. AQP9 and AQP11 mRNA was also detected in the choroid. No mRNA of AQP6, AQP8, AQP10 or AQP12 was detected. Anti-AQP7 immunolabeling was detected in the corneal epithelium, corneal endothelium, trabecular meshwork endothelium, ciliary epithelia, lens epithelium, the inner and outer limiting membrane of the retina, the retinal pigment epithelium and the capillary endothelium of all parts of the eye. AQP9 immunolabeling was detected in the nonpigmented ciliary epithelium and retinal ganglion cells. AQP11 immunolabeling was detected in the corneo-limbal epithelium, nonpigmented ciliary epithelium and inner limiting membrane of the retina.
Conclusions: Selective expression of AQP7, AQP9 and AQP11 was found within various structures of the human eye. The detection of these aquaporins in the eye implies a role that may not only be related to water transport but also to the transport of glycerol, lactate and ammonia, with importance for metabolism, especially in the retina.

● Tu-No3-2

A digital slit lamp camera system for conventional and infrared transillumination photography of intraocular tumours

Krohn, Jørgen[1]; Kjersem, Bård[2]
[1]University of Bergen, Bergen, NORWAY; [2]Haukeland University Hospital, Bergen, NORWAY

Purpose: To present a new technique for conventional and infrared transillumination photography of uveal melanoma and other intraocular tumours.
Methods: Transillumination imaging was performed with a standard digital slit lamp camera system (Photo-Slit Lamp BX 900, Haag-Streit®), in which the background illumination is provided via a fibre optic cable for flash illumination and continuous modelling light. The system was modified by simply loosening the distal end of the background illumination cable from its holder, allowing the flexible fibre optic cable to be freely moved by the examiner. The patient's eye was held open by a lid speculum, and the head was positioned on the head and chin rest of the slit lamp. Transillumination was achieved by gently pressing the tip of the light fibre cable against the globe. The camera was then fired and the flash delivered through the background illumination cable while synchronising with the camera shutter. For infrared imaging, the original camera body was replaced by a custom-made Canon EOS® 30D converted for infrared photography by exchanging the infrared light blocking filter ("hot mirror") with a 720-nm filter.
Results: Both conventional and infrared transillumination photography were performed in patients with ciliary body or anterior choroidal tumours. The high magnification and resolution of the photographs made it possible to evaluate the exact location and extent of the tumours in relation to the ciliary body and fine landmarks such as conjunctival and episcleral vessels. The infrared images were characterised by a high contrast and a uniform light distribution.
Conclusions: We recommend the use of these techniques in all cases where photographic documentation of transilluminated intraocular tumours is considered important.

● Tu-No3-3

Diagnostic aspects and immunologic indentification potentials of ocular adnexal lymphoma: report of selected cases.

Paulavièienë, Rasa[1]; Aðoklis, Rimvydas[2]; Malyðko, Kristina[2]; Petroðka, Donatas[3]; Kryþauskaitë, Lina[4]; Rutkauskaitë, Dileta[5]
[1]Vilnius University Hospital Santariskiu Klinikos/Center of Eye Diseases, Vilnius, LITHUANIA; [2]Vilnius University Hospital Santariskiu Klinikos Center of Eye Diseases/Viilnius University, Vilnius, LITHUANIA; [3]State Center of Pathology/Vilnius University, Vilnius, LITHUANIA; [4]Vilnius University Hospital Santariskiu Klinikos/Center of Hematology, Oncology and Transfusion Medicine, Vilnius, LITHUANIA; [5]Vilnius University Hospital Santariskiu Klinikos/ Center of Radiology, Vilnius, LITHUANIA

Purpose: To discuss diagnostic aspects and immunologic indentification of ocular adnexal lymphoma and to present selected cases of ocular adnexal lymphoma.
Methods: Medical records, photographs and histological slides of two patients with ocular adnexal lymphoma were retrospectively analysed.
Results: Two male patients were diagnosed with ocular adnexal lymphoma. In both cases the onset of the disease was insidious and disease course was slowly progressive. The main complaint was slowly growing, painless mass in the region of inferior eyelids (case 1) and at the site of bulbar conjunctiva (case 2). An accurate diagnosis of ocular adnexal lymphoma was done after performing biopsy of the lesion, histologic tissue evaluation and immunologic identification. Histologic findings revealed mantle cell lymphoma in case 1 and marginal zone lymphoma in case 2. After additional tests had been done, the two patients were diagnosed with extensive lymphoma.
Conclusions: Complaints and clinical findings in case of adnexal lymphoma can have various expressions and resemble benign reactive lymphoid hyperplasia. In order to obtain an accurate diagnosis, every growing mass should be suspected of being

potentially malignant and biopsy followed by tissue histologic evaluation should be performed. All patients with ocular lymphoma should have a complete workup to rule out a systemic lymphoma.

● Tu-No3-4

Lymphoma of the eyelids: a nation-based study

Heegaard, Steffen[1]; Rasmussen, Peter K.[1]; Ralfkiaer, Elisabeth[2]; Prause,Jan Ulrik[1];Sjö,Lene D.[2];Toft,Peter B[3],Siersma Volkert D[4]
[1]Eye Pathology Institute, University of Copenhagen, Copenhagen, DENMARK; [2]Copenhagen University Hospital, Copenhagen, DENMARK; [3]University of Copenhagen,Glostrup Hospital, Glostrup, DENMARK [4]Institute of Public Health, University of Copenhagen, Copenhagen, DENMARK

Purpose: To characterise the clinicopathological features of the lymphoma of the eyelids.
Methods: All cases of eyelid lymphoma between 1980 and 2008 were retrieved from the Danish Registry of Pathology. Histological specimens were re-evaluated using a panel of monoclonal antibodies. Clinical files from all patients with confirmed lymphoma were collected.
Results: Sixteen patients with lymphoma of the eyelids were identified. Twelve of the patients were males and the median age was 71 years (range, 31-88). The distribution of lymphoma subtypes were: extranodal marginal zone lymphoma (EMZL) 31% (5/16), diffuse large B-cell lymphoma (DLBCL) 19% (3), anaplastic large T-cell lymphoma (T-ALCL) 19% (3), follicular lymphoma (FL) 13% (2), peripheral T-cell lymphoma, unspecified (PTCL, NOS) 13% (2), chronic lymphocytic leukemia/small lymphatic lymphoma (CLL/SLL) 6% (1). Nine patients (56%) presented with stage I/II lymphoma. Two patients (13%) had stage III lymphoma and five patients (31%) presented with stage IV lymphoma. The 5-year overall survival rate (OS) was 67%. The patients with DLBCL had a significantly worse median survival (8.4 months) compared with other lymphoma subtypes (EMZL; FL; PTCL, NOS; CLL/SLL; T-ALCL) (8.4 months vs. 11 years, log-rank p = 0.0001).
Conclusions: Lymphoma of the eyelids is rare and is mainly prevalent in elderly male patients. Most patients had unilateral involvement. The occurrence of T-ALCL was relatively high compared with the distribution of lymphoma subtypes of the orbit. The prognosis for the whole population was relatively good. However, patients with DLBCL had a significantly worse survival.

● Tu-No3-5

***MYB-NFIB* gene fusion and copy number alterations in adenoid cystic carcinoma of the lacrimal gland**

von Holstein, Sarah Linéa[1]; Fehr, André[2]; Therkildsen, Marianne Hamilton[3]; Prause, Jan Ulrik[1]; Stenman, Göran[2]; Heegaard, Steffen[4]
[1]University of Copenhagen, Copenhagen, DENMARK; [2]University of Gothenburg, Gothenburg, SWEDEN; [3]Rigshospitalet, Copenhagen, DENMARK; [4]University of Copenhagen/Glostrup Hospital, Glostrup, DENMARK

Purpose: To evaluate the expression of the *MYB-NFIB* gene fusion and target genes as well as to study copy number alterations in adenoid cystic carcinoma (ACC) of the lacrimal gland.
Methods: Fourteen ACCs and 19 non-ACC epithelial tumors of the lacrimal gland were included in the study. RT-PCR and nucleotide sequence analysis was used to identify the *MYB-NFIB* fusion. Q-PCR and immunohistochemistry was used to evaluate the expression of *MYB* and *MYB-NFIB* target genes. High resolution array-based comparative genomic hybridisation was used to study copy number alterations.
Results: The patients had a median age at diagnosis of 43 years and the gender distribution was equal (M:F, 7:7). In 8 (60%) patients the tumors were stage T4 and in 2 (14%) patients the tumors were grade 3. Median time of survival was 9 years. The *MYB-NFIB* fusion was detected in 7 of 14 (50%) ACCs but not in any of the other epithelial tumors. *MYB* RNA and protein were overexpressed in all tested cases of ACC. *MYB* target genes were also overexpressed and so *MYC* was expressed in 13 of 13 (100%) cases, *KIT* in 12 of 13 (92%) cases, *BCL2* in 12 of 13 (92%) cases, *CCNB1* in 10 of 13 (77%) cases and *CCNE1* in 12 of 13 (92%) cases. The most frequent recurrent copy number alterations were loss of 6q in 3 of 10 (30%) cases, loss of 12q in 3 of 10 (30%) cases and gain of 22q in 3 of 10 (30%) cases.
Conclusions: *MYB-NFIB* is expressed in ACC of the lacrimal gland and is tumour specific also for ACC of this anatomic location. *MYB* and downstream targets are overexpressed and thereby potential therapeutic targets. ACC of the lacrimal gland seems to be genetically similar to ACC of the salivary glands in this respect.

