Cataract I Refractive Contact Lenses

[7768] Posterior Corneal Asphericity and the refractive outcome after a combined phacovitrectomy

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Purpose: Our aim was to assess the correlation of posterior corneal Asphericity to the IOL power calculation errors using the SRK-T and Barrett II universal formulas for eyes after a combined Phacovitrectomy with internal limiting membrane (ILM) peeling. **Methods:** We retrospectively analyzed Forty-one eyes of forty-one patients, who were evaluated following a combined Phacovitrectomy with ILM peeling. Intraocular lens (IOL) power was calculated using the SRK-T and Barrett II universal formulas. All surgeries were performed by one fellowship trained vitreoretinal surgeon between 2016 and 2021. The actual difference between the achieved and target refraction was calculated for prediction error. The mean absolute error (MAE) was taken as the absolute value of the prediction error. **Results:** Forty-one eyes of 41 patients were included, all had at least 1-month postoperative data. 19 eyes were of females (46%) and 22 of males (54%). The average age of the study population was 77.5 ± 10.7 years. The mean axial length was 22.7 ± 4.6 mm, the mean anterior chamber depth was 3 ± 0.8 mm, the mean posterior Q-value was -0.29 +/- 0.27. The mean absolute error (MAE) for both formulas 1 month post-operatively for SRK-T and Barrett II universal formula, were 0.73 and 0.65, respectively. Multiple regression analysis showed a significant correlation between posterior corneal asphericity and SRK-T mean absolute error ($r=0.35$, $R2=0.12$, $P < 0.05$). **Conclusion:** Posterior corneal surface Asphericity was significantly correlated to refractive error of the SRK-T formula for eyes following a combined Phacovitrectomy.

Financial Interests: None
Grants: None

[8301] Comparison of visual performances of enhanced monofocal vs. standard monofocal IOLs in a mini-monovision approach

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Purpose: To compare visual performances and quality of life of patients who received either monofocal IOLs (i.e., Alcon SN60WF or J&JTecnis DCB00) or an enhanced monofocal IOL (i.e., Tecnis Eyhance) in a mini-monovision target approach. **Background:** Monofocal lenses are the most common intraocular IOLs employed during cataract surgery because of their relatively low cost and good performance for distance sight. However, these lenses, generally, do not exonerate patient from spectacle use for near or intermediate tasks. On the other hand, enhanced monofocal IOLs (e.g. Tecnis Eyhance) feature optical properties conferring patients with good intermediate visual outcomes. Satisfactory near visual acuity results, regardless of IOL type, may be achieved through mini-monovision. We assessed visual performance outcomes between these IOLs, in a mini-monovision approach. **Methods:** Patients who underwent bilateral cataract surgery at the Ospedale Italiano, with implantation of Alcon SN60WF, J&J Tecnis DCB00, or J&J Tecnis Eyhance DIB00 with a pre-operative mini-monovision target were convoked for an ophthalmologic examination. Post-operative spherical equivalent was measured by Nidek® auto-refractometer. Best-uncorrected binocular visual acuity (BUCBVA) at far (3m), intermediate (66 cm), and near (40 cm) was measured using Snellen charts, while binocular contrast sensitivity (100%, 25%, and 5%, all at 1m) with Pelli-Robson charts. Visual performance in daily life was evaluated with the Cataract VF-14 quality of life survey. **Results:** 72 patients (35 in the monofocal IOL and 37 enhanced IOL group) were enrolled. Patient demographics were similar between both groups. Patients implanted with enhanced IOL exhibited statistically significant better BUCBVA results at 66 cm and 40cm distances compared to patients in the monofocal group. Additionally, patients in the enhanced IOL group presented a better contrast sensitivity in lower contrast conditions (5%) than patients with monofocal IOL. The quality of life survey showed statistically significant higher scores in daily activities without spectacles for patients with enhanced IOL. This difference is ablated when spectacles are used. **Conclusion:** Our results indicate that enhanced monofocal IOLs, combined with a mini-monovision approach, provide patients with good visual performance at all tested distances. Notably, at near and intermediate distances, enhanced monofocal IOLs perform better compared to standard monofocal IOLs.

Financial Interests: None
Grants: None

[8392] Capsular Bag Distension Syndrome after Uneventful DMEK for Fuchs Corneal Endothelial Dystrophy

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Capsular bag distension syndrome or capsular block syndrome is a rare complication of cataract surgery characterized by accumulation of fluid between the intraocular lens and the posterior lens capsule, leading to visual deterioration. A small continuous curvilinear capsulorhexis, residual cortical lens material, as well as residual viscoelastic material behind the intraocular lens are associated with increased risk of fluid entrapment. Capsular bag syndrome usually occurs in the early postoperative period, but it has also been described as late as 14 years after cataract surgery. Nd-YAG laser posterior capsulotomy is the treatment of choice in most cases, facilitating the drainage of the fluid in the vitreous cavity. Late-onset capsular block syndrome is often associated with *Propionibacterium acnes*, requiring surgical management.

Hereby we report a case of a 72-year-old female patient with Fuchs corneal endothelial dystrophy, who underwent an uneventful endothelial keratoplasty (DMEK). She was subjected to bilateral cataract surgery 6 years ago. In the early postoperative period we observed the development of capsular block syndrome OS. After intensive follow-up examination for excluding Propionibacterium acnes-related endophthalmitis, we proceeded with Nd-YAG capsulotomy, which resulted in drainage of the fluid in the vitreous cavity and immediate visual recovery. To our knowledge this is the first report of capsular bag syndrome after DMEK and therefore anterior segment surgeons should be aware of this rare complication.

Financial Interests: None
Grants: None

[8400] Indications, complications and early postoperative course of recovery of intraocular lens exchange surgery: A single center retrospective study

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Purpose: To analyze the indications, complications, and early course of recovery of intraocular lens (IOL) exchange surgery. **Methods:** Records of patients who underwent IOL exchange during a 6-year period at a tertiary referral center were reviewed and the indications and complications after surgical intervention were analyzed. Their effects on postoperative corrected distance visual acuity (CDVA), intraocular pressure (IOP), use of IOP lowering medications, and refractive cylindrical power were assessed. **Results:** One hundred and seventy-one eyes (165 patients) were investigated. The most frequent indication for IOL exchange was lens dislocation in 163 eyes (95.32%). The main causes of IOL dislocation were pseudoexfoliation syndrome (PEX) in 98 eyes (57.31%) and complications during cataract surgery in 40 eyes (23.39%). During IOL exchange, an anterior iris-claw fixation was performed in 159 eyes (92.98%). After significant initial deterioration to 1.59 ± 1.08 logMAR on postoperative day 1 ($p = < 0.001$), the CDVA recovered to preoperative levels within 28 days. A significant decrease in IOP was observed on postoperative day 1 ($p = 0.04$). The most common postoperative complications were corneal edema in 114 eyes (66.67%) and vitreous hemorrhage in 67 eyes (39.18%). **Conclusion:** The high early postoperative prevalence of corneal edema and intraocular hemorrhage was found to affect visual recovery after IOL exchange, causing a significant initial deterioration of CDVA and a delay of full visual recovery. These findings suggest, that surgical approaches minimizing the risk of this type of complications should be favored.

Financial Interests: None
Grants: Funding: Stiftung für wissenschaftliche Forschung am Stadtspital Triemli, Werner H. Spross Stiftung zur Förderung der Augenheilkunde.

[8404] Partieller Verlust einer Haptik bei hydrophilen Intraokularlinsen: Inzidenz, Ursachen und klinische Ergebnisse

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Hintergrund: Der Verlust von Teilen der Linsenhaptik während der Implantation scheint ein klinisch seltenes Ereignis zu sein. Systematische Untersuchungen zu Inzidenz, Ursache und zu klinischen Auswirkungen liegen bislang nicht vor. **Methoden:** Retrospektiv wurden Ereignisse von partiellem Haptikverlust bei hydrophilen Intraokularlinsen vom Typ MI60 MICS und Akreos Adapt AO (Bausch&Lomb) bei einem Operateur (HG) über einen Zeitraum von 14 Monaten erfasst und anhand von OP-Filmen, asservierter Shootersysteme und klinischer Verlaufsbeobachtungen analysiert. Sämtliche Implantationen erfolgten mit Viscojet-Shootersystemen der Fa. Medicel (Altenrhein/Schweiz) unter Verwendung mitgelieferter Kartuschen (2.2/1.8 mm). Als Viscoelastikum wurde OcuCoat (Bausch&Lomb) verwendet. Die Biomechanik von Teilabrissen der Linsenhaptik wurde im Laboraufbau experimentell untersucht und die Geometrie der Linsenposition bei Haptikteilabrissen im Modell simuliert. **Ergebnisse:** Bei 19 von 1175 Eingriffen (1.6 %) kam es im Beobachtungszeitraum zum partiellen Abriss einer Linsenhaptik. In 12 von 564 Fällen (2.1 %) betraf dies Linsen vom Typ MI60 MICS und bei 7 von 611 Augen (1.1 %) die Akreos Adapt AO-Linse. Eine Prädisposition der Linsenstärke war nicht feststellbar. Auf einen intraoperativen Linsenaustausch wurde in allen Fällen bei ausreichender Zentrierung verzichtet. Postoperativ waren keine relevanten Dezentrierungen erkennbar. Intraokulare Haptikfragmente wurden weder intra- noch postoperativ gefunden. Die mikroskopische Analysen asservierter Shootersysteme liess klar erkennen, dass ein Großteil der Implantatläsionen auf eine Einklemmung von Linsenhaptiken in der Kartusche zurückzuführen waren. Modellrechnungen zur IOL-Kapselsack-Relation ergaben, dass ein partieller Abriss einer der vier Haptik bei den verwendeten IOLs eine ausreichende Zentrierung gewährleistet. **Schlussfolgerungen:** Partielle Haptikabrisse im Linsenshooter treten relativ selten bei Implantation der verwendeten Intraokularlinsen auf. Die Ursachenabklärung zeigt, dass der überwiegende Anteil der Läsionen offensichtlich auf eine Einklemmung der Haptik in der Kartusche zurückzuführen ist. Durch eingehende Schulung des Assistenzpersonals und mikroskopische Kontrollen der beladenen Kartuschen können Läsionen der Linsenhaptik vermieden werden.

Financial Interests: None
Grants: None

[8406] Comparison of a new Swept-Source Optical Coherence Tomography Biometer with comparator devices

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Purpose: To assess and compare the clinical performance of a new swept-source optical coherence tomography (SS-OCT) biometer (Eyestar; Haag-Streit) to the clinical performances of comparator devices and report the limits of agreement, repeatability, and correlations. **Methods:** Prospective, open label, single-arm, national, mono-centric, comparative study. 88 eyes of 49 patients were enrolled. All of them underwent biometry examinations with the EYESTAR, LENSTAR LS, Pentacam HR as well as with the Atlas. Biometry measurements of the EYESTAR were compared to the three market devices and statistically evaluated. **Results:** High agreement was found for axial length (AL), anterior chamber depth (ACD), and average keratometry (mean K) measurements. **Conclusion:** The new SS-OCT biometer EYESTAR demonstrated good agreements for all parameters compared to the reference devices.

Financial Interests: Working for company or competing comp.
Grants: This study was paid by and performed for Haag-Streit as a non-inferiority and registration study for the eyestar.