● Tu-No3-6

Adjuvant brachytherapy of orbital tumours with "inverted" iodine plaques

Kivelä, Tero; Leivo, Tiina; Järvinen, Esko; Heikkonen, Jorma
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To describe our experience with "inverted" iodine plaques as adjuvant treatment after resection of orbital tumours.
Methods: Between 1999 and 2007, three patients (ages 17-48 years) underwent resection of an lacrimal gland tumour (2 adenocystic and 1 recurrent adenocarcinoma) followed by application of an "inverted" iodine plaque to manage any microscopic infiltration, *i.e.* a gold plaque carrying iodine-125 seeds on its convex rather than concave side. One patient (age 74 years) underwent brachytherapy with the seeds placed on the convex surface of a ruthenium silver plaque to manage an eye with a late extrascleral recurrence of a previously irradiated uveal melanoma following resection of the orbital extension.
Results: The diameter of the plaques was 20 mm. The plaque was sutured to the sclera so that when the eye was in the primary position the lacrimal fossa was targeted. When the eye moved, the irradiated volume enlarged. A 40-56 Gy dose was calculated to the depth of 10 mm, and the dose at 5 mm was 80-134 Gy. Treatment time was 59-154 hours. In one case, the iodine seeds were placed asymmetrically to limit radiation to the eyelid skin. In two patients, transient erythema of the upper eyelid developed, which resolved in a few months time. In case of the extraocular melanoma, the dose was the same. Recurrent tumours have not developed, but the treatment was not successful in eradicating the recurrent adeno-

carcinoma. One patient developed 13 years after treatment a solitary pulmonary metastasis from adenocystic carcinoma, which was resected.
Conclusions: An "inverted" iodine plaque is one option for adjuvant irradiation of the orbit which shields the eye from radiation damage.

Posters

● Sa-Ba1-1

Hypoxia stimulates the synthesis and release of brain natriuretic peptide (BNP) in RPE cells

Arjamaa, Olli[1]; Kaarniranta, Kai[2]; Nikinmaa, Mikko[1]; Aaltonen, Vesa[1]
[1]University of Turku, Turku, FINLAND; [2]University of Eastern Finland, Kuopio, FINLAND

Purpose: The blood flow and the oxygen availability of retina are modulated by locally produced peptides which also can change the function of neurons. The natriuretic peptide system has been isolated and characterised in human retina and these peptides localise in RPE cells. A high concentration of natriuretic peptides has been previously measured from the vitreous of patients suffering of PDR. However, the stimulus to which the natriuretic peptide system responds in PDR has remained unknown.
Methods: We hypothesised that hypoxic conditions will increase the release of BNP from human RPE cell culture. RPE cells were exposed to hypoxia for several hours. Samples were collected at time intervals and analysed for BNP peptide and for BNP mRNA. The parallel measurement of VEGF served as a positive control.
Results: In hypoxic conditions RPE cells secreted statistically significant amounts of BNP. These findings characterise for the first time a stimulus for the natriuretic peptide system in retina and explain previous clinical results.
Conclusions: The measurement of natriuretic peptides in the vitreous may guide the treatment of the intraocular diseases in which the retina is suffering from hypoxia.

● Sa-Ba1-2

Interocular vascular communication through collateral vessels in an experimental pig model

Morén, Håkan[1]; Gesslein, Bodil[2]; Per, Undrén[2]; Andréasson, Sten[2]; Malmsjö, Malin[2]
[1]Lunds University, Lund/St Erik's Eye Hospital, Stockholm, SWEDEN; [2]Lund University and Skåne University Hospital, Lund, SWEDEN

Purpose: The authors recently presented an endovascular coiling model of retinal ischemia. In order to elaborate this model, the aim of this study was to examine if there is collateral blood supply with direct communication between the right and left eye and also if the extent of ischemia following vascular occlusion is dependent on this collateral blood supply.
Methods: The external carotid system of 8 pigs (mean weight, 70 kg) was catheterised using a fluoroscopy monitored, transfemoral, endovascular approach. Vascular occlusion of the ophthalmic artery was performed using coils. Retinal function was evaluated using multifocal electroretinography (mfERG).
Results: Unilateral angiograms of the ophthalmic artery showed bilateral retinal contrast filling almost simultaneously. There were angiographic signs of net collateral flow from the right to the left eye or *vice versa*. Occlusion of the ophthalmic artery in eyes where the net collateral flow originated resulted in attenuated mfERG b-wave amplitudes on day 1 in both eyes indicating retinal ischemia. By contrast, occlusion in eyes with both direct and collateral blood supply resulted in less attenuated amplitudes in both eyes indicating less ischemia.
Conclusions: The present study shows evidence of direct vascular communication through collateral blood vessels between the two eyes. This has not been shown in pigs before. The degree of ischemia following occlusion of the ophthalmic artery seems to be influenced by whether the occluded eye has only direct or also additional collateral supply. This collateral blood circulation may have clinical importance, *i.e.* to influence retinal ischemia in the event of vascular occlusion. It may also be of importance to further development of experimental models of retinal ischemia.

● Sa-Ba1-3

Impaired multifocal electroretinogram implicit times in symptomatic carotid artery disease: correlation to blood pressure

Kofoed, Peter K; Munch, Inger C; Holfort, Stig K; Sillesen, Henrik; Jensen, Leif P; Iversen, Helle K; Larsen, Michael
University of Copenhagen, Copenhagen, DENMARK

Purpose: Oxygen supply is fundamental for retinal function; and ischemia is considered an essential part of the pathogenesis of many eye diseases. Hypoxia has been shown to impair dark adaptation in ophthalmologically healthy patients and ischemia is known to delay multifocal electroretinographic (mfERG) implicit times in ocular ischemic syndrome eyes in patients with occlusive carotid artery disease. In this study, we examined mfERG in patients with carotid artery disease without the ocular ischemic syndrome or other ocular disease.
Methods: Retinal function in 13 patients with carotid artery disease was assessed by mfERG, ophthalmic systolic blood pressure measurement by ocular pneumoplethysmography, carotid artery by ultrasonography. Data analysis compared the eye on the most stenotic side with the fellow eye in the same patient.
Results: Summed mfERG implicit times (N1 and P1) were 3.4% and 2.0% longer ($p=0.013$ and 0.021) and N1 and P1 amplitudes were 18.0% and 16.0% lower ($p=0.0041$ and 0.020) in eyes on the side with the higher stenosis compared with the contralateral eyes. In addition to the effect of carotid artery stenosis, shorter implicit times and higher amplitudes were correlated with higher brachial systolic arterial blood pressure ($p = 0.0028$, 0.011, 0.041 for N1, P1, N2 implicit times, and $p = 0.0086$, 0.016, 0.040 for N1, P1, N2 for amplitudes, respectively).
Conclusions: Suppression of retinal cone function assessed by mfERG in clinically healthy eyes occurred in proportion to the degree of carotid artery stenosis and was correlated to arterial blood pressure. These new findings of the effect of retinal perfusion pressure on cone function have clear parallels in previous studies of rod function assessed by dark adaptatometry in patients with carotid artery stenosis.

● Sa-Ba1-4

Retinal detachment recurrence: quantitive estimation system of proliferative vitreoretinopathy severity

Sosnovsky, Sergey; Haritonova, Natalya
Military Medical Academy, RUSSIAN FEDERATION

Purpose: The success of retinal detachment (RD) surgery depends on the correct choice of the extent of surgery which is mostly dependent on the severity of proliferative vitreoretinopathy (PVR). In this regard, the system of quantitative assessment of PVR severity could be useful for planning of reattachment surgery.
Methods: This retrospective study included analysis of a case series of 443 patients with RD. The suggested quantitative criterion for the PVR severity assessment is PVR Severity Index (PVR-SI), which represents the absolute value in points (from 1 to 15) based on the PVR grades according to Machemer's classification. The PVR-SI was analysed in relation to several factors, indicating the course of PVR, such as the presence of retinal detachment recurrence (RDR), the number of RDRs, eye wall and intraocular structure damage degree, the presence of intraocular foreign bodies and inflammatory complications, and the number of surgical reattachment procedures.
Results: The PVR-SI in patients without RDR was 4.12±0.18 and in patients with RDR 8.06±0.34 ($p<0.001$). In patients with several RDRs the PVR-SI was: in case of 1 RDR 7.92±0.64, in case of 2 RDRs 7.75±0.56, in case of 3 RDRs 10.4±0.97, and in case of 4 RDRs 11.0±1.21. The PVR-SI had direct moderate correlation with the presence of RDRs ($r=0.503$, $p<0.001$), with number of RDRs ($r=0.47$, $p<0.001$), and with the number of conducted operations ($r=0.45$, $p<0.001$).
Conclusions: Suggested quantitative criterion of PVR course estimation has high self-descriptiveness and can be used for assessment of different risk factors in the progress of intraocular proliferation. In clinical practice the PVR-SI provides quantitative description of PVR severity that can help in planning of reattachment surgery extent.

● Sa-Ba1-5

About risk factors for recurrence of retinal detachment after removal of silicone oil in the treatment of proliferative vitreoretinopathy

Romanovska, Oksana; Sosnovsky, Sergey
Kirov Military Medical Academy, Kirov, RUSSIAN FEDERATION

Purpose: In most cases, vitreoretinal surgery for retinal detachment complicated by severe proliferative vitreoretinopathy ends with introduction of substitutes of the vitreous body. Of these, silicone oli holds the first place regarding tolerance and the physical and chemical properties. If it left in the vitreous chamber for more than 3 months, especially in the presence of complications, the question arises regarding its removal. However, in 30% of cases after removal of silicone oil, recurrent retinal detachment occurs. Our purpose was to study and analyse the risk factors that can lead to a recurrence of retinal detachment in face of silicone tamponade of the vitreous chamber.
Methods: Forty patients with silicone tamponade, operated for retinal detachment of different origins, complicated by proliferative vitreoterinopathy were observed. Preoperative and postoperative examination of all patients included visual acuity, perimetry, electroretinography (flicker ERG, 30 Hz), determiming the threshold electrical sensitivity (ech), determination of lability, tonometry, biomicroscopic ophthalmoscopy. Times of observation were from 3 months to 3 years.
Results: The analysis of the major risk factors leading to relapse: these included fixed star folds on the surface of the retina, the presence of large holes in the retina with raised edges and a high risk of relapse, the presence of residual retinal detachment under silicone tamponade, the presence of progressive epiretinal fibrosis at the surface of the retina, and incomplete silicone tamponade in the vitreous chamber.
Conclusions: In patients with silicone tamponade of the vitreous chamber in treatment of severe retinal detachment, In the presence of risk factors the risk of recurrence is 70-85% after removal of silicone oil.

● Sa-Ba1-6

Evidence of neuroplasticity in the human visual cortex following beneficial anti-VEGF treatment in exudative age-related macular degeneration

Vottonen, Pasi[1]; Pääkkönen, Ari[1]; Tarkka, Ina[2]; Kaarniranta, Kai[1]
[1]Kuopio University Hospital, Kuopio, FINLAND; [2]University of Jyväskylä, Jyväskylä, FINLAND

Purpose: Age-related macular degeneration is the most common cause of blindness in the elderly in western countries. Five years ago a new treatment based on intravitreal injection of anti-VEGF showed improved visual acuity in exudative wet AMD cases. As the vision improves relatively quickly with this treatment strategy, we wanted to know if the cortical visual processing is modified as well.
Methods: Our interventional case series included 6 elderly patients who underwent injection treatment to the worse eye. Their visual acuity, optical coherence tomography and visual processing were assessed directly before the treatment began and 6 weeks after the last injection.
Results: All patients showed improved visual acuity and reduced retinal fluid after the treatment. All but one patient showed increased VEP P100 component amplitudes in the treated eye. These VEP changes were consistent with improved vision while the untreated eyes showed no improvements.
Conclusions: Our results indicate that anti-VEGF injections improved visual function of the treated eyes both at the level of the retina and at the level of visual cortical processing.

● Sa-Ba1-7

Bilateral progressive Coats-type exudative retinopathy in Usher syndrome type IIIA from c.528T>G *CLRN1* mutation

Täll, Martin; Lindahl, Päivi; Immonen, Ilkka; Loukovaara, Sirpa; Sankila, Eeva-Marja; Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To describe bilateral, progressive, Coats-type exudative retinopathy in a boy with Usher syndrome type IIIA.

Methods: An interventional case report.
Results: A 9-year-old boy with a hearing loss of medium severity diagnosed 4 years earlier developed nyctalopia and began to stumble on objects, leading to suspicion of a visual field defect. His visual acuity (VA) was 20/50, OD, and 20/40, OS, with no significant refractive error. The RPE was distinctly flecked. Dilated retinal vessels with a confluent accumulation of subretinal lipid were seen temporally, OD, and two similar smaller lesions without obvious vascular pathology, OS. The vitreous showed diffuse cellular or lipoid deposits. The ERG was close to isoelectric and Goldmann visual fields were constricted. Two months later, vision had deteriorated 20/100 and the exudates extended to the macula, OD. He underwent bilateral peripheral cryocoagulation. Genetic testing uncovered the predominant Finnish c.528T>G homozygous mutation of *CLRN1* (clarin-1). During the next 8 months, exudates slowly regressed with vision improvement to 20/40, OD, but telangiectasias appeared leading to extension of exudation to the macular area, OS. Twenty months after a second cryocoagulation, OS, the exudates remain regressed bilaterally with 20/40 vision, OD, and 20/30 vision, OS.
Conclusions: Bilateral Coats-like exudative retinopathy is well known from diverse types of retinitis pigmentosa and from Usher syndrome type II unrelated to *CLRN1*. It has not so far been reported in Usher syndrome type IIIA, which predominates in Finland, raising the possibility that other genes might contribute to the Coats phenotype.

● Sa-Ba1-8

A novel Transthyretin Lys90Glu mutation presenting with vitreous amyloidosis and carpal tunnel syndrome

Raivio, Virpi[1]; Jonasson, Jenny[2]; Myllykangas, Liisa[3]; Ala-Mello, Sirpa[1]; Kankuri-Tammilehto, Minna[4]; Kiuru-Enari, Sari[1]; Westermark, Per[5]; Tanskanen, Maarit[5]; Kivelä, Tero[1]
[1]Helsinki University Central Hospital, Helsinki, FINLAND; [2]Umeå University Hospital, Umeå, SWEDEN; [3]University of Helsinki/Helsinki University Central Hospital, Helsinki, FINLAND; [4]Turku University Hospital, Turku, FINLAND; [5]Uppsala University, Uppsala, SWEDEN;

Purpose: Over 100 mutations in the transthyretin (TTR) gene have been reported, termed as familial amyloidotic polyneuropathy (FAP). We describe a novel *TTR* mutation, presenting with vitreous opacities and carpal tunnel syndrome.
Methods: A 78-year-old woman (the proband) with vitreous opacities in her right eye, her daughter with dry eye syndrome, and brother with carpal tunnel syndrome were tested for a mutation in *TTR*. The opacities in the proband's right eye were removed and stained with Congo red and immunohistochemistry against wild type TTR. Skin and gut biopsies of the proband and her daughter and soft tissue material removed from the wrist of the brother were examined histopathologically. Leukocyte DNA from the proband was analysed by direct sequencing of exons 1 to 4 of *TTR* and the DNA from the daughter and brother using segregation analysis.
Results: A point mutation c.268 A>C, in *TTR* leading to a missense mutation p.Lys90Gln (HGVS nomenclature, former Lys70Gln) was found in the DNA of the subjects. The vitreous material was pearl string-like, adherent to vitreous fibrils. This material and the skin and mucous membrane biopsies of the proband showed red to green birefringence typical to amyloid, and were immunoreactive with antibodies against TTR. The biopsy from the brother's wrist also showed TTR amyloidosis. Vitreous opacities were removed from the proband's left eye, and deep sclerectomy of the right eye and blepharoplasty due to blepharochalasis were performed later.
Conclusions: We present a novel autosomally dominantly inherited Lys90Gln mutation in *TTR*. This is the first reported family with FAP in Finland where hereditary gelsolin type (AGel) amyloidosis is prevalent.