[8419] Combining Spectral-Domain OCT and Air-puff Tonometry Analysis to Diagnose Keratoconus

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Purpose: To investigate the diagnostic capacity of SD-OCT combined with air-puff tonometry using artificial intelligence (AI) in differentiating between normal and KC eyes.
Methods: Patients who had either: undergone uneventful LVC with at least 3 years of stable follow-up, forme fruste keratoconus (FFKC), early keratoconus (EKC), or advanced keratoconus (AKC) were included. SD-OCT and biomechanical information from air-puff tonometry was divided into training and validation sets. AI models based on random forest (RF) or neural networks (NN) were trained to distinguish FFKC from normal eyes. Model accuracy was independently tested in FFKC and normal eyes. Receiver operating characteristic (ROC) curves were generated to determine area under the curve (AUC), sensitivity, and specificity values.
Results: 223 normal eyes from 223 patients, 69 FFKC eyes from 69 patients, 72 EKC eyes from 72 patients, and 258 AKC eyes from 258 patients were included. The top AUC ROC values (normal eyes compared with AKC and EKC) were Pentacam Random Forest Index (PRFI) (AUC=0.985 and 0.958), Tomographic and Biomechanical Index (TBI) (AUC=0.983 and 0.925), and Belin-Ambrósio Deviation Index (BAD-D) (AUC=0.981 and 0.922). When SD-OCT and air-puff tonometry data were combined, the RF AI model provided the highest accuracy with 99% AUC for FFKC (75.00% sensitivity; 94.74% specificity).
Conclusions: Currently, AI parameters accurately diagnose AKC and EKC, but have a limited ability to diagnose FFKC. AI-assisted diagnostic technology that utilizes both SD-OCT and air-puff tonometry may overcome this limitation, leading to improved management of patients with KC.

Financial Interests: None
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[8420] OCT Elastography In Normal And Keratoconus Subjects

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Purpose: To investigate the suitability of small-amplitude ambient pressure modulation combined with optical coherence tomography (OCT) to discern healthy from keratoconic corneas in vivo. **Setting:** The study was performed at the ELZA Institute AG, Dietikon (Switzerland) in collaboration with ETH Zurich and the University of Bern. **Methods:** Analyses were conducted in 4 progressive keratoconus patients and 3 healthy individuals. A commercial anterior segment OCT system was combined with an external pressure unit for biomechanical assessment. In a single measurement, 128 subsequent B-scans were recorded (approx. 2.5 seconds duration), while the ambient pressure in front of the eye was suddenly reduced by 6.1 +/- 1.3 mmHg. The raw OCT signal was exported and a complex vector summation approach was adopted to compute the displacement between subsequent A-lines, as well as the axially induced strain. To increase the signal-to-noise ratio, the signal from within the optical zone was averaged. **Results:** KC corneas presented a positive posterior displacement (0.4 nm/mmHg), while healthy corneas presented a negative posterior displacement (-1.8 nm/mmHg), both with respect to the mid-corneal region. Differences were significant with p=0.009. **Conclusions:** Non-invasive corneal biomechanical evaluation under close-to-physiologic stress conditions allows for the differentiation between normal and keratoconus corneas and is a promising approach in the diagnosis of anterior segment degenerative diseases.

Financial Interests: None
Grants: Support by Swiss National Science Foundation (Ambizione PZ00P2_174113 to SK).

[8439] Clinical Outcomes and Patient Satisfaction With a New Non-Diffractive Extended Depth-of-Focus (EDOF) Intraocular Lens (Isopure®)

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Purpose: To evaluate clinical outcomes after uncomplicated bilateral phacoemulsification surgery with an implantation of Iso-

pure® (BVI) in a large cohort of cataract patients in terms of visual acuity (distance, intermediate and near), binocular defocus curves, spectacle independence and patient-reported photic phenomena. **Methods:** Single-center retrospective study including 124 ocular comorbidities-free eyes of 62 patients with ≤ 1.5 D regular corneal astigmatism, who underwent a routine bilateral same-day cataract surgery with an implantation of Isopure®. Mini-monovision (-0.5 D in the non-dominant eye) was used in all patients, and algorithm-guided opposite clear corneal incisions were applied in 68 eyes with pre-existing corneal astigmatism from 0.6 D up to 1.5 D. Four to six weeks postoperative review included assessment of visual acuity at 4m, 80cm and 40cm, binocular defocus curve from +1.0 to -2.0 D (step size 0.5 D), spectacle independence (PRISQ questionnaire) and subjective ratings of picture-referenced photic phenomena (modified NEI Quality of Vision questionnaire (RQL-42)). **Results:** Mean postoperative spherical equivalent was -0.15 D ± 0.41 in the plano group and -0.46 D ± 0.35 in the mini-monovision group. Postoperative monocular corrected distance visual acuity (CDVA) was -0.04 ± 0.07 logMAR (n = 124). Monocular uncorrected distance visual acuity was 0.06 ± 0.11 logMAR in plano eyes (n =62). Binocular uncorrected visual acuity was:
- distance: -0.02 ± 0.07 logMAR
- intermediate: 0.13 ± 0.11 logMAR
- near: 0.40 ± 0.20 logMAR

The binocular defocus curve demonstrated a smooth slope over a range of tested dioptrical powers. At the level of binocular CDVA of 0.2 logMAR (or better) the curve extended from -1.5 D (~67cm) to +1.0 D. 96.4% of patients felt comfortable seeing far without glasses, 94.6% at intermediate distance, and 34.0 % at near. When confronted with reference pictures, 5% of all patients reported halos, 16% starbursts, and 16% glare. Only 7% (n=4/56) of patients were disturbed by them in everyday life.
Conclusion: In patients undergoing bilateral cataract surgery, Isopure® provided an extended range of functional vision up to 67cm, resulting in a useful uncorrected near vision, good uncorrected intermediate vision and excellent uncorrected distance vision. Subjective patient satisfaction in terms of spectacle independence and photic phenomena was high. The excellent CDVA further supports the safety of the of the Isopure® IOL.

Financial Interests: None
Grants: None

[8459] Use of spectacles after cataract surgery

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Purpose: To assess the use of spectacles and patient satisfaction after cataract surgery aiming for emmetropia. **Methods:** Patients after bilateral cataract surgery at the eye clinic of the cantonal hospital of Lucerne were eligible for inclusion in this prospective observation study. In a phone interview ≥ 6 months after surgery, the following items were assessed: spectacle lens type, duration of spectacle wear (0-100% of daytime), spectacle use by activity, cost of new spectacles, satisfaction with lens choice, satisfaction with preoperative consultation regarding lens choice. A selection of patients, who had undergone bilateral implantation of aspheric monofocal intraocular lenses (IOLs) (Tecnis 1®, Johnson&Johnson) with a target refraction of +0.1 to (-0.5)D in both eyes were considered. **Results:** 70 patients were included in this study. Depending on their postoperative refraction patients were further grouped to: group A with perfect emmetropia in both eyes (i.e. spherical equivalent (SE) of +0.25D to -0.25D), group B with a perfect refraction in one eye (i.e. SE of +0.25D to -0.25D) and a less perfect refraction in the other eye (i.e.< -0.25D) and group C with bilateral SE of < -0.25D. 27 patients achieved perfect emmetropia (group A), 21 patients were found in group B and 22 in group C. Postoperative spectacle dependence was high (n=68, 97%). Overall, 45 patients (64%) wore varifocals (group A: 17 patients, group B: 11, group C: 17) and most of them (n=37, 82%) wore their glasses for more than 50% of daytime. Median costs for new glasses reported by patients were CHF 980 ± 746, with the lowest median costs in group B: CHF 700. Spectacle use varied between the groups. The following number of patients wore glasses for the whole daytime: in group A 10 patients (37%), in group B 4 patients (19%), in group C 12 patients (55%). The spectacle dependence was higher for near vision tasks than for far vision tasks e.g. reading (n=63) vs. watching TV (n=32). Patient satisfaction regarding lens choice was very high despite the use of glasses (median score: 5 of 5 ± 0.6). **Conclusions:** The majority of patients who achieve bilateral emmetropia with implantation of monofocal aspheric lenses buy varifocal spectacles within 6 months postoperatively and use them regularly. The costs for such spectacles are considerable. In group B less varifocal glasses were worn, lower costs for new spectacles were caused and less duration of spectacle wear was needed.

Financial Interests: None
Grants: None

[8546] Long-term outcomes after bilateral implantation of multifocal intraocular lenses: 10 years follow-up

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Purpose: To evaluate and compare the long-term results after bilateral implantation of different multifocal intraocular lenses (MIOLs). **Methods:** Patients who underwent cataract surgery with bilateral MIOLs implantation were evaluated. Patients were divided into 5 groups: Group 1 received a refractive ReZoom NGX1 IOL (AMO), Group 2 a diffractive Acrysof ReSTOR SA60D3 IOL (Alcon), Group 3 a diffractive Tecnis ZM900 IOL (AMO), Group 4 and Group 5 were implanted using the mix and match approach with refractive ReZoom-diffractive ReSTOR IOL and refractive ReZoom-diffractive Tecnis ZM900 IOL, re-

spectively. Primary outcome measures were distance, near, and intermediate distance visual acuity measured 6 months and 10 years after surgery. Secondary outcomes were defocusing curves, contrast sensitivity, patients' satisfaction, and spectacle independence. **Results:** All patients achieved good uncorrected distance visual acuity (UCDVA) and best corrected distance visual acuity (BCDVA) without significant differences between groups (p>0.05). Decrease in contrast sensitivity was evident particularly at high spatial frequencies. Overall satisfaction, following the implantation of multifocal IOLs proved to be high, even in those patients who complained about the presence of dysphotopia (halos and glares). **Conclusion**: MIOLs could provide adequate functional vision and patients' satisfaction, despite the incidence of side effects, in carefully selected patients willing spectacle independence.

Financial Interests: None
Grants: None

[8557] An update on the role of anterior segment optical coherence tomography (AS-OCT) in the pre-operative management of cataract patients scheduled for cataract surgery

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Purpose: Anterior segment OCT (AS-OCT) is a non-invasive, high-resolution imaging method with several potential applications and currently plays a pivotal role in the diagnosis and monitoring of many ocular anterior and posterior segment pathologies. Its potential use includes also a presurgical evaluation for anterior chamber procedures including cataract surgery. This review aims to summarize the available literature on the use of AS-OCT in preoperative management before a cataract surgery procedure. **Methods:** The review has been conducted after an initial search on Pubmed using selected keywords and MESH terms: 'optical coherence tomography', 'anterior segment coherence tomography' which were searched in combination with 'anterior chamber angle',' anterior chamber depth', 'anterior chamber volume', 'cataract surgery', 'biometry', 'axial length', 'refractive outcome' and 'surgical technique'. The results of the literature search have been analyzed by two authors in parallel. In case of disagreement, a third author has been involved to select works to be included. **Results:** From 218 articles extracted from the initial research, 163 abstracts were identified for screening, and 42 of these met the inclusion/ exclusion criteria for full-text review. Eight articles were excluded: one was not written in English, four were review papers, and three had a severe bias. The characteristics of the 42 studies included in this systematic review were subgrouped Specifically, 23 studies evaluated anterior chamber anatomy, 13 studies assessed biometry and refractive outcome, and 6 articles appraised surgical technique. No data synthesis was possible for the heterogeneity of available data and the design of the available studies (i.e. case reports or case series). Thus, the current systematic review reports a qualitative analysis, detailed issue-by-issue below narratively. **Conclusion:** Our research shows that AS-OCT (even if the available evidence is conclusive only in a few studies) may be an important and useful instrument in the preoperative evaluation of patients undergoing cataract surgery, especially in the detecting anatomical changes like widening of the anterior chamber angles, increase of anterior chamber depth (ACD), and anterior chamber volume. More high-quality research is needed to assess the potential utility of AS-OCT as a preoperative diagnostic tool for the management of cataract surgery.