● Sa-Ba1-9

Higher age at onset of type 1 diabetes increases risk of macular edema

Hietala, Kustaa[1]; Forsblom, Carol[1]; Summanen, Paula[1]; Groop, Per-Henrik[2]
[1]University of Helsinki, Helsinki, FINLAND; [2]Folkhälsan Research Center, Helsinki, FINLAND

Purpose: To investigate whether age at onset of type 1 diabetes is a risk factor for clinically significant macular edema (CSME).
Methods: A sample of 1,354 patients with a mean duration of diabetes 24.6±11.6 years was drawn from the FinnDiane Study population and divided into age at onset groups 0-4 (n=184), 5-14 (n=662) and 15-40 years (n=508). Type 1 diabetes was defined as age at onset ≤40 years, C-peptide negativity and insulin treatment initiated within one year of diagnosis. Retinopathy status was assessed from fundus photographs and stereoscopic fundus examinations and graded with the ETDRS scale.
Results: After 30 years of diabetes, the estimated cumulative incidences of CSME were 17.0% (95% CI, 10.7-24.5) in age at onset group 0-4 years, 27.4% (95% CI, 22.7-32.4) in age at onset group 5-14 years, and 34.1% (95%CI, 27.3-41.0) in age at onset group 15-40 years (p=0.002). In a competing risks regression model, adjusted for covariates selected with Bayesian information criteria, age at onset 5-14 years (HR 1.89 [95%CI, 1.22-2.91], p<0.004), and age at onset 15-40 years (HR 3.72 [95%CI, 2.35-5.89], p<0.0001), were significant overall risk factors for CSME (p<0.0001). Higher ETDRS-score (HR 1.04 ([95% CI, 1.03-1.05]), HbA1c (HR 1.12 [95% CI, 1.02-1.23], p=0.016), and total cholesterol (HR 1.19 [95% CI, 1.04-1.37], p=0.013) also increased the risk of CSME.
Conclusions: Higher age at onset of type 1 diabetes is a significant risk factor for macular edema. This suggests that ageing may modify the risk of microvascular complications in type 1 diabetes.

● Sa-Ba1-10

The wishes of young adults with type 1 diabetes on organizing photographic screening for retinopathy

Savola, Laura[1]; Falck, Aura, MD[2]; Hautala, Nina, MD[2]
[1]University of Oulu, Oulu, FINLAND; [2]Oulu University Hospital, Oulu, FINLAND

Purpose: The aim of the study was to assess the views of a population with a long history of type 1 diabetes (T1D) on the frequency and the invitation system of photography screening for diabetic retinopathy (DR) in Finland.

Methods: The severity of DR was assessed from fundus photographs and a questionnaire was filled out by 121 subjects attending a follow-up study of DR. The patients, 70 men and 51 women, were 30±3 years of age and the duration T1D was 23±4 years. They were asked if screening should be a) free of charge and include all patients with T1D and even fetching from home those not responding to invitations, or b) free of charge and invitations sent up to 2 or 3 times if needed, or c) a possibility to make free appointments, or d) self-made appointments and a small fee, and how often they thought screening should take place.
Results: Screening was suggested to take place at 1.1±0.6 (range, 0.4-5) years intervals. Personal, and repeated if necessary, invitations for screening b) were wished by 81/121 (67%), while a) was suggested by 23/121 (19%), c) by 14 (12%) and d) by 3 (3%). Proliferative retinopathy was present in 34, and a third, 12, of these individuals were among those favoring very active screening a) (p=0.008).
Conclusions: Automatically, and repeatedly if needed, sent invitations by the health care system for free screening photography are wished by the great majority of young adults with T1D since childhood. In the opinion of most patients, screening for DR should take place once a year.

● Sa-Ba1-11

The 18-year-follow-up of diabetic retinopathy in young adults with type 1 diabetes since childhood - The Oulu Cohort Study of Diabetic Retinopathy

Hautala, Nina; Hannula, Virva; Palosaari, Tapani; Ebeling, Tapani; Falck, Aura
Oulu University Hospital, Oulu, FINLAND

Purpose: The present study elucidates the prevalence of diabetic retinopathy (DR) and the disparity in occurrence of DR between the genders in a cohort of young Finnish adults with type 1 diabetes (T1D) since childhood.
Methods: The original cohort population consists of 216 patients with T1D who lived in the Northern Finland in June 1989-March 1990 having follow-up visits at the paediatric diabetes clinic of the Oulu University Hospital. The prevalence of DR was evaluated by fundus photographs taken first in 1989-1990 at the age of 5-17 years and again in 2007. The prevalence of DR was analysed from 172 patients, 80% of the original cohort of 216, at the age of 22-35 years. 8 (4%) of the patients had died and 36 patients (17%) did not attend to the re-evaluation.
Results: No signs of DR were present in 11 (5%) of the living subjects, while 161 (77%) had any DR. Proliferative diabetic retinopathy (PDR) was documented in 60 of 208 cases (29%). The prevalence of any DR may vary between 77% and 95%, and that of PDR between 29% and 46% assuming the subjects not participating in the re-evaluation had either no DR or that all had PDR. There were no statistically significant differences between the genders in the prevalence of DR (p=0.36). The patients were 7±4 years of age (range, 0-15 years) when the diagnosis of T1D was made, and the average duration of diabetes at the time of the re-evaluation was 23±4 years (range, 17-32 years).
Conclusions: After 18 years of follow-up, the prevalence of any DR and PDR is high in both young men and women with T1D since childhood. The early age at onset of T1D as well as the long duration of diabetes increase the risk of microvascular complications, although the long-term risk associated with the childhood years of T1D on development of DR and PDR is not fully understood.

● Sa-Ba1-12

Fundus photography screening of diabetic retinopathy in the mobile eye examination unit EyeMo in Finland – 5-year experience in 2007-2011

Hautala, Nina
Oulu University Hospital, Oulu, FINLAND

Purpose: This study elucidates the 5-year experiences of screening for diabetic retinopathy (DR) by an alternative service model, mobile eye examination unit (EyeMo) in Finland.
Methods: During the years 2007-2011, 14,866 fundus photographs were taken from T1D and T2D patients in EyeMo in the Northern Ostrobothnian Hospital District. Fundus images were taken and transferred electronically to the Oulu University Hospital. The degree of retinopathy was determined by skilled nurses or an ophthalmologist.
Results: Seventy-eight percent of all diabetic patients in the area attended fundus photography screening. Of these patients, 43% had no signs of DR, 23% had mild background retinopathy and 31% had either moderate or severe background retinopathy or preproliferative retinopathy. The number of the patients who required treatment for proliferative retinopathy or macular edema had decreased from 5% in 2007 to 3% in 2011. The delay from fundus photography and its analysis to treatment was significantly shorter in EyeMo compared to those municipalities organising screening for DR alternatively. Both T1D and T2D patients in need for regular screening for DR have increased during past years.
Conclusions: The EyeMo is a feasible alternative model for screening of DR in sparsely inhabited area where the distances are long. As screening has become more effective, patients have an access to care earlier and the number of patients requiring treatment for severe DR has decreased. Moreover, increasing part of the screening population had not any DR. Since the mobile unit performs high-volume examinations with the same experienced personnel, the quality of the examinations as well as the implementation, modification and control of care protocols can be guaranteed and high-volume services translate also into lower unit costs.

● Sa-Ba1-13

The EU Medical Devices Legislation in Diabetic Retinopathy Screening

Forsvik, Heikki; Voipio, Ville; Lamminen, Johanna
Tampere University of Technology, Tampere, FINLAND

Purpose: The objective is to find out how the EU legislation over medical devices affects the diabetic retinopathy screening by fundus imaging when there are multiple organisations participating in the process.
Methods: The study is carried out as a literature review. The main literature consists of the relevant EU directives and different official and semi-official guidelines of their application. These regulatory documents are reflected onto the workflow of fundus

imaging and image interpretation in diabetic retinopathy screening to find out how the medical directive should be taken into account in this task.
Results: Technically, diabetic retinopathy screening is a three-step process: the image is acquired with a fundus camera, stored into a data storage, and finally viewed and possibly processed. In addition to these steps the image is transferred over various data transfer paths. The fundus camera system seems to be a medical device governed by the directives. The situation with software is complicated; the medical device classification of a computer program depends on the intended use of the program. So, the legal status of storage software, image processing software, and the viewing station is ambiguous. Especially the image processing part is complicated, as the image processing changes the original image.
Conclusions: The EU medical devices legislation has been extended in 2010 to cover software intended for diagnostic or therapeutic purposes. The practical implications of the legislation are still partly unclear, and in the case of diabetic retinopathy screening it is difficult to define which parts of the process the directives cover. However, finding the answers to these questions will help to improve the technical quality of fundus imaging.