Financial Interests: None
Grants: None

Uveitis | Intraocular Inflammation

[7850] When your patients need new glasses every day

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Purpose: We report on a rare case of intermittent bilateral myopic shifts in a healthy, young patient.
Observations: A 35-year-old so far healthy lady presented with a subacute onset of right-sided blurry vision and headache. The patient never wore glasses and had no ophthalmological pathology so far. Upon initial assessment, refraction showed a unilateral myopia of -2.38 diopters spherical equivalent (SE) on the right eye with otherwise normal anterior and posterior segments, normal neuroophthalmological status and a 20/20 best corrected visual acuity (BCVA) on both eyes. Since the initial findings could not explain the refractory variability, diabetes and thyrotoxicosis was ruled out serologically and an additional cranial MRI was performed to exclude cerebral pathologies. Furthermore, a neurological examination revealed no pathologies apart from the headache of unknown entity. A follow-up visit 2 weeks later revealed a myopic shift of the left eye (-2.5 diopters SE) and a complete regression of myopia on the right eye. However, the BCVA dropped to 20/50 on the right and 20/400 on the left eye. In addition, a slight anterior chamber flare was noted. The funduscopic examination presented with diffuse serous retinal detachments in both eyes with prominent subretinal fluid confirmed with SD-OCT (Avanti Optovue, Inc., Fremont, CA). Fluorescein angiography (Zeiss Visucam PRONM/FA, Oberkochen, Germany) revealed pinpoint leakages and confirmed the suspected diagnosis of a Vogt-Koyanagi-Harada (VKH) syndrome. Upon inquiry, the patient remembered that she had suffered from a slight urinary tract infection before the first onset of symptoms. She was immediately referred to a neurology center for high-dose

intravenous methylprednisolone and showed a functional and anatomical improvement and the absence of headache after 5 days of treatment. Her BCVA increased to 20/20 on her right eye and 20/25 on her left eye, the subretinal fluid showed a clear regression on SD-OCT. **Conclusions:** VKH syndrome is a rare condition with binocular involvement in the majority of cases. Initial ocular manifestations associated with neurological symptoms may guide clinicians to diagnose VKH in an early prodromic stage in young female patients with unexplained visual acuity fluctuations in order to initiate a prompt and adequate therapy.

Financial Interests: None
Grants: None

[8175] Multimodal imaging in TBC chorioretinitis

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Purpose: Description of the distinguishing features between active and non-active chorioretinal tuberculosis (TBC) in multimodal imaging.
Methods: Retrospective analysis of a case series of 6 patients (9 eyes) with infection by Mycobacterium tuberculosis was performed. The activity of the chorioretinal lesions was assessed by clinical examination and multimodal imaging (optical coherence tomography (OCT), fundus photography, fundus autofluorescence imaging (FAF), fluorescence angiography (FA) and indocyanine green angiography (ICG)). The association between symptoms, chorioretinal changes and systemic disease activity was also evaluated. **Results:** Mycobacteria tuberculosis could be detected in the blood culture of all patients. A chorioretinal manifestation of the systemic disease was found in all patients at the initial ophthalmological presentation. In five patients the lesions appeared active and in one patient they were inactive. FA and ICG showed the active foci with irregular, blurred borders. Hypofluorescent areas correlating to the lesions appeared on the ICG images, hypofluorescent areas with hyperfluorescent spots could be seen on the FA images. In the late phase of FA, a clear increase in hyperfluorescence in the sense of a leakage due to hyperpermeability in the area of the lesions could be determined in active lesions. Signs of vasculitis could also be seen in the majority of patients. In the OCT, the active lesions were accompanied presented with SRF and IRF as well as PED in the area of the foci. **Conclusion:** Multimodal imaging is very important and helpful in distinguishing between active and inactive TBC lesions. In this way, the further therapeutic procedure can be adapted and initiated to the findings. Even in patients who are not immunosuppressed, an underlying systemic disease should be ruled out in case of corresponding chorioretinal changes using serological and imaging methods.

Financial Interests: None
Grants: None

[8422] Scleromalacia occurring after strabismus surgery

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Purpose: To describe the case of a patient diagnosed with post-surgical scleromalacia more than 50 years after surgery. **Method:** Observational case report **Results:** We are describing the case of a 67-year-old patient with a past medical history of bilateral pulmonary embolism in 2009 caused by a mutation of Factor V Leiden, osteoporosis and polymyalgia rheumatica in 2018. Her past ophthalmic history includes strabismus surgery in childhood. The patient presented a punched scleral lesion with localised necrosis and adjacent redness of her right eye without any pain. Indocyanine green (ICG) angiography of the sclera showed hypercyanescence of scleral blood vessels around necrosis and ICG leakage. Due to recent onset of the lesion, diagnosis of anterior necrotizing scleritis was suspected and the patient was started on 20 mg q.d. Prednisone which was tapered slowly and finally completely stopped. An extensive blood testing was negative for rheumatoid and infectious diseases. At 1-month follow-up, the necrotizing lesion was stable and remained stable over 3.5 years of follow-up. In front of such lesions, the clinician must rule out the diagnosis of inflammatory or infectious anterior necrotizing scleritis. However, the lack of pain in this patient can direct us towards a non-inflammatory anterior necrotizing scleritis (scleromalacia perforans). The presence of a mutated Factor V Leiden might also cause a localized thrombosis of an episcleral blood vessel resulting in necrosis. As this patient did not show any progression of her necrosis over 3.5 years with negative blood tests and an history of strabismus surgery, the diagnosis of post-surgical scleromalacia was made. This condition can be caused by excessive conjunctival manipulation and episcleral and scleral cautery which promote an avascular state leading to necrosis. **Conclusion:** The diagnosis of post-surgical scleromalacia should be mentioned in patients with necrotizing punched scleral lesion which are stable over time with negative blood testing for rheumatoid and infectious diseases.

Financial Interests: None
Grants: None

[8433] Neoplastic and paraneoplastic autoimmune retinopathy: a compilation

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Purpose: To report on the clinical, immunological, imaging and electrophysiological features of patients with autoimmune retinopathy (AIR) including neoplastic and paraneoplastic retinopathy. **Methods:** Single-center, retrospective study of patients with the diagnosis AIR. Patients were seen during a period from 2019 until 2022 (and ongoing) at the University Hospital of Zurich, Zurich, Switzerland. All patients signed informed consent. **Results:**

In this cohort, we included eight eyes of four patients with AIR (two male and two female patients) with a mean age of 60.25±19.31 years. All patients were Caucasian. Two patients suffered from slow vision loss and optical blur, one demonstrated acute vision loss within one week with fever and weight loss and one patient described a visual wavy grid in his visual field. Visual acuity (VA) at baseline for both eyes was 0.7988 ± 0.50286, whereas the final visit VA was 0.7069±0.40447 in both eyes. Angiographic findings included a hot disc (75%) with leakage of the central vessels. Three patients tested positive for Anti-Recoverin antibodies, two for Alpha Enolase and one for Anti-Retina IgGAM, All of the patients received immunosuppressant therapy: one with oral prednisone only, three patients prednisolone combined with rituximab, two of them with additionally mycophenolate mofetil. The electrophysiology testing revealed mainly reduction in the rod response; the cone response in severely affected cases was also reduced. Two patients received plasmapheresis. One patient underwent in addition subtenon and orbital floor steroid injection. All of them experienced deterioration of their initial symptoms during the course of follow-up. **Conclusion:** The diagnosis of autoimmune retinopathy is a very rare condition. Clinicians can face challenges in diagnostics and management, since no clear guidelines exist. We emphasize the importance of considering the suspicion of AIR, particularly in mid-aged and elderly patients with acute and subacute vision loss in the presence of non-specific posterior segment changes. Paraneoplastic disorders should be excluded first line. An important diagnostic parameter is the evidence of autoimmune antibodies. An interdisciplinary therapeutic approach is crucial.

Financial Interests: None
Grants: None

[8445] Presumed ocular histoplasmosis syndrome in a five-year-old girl in a non-endemic area

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Purpose: Presumed ocular histoplasmosis syndrome (POHS) is a chorioretinal disorder with distinct fundus appearance, characterized by peripapillary atrophy (PPA), multiple chorioretinal scars called histo spots and possible development of choroidal neovascularization (CNV) or corresponding sequelae such as disciform scars. It is usually found in regions endemic for Histoplasma capsulatum (HC). **Clinical Case:** A five-year-old Swiss girl was referred for incidental findings of various asymptomatic chorioretinal scars. The patient had never visited any PHOS endemic country and systemic anamnesis was noncontributory. Corrected visual acuity was 1.0 OU. There was no anterior or posterior ocular inflammation and intraocular pressure was normal. Fundoscopy showed typical multiple disseminated punched-out atrophic and pigmented histo spots in the mid-peripheral retina sparing the macula, concentric equatorial linear streaks (Schlaegel's lines) and circumferential pigmented PPA in both eyes. Fluoresceine angiography pointed out window defect hyperfluorescence of the histo spots without any exudation, progressive scleral staining, and partial staining of the scars on ICG. OCT centered on the lesions highlighted focal areas of outer retinal atrophy. Histo spots were hypoautofluorescent and hyperreflective and irregular on infrared imaging. We renounced to do an unspecific histoplasmin skin test not routinely recommended and known to favor inflammation reactivation or exacerbation in asymptomatic patients. Due to the young age and the absence of symptoms or CNV, no specific treatment was offered. One year follow-up showed no new histo spots nor CNV occurrence. **Discussion:** Primary POHS infection likely occurring many years before the development of ocular lesions, one hypothesis of POHS acquired by a young Swiss girl in a non-endemic area would be a possible transplacental asymptomatic infection during the mother's pregnancy. Another way is to consider the possibility to be rarely directly infected by HC in a non-endemic country. Eventually, as the exact etiology is still debated, other offending agents such as Epstein-Barr virus or other systemic mycosis (i.e., Coccidioidomycosis, Blastomycosis) having crossed-immunity could mimic POHS. **Conclusion:** POHS could be encountered in non-endemic areas and there is no clear consensus regarding its exact pathogenesis. Lifelong funduscopic follow-up is essential to track secondary CNV that usually respond to anti-VEGF therapy.