● Sa-Ba1-14

Photographic follow-up of diabetic patients after scatter laser photocoagulation: preliminary results

von Wendt, Gunvor[1]; Lanki, Helena[2]; Sipilä, Virpi[2]; Uhlenius, Nina[2]; Kähönen, Matti[2]; Kivelä, Tero[3]; Summanen, Paula[2,3]
[1]St Erik's Eye Hospital, Stockholm, SWEDEN; [2]Municipal Health Care, City of Helsinki, Helsinki, FINLAND; [3]Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To study the frequency of neovascularisation on the disc (NVD) or elsewhere on the retina (NVE), or both, in diabetic patients after fundus scatter photocoagulation for either severe non-proliferative or proliferative diabetic retinopathy.
Methods: During 2.5 months in 2010, 48 patients fulfilling the above mentioned criteria underwent 60° red-free digital fundus photography at Herttoniemi Hospital. In screening purpose 2 images, one macula and the other optic disk cantered are taken, but after laser treatment, additional fields as well. There were 18 men and 30 females, 32 with T1D and 15 with T2D. The average duration of diabetes was 34 and 15 years, and the age at the examination 50 and 67 years (range, 28-74 and 42-83, respectively). One person had secondary DM. Two patients had only one eye, and for 5 patients only one eye was treated; thus 89 eyes were eligible for the evaluation. The median number of images per eye was 6; 2 for only 3 eyes. Two ophthalmologists graded the fundus images for the extent of panretinal photocoagulation (PRP) and the presence and location of NVDs and NVEs.
Results: Of the 89 eyes, 38 had full and 41 incomplete PRP, and 10 had local/sectorial scatter laser. The quality of the picture did allow the assessment of NVDs in all but three and NVEs in all but 7 eyes. NVDs were found in 2 patients, bilaterally in one (3/86, 3 % of eyes) and were suspected in 3 more eyes. NVEs were found in 11 eyes of 9 patients (11/82, 13% of eyes) in untreated areas or among laser scars. The majority of NVs were located superotemporally. Nine of 11 persons with active NVs had T1D. Seventeen patients were referred for clinical evaluation and treatment.
Conclusions: As the number of laser treated diabetic patients is increasing, efficient ways to detect further NVs are needed. Fundus photography may serve as a follow-up method, however, as majority of NVEs may occur outside the disc and macula centered fields, additional fields are needed.

● Sa-Ba1-15

A sudden visual loss of a cigar-smoking man: central retinal vein occlusion and genetic trombophilia

Usmi, Petri[1]; Summanen, Paula[1];Lassila, Riitta[2]

[1]Helsinki University Central Hospital/Ophthalmology, Helsinki, FINLAND, [2]Helsinki University Central Hospital/Haematology, Helsinki, FINLAND

Summary: A 52-year-old man was seen for sudden visual loss, RE, since yesterday. He was healthy (BP 129/90 mmHg, height 176 cm, weight 65 kg, no family history). He smoked cigars. VA was CF at 1.5 m/1.0. Anterior segment and media were normal with IOP 20/19 mmHg. Dilated fundus examination revealed dilated tortuous veins, edema and haemorrhages in all quadrants and optic disc edema. Central retinal vein occlusion (CRVO) was diagnosed. Left fundus had reduced AV-ratio, narrow arterioles and mild AV-nickings. MRI was normal. SR, CRP and blood cell count were normal, HB was high 170 mmHg. Coagulation activity was elevated (thrombin time 17 s [normal 17-25], D-dimer 1.2 mg/L [<0.5], fibrinogen 4.7 g/L [1.7-4]) but FVIII normal. Homocystein was raised at 16.5 µM. LMW heparin, enoxaparin 60 mgx2 s.c. and B-vitamin were initiated. LDL was high 5.9 mmol/l and simvastatin was started. Cessation of smoking was recommended. p.R506Q mutation (c.1691G>A) leading to resistance of the activated protein C was found and he was homozygotic for FV Leiden. Genetic testing was recommended for relatives. Anticoagulation (AC) for at least 3 months was planned. A month later coagulation activity had improved and treatment continued. VA was 1.0/1.0 and disk edema and venous tortuosity had disappeared with few haemorrhages left. Chest pain experienced recently had disappeared. Whether the clinical picture and response to AC in CRVO and genetic thrombophilia differs from those without genetic predisposition is unknown. Prevalence of FV Leiden mutation is 2-5% but 10-20% in those with venous thrombosis. In heterozygotes the risk is 2-5X and in homozygotes at least 10X higher. Coincidence of risk factors (smoking, hyperlipidemia and thrombophilia) may increase the severity of thrombotic process. Diagnosing coagulation defects is essential for tailoring prophylaxis and appreciating thrombosis risk in first degree relatives.

POSTER SESSION 2: NEURO-OPHTHALMOLOGY, GLAUCOMA, UVEITIS AND STRABISMUS

● Su-Ba1-1

The intrinsically photosensitive retinal ganglion cell function is possibly upregulated in non-arteritic ischemic optic neuropathy patients

Herbst, Kristina[1]; Sander, Birgit[1]; Hannibal, Jens[2]; Lund Andersen, Henrik[1]; Milea, Dan[3]
[1]Glostrup Hospital, Glostrup, DENMARK; [2]Bispebjerg Hospital, Copenhagen, DENMARK; [3]University Hospital Angers, Angers, FRANCE

Purpose: A key indicator of the intrinsically photosensitive retinal ganglion cells (ipRGC) activation is a persistent pupil contraction after exposure to bright blue (480 nm) light. We aimed to explore whether the ipRCG pupil response is decreased in patients with a unilateral non-arteritic anterior ischemic optic neuropathy (NAION).
Methods: A consensual pupil response to blue (470 nm) or red (660 nm), continuous (20 s), bright (300 cd/m2) light was recorded in each eye of 11 NAION patients. Responses elicited in the affected eyes were compared to the contralateral non-affected eyes and to healthy controls (n=11). The response was calculated during illumination (maximal and sustained amplitudes) and after light offset (postillumination response). The latter was assessed as area under the curve (AUC) within 0-10s (early response) and 10-30s (late response) after light offset. A retinal nerve fiber layer (RNFL) thickness was measured by OCT.
Results: The pupil response of the affected eyes was significantly reduced for blue and red stimuli compared to the contralateral non-affected eyes. This indicated ganglion cell atrophy, which was confirmed by a decreased RNFL thickness ($p<0.001$). However, when compared to the controls, the postillumination responses were not reduced. Additionally, the postillumination response of the non-affected eyes versus the controls was increased ($p<0.01$) at blue light conditions.
Conclusions: Despite a significant atrophy of the retinal ganglion cells caused by NAION, ipRGC function (determined from pupil responses) was not decreased. Moreover, for the contralateral nonaffected eyes, we observed increased ipRGC function. This suggests a possible compensatory ipRGC upregulation after a unilateral NAION. We speculate where in the pupil reflex arc this may occur.

● Su-Ba1-2

Overexpression of the *N*-terminal domain of collagen XVIII affects eye growth, intraocular pressure and cataract formation

Hurskainen, Merja[1]; Aikio, Mari[2]; Brideau, Gaëlle[2]; Hägg, Pasi[3]; Veijola, Jukka[3]; Sormunen, Raija[2]; Heljasvaara, Ritva[2]; Pihlajaniemi, Taina[2]
[1]University of Oulu/Oulu University Hospital, Oulu, FINLAND; [2]University of Oulu, Oulu, FINLAND; [3]Oulu University Hospital, Oulu, FINLAND

Purpose: In humans, lack of collagen XVIII leads to Knobloch syndrome with eye abnormalities such as severe myopia, lens abnormalities, vitreoretinal degeneration, macular abnormalities, iris pigment on the anterior lens capsule, shallow anterior chambers and retinal detachment. In mice, lack of collagen XVIII results in delayed regression of the hyaloid vasculature and abnormal vascularisation of the retina, atrophy of the ciliary body and fragility of the iris and attenuation of vision.
Methods: The purpose of this study was to evaluate the functions of the short *N*-terminal non-collagenous (NC) domain of collagen XVIII in the mouse eye, using transgenic mice overexpressing the short *N*-terminal NC domain of collagen XVIII [Sh1 (heterozygous) and Sh2 (homozygous) mice].
Results: Sh1 and Sh2 mice showed increased axial length in FVB background, but not in C57 background. IOP was statistically significantly reduced in the homozygous transgenic Sh2 mice compared to controls in FVB strain at the age of 6 months, and significantly increased in heterozygous transgenic Sh1 FVB mice over 1 year of age. Also, transgenic mice in the FVB stain had a remarkable incidence of cataract, lens subluxation, phthisis, retinal detachment and degeneration, corneal vascularisation and opacities and intraocular haemorrhages. Occasionally, folds in the Descemet's membrane and excessive material on zonules were seen in the transgenic mice. EM revealed excess of fibrillin near the CB as well as intraocular inflammatory cells and calcification. Indirect ophthalmoscopy of FVB mice revealed cupping of the ONH, and sections of the ON showed diminished amount of myelinated axons in the Sh1 mice.
Conclusions: Overexpression of the *N*-terminal domain of collagen XVIII affects eye growth, intraocular pressure and cataract formation.

● Su-Ba1-3

Correlation of glaucoma frequency with environmental and geographical factors in Kyrgyzstan: an epidemiological study

Imanbaeva, Saltanat
Microsurgery Department/Ophthalmology, Bishkek, KYRGYZSTAN

Purpose: Glaucoma is the main driver of blindness growth in the world, Kyrgyzstan is not the exception. Ministry of Healthcare of Kyrgyzstan estimates that glaucoma is the most common reason for disability and blindness: 30.2%. In the past glaucoma used to affect older people, but recently glaucoma is commonly observed in people younger than 30 years. In other words, glaucoma

problem transformed from ophthalmologic to a social one. There is a need for development of preventive measures.
Methods: Statistical analysis of Ministry of Health annual reports was made (2004-2009).
Results: Trend showed that compared to other eye diseases glaucoma was the main reason for blindness. In 2004 there were more than 6,000 patients with glaucoma in Kyrgyzstan. At the end of 2007 there were 7,904 patients with glaucoma in Kyrgyzstan. On average 24% of the total glaucoma patients in Kyrgyzstan were from the Osh region (southern Kyrgyzstan), 17% from Bishkek (Capital, northern Kyrgyzstan) and 12% from other regions. High level of glaucoma in Bishkek is probably due to better access to medical care by patients compared to other regions. High level of glaucoma in Osh region (south) can be attributed to various environmental, geographical, social and economic factors. The climate in the south of Kyrgyzstan is hotter, poverty level is higher and the landscape is different to northern Kyrgyzstan. In the other northern regions (non-Bishkek) such as Naryn, Talas, Issyk-Kul glaucoma patients constituted on average 12% of the total.
Conclusions: Glaucoma rates were higher in the southern regions, where climate is hotter, compared to the northern regions.

● Su-Ba1-4

Diagnostic accuracy of scanning laser polarimetry and optical coherence tomography in primary diagnostics of glaucoma

Lindbohm, Nina[1]; Harju, Mika[2]
[1]Helsinki Private Eye Hospital, Helsinki, FINLAND; [2]Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: The aim of the study was to evaluate the diagnostic accuracy of scanning laser polarimetry (GDx®) and optical coherence tomography (OCT) in patients with suspect glaucoma.
Methods: We examined 200 eyes of 100 subjects with suspect glaucoma. Glaucoma suspicion was defined as intraocular pressure (IOP) repeatedly >21 mmHg, optic nerve head (ONH) cup/disc (C/D) ratio 0.6 or more, disobedience of the ISNT-rule, or C/D ratio asymmetry between eyes of >0.2. Examined eyes were considered normal or glaucomatous based on the examination of the retinal nerve fiber layer (RNFL) photographs, the visual field examined with the Humphrey® automatic perimeter, and the appearance of the ONH. Two out of three positive results were required for the diagnosis of glaucoma. The peripapillary RNFL was examined with GDx® and Cirrus® OCT. The GDx® result was considered glaucomatous if the acquired RNFL thickness was less than the lower 1% limit of the normal population in the mean, superior, or inferior average, or the nerve fibre index (NFI) was>50. OCT was considered glaucomatous if the mean or any quadrant or clock hour RNFL thickness was less than the lower 1% limit of the normal population.
Results: Based on ONH appearance, RNFL photography and automated perimetry, glaucoma was detected in 39 of 200 eyes. The sensitivity and specificity of GDx® to detect these eyes was 49% and 84%, respectively. The corresponding sensitivity and specificity of OCT was 41% and 86%. The diagnostic accuracy was 78% for both tests.
Conclusions: The sensitivity of OCT and GDx® is poor in a setting where only 20% of eyes have glaucoma, if diagnosis by ONH and RNFL appearance and visual field testing is considered accurate.

● Su-Ba1-5

Using silicon drainages in repeated non-penetrating deep sclerectomy (NDSE) in patients with failed previous glaucoma surgery

Imanbaeva, Saltanat
Microsurgery Department/Ophthalmology, Bishkek, KYRGYZSTAN

Purpose: In some patients, in different periods after anti-glaucoma operations, relapse of IOP is observed. More lasting decrease of IOP in terms of duration and level is still achieved after trabeculectomy, which has high percentage of serious sight-threatening complications. The goal of the study is evaluation of efficacy and safety of conducting repeated non-penetrating deep sclerectomy (NDSE) in patients with operated primary open-angle glaucoma.
Methods: For periods 2000-2008, 378 NDSE procedures in 363 patients with open-angle glaucoma were performed. Patient's age: 61.0±11.5. Forty-eight (12%) of eyes with operated glaucoma. In 23 cases, silicon tunnel drainage was used, in 25 cases silicon porous drainage was used, with suggested modification. Follow-up period is from 1-18 months.
Results: 1. At the time of last visit, qualified success with IOP ≤21 mmHg was achieved in 29 eyes (60%) without medication; 19 eyes (39%) were medically controlled. 2. IOP was reduced; visual acuity improved in 36 eyes (75%) and remained the same in 12 eyes (25%) 3. IOP was reduced from 24.3±3.9 mmHg pre-operatively to 17.9±3.1 mmHg post-operatively 4. Only major complication in 6 eyes (12%) was microperforation. After the surgery in a group of patients with silicon tunnel drainages IOP was reduced from 27.3±3.9 to 20.5±3.2 mmHg. After the surgery in a group of patients with silicon porous drainages IOP was reduced more significantly from 27.3±3.9 to 17.9±3.1 mmHg.
Conclusions: Despite surgery being repeated, this study could confirm efficacy and safety of repeated NDSE. After repeated NDSE complication rate is very low. For the purpose of increasing the efficacy of surgery we used two types of silicon drainages, porous and tunnel. Porous silicon drainage was more efficient for reduction of the IOP in terms of both level and duration

● Su-Ba1-6

Diode-laser contact transscleral thermotherapy of ciliary body: a new treatment procedure for absolute glaucoma

Boiko, Ernest; Kulikov, Alexey; Skvortsov, Viacheslav
Medical Military Academy, RUSSIAN FEDERATION

Purpose: In recent years transscleral diode laser cyclophoto-coagulation (TDLC) has become an alternative to enucleation in absolute glaucoma. This allows controlling pain in 98% and de-creasing intraocular pressure in 88%, thus saving the eye. When per-forming TDLC during routine procedure (P=0.8-2.5 W, t=1-6 s) ciliary body tissue coagulation occurs, which is accompanied by a pop effect in 71.3% of cases. This indicates vaporising mechanic-al tissue lacerations. This results in intraocular haemorrhage in 11.4% of cases, which complicates the postoperative course and imposes limitations to the use of the given technique. To improve

laser cyclodestruction a technique based on a biological effect of thermotherapy instead of coagulation was studied.
Methods: The experimental part of the study includes 36 rabbits which underwent diode laser transscleral exposure of ciliary body in various modes. The clinical part of the study includes 47 patients, who underwent transscleral thermotherapy of ciliary body (TSTT CB) using a recommended mode (P=0.4-0.5 W, t=15-20 s).
Results: The experiment showed that in order to decrease the risk of haemorrhagic complications upon achieving adequate changes in ciliary body processes (due to thermal effect) it is advisable to decrease laser radiation power, while increasing exposure. Clinical use of the developed TSTT CB procedure demonstrated the decrease of haemorrhagic complications rate from 11.4% to 1.2%. Also, ciliary body thermotherapy appeared to be as effective as traditional TDLC: there was no pain syndrome, and intraocular pressure remained normal in 83.3% and 81.5% of patients, respectively, during a year.
Conclusions: The recommended treatment procedure of absolute glaucoma (TSTT CB) is as effective as traditional TDLC. At the same time it is safer, because it allows a significant decrease of haemorrhagic complications rate.

● Su-Ba1-7

Version of cosmetic rehabilitation of patients with post-traumatic uveitis of the blind eye

Shamrey, Denis; Sosnovsky, Sergey; Kulikov, Alexey
Medical Military Academy, RUSSIAN FEDERATION

Purpose. The posttraumatic partial atrophy of the eyeball after a heavy injury develops in 6.5-26.5% of patients and is often accompanied by a slow chronic uveitis. In these cases, for prevention of a sympathetic ophthalmia enucleation of the eyeball is carried out, which often results in cosmetic defects. The purpose of this paper is to make an analysis of cosmetic rehabilitation of patients after an evisceration with porous polytetrafluorethylene implant implantation at post-traumatic uveitis on partially atrophic blind eyes.
Methods: Forty-six patients with posttraumatic slow uveitis on partially atrophic blind eyes underwent an operation, "a back evisceration", consisting of removal of distant internal covers from the posterior segment of the eyeball. Then in the fibrous capsule of the eye an ophthalmologic implant from porous polytetrafluoroethylene with a diameter of 20 mm was placed. With 12 patients, who had a considerable (over 5 mm in comparison with the fellow eye) reduction of the axial length of the eyeball, an operation was supplemented with the donor "back" scleroplastic surgery. Cosmetic effect was estimated by the volume of movements of the created stump and a cosmetic thin-walled artificial limb in degrees. Efficiency of rehabilitation was estimated with the use of aesthetics factor. Follow-up time lasted from 3 months to 4 years.
Results: Mobility of the stump made up 181.8±18.7°. Mobility of the cosmetic artificial limb, set on the created stump, made up 147.0±23.4°. Mobility of intact eyes made up 205.3±16.2°. Factor of aesthetics accounted to 76.4±13.5%.
Conclusion: The offered way of formation of locomotor stump of eyes provides high level of cosmetic and social rehabilitation in patients with posttraumatic uveitis.