Financial Interests: None
Grants: None

[8453] Syphilis related acute retinal necrosis and panuveitis of the left eye: A case report

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Purpose: To report a rare case of acute retinal necrosis (ARN) related to an infection with syphilis. **Methods:** Retrospective review case report **Results:** A 57 year old male patient complained of a left pink eye, left ocular pain and left blurry vision for two weeks. He had no general complaints, fever, cough or weight loss. His medical history only revealed a Diabetes mellitus Type II. He had a short course of oral corticosteroids until one week prior to onset of symptoms for a gluteal rash. The initial visual acuity was 0.8 on the right eye and 0.25 on the left eye . Intraocular eye pressure was normal. Anterior segment und fundus examination of the right eye were non-remarkable. Slit lamp examination of the left eye revealed 1+ anterior chamber cells and pigmentary imprint on the lens presumably from previous posterior synechiae. The fundoscopy showed moderate vitritis with superonasal retinal whitening and opacification in accordance with acute retinal necrosis. Blood sample were taken to screen for common infectious diseases (HSV, VZV, CMV, HIV, Toxoplasmosis, Tuberculosis and Syphillis) and an empirical treatment was established with oral Valaciclovir, Sulfamethoxazol/Trimethoprim, local corticosteroids and mydriatic eye drops. The following day an intravitreal Injection with Foscarnet was performed due to a progress of the area of retinal necrosis. Three days after initial presentation serology results came back positive for syphilis. Treatment was

adapted accordingly and intravenous Penicillin G was administered over a two week period. **Conclusion:** Ocular syphilis can be challenging to diagnose for ophthalmologists and therefore serologic testing should be performed in any uveitis screening, especially in atypical cases. Syphillis is a treatable disease and ocular manifestation can occur in any stage. Ocular syphilis is generally classified as neurosyphilis and is therefore an immediate emergency. It is important to screen, detect and treat syphilis as soon as possible to prevent further progression with high complication risks of organ involvement and even the risk of death.

Financial Interests: None
Grants: None

[8457] Bilateral severe panuveitis occurring during check-point inhibitor therapy with Dabrafenib and Trametinib therapy due to ocular toxoplasmosis. A case report

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Bilateral severe panuveitis occurring during check-point inhibitor therapy with Dabrafenib and Trametinib therapy due to ocular toxoplasmosis. A case report Authors: Safia Hsin, Theodor Stappler, Ann Schalenbourg, Yan Guex-Crosier **Purpose:** Severe ocular inflammation is a well-known complication of check-point inhibitors while managing systemic cancer, but other causes of ocular inflammation should be ruled out. **Methods:** A 57-year-old woman presented with severe bilateral uveitis occurring during check-point inhibitors therapy with Dabrafenib and Trametinib for metastatic pulmonary adenocarcinoma. **Results:** Her best visual acuity was limited to counting fingers in the right eye (RE) and to 0.25 in the left eye (LE). Vitritis was respectively of 3+ in the RE and 2+ in the LE. Bilateral yellow foci were present in OU with choroidal folds. Laboratory work-up revealed a positive serology for ocular toxoplasmosis. When an anterior chamber PCR for Toxoplasma gondii resulted negative, a diagnostic vitrectomy allowed to confirm a positive PCR for Toxoplasma gondii. A complete healing of the ocular lesions was observed after 2 months' anti-biotherapy with sulfadiazine and pyrimethamine. Dabrafenib and Trametinib were maintained. Final visual acuity was 0.8 (RE) and 0.63 (LE). **Conclusion:** Severe ocular inflammation during check-point inhibitor therapy is not always an immune-related adverse event (irAEs), but may occur as a secondary infectious complication. Vitrectomy is necessary to avoid a delay in the diagnosis as well as an unnecessary interruption of the checkpoint inhibitor therapy.

Financial Interests: None
Grants: None

[8480] More than meets the (right) eye

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Purpose: We report a case of a healthy, young man with subacute unilateral decrease in VA after a road traffic accident at 80 km/h (50 mph). **Observations:** A 19-year-old man was airlifted by trauma emergency services after being involved in a road accident. Police files reported the vehicle flipping over at 80 km/h (49 mph) and the man was found conscious in the crushed car and could be extracted by paramedics. Full-body trauma CT scan revealed no fractures or internal lesions and the patient was discharged after a 24-hour uneventful routine neurological surveillance. He however reported a blurry vision in the right eye without pain which was new to him as he never wore glasses and had no ophthalmological pathology so far. BCVA upon initial assessment was at 20/20 on the left and 20/50 on the right eye with -0.50 diopters spherical equivalent (SE) on the right. Funduscopic examination revealed multiple extensive retinal hemorrhages, diffuse cotton-wool spots and Purtscher flecken in the right eye. There was no optic disc swelling. SD-OCT scan (Avanti Optovue, Inc., Fremont, CA) showed prominent subretinal fluid and hyperreflectivity of the inner retinal layers. The left eye was strictly normal. An oral steroid therapy was immediately initiated and follow-up showed a slight increase of BCVA on the right side to 20/30 (-0.25 dpt SE) after 3 weeks of steroid use. **Conclusions:** Purtscher retinopathy was first described in 1910 and is associated with cranial trauma without direct ocular injury. Due to the lack of evidence-based treatment guidelines, observation alone or in conjunction with high-dose corticosteroids are possible therapeutic strategies. Visual outcome is uncertain and relies on stabilizing damaged neuronal membranes and microvascular structures.

Financial Interests: None
Grants: None

[8564] Optical Coherence Tomography of Retinal Granulomas in presumed Ocular Sarcoidosis

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Purpose: To report the evolution of retinal granulomas and response to treatment in a case of presumed ocular sarcoidosis using optical coherence tomography (OCT). **Methods:** Retrospective case report. **Results:** A 62 year old patient with a history of anterior uveitis and recent cataract surgery in his right eye was referred for vitreous bleed in his right eye. Medical history showed diabetes mellitus type 2 and arterial hypertension. Initial visual acuity in the right eye was counting fingers and in the left eye 20/30 Slip lamp examination showed 2+ anterior chamber cells and iris neovascularization. There was no fundus view due to a dense vitreous bleed. Left eye examination showed a white parapapillary lesion but no anterior or vitreous cells nor other findings. Treatment included intravitreal anti-VEGF injections and topical steroids for the right

eye. Anterior segment inflammation improved, but vitreous bleed persisted. Two month later, he developed a right retinal detachment, which was treated with vitrectomy. Postoperative phase was uneventful. Over the next year, small retinal granulomas appeared in the left eye. Due to suspicion of ocular sarcoidosis, blood work up as well as chest computer tomography was initiated, which did not reveal any systemic sign of sarcoidosis. Treatment included oral cortisone and adalimumab bi-weekly, with good initial response. After tapering his oral steroids, the flecks and complaints recurred, which responded well to intravitreal dexamethasone implant. Meanwhile, further systemic work up showed hilar lymphadenopathy in positron emission tomography and increased biomarkers. Diagnosis of presumed sarcoidosis was established and adalimumab increased to one-weekly. Suspicion of sarcoidosis was based on the appearance of multiple retinal granulomas. Using OCT, these could easily be assigned to the retinal layers and disease activity could be monitored by their regression and recurrence. Amount and sizes of granulomas corresponded well to the patient's amount of disturbances. Macular retinal granulomas regressed nearly completely under high doses of oral as well as to intravitreal dexamethasone implant. Granulomas that were more peripheral partially regressed to oral cortisone as well as intravitreal dexamethasone implant. **Conclusion:** Retinal granulomas are a typical sign in ocular sarcoidosis. OCT facilitates their monitoring and it might be used as a surrogate for disease activity in otherwise clinically qu [incomplete]

Financial Interests: None; **Grants:** None

[8610] Assessment of human donor eyes from patient having died of COVID-19 – what do we see?

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Purpose: To evaluate specific imaging und histologic findings of COVID-19 affected eyes. Thus seeking information about ocular involvement in COVID-19 infection and possibly identifying clinical / diagnostic markers. **Setting/Venue:** Post-mortem analysis of human donor eyes at the Department of Ophthalmology, University Hospital Zurich and University of Basel, Zurich / Basel, Switzerland **Methods:** Donor eyes of patients having died of COVID-19 and control eyes were imaged with ex-vivo optical coherence tomography (OCT), near – Infrared (NIR) (787 nm), autofluorescence (AF) (580 nm) and wide-angle fundus photography. Five of these eyes were processed histologically. High resolution light microscopy was performed. Images acquired with light microscopy and the corresponding OCT sections were analyzed. **Results:** We were able to obtain multi-modal ex-vivo imaging including wide-angle fundus photography for five COVID eyes and two control eyes. Typical post-mortem artefacts including retinal detachment and swelling of the retina were detected in all eyes. We did not observe any specific difference between COVID- and control eyes in clinical ex-vivo imaging. Histology revealed some occluded vessels in the choriocapillaris layer in all of the examined COVID eyes, but in none of the control eyes. There was no corelate in clinical ex-vivo imaging. **Conclusion:** Occluded choriocapillary vessels were seen in COVID eyes, but not in the control eyes. Correlation to clinical ex-vivo imaging was not found. Care has to be taken in the interpretation of these findings, due to the presence of typical post-mortem artefacts in the examined tissue. Clinical studies with larger cohorts as well as further histologic studies will be needed to confirm or refute our findings.

Financial Interests: None
Grants: None

Glaucoma

[7781] Primary open angle glaucoma progression in glaucoma patients with unchanged topical treatment over 3 years – retrospective observational cohort analysis

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Purpose Lowering intraocular pressure (IOP) is a mainstay of glaucoma therapy. It is however still an open question whether a comparable level of long-term IOP lowering achieved by different medications results in comparable protection for the retinal ganglion cells. **Purpose** of this study was to retrospectively analyze glaucoma damage progression in two cohorts of primary open angle glaucoma patients with different and unchanged therapy over a period of three years, and the main objective of this study was to determine possible differences in terms of structural (retinal nerve fiber layer thickness - RNFL) and functional (visual field - VF) outcome. **Patients and Methods** The retrospective observational cohort analysis compared two differently treated groups of glaucoma patients with their original, at study entry, topical therapy unchanged over three years. Main endpoint was the time course of RNFL thickness and VF mean defect (MD). **Results** Twenty-one eyes were included in each group. The first group (21 eyes) was on a fixed combination of timolol and dorzolamide twice a day and the second group on one drop of prostaglandin analogon, either latanoprost alone (15 eyes) or travoprost alone (6 eyes), in an unchanged regimen over a period of three years. IOP in mmHg at baseline and at 36 months was 11.9±2.4 and 13.0±2.1 in the first, and 12.9±3.0 and 14.1±3.2 in the second group, respectively. RNFL thickness values in micrometers were at baseline and at 36 months 77.8±12.3 and 76.6±15.2 in the first, and 77.5±15.2 and 72.8±14.5 in the second group, respectively. VF MD in dB were 1.7±2.5 and 1.2±2.9 in the first, and 0.9±2.3 and 0.7±2.6 in the second group, respectively. **Conclusion** Both groups had comparable baseline, as well as mean overall IOP.

However, the course of IOP levels over time was different in the two groups, showing earlier and more pronounced long-term-drift in the prostaglandin analogon treated group. RNFL thickness was comparable at baseline, however, RNFL thinning over time was more pronounced in the prostaglandin analogon treated group. There were no statistical differences between the groups in terms of VF MD at baseline and over time.

Financial Interests: None; **Grants:** None

[7852] Retrospective analysis of prognostic value of Optical Coherence Tomography Angiography for the development of glaucomatous damage – one year follow-up retrospective observational cohort analysis

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Purpose Detecting glaucoma damage progression is an essential component of follow up of glaucoma patients. It is still unclear which of the currently available and routinely used parameters of glaucoma damage heralds the loss of retinal ganglion cells first. We analysed local hospital data on primary open angle glaucoma (POAG) patients and looked for the correlations between the optical coherence (OCT) structural, OCT-angiography and visual field (VF) parameters. Patients and Methods Results of eye examinations of POAG patients at baseline, 6 months and 12 months were analysed. Inclusion citeria were, apart from diagnosis of POAG, also availability and quality of all modalities of examination data, and no surgical intervention on eyes during the observation period. Data on VF mean defect (MD), OCT peripapillary nerve fiber layer (RNFL), OCT macular ganglion cell layer and OCT-angiography, peripapillary and in macula, were parameters of interest; correlations of structural (OCT and OCT-A) on one, and functional parameters (VF MD) on the other side, at baseline and as change over time (first 6 months vs. second 6 months) were performed. **Results** All together data from 78 eyes of 78 POAG patients were included in the analysis. Correlations at baseline were all highly significant (Spearman's r-coefficients between 0.31 and 0.8, all $p < 0.05$). None of the correlations of parameter change over time was significant (all $p > 0.05$). **Conclusion** Whereas a robust correlation was observed at baseline between the structural (OCT and OCTA) and functional (VF MD) parameters, none of the examination modality could predict a change in the other modalities during the one year period. Results confirm the necessity of regularly performing both the structural and functional examinations in our glaucoma patients.