● Su-Ba1-8

Difference in the anterior chamber angle of the four meridians

Källmark, Fredrik; Pettersson, Lovisa
Karolinska Institutet, Stockholm, SWEDEN

Purpose: This present study aimed to investigate the changes in the anterior chamber angle width according to four different meridians correlated with the individual grade of ametropia, strabismus and corneal thickness.
Methods: Both eyes of 50 healthy subjects were included in the study. The angle width was measured in four meridians (0°, 94°, 180°, 274°) three times in each eye with the Sirius® Scheimpflug camera.
Results: The result shows that in a mixed population of different grades of ametropia and strabismus the nasal angle is narrower than the equivalent angle on the temporal side. In the same group no difference between the inferior and superior angle was found. A significant difference between the group of exophorias and ortophorias was found whereas the subjects with exophoria had a greater difference between the nasal and temporal angle. No correlation between difference in angle and corneal thickness was found.
Conclusions: When examining the chamber depth it is important to take this difference into account and always examine both the nasal and temporal angle, especially when the patient has exophoria.

POSTER SESSION 3: CORNEA, ONCOLOGY, OCULOPLASTICS, VISUAL REHABILITATION AND OPHTHALMIC HISTORY

● Mo-Ba1-1

Chronic adenoviral conjunctivitis and local cytokine state

Chernakova, Galina[1]; Kochergin, Sergey[1]; Klescheva, Elena[1]; Mezentseva, Marina[2]
[1]Russian State Medical Academy of Postgraduate Education, RUSSIAN FEDERATION; [2]Gamaleya Epidemiology and Microbiology Research Institution, RUSSIAN FEDERATION

Purpose: Adenoviral conjunctivitis may manifest both in acute and chronic forms, although its chronic form is less known by ophthalmologists. Adenoviruses are capable of establishing tissue latency, including in the conjunctiva.
Methods: Sixty patients with chronic adenoviral conjunctivitis (group A) were followed up for approximately 3 weeks. All of them had a history of acute conjunctivitis during the last 2 years and positive results to adenoviral DNA by PCR (100%). Besides, all probes were negative for HSV and *Chlamydia* spp. After the initial eye examination, topical treatment was indicated, including recombinant IFN, non-steroidal anti-inflammatory drugs, and antiseptics. Local cytokine state was evaluated from conjunctival scrapings on the 1st, 7th and 14th day in group A *vs.* healthy volunteers (n=60) by both gene cytokine expression (RT-PCR) and real cytokine quantities by cytoflowmetry.
Results: We revealed raised mRNA IFN-γ, IL-2 ad IL-6 expression in group A *vs*. healthy controls before treatment with step-by-step reduction during the disease course. Raised amounts of IFN-γ and IL-2 with simultaneously normal IL-4 and IL-13 testify about cytokine imbalance, mediated by adenovirus. By the 7th day, we observed reduction of symptoms, accompanied by lowed cytokine quantities. However, PCR was still positive in 80%. By the 14th day only 15% of patients showed moderate (+1) conjunctival redness, which corresponded to further cytokine decrease and reduced percentage of patients with positive PCR (35%). The majority (95%) had chronic GI, dental and throat infections.
Conclusions: Chronic adenoviral conjunctivitis is a special clinical form with its own immune pathogenesis and clinical manifestations defined by decreased symptom intensity and positive PCR to adenoviral DNA.

● Mo-Ba1-2

Ocular lesions associated with paraneoplastic pemphigus (PNP): case report

Goulia, Olga; Gkika, Maria; Rasoglou, Achileas; Boutas, Stelios
Euromedica Blue Cross Clinic, Thessaloniki, GREECE

Purpose: To report a case of paraneoplastic pemphigus (PNP) with ocular involvement.
Methods: A 78-year-old man presented at outpatient service complaining of irritation, burning and foreign body sensation in the eyes and burning in the oral cavity for a week. He had already received a month of treatment with antihistamines for pruritic, urticarial plaques over the limbs prescribed by an internist. His medical history was positive for chronic lymphocytic leukemia.
Results: Dry eye was diagnosed and the patient was administered tear substitutes. A month later, the patient returned with acute conjunctivitis, crusts in the lips, painful erosive stomatitis and exacerbation of the skin lesions. He was referred to the Department of Oral Pathology, where he was diagnosed with PNP. Death occurred 3 months after the diagnosis, as a result of respiratory infection and failure.
Conclusions: PNP is a haematologic and non-haematologic, malignancy-driven, autoimmune multiorgan syndrome. Treatment of PNP is difficult and unsatisfactory and the prognosis is poor. Ocular involvement in PNP is an early or late manifestation characterised by autoimmune-induced conjunctival inflammation and dry eye disease with consequent lid and corneal affection, which may eventually result in permanent visual loss. Ocular disease can be difficult to treat. The main aid is early detection and management by taking careful attention to symptoms and signs of early ophthalmic disease and by achieving a good collaboration between ophthalmologists, oral pathologists and dermatologists. Management usually involves aggressive lubrication, therapeutic contact lenses, topical antibiotics and systemic therapy with immunomodulators to control inflammation and to prevent irreversible blindness, as well as surgical intervention in advanced cases.

● Mo-Ba1-3

Morphologic investigation of the limbal stem cell niche in aniridia by *in vivo* confocal microscopy

Lagali, Neil[1]; Eden, Ulla[1]; Utheim, Tor Paaske[2]; Chen, Xiangjun[2]; Riise, Ruth[2]; Dellby, Anette[1]; Fagerholm, Per[1]
[1]Linköping University, Linköping, SWEDEN; [2]University of Oslo, Oslo, NORWAY

Purpose: To document the *in vivo* morphology of the corneal limbal stem cell niche in patients with varying degrees of aniridic keratopathy.
Methods: Thirty subjects were examined and consisted of patients with aniridia and unaffected family members. The grade of aniridic keratopathy, limbal involvement, and transparency were assessed by slit lamp biomicroscopy, and the limbal palisades region of the cornea was examined in all subjects (bilaterally where possible) by laser-scanning *in vivo* confocal microscopy.
Results: In patients with the most severe stages of aniridic keratopathy, the limbal stem cell niche was completely absent and replaced by blood vessels, inflammatory cells and tissue with a conjunctival phenotype. In those with milder keratopathy and clear corneas, limbal palisades were altered to varying degrees, with some corneas appearing morphologically normal. In corneas with mild keratopathy, *in vivo* image montages revealed varying patterns of palisade ridges and focal stromal projections and, surprisingly, similar patterns were observed in some unaffected relatives. The density and distribution of ridges and focal stromal projections in the limbal palisades region appears to be complex and varying, for as yet unknown reasons. Some of these structures also appear to be redundant, as a possible protection mechanism.
Conclusions: Correlation between limbal palisade morphology and severity of keratopathy was present and could be used as a prognostic or early screening tool and as a possible indicator of the

potential for adverse reaction of the cornea to therapeutic ocular interventions.

● Mo-Ba1-4

Cataract, cataract surgery and keratopathy in patients with congenital aniridia

Eden, Ulla[1]; Lagali, Neil[1]; Utheim, Tor Paske[2]; Riise, Ruth[3]; Fagerholm, Per[1]
[1]University of Linköping, Linköping, SWEDEN; [2]Oslo University Hospital, Oslo, NORWAY; [3]Norwegian Association for the Blind and Partially Sighted, Oslo, NORWAY

Purpose: To establish what type of cataract is predominant in aniridia and to describe at what age cataract surgery is performed, and to assess the outcome of cataract surgery and to what extent surgical procedures influence the keratopathy.
Methods: Fifty-four eyes with aniridia in Norway were examined in 2012 and out of them 32 eyes had been examined also earlier, in 2004. Visual acuity, corneal sensitivity, tear quantity and quality (tear film break-up time, BUT) was assessed. Slit lamp examination was supplemented with digital photographs. Anterior segment optical coherence tomography, ultrasound pachymetry and *in vivo* confocal microscopy were employed in the second examination.
Results: All but two of the patients had cataract or had undergone cataract surgery. Posterior and sometimes anterior polar cataract was the predominant feature, later combined with superficial posterior zonular opacifications. The youngest patient with cataract was only 2 years old. Fifty percent of the eyes had undergone intraocular surgery. Out of the 9 patients with increasing keratopathy, intraocular surgery had been performed in 4 eyes. In 3 patients, intraocular surgery had been done in just one eye, however, keratopathy did not appear to worsen due to surgery. All eyes in the group with severe keratopathy had decreased BUT and 50% in the group with mild keratopathy.had it as well. In 60% of the eyes with severe keratopathy, the corneal sensitivity was decreased compared to one of the eyes with mild keratopathy.
Conclusions: Polar lens opacifications were common and cataract developed very early in life. Factors that may predict the progression of keratopathy are decreased BUT, corneal sensitivity and ocular surface disorders. The influence of cataract and glaucoma surgery on aniridic keratopathy will be reported.