Financial Interests: None; **Grants:** None

[8429] Rapidly progressive visual field deterioration in a glaucomatous patient treated with several anti-VEGF injections for neovascular AMD: a Case report

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Purpose: To describe visual field deterioration in a glaucomatous patient treated with multiple anti VEGF injections (IVTs) for wet AMD. **Case description:** We present a case of an 80 years old Caucasian male patient treated with 18 intravitreal injections of both ranibizumab and aflibercept for wet AMD in his right eye since October 2018. He was previously followed for open angle glaucoma treated with three topical drugs and filtering non-penetrating deep sclerectomy during the course of treatment in July 2019. **Case Report:** Over 2 years of IVTs treatment, the patient experienced an accelerated rapid progressive visual field (VF) deterioration (MD change from 13.7 to 16.8 dB) without any elevation of his IOP being observed during regular follow up (range 8 to 19 mmHg). Because of this unexpected VF evolution, IOP was measured immediately after the next planned IVT, which revealed a rise in IOP of 27 mmHg 5 min after injection, gradually decreasing to 21 mmHg after 15 min, and to 17 mmHg over 30 min. **Discussion:** Recurrent intravitreal anti-VEGF injections are currently the treatment of choice of wet AMD. Even if both chronic rise and transient high-rise in IOP is well known to occur respectively over time or immediately after IVTs, the retina specialists often give poor attention to it. Transient rise in IOP is due to the increase in volume by the intravitreal fluid that may affect the blood supply of the optic nerve and consequently alter the visual field. We postulate that there is a direct relationship between episodes of increase in IOP after intravitreal injections, even when such increase is mild, and visual field deterioration, particularly in patients with optic nerve damage. **Conclusion:** Our case shows that IOP elevation can happen immediately after IVTs in glaucomatous patients even in the absence of chronic IOP rise measured regularly in clinic and despite medical anti glaucomatous drops and previous glaucoma surgery. Close monitoring of intraocular pressures immediately after intravitreal injections, considering not only acute spikes but also mild increases, as well as more frequent visual field exams seem to be recommended, especially in glaucomatous patients.

Financial Interests: None
Grants: None

[8446] Endothelial cell density after XEN45 and PreserFlo Microshunt implantation – retrospective analysis

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Purpose: One of the relevant long-term complications of glaucoma surgery is a loss of corneal endothelial cells postoperatively, leading in the long-run possibly to corneal decompensation and reduction of vision. Loss of endothelial cells can be particularly pronounced with the use of drainage implants. Glaucoma surgery has seen a number of new implant devices lately and two implants introduced during the past several years, XEN and PreserFlo, are both designed for controlled subconjunctival filtration. We retrospectively analyzed their effect on the corneal endothelial cell density (ECD). **Methods:** Operated patients with either of the two techniques were clinically followed up and their data retrospectively analyzed from medical records. Only standalone procedures, without combined phacoemulsification, were considered in this analysis. Further inclusion criteria were the diagnosis of open-angle glaucoma, no previous glaucoma surgery other than laser trabeculoplasty and available data on ECD in the medical records. The PreserFlo Microshunt cohort was imaged preoperatively, 1 week and 3 months postoperatively; the XEN cohort data was available preoperatively and 3 years postoperatively. **Results**: Mean preoperative ECD values in 15 patients in the PreserFlo cohort were 1872 ± 164 and 1986 ± 157 cells/mm2 in the operated and the control contralateral eye, respectively; corresponding ECD values in 8 patients of the XEN cohort were 1963 ± 184 and 2156 ± 204 cells/mm2. After 3 months ECD values in the former cohort were 1676 ± 180 and 1988 ± 176 cells/mm2; after 3 years ECD values in the latter cohort were 1472 ± 247 and 1972 ± 272 cells/mm2. Analysis of variance revealed no significant differences between the operated and the control contralateral eyes in either group. **Conclusion**: A trend of increased loss of endothelial cell density in comparison to the contralateral control eye was observed both short-term in the PreserFlo Microshunt and long-term in the XEN operated eyes. Overall, both procedures seem to be safe regarding their influence on the endothelial cell count. No clinically manifest corneal decompensation was observed.

Financial Interests: None
Grants: None

[8603] Nyctohemeral Effects of Ocular Hypotensive Medications Measured with an Intraocular Telemetry Sensor

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Purpose: To evaluate nyctohemeral effects of ocular hypotensive medications (OHM) on intraocular pressure (IOP) in patients with primary open-angle glaucoma (POAG) implanted with an ocular telemetry sensor. **Methods:** Twenty-two patients who had previously been implanted with a sulcus-based IOP sensor (Eyemate, Germany) were included. They were requested to obtain at least four daily measurements of IOP using a reader device. Data were grouped according to eye and medication so that an eye treated with a particular medication was considered as one group, and the same eye treated with a different medication during the observation period was considered as a different group. A day was divided into seven periods, and all periods when an eye was treated with only one medication were selected. There were four classes of medications that were analyzed including prostaglandin analogues (PGA), beta-blockers (BB), carbonic anhydrase inhibitors (CAI), and alpha-agonists (AA). Mean IOP, standard deviation (SD) of IOP, and IOP range were evaluated. **Results:** The mean age of patients was 67.8 ± 6.8 years (36.4 % female) and the mean follow-up was 19.2 ± 21.3 months (range: 1-58). A total of 4445 periods from 16 eyes were included for analysis. The number of days treated with one medication was 51 for PGAs, 77 for AAs, 110 for CAIs, and 1165 for BBs. For the two nocturnal periods ('Late' and 'Night'), SD IOP was lowest in the PGA group and highest SD in the AA group. **Conclusions:** Continuous IOP monitoring shows that PGAs have the most pronounced effect on lowering IOP fluctuations during the nocturnal period, while BBs and AAs had the least effect. BBs and CAIs had lower fluctuations than PGAs during the morning and noon periods. Our findings demonstrate the importance of considering the nychthemeral effects of ocular hypotensive medications when evaluating treatment options in glaucoma patients.

Financial Interests: Consultant with business int.
Grants: None

Retina | Vitreous

[8383] The value of combined ophthalmo-genetic approach in diagnosing Refsum disease in a case of retinitis pigmentosa

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Case presentation: A 12-year-old male was referred due to bilateral visual field constriction, diffuse pigmentation of the retina and normal visual acuity (BCVA: OU: 1.0). Results of the ffERG- and DA- examinations showed completely attenuated scotopic responses and up to 95% reduced photopic responses. His visual fields (Goldmann Perimetry, 3IIIe) revealed only slight constriction. In that context the diagnosis of retinitis pigmentosa was established. The family history for retinitis pigmentosa was

negative. In addition, the index patient and all siblings are reported as healthy. In a follow-up referral 12 years later, subjective progression of nyctalopia and increased photosensitivity, were reported. Visual field examination revealed asymmetric progressive constriction, more pronounced in the left eye. His BCVA (OD: 1.0, OS: 0.8) was still preserved. A cystoid macular edema was documented on fundus imaging, more pronounced in the right eye. The ffERG confirmed a generalized cone- and rod dysfunction in both eyes. The mfERG revealed still preserved central responses by severely attenuated paracentral responses, in both eyes. At this point, genetic testing was suggested and the patient agreed by signing the written informed consent. The analysis identified heterozygosity for two likely pathogenic variants (c.678+5G>T and c.824G>A; p.? and p.(Arg275Gln) in the PHYH (PHYtanoyl-CoA Hydroxylase) gene, the genetic cause of the recessively inherited Refsum disease. If the two likely pathogenic variants would be located on two different alleles, a compound heterozygosity would be present in this patient, compatible with the clinical diagnosis of syndromal retinitis pigmentosa in presence of a Refsum Syndrome. **Conclusion:** In this now 25-year-old male, with retinitis pigmentosa and progressive visual field constriction, genetic testing enabled the diagnosis of an adult Refsum disease through identifying compound heterozygosity for two likely pathogenic variants in PHYH. The patient has immediately been advised about dietary restriction of phytanic acid, in order to slow the progression of the disease. Refsum disease is associated with elevated plasma phytanic acid levels, late-onset retinitis pigmentosa, and variable combinations of anosmia, polyneuropathy, deafness, ataxia, ichthyosis, cardiac arrhythmia and heart failure. Thus, an expert multispecialty team is of benefit to our Refsum patients and their relatives, as it is now scheduled for our patient.

Financial Interests: None; **Grants:** None

[8387] Quiescent circular type 1 macular neovascularization around atrophy on OCTA

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An 80-year-old female was referred for evaluation of possible exudative age-related macular degeneration (AMD). Clinical examination showed pseudophakia and otherwise unremarkable anterior segments. On fundoscopy, both eyes showed signs of late AMD with drusen, pigment epithelial detachments (PED), and fovea-involving complete atrophy of the outer retina and the retinal pigment epithelium (RPE), or cRORA. Multimodal imaging of the right eye demonstrated a double layer sign around the central cRORA, but no intra- or subretinal fluid on optical coherence tomography (OCT), whereas the left eye showed large drusenoid PEDs, but no double layer sign and no intra-/subretinal fluid. OCT angiography of the right eye revealed a large sub-RPE macular neovascular membrane with a circular extension around the central atrophy. Thus, diagnosis of neovascular AMD with a quiescent/inactive type 1 macular neovascularization (MNV) was established. This case demonstrates the benefit of OCTA in diagnosing neovascular AMD expecially for quiescent membranes, and shows an interesting presentation of cRORA encircled by a type 1 MNV. As shown in the literature, the presence of a type 1 MNV could be protective against a rapid progression of atrophy and maybe does not need to be aggressively treated when only discreetly exudative.

Financial Interests: None; **Grants:** None

[8415] Retreatment of recurrent wet AMD with an alternative intravitreal anti VEGF drug after ocular inflammation following intravitreal brolucizumab injection: about two cases

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Purpose: We report here 2 cases of ocular tolerance to further intravitreal (IVT) injection of antivascular endothelial growth factor (anti- VEGF) required for wet age related macular degeneration (AMD) recurrence that previously presented severe intraocular inflammation following intravitreal brolucizumab administration. Clinical cases: **Case 1:** 88-year-old woman with a wet AMD in her left eye who had persistent subretinal fluid despite receiving intravitreal anti-VEGF agents including ranibizumab and aflibercept. A switch to brolucizumab was decided. Two weeks after the third dose, she had visual loss decreasing from 20/40 to counting fingers at 50cm. Fundus examination revealed retinal whitening and perivenous sheathing. Fluorescein angiography confirmed retinal arterial occlusion. Differential diagnosis were ruled out. She was treated by intravenous methylprednisolone and prednisolone eye drops. At 3 months, VA improved to 20/80 with no intraocular inflammation but subretinal fluid recurred. Ranibizumab IVT was rescheduled with preventive treatment by oral and local prednisolone without any inflammation recurrence. **Case 2:** 80-year-old man with a wet AMD in his right eye who had persistent subretinal fluid despite IVT injection of aflibercept. A switch to brolucizumab was decided. Two months after the third dose, he had blurred vision. VA decreased from 20/20 to 20/25. Examination showed 1+ anterior chamber cells and vitritis. We confirmed the diagnosis of anterior uveitis with pars planitis. Differential diagnosis were ruled out. A treatment by prednisolone eye drops was initiated. One week later, VA improved to 20/20 with no inflammation. Three weeks later, subretinal fluid due to AMD increased. He was retreated by aflibercept with prednisolone eye drops, 48 hours before and after IVT injection with no inflammation recurrence. **Discussion:** Brolucizumab is the latest FDA-approved anti-VEGF agent for wet AMD. Since its wider use, few cases of severe ocular inflammation were reported in post-marketing surveillance. Because wet AMD recurrences should be expected after intraocular inflammation, insight into treatment tolerance in cases that received further IVT retreatment is needed. **Conclusion:** Our cases demonstrated that IVT reinjection with a different anti-VEGF drug for wet AMD recurrence can be safely reperformed. The use of local steroids could

be effective in preventing ocular inflammation recurrence after severe inflammation due to brolucizumab.

Financial Interests: None
Grants: None

[8423] Two cases of acute macular neuroretinopathy (AMN) associated with COVID-19 infection

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Purpose: A variety of different eye pathologies were reported in association with the COVID-19 pandemic. In the 2 cases described here AMN was observed after COVID-19 infections. **Methods:** Clinical findings and multimodal imaging were documented in these cases. **Results:** Case 1: A 28-year-old female with a 5-day history of COVID-19 infection presented with headache and fatigue. She noticed bilateral paracentral scotomas. No other visual symptoms were present. Visual acuity (Snellen) was 1.0 in both eyes (OU) and her eye history was uneventful. Near infrared images (NIR) presented petaloid hyporeflective perifoveal lesions and corresponding slightly hypofluorescent areas of autofluorescence in both eyes. SD-OCT revealed hyperreflective changes in the outer plexiform and nuclear layers, as well as in the ellipsoidal and interdigitation zones. None of these findings were present at a routine check-up 2 months ago. OCT-angiography performed 4 weeks after infection did not present any vascular abnormalities. At the 2-month follow-up the patient reported a substantial improvement of her scotomas. Case 2: A 43-year-old female patient with a history of rheumatoid arthritis presented with subjective perception of a paracentral scotoma in temporal upper position of her right eye 4 weeks after COVID-19 infection. Methotrexate medication (15 mg/day) was immediately discontinued after her positive COVID-19 test result. Visual acuity was 1.0 OU. Funduscopy presented a small area with faint hyperpigmentation nasally inferior to the fovea. The area was slightly darker in NIR images and presented partial disruption of the ellipsoid and interdigitation zones and attenuation of the outer nuclear layer in SD-OCT. Two identical but much smaller lesions were found nasally and superonasally to the fovea. **Conclusion:** Clinical findings in these cases, together with few recent reports suggest that AMN may occur in association to COVID-19 infections. It can be speculated that patients under immunosuppressive treatment may be at higher risk to develop this complication under COVID-19 infection.

Financial Interests: None
Grants: None

[8424] The use of the classification system for Pachychoroid Disease in clinical practice based on some clinical case studies from the Pallas Klinik Olten

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Purpose: Pachychoroid diseases of the macula are a concept describing a group of retinal diseases that are associated with a thickening of the choroid by dilated choroidal vessels, attenuation of the choriocapillaris, alterations of the retinal pigment epithelium and in some cases pachychoroid-associated neovascularization. In this regard, there is a proposed classification system, in which the different clinical manifestations of the pachychoroid diseases are classified by morphological definition and pathogenesis. Based on clinical case studies from the Pallas Klinik Olten, we would like to exemplify the existing classification systems on Pachychoroid Disease and would like to show that the existing classification system proves to be useful in everyday clinical practice. **Methods and Observation:** Different clinical diagnostic methods were used, among others fluorescein angiography, optical coherence tomography and especially optical coherence tomography angiography (OCT-A). Based on the imaging data and by using this classification system, the different clinical case studies could be well classified by the morphological appearance, including uncomplicated pachychoroid, pachychoroid pigment epitheliopathy, central serous chorioretinopathy, pachychoroid neovasculopathy with and without neurosensory detachment and pachychoroid aneurysmal type 1 choroidal neovascularization. **Results:** Based on the results of the apparative diagnostic examinations, different clinical case studies from the Pallas Klinik Olten could be well classified by their morphological appearance and by using a proposed classification system for pachychoroid dieseases. **Conclusion:** In our opinion, the classification system on pachychoroid disease is very helpful in diagnostics and classification of pachychoroid diseases of the macula in the clinical practice. The addition of newly identified subgroups of pachychoroid diseases will improve its clinical use further.

Financial Interests: None
Grants: None

[8425] Excentric, transient, flat retinal detachment after refixation of a subluxated intraocular lens implant

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Pallas Kliniken, Olten

Purpose: It is the aim of this report to describe the observation of a flat, excentric retinal detachment in a patient after surgical re-fixation of an in-the-bag subluxated intraocular lens implant. **Material and Methods:** This report includes clinical findings and SD-OCT imaging of the observed case. **Results:** The 80-year-old female patient was referred for further surgery after subluxation of her in-the-bag subluxated intraocular lens implant. Best corrected Snellen visual acuity was 0.6p in the right eye (OD) with

a correction of -1.0 sph -0.75 cyl/143° and 0.6p in the left eye (OS) corrected with +11.5 sph, -0.5 cyl/64°. 10 years ago the patient had received cataract lens surgery with posterior chamber intraocular lens implantation (OD 23.0 D, OS 22.5 D, Physiol H65 C/N; axial length 22.72 OD, 22.48 mm OS). Preoperatively, both eyes were hyperopic with pseudoexfoliation. An excentric dome shaped configuration of the posterior segment (OD > OS) was present in both eyes in addition to fine choroidal folds and a tilted disc OD. The subluxated intraocular lens was re-fixated by transscleral sutures after removal of the lens bag in conjunction with a Pars plana vitrectomy. No peeling of the internal limiting membrane was performed. On day 1 and 2 after surgery a flat retinal detachment was observed along the inferior temporal retinal artery in the nasal inferior quadrant of the fovea. No retinal defects could be detected. Until day 8 after surgery the subretinal fluid had spontaneously resorbed. No further complications occurred during long-term follow-up of 3 years. Final visual acuity was 0.8 with a correction of -0.5 sph, -2.5 cyl/52°. **Conclusion:** A flat retinal detachment without retinal defects after surgical interventions is obviously a very rare observation. In the case observed the subretinal fluid resorbed spontaneously. The underlying pathogenetic mechanism remains unclear.

Financial Interests: None
Grants: None

[8426] Welder´s maculopathy caused by improper function of an electronically controlled protection shield

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Pallas Kliniken, Olten

Purpose: Welding arc retinopathy seems to have become a rarely reported observation within the last decade. This may be resulting from improved protection of workers by electronically controlled protection shields. A case of welder´s maculopathy secondary to a technical deficit of the protection shield is described in this report. **Material and Methods:** This report includes clinical findings, multimodal imaging and follow-up data of the observed case. **Results:** The 64-year-old male patient was referred for unexplained visual deficits in his left eye. The patient reported a sudden deterioration of visual acuity 5 weeks ago. This occurred in conjunction with a defect of the electronically controlled protection shield, he was using during welding. The dysfunction of the shield was primarily noticed by perception of intensive flickering lights in his left eye. Further ophthalmological and general history was uneventful. Best corrected Snellen visual acuity was 1.0p in the right eye (OD) with a correction of +2.25 sph. -0.75 cyl/90° and 0.4 in the left eye (OS) corrected with +3.0 sph. -1.0 cyl/110°. On slit lamp examination minor superficial corneal scars in excentric position due to previous foreign body impact OS were found. Funduscopy of OD was normal, OS presented central pigmentary abnormalities. In SD-OCT a pronounced attenuation of the outer nuclear layer and disruption of the ellipsoid and interdigitation zones in central position were found. Functional and structural findings did not change during the next 7 years of follow-up. **Conclusion:** The development of new technical devices with automatic protection mode generally provides improved safety for staff during welding. Thorough instructions about possible malfunction of these protection devices seem to be necessary and may be helpful to avoid damages as observed in this case.

Financial Interests: None
Grants: None

[8432] Clinical heterogeneity in two siblings harboring a heterozygous PRPH2 pathogenic variant

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Background: The aim of the study is to describe the clinical and genetic correlation of a c.469G>A, p.(Asp157Asn) heterozygous pathogenic variant in PRPH2 in two siblings of Italian origin. **Patients and Methods:** Both patients underwent ophthalmic examination, electrophysiological testing, autofluorescence imaging and optical coherence tomography (OCT). A screening for pathogenic variants of the obtained DNA from the family members was carried out. **Results:** The 52- (♀, index patient) and 50-year (♂) old siblings had BCVA (RE and LE) 20/20 and 20/16 (♀) and 20/25 and 20/40 (♂), respectively and suffered increased sensitivity to glare. Yellow irregular macular deposits, numerous small irregular hypo- and hyperautoreflective spots at the posterior pole, a patchy loss of photoreceptors and retinal pigment epithelium (RPE) in the perifoveal region were seen. Electrophysiology showed dysfunction of rods and cones, with more affected central cone dysfunction in the index female sibling, contrary to the generalized rod dysfunction in the male sibling. The clinical, electrophysiological, and multimodal imaging findings of both siblings pointed towards Stargardt retinopathy with heterogenic presentation. The DNA analysis identified a novel autosomal dominant c.469G>A,p.(Asp157Asn) heterozygous pathogenic variant in PRPH2 associated with macular cone-rod dystrophy. PRPH2 codes for Peripherin-2, a membrane protein that consists of 346 amino acids. **Conclusions:** Our findings confirm a heterogeneity in clinical presentation associated with pathogenic variants in PRPH2. It may follow either an autosomal dominant or an autosomal recessive mode of inheritance and show a very heterogeneous clinical manifestation of retinal degeneration, e.g. autosomal dominant retinitis pigmentosa (♂ sibling), autosomal dominant macular dystrophy (index ♀ sibling), but also autosomal recessive retinitis pigmentosa.

Financial Interests: None
Grants: None

[8440] Incidental unilateral retinal vessel findings and its consequences

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Background/History: A 32-year-old male was referred because of an incidental finding of abnormal retinal vessels in the retina of his right eye. He did not report visual symptoms. The patient was healthy, had an unremarkable medical history and was born at term. Visual acuity was 20/16, intraocular pressure was 19 mmHg in both eyes. Slit-lamp examination of the anterior segment of both eyes showed no abnormalities. On fundoscopy, an abnormal vessel configuration in the peripheral temporal retina with pretretinal fibrotic membranes was seen. Wide field fluorescein angiography showed a distinct abnormal arterial vessel along the inferior temporal arcade with abnormal temporal dragging of the peripheral branching and associated perfusion impairment of the capillary system between 6.30 and 10.00 o`clock. In addition, a focal leakage, typical of retinal neovascularization, was visible. The left retina was unremarkable. **Methods:** Single retrospective case report. **Therapy and outcome:** The patient was diagnosed with a vascular abnormality with peripheral ischemia and retinal neovascularization. Mild FEVR, dominant vitreoretinopathy, sickle cell retinopathy, collagenosis or Incontinentia pigmenti were the main differential diagnosis. A cMRI is planned to exclude cranial malformations (Wyburn-Mason Syndrome), blood testing to exclude sickle cell disease and genetic testing for FEVR. **Conclusion:** Our unilateral finding is related to a vascular retinal pathology. The peripheral avascularity, neovascularization and vascular leakage can be seen in FEVR, sickle cell retinopathy or even in retinopathy of prematurity (ROP). This case highlights the wide range of clinical pictures, which often overlap and may require a detailed birth and family history and extensive testing.