Mo-Ba1-5
Multiple myeloma of the iris: response to bortezomib

Kivelä, Tero
Helsinki University Central Hospital, Helsinki, FINLAND

Purpose: To report response to systemic bortezomib of a relapse of multiple myeloma in the iris.
Methods: A 60-year-old man was diagnosed with multiple myeloma, IgGλ type (stage IIIA) in 2000. He was first managed with vincristine, adriamycin and dexamethasone, resulting in partial response (PR), and then with cyclophosphamide and dexamethasone, resulting in complete response (CR), followed by autologous stem cell transplantation. No M-component was detected until May 2008, when a solitary plasmocytoma of the humerus appeared and was managed with thalidomide. Soon thereafter, a new, diffusely infiltrating unilateral iris lesion developed.
Results: At diagnosis the patient was asymptomatic with 20/20 vision, IOP 14 mmHg, and cells in the anterior chamber. The iris was diffusely reddish with a circle of pigment epithelial cysts around the pupillary margin. The fundus was normal. He received two courses of bortezomib, a reversible proteasome inhibitor, with dexamethasone. After the 1st course, the cells and the redness of the iris disappeared. Two months after the 2nd course of bortezomib, while on lenalidomide maintenance therapy, he continued to be asymptomatic with an IOP of 14 mmHg and a normal iris.
Conclusions: Bortezomib was effective in eradicating an intraocular relapse of multiple myeloma in a patient who previously had received several types of conventional chemotherapy.

● Mo-Ba1-6

Orbital abscess and foreign body: treatment, results and long-term outcome

Vares, Piret; Vesti, Eija; Irjala, Heikki; Kinnunen, Ilpo; Liukkonen, Janne
University of Turku, Turku, FINLAND

Purpose: Orbital abscess is usually a complication of paranasal sinus infection. Trauma and orbital foreign body are also causes. Prompt action is needed to treat these complications to prevent deterioration of situation. Intravenous antibiotics and abscess drainage are the methods of treatment. Postoperative complications may arise even with adequate treatment. Our aim was to seek short and long-term postoperative symptoms.
Methods: This was partly a retrospective study of all patients admitted to the ENT ward in 1997-2008 who went through surgery due to orbital foreign body, orbital or subperiosteal abscess. All patients were invited to a follow-up visit to determine any long-term symptoms and they were asked to complete a follow-up questionnaire.
Results: Ten patients were included in the study. Four of them had an abscess due to sinus infection, three had trauma-induced abscesses, in one case the etiology was unknown and two had a history of orbital foreign body. Three patients attended to the extra follow up and two besides them completed the follow up questionnaire. Four patients had preoperative diplopia and three (30%) had diplopia during discharge. Long-term diplopia remained in 20%. A patient with trauma-induced abscess presented with short-term loss of visual acuity, but malposition of the eye and diplopia remained the long-term problems. Another patient with foreign body retained no visual acuity and his eye remained opthalmoplegic with upper lid ptosis. Visual acuity returned to the preoperative level in all the other patients.
Conclusions: Despite severe preoperative findings almost all symptoms subside fairly rapidly after surgical abscess drainage. In serious cases diplopia and loss of visual acuity remain even with appropriate treatment.

● Mo-Ba1-7

Using registry data to monitor the ophthalmological and social status of visually impaired persons in Finland

Ojamo, Matti
The Finnish Federation of the Visually Impaired, Helsinki, FINLAND

Purpose: The Finnish Register of Visual Impairment was founded by the national Board of Health in 1983. According to an Act, health care authorities and institutions are responsible for forwarding to the Registry basic medical information on persons with visual impairment. Together with a governmental office (THL) the Finnish Federation of the Visually Impaired maintains the Registry. The Registry serves as a basis for preventive measures and treatment of visual impairment, as well as for planning of rehabilitation and other special services for persons with visual impairment. In addition, the Registry provides research material on ophthalmological diseases and visual impairment. It also aims to promote and support research in the field.
Methods: Central statistics illustrating the profile of visual impairment can be found in the Annual Report released by the Registry
Results: According to the latest statistics for 2010, the mean age of visually impaired persons in Finland is 79 years. Age-related diseases cause 46% of visual impairment, hereditary diseases 15%, neurological diseases 13%, congenital causes 9% and diabetic retinopathy 7%. AMD covers 42% of all diagnoses. Seventy-seven percent of visually impaired persons have low vision, 21% are blind and 2% have an unknown degree of visual impairment. Every 5 years, special statistics on the social status of the visually impaired persons (VIP) are produced using national census data combined with the Registry. These statistics show that in the working age group 22% of the VIP is fully employed and another 22% are partially employed. In the same age group, 44% have got only basic education (up to 9 years), 41% have secondary education and 15% have higher education (13 years+).
Conclusions: The Registry provides useful and up-to-date information that can freely be accessed at: www.nkl.fi\nvrek > Annual Statistics

● Mo-Ba1-8

The last image: on the history of optography

Gerstmeyer, Kristian[1]; Ogbourne, Derek[2]; Scholtz, Sibylle[3]
[1]Augen-Praxisklinik Minden, Minden, GERMANY; [2]Museum for Optography, UNITED KINGDOM; [3]University of Heidelberg, Heidelberg, GERMANY

Purpose: How to identify, by fixation on the retina, the last image a person appears to see before dying and its use in criminology was first explored in the 17th Century and then at the end of the 20th Century when the forensic use of optography was still a matter of research. This poster illustrates the history of optography.
Methods: Selective literature, research of books and articles in journals via PubMed, Google Scholar and Google, in close co-operation with the Museum of Optography.
Results: In the middle of the 17th Century, the monk Christopher Schiener discovered by chance, on the retina of a frog, an image of a flame. This he interpreted as the last thing the frog had seen before it had died. This last image on the retina became known as an "optogram" (optography: the process, optogram: the product). In the 260 years of history of optography the region of Heidelberg has mainly been its centre of research: Heidelberg's physiologist Wilhelm Kühne produced the first identifiable optograms. In 1880 he uncovered in the eye of an executed man in Bruchsal the first human optogram. In 1975 due to improved knowledge and modern techniques the importance of optography for criminology has been evaluated again by ophthalmologists from Heidelberg and conclusively assessed in the negative.
Conclusions: If any, the scientific importance and benefit of optography is rated as minimal today. Historical considerations of using optography as a forensic instrument were not realised. Meanwhile, as a subject for the visual and literary imagination, optography has been a fruitful area of investigation, often interpreting this fascinating borderline between life and death in new and exciting ways.

● Mo-Ba1-9

Fifty years of soft contact lenses: life and impact of prof. Otto Wichterle

Scholtz, Sibylle; Auffarth, Gerd U
University of Heidelberg, Heidelberg, GERMANY

Purpose: Prof. Otto Wichterle was one of the most important pioneers of modern soft contact lens industry; his work has made a significant impact on the ophthalmic world. Fifty years ago, in 1961, Wichterle produced the first soft contact lenses. Due to his work, nowadays millions of people around the world enjoy comfortable vision correction with soft contact lenses. This poster honours Wichterle's scientific achievements.
Methods: Our poster is based on an intensive literature research of current and historic literature via PubMed, Google Scholar and Google in order to document the life and to evaluate the scientific impact of Wichterle's work.
Results: Our poster gives an overview of life and the impact on ophthalmology by the Czechoslovakian chemist prof. Otto Wichterle born in 1913. The most important steps in the development of soft contact lenses will be shown and the impact on the visual correction of millions of people with refractive errors will be discussed. Today contact lenses gain more and more importance again when the visual function needs to be improved while suffering from complications after refractive surgery.
Conclusions: Prof. Otto Wichterle was an outstanding man of honour and a remarkable scientist. His vision of life without glasses became reality by his tenacity and exceptional commitment to science, even under adverse conditions for which he was not responsible. Due to his attainment of creating soft, hydrophilic contact lenses, millions of people suffering from refractive errors have been able to achieve natural vision again. From Prague around the world – in only 50 years Otto Wichterle's invention conquered the globe!

All Authors Index