Financial Interests: None
Grants: None

[8441] Acute ocular complications after recently diagnosed Goodpasture syndrome – an unusual case of hypertensive retinopathy

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Background: Goodpasture's syndrome (GS) or anti-glomerular basement membrane disease is a rare autoimmune disease with an estimated incidence of about 0.5-1 case per million per year. Commonly GS presents first with acute renal failure due to rapidly progressive glomerulonephritis and life-threatening pulmonary hemorrhage. Only a handful of reports on patients with ocular manifestations exist, making this an exceptional case and one that we can learn from for other patients with hypertensive retinopathy.
Patient and methods: Retrospective case report on a patient with recent GS diagnosis who presented with acute ocular symptoms. Patient consent was obtained.
Results: Referral of a 17-year-old male with acute blurred vision and headache. A diagnosis of GS was established three months earlier and treatment with immunosuppressants and plasmapheresis had been installed. At the day of first ocular manifestation and emergency referral a best corrected visual acuity of 0.64 decimal on both eyes was measured. Fundoscopy revealed bilateral optic disc edema, flame and spot bleeding along retinal nerve fibers and cotton wool spots. The optical coherence tomography showed bilateral center involved macular edema with subfoveal photoreceptors' layer detachment. The patient's blood pressure was measured at 190/112mmHg and a hypertensive retinopathy grade IV was assessed. As this represents a life-threatening condition requiring blood pressure reduction within 24 hours, the patient was immediately sent to the general emergency department.
Conclusions: Ocular manifestations appear in few patients with GS and are thought to be linked to secondary hypertension. Hence, treatment of ocular involvement is based on optimal blood pressure control. If signs of hypertensive retinopathy are present, blood pressure should be measured. As this rare case displays, signs of hypertensive retinopathy may indicate a life-threatening state.

Financial Interests: None
Grants: None

[8444] Peripapillary vessel attenuation and its correlation with structural findings in retinitis pigmentosa.

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Purpose: To investigate relationship between the peripapillary retinal vessel diameter and the structural findings, measured by spectral-domain Optical Coherence Tomography (SD-OCT) imaging, in patients with retinitis pigmentosa (RP). **Patients and methods:** A cross-sectional study based on 42 patients with RP (84 eyes) and 22 controls (44 eyes) was performed. Retinal vessel diameters were measured using a computer-based program of the retinal vessel analyser using the Oxymap T1 device. We evaluated the mean diameter in all four major retinal arterioles (D-A) and venules (D-V) within 1.0-1.5 optic disc diameters from the disc margin. Using SD-OCT we studied the relation of retinal vessel diameters with the length and continuity of ellipsoid zone (EZ) from the fovea as well as the amount of hyperreflective foci within the entire retina (HRF-ER) and the outer nuclear layer (HRF-ONL) measured with SD-OCT horizontal scans.
Results: Mean (±SD) D-A and D-V were narrower in patients with RP [92.77 µm (±18.50µm) and 123.31 µm (±22.48 µm), respectively] when compared to controls [103.00µm (±9.70µm) and 158.09 µm (±16.26 µm), respectively; the p-values between groups were $p < 0.001$ for D-A and D-V, linear mixed-effects model]. The RP group revealed clear differences compared to the controls concerning the presence of HRF-ER and HRF-ONL, but also the EZ-length ($p < 0.001$). In the presence of macular edema in RP, more attenuated D-A correlated significantly with the amount

of HRF-ER (p=0.023) and more attenuated D-V with the amount of HRF-ER and the HRF-ONL (p=0.007, respectively p=0.008). The EZ-length did not showed statistically significant relation with the peripapillary vessel attenuation.
Conclusions: Peripapillary retinal vessel diameter is narrower proportionally to structural alterations in RP.

Financial Interests: None
Grants: None

[8448] Unusual Presentation of Bull`s-Eye Maculopathy

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Introduction: A 59-year-old patient presented to the emergency room of our eye clinic with a combined central retinal artery occlusion (CRAO) and central retinal vein occlusion (CRVO). In the funduscopic examination, a bull's-eye maculopathy was incidentally found on both eyes. **Case Report:** The patient reported about a sudden vision loss in the left eye, when he presented in the emergency room. In the clinical and laboratory work-up, an incomplete combined CRAO and CRVO due to a giant cell arteritis was diagnosed. The visual acuity of the right eye was 0.8 (20/25) and of the left eye 0.2 (20/100). The intraocular pressure was within normal limits and the anterior segment was without pathological findings. In the funduscopic examination, a bull`s-eye maculopathy was suspected. Optical coherence tomography and fundus autofluorescence confirmed the suspected bull`s-eye maculopathy. Rheumatology confirmed the diagnosis of a giant cell arteritis and the patient received a high-dose steroid therapy. Apart from a previously diagnosed seronegative polyarthritis, which was treated with steroids and analgesics, the patient had no systemic diseases. The patient had never received any treatment with hydroxychloroquine or chloroquine beforehand. In the differential diagnosis of a bull`s-eye appearance of the macula are genetic maculopathies, benign concentric annular macular dystrophy (BCAMD) emerging as the most probable diagnosis. Electrophysiological examinations and genetic blood tests were conducted to confirm the diagnosis of a BCAMD. **Conclusion:** The differential diagnosis of bull`s-eye maculopathy encompasses especially toxic and genetic causes, amongst which hydroxychloroquine maculopathy is most common. We present the rare case of a patient who was incidentally diagnosed with BCAMD after suffering a combined CRAO and CRVO when having a giant cell arteritis.

Financial Interests: None
Grants: None

[8450] Recent COVID-19 infection associated with paracentral acute middle maculopathy: a risk factor for central retinal vein occlusion?

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PURPOSE Central retinal vein occlusions are not well-known complications of SARS-CoV-2 infection. We describe a case of central retinal vein occlusion secondary to COVID-19 and discuss the relation between these two conditions. **METHODS** A 47-year-old woman with no underlying ocular or medical condition presented to the hospital complaining about sudden onset of multiple scotomas in her left eye. She had been positively tested for a COVID-19 infection two days prior to the visit and had been symptomatic for four days. She had no oral contraception and no other risk factors. **RESULTS** Her best corrected visual acuity was 1.0 in the right eye and 0.04 in the left eye. Clinical exam showed a left relative afferent pupillary defect and a nasally localized papilledema on fundoscopy of the left eye. Multiple dot and blot hemorrhages were also present. Optical Coherence Tomography revealed a small cystoid macular edema and paracentral acute middle maculopathy. The results of the fluorescein angiography were consistent with a central retinal vein occlusion. Laboratory work-up later revealed an elevated fibrinogen level corresponding the COVID-19-induced hypercoagulable state. No other prothrombotic conditions were found. The patient immediately received an intravitreal injection of Lucentis after diagnosis. Complete resolution of the retinal hemorrhages and papilledema was observed 1.5 month after treatment and the final visual acuity was 1.25 in the left eye. **CONCLUSION** Coagulation abnormalities are frequently observed in infectious diseases such as COVID-19 infection and the resulting prothrombotic state can sometimes lead to central retinal vein occlusion, irrespective of the presence of other classical risk factor. The consideration of this information can help for prompt diagnosis and therefore appropriate treatment which could hopefully lead to complete healing of retinal lesions.

Financial Interests: None
Grants: None

[8452] Macular serpiginous chorioretinitis associated with Francisella tularensis infection: A case report

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Purpose: To report a case of infectious macular serpiginous chorioretinitis related to tularemia with rapid progression and severe visual impairment. **Methods:** Case report **Results:** A 41-year-old female patient presented with central scotoma in the left eye followed by similar symptoms in the right eye few weeks later. No history for other ocular diseases. Systemically, diabetes mellitus type 2 was known for several years. The initial visual acuity (VA, Snellen scale) was 1.0 on the right eye and 0.4 on the left eye. The anterior segment was unremarkable at first presentation. The

clinical examination of the posterior segment did not show signs of inflammation of the vitreous or the vessels, there was mild alteration visible in the foveal area with pigmentary changes. Optical coherence tomography (OCT) revealed focal alteration of the ellipsoid zone subfoveally. The initial fundus fluorescence angiography (FLA) did not show other pathologies. After excluding frequent infectious disease (i.e. syphilis and tuberculosis), oral steroid treatment was initiated and followed by weekly taper. At the dosage of 10mg a day, the patient experienced deterioration in her central vision. Within two weeks, VA dropped to 0.4 in the right eye and to counting fingers in the left eye. The patient complained of a new left periocular pain. Slit lamp examination showed conjunctival redness, anterior chamber cells, focal transilluminescence and partial atony of the iris. OCT revealed central atrophy of the outer retina, retinal pigment epithelium and alteration of the underlying choroid in the left eye. There was a new adjacent yellowish lesion with hyperreflective changes of the outer retina overlying subretinal fluid. A repeated FLA showed late hyperfluorescence. The OCT of the right eye showed focal alteration of the ellipsoid zone superotemporal to the fovea. An advanced interdisciplinary work-up revealed positive serology for tularemia. Upon reassessment, the patient remembered having taken care of rabbits for few weeks around the time of developing the initial symptoms. Treatment with doxycycline was started for three weeks. **Conclusion:** Macular serpiginous chorioretinitis can be associated with systemic diseases, both infectious and non-infectious/inflammatory origin. In cases of atypical presentation, rare conditions such as tularemia should be considered in the work up and ruled out, especially in the setting of contact with rabbits.

Financial Interests: None
Grants: None

[8458] SPATA7 – associated juvenile Retinitis Pigmentosa in two brothers from a consanguine Iraqi family in Switzerland: a case series.

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Purpose: To report a rare case of two brothers suffering from juvenile Retinitis pigmentosa caused by a homozygous mutation variant in SPATA7 and to illustrate diagnostic key findings by multimodal retinal imaging, functional retinal assessments and pedigree analysis. **Methods:** A retrospective case study. **Results:** A 16-year-old young man and his 12-year-old brother of Iraqi descent have presented for myopia progression evaluation and recurrence of strabismus. They had normal best corrected visual acuity and both had an history of strabismus and minor myopia. They also acknowledged increasing difficulties with ball sports and frequent stumbling. Fundus imaging techniques including OCT as well as functional retinal analyses with visual field perimetry and full-field electroretinography have exhibited in both cases the phenotype of juvenile Retinitis pigmentosa with an early degeneration and functional loss of the retinal periphery and preserved foveal structure. The consanguine family pedigree has suggested an autosomal recessive inheritance pattern. Genetic sequence analyses revealed a homozygous nonsense mutation variant in the SPATA7 gene (c.253C>T, p.(Arg85*)) and confirmed the diagnosis. To our knowledge, this is the first case of molecular-genetically identified SPATA7-associated juvenile Retinitis pigmentosa in Switzerland. **Conclusion:** Juvenile Retinitis pigmentosa must be considered in early childhood. In our cases, only a careful anamnesis highlighted the previously undetected visual field problems in physical activities and led to further medical evaluation. Familial consanguinity may reinforce suspicion of hereditary eye disorders. Early signs of peripheral visual field defects can be missed, because affected children are not aware of them and testing can be challenging.

Financial Interests: None; **Grants:** None

[8464] Die Rolle der optischen Kohärenztomographie bei der Poppers-Makulopathie

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Einleitung Poppers ist eine Sammelbezeichnung verschiedener insbesondere als Partydroge genutzter flüssiger Inhalativa aus Alkylnitriten mit aphrodisierender Wirkung. Die Poppers-Makulopathie stellt eine seltene bislang nur wenig verstandene Folge akuter oder chronischer Poppers-Inhalation dar, wobei ursächlich die akute Freisetzung von Stickstoffmonoxid (NO) durch Alkylnitrite diskutiert wird. Die Diagnose Poppers-Makulopathie wird zumeist durch die Anamnese und die Befunde in der optischen Kohärenztomographie (OCT) gestellt. Wir berichten über einen gesunden 35-jährigen Patienten, der sich notfallmässig mit akuter Visusabnahme vier Tage nach erst- und einmaligem Popperskonsum vorstellte. **Methoden** Nach Erstvorstellung erfolgten Verlaufskontrollen mit Bestimmung von Visus, Intraokulardruck, spaltlampenbiomikroskopischer Untersuchung, Funduskopie sowie zusätzlich spectral-domain OCT, Fundusautofluoreszenz und Widefield-Fundusfotographie. **Ergebnisse** Bei der Erstvorstellung betrug der bestkorrigierte Visus des Patienten rechts 0.4 und links 0.5. Die vorderen und hinteren Augenabschnitte waren spaltlampenbiomikroskopisch unauffällig. In Makula-OCT zeigte sich eine unregelmässige, leicht verdickte foveale ellipsoide Zone (EZ) mit granulärem Aspekt. In einer Verlaufskontrolle nach 2 Wochen zeigte sich ein leicht gebesserter Visus (BCVA OD 0.5, OS 0.63) bei zeitgleicher Zunahme der hyperreflektiven granulären Veränderungen der EZ im OCT. Nach 6 Wochen stieg der Visus auf 0.8 beidseits an und die OCT-Befunde waren regredient. **Schlussfolgerung** Zur richtigen Diagnosestellung der Poppers-Makulopathie sind eine ausführliche Anamnese und Bildgebung mittels SD-OCT unverzichtbar. In der OCT-Bildgebung werden drei verschiedene Phänotypen dieser Makulopathie beschrieben: subfoveale Störung im Bereich der EZ, vitelliform-ähnliche Läsion und Mikroforamen. Bei hiesigem Fall handelt es sich um den häufigeren ersteren Phänotyp . Eine funktionelle und strukturel-

le Erholung dieser Erkrankung ist in der Literatur nicht immer beschrieben, wobei bei hiesigem Phänotyp eine restitutio ad integrum in einem Drittel der Fälle beschrieben wird, ein weiteres Drittel zeigt eine partielle Erholung und der Rest kaum Besserung der Befunde im Verlauf. Die OCT-Untersuchung stellt die wichtigste multimodale Bildgebung dar bei der Poppers-Makulopathie, sowohl bei der Diagnosestellung als auch für den Verlauf, und erlaubt die Unterteilung in drei Phänotypen mit verschiedenen Prognosen.

Financial Interests: None
Grants: None

[8468] Nationales Qualitätsregister für das Port Delivery System (PDS)

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Purpose: Mit Einführung eines neuen chirurgisch eingesetzten Medical Device in der Ophthalmologie (Port Delivery System - PDS), wurde in Zusammenarbeit mit vitreoretinalen Ophthalmochirurgen (PDS Arbeitsgruppe), Datenbankspezialisten und dem Hersteller ein Qualitätsregister erarbeitet. Das Ziel des Registers ist die Sicherstellung der qualitativ hochstehenden Handhabung sowie die angepasste Schulung der Operateure. Das Führen dieses zweckgebundenen Registers dient gleichzeitig der im Krankenversicherungsgesetz (KVG) vorgegebenen Stärkung von Qualität und Wirtschaftlichkeit. **Methods:** Die Kriterien und die einzelnen Datenpunkte wurden in der PDS Arbeitsgruppe erarbeitet. Eine Zuständigkeitsabklärung erfolgte bei der Ethikkommission Nordwest- und Zentralschweiz zur Sicherstellung der Trennung von Forschungsfragen und Qualitätssicherung. Als Plattform dient die Adjumed.net Datenbank, welche in anderen chirurgischen Disziplinen seit Jahren etabliert ist, aufbauend auf dem ISO-zertifizierten Blueprint der Arbeitsgemeinschaft für Qualitätssicherung in den Chirurgischen Disziplinen (AQC). Sicherheit und Leistungsfähigkeit werden durch eine die Komplexität abbildende Server- und Datenbankstruktur gepaart mit weiteren Massnahmen wie Managed Firewalls, Security Audits (Penetration Tests und Code Reviews) und verteilten Backups sichergestellt. Sämtliche Einträge im Register sind per automatischem Change-Log auditierbar. **Results:** Das Register wurde als webbasierte Plattform realisiert. Patientenangaben werden anhand ihres Patient Identifier (PID) im lokalen Klinikinformationssystem (KIS) identifiziert und an das Register weitergereicht, wo die Angaben komplettiert werden. Als qualitätsrelevante Parameter wurden identifiziert: Patientenalter und -geschlecht, Implantat-ID, Datum des jeweiligen Eingriffs (Implantation, Refill, Revison) und der ausführende Operateur. Automatisierte Reports zeigen die operativen Tätigkeiten und den Schulungsbedarf der einzelnen Operateure auf. Die einzelnen Teilnehmer haben jederzeit Zugriff auf ihre eigenen Daten und können sich benchmarken. **Conclusion:** Die gesammelten Erfahrungen können helfen, langfristig erfolgreich ophthalmologische Qualitätsmessung zu etablieren. Realisierbar ist dies durch eine Anbindung an lokale IT-Systeme sowie ein Datensatz, der sich weiterhin auf das Wesentliche beschränkt, um den zeitlichen Mehraufwand für die Nutzer zu minimieren.

Financial Interests: Support from a for-profit company; consultant with business interests
Grants: Roche Pharma (Schweiz) AG

[8478] Biomarkers in epiretinal gliosis and vitreomacular traction – clinical examples

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Background: Besides visual acuity and duration of sympthoms, biomarkers based on OCT imaging have been describes as helpful in defining the stage of pathology and predicting the chance of improvement of visual acuity and metamorphopsia in patients considered for pars plana vitrectomy and /or peeling procedures. **Methods:** For this study we analyzed cases before and after pars plana vitrectomy, cases of natural history, and cases with macular comorbidies seen in our clinic. **Results:** Follow up was up to nine years. Patients generally showed improved retinal thickness in OCT images post-operatively and improved visual acuity in most cases. Improvement in retinal thickness continued over several months. We could identify cases where OCT biomarkers for better or poorer prognosis appear not to be correct. We also observed improvement of co-morbidities like macular edema secondary to retinal vein occlusions and age related macular degeneration if vitremacular traction was released. **Conclusion:** Biomarkers based on OCT findings are helpful to predict outcome of pars plana vitrectomy and / or peeling surgery, but have limitations.

Financial Interests: None
Grants: None

[8481] Lux in tenebris

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Purpose: We report the case of an 81-year-old diabetic patient presenting with characteristic symptoms of a central retinal artery occlusion (CRAO) and complete amaurosis on the right eye. 4 hours after the onset of symptoms the patient progressively regained partial vision in the absence of any thrombolytic treatment. **Observations:** The patient reported to our office after acute onset of right-sided unilateral amaurosis in the afternoon around 3pm. Ophthalmological assessment revealed fundus with extensive retinal ischaemia, cherry-red spot and typical black-and-white pattern on SD-OCT scan (Avanti Optovue, Inc., Fremont, CA). BCVA was at nulla lux on the right (+0.00 diopters SE) and 20/20 on the left. The patient was referred immediately to the neurological stroke unit where a CT-angiography ruled out cerebral thrombosis. Oral aspirin and atorvastatin were initiated in an

attempt to prevent further clogging. 4 days after initial presentation the patient was seen at our office and reported partial recovery of right-eyed vision only 4 hours after complete vision loss 4 days ago. Surprisingly, BCVA was at 20/100 (-0.625 dpt SE) and FLA showed reperfusion of formerly ischemic zones in all 4 quadrants, decreased retinal edema and only discreet residual peripapillary vessel leakage in late frames. **Conclusions:** CRAO is a multidisciplinary emergency that needs immediate ophthalmological attention and admission to a specialized neurological stroke unit. Origins can be diverse , yet thrombo-embolic, traumatic or inflammatory causes prevail. Oxygen deprivation tolerance of retinal tissue is notoriously low and attempts to re-perfuse occluded vessels mostly fail as therapeutic options are scarce. Ischemia-reperfusion models in rhesus monkeys are being used for neuroprotective strategies yet spontaneous reperfusion after complete CRAO hasn't been studied extensively.

Financial Interests: None
Grants: None

[8520] Erste Erfahrungen mit dem Port Delivery System (PDS) in der Schweiz

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Kritische Aspekte zur Gewährleistung der Patientensicherheit sind die minutiöse Vorbereitung und Schulung der Ärzte, die die Therapiebelastung der Patienten erkennen und eng mit dem Roche "Surgical Excellence Program" (SEP) zusammenarbeiten wollen. **Methoden:** Patienten mit einem nachgewiesenen Ansprechen auf intravitreale anti-VEGF Injektionen können aufgrund anatomischer Einschlusskriterien identifiziert werden. Argumente für ein Implantat sind die mit der herkömmlichen Therapie verbundenen sehr häufigen intravitrealen Injektionen, Angst vor Spritzen und Schmerzen bei der Injektion.
Resultate: Die Implantationen des PDS werden im Rahmen einer Studie in ausgewählten ophthalmologischen Kliniken in der Schweiz durchgeführt, die über eine entsprechende Studienerfahrung, eine grosse Patientenzahl zur Selektion sowie OP-Räumlichkeiten inkl. Bilddiagnostik und Videoaufzeichnung verfügen. Ausschliesslich Netzhautchirurgen, die im Implantationsverfahren geschult wurden und welche die vorangehende Simulation der Implantation und des Refill-Vorgangs mit dafür konstruierten Virtual Reality-Systemen durchgeführt haben, sind zur Implantation berechtigt. Seit November 2021 konnte bei über 10 Patienten die Implantation erfolgreich durchgeführt werden, wobei ein international genutztes Protokoll exakt befolgt und die Eingriffe per Video ausgewertet wurden.
Schlussfolgerung: Eine sorgfältige Patientenselektion und -organisation, die Einhaltung regelmässiger Schulungen, sowie eine gut abgestimmte Logistik sind zentral, um eine erfolgreiche funktionsübergreifende Zusammenarbeit zwischen dem SEP und den behandelnden Kliniken zu gewährleisten. Nur so kann der Behandlungserfolg bei maximaler Patientensicherheit erreicht und die Vorteile des PDS durch die stark reduzierte Behandlungshäufigkeit umgesetzt werden.

Disclaimer: Das beschriebene Produkt (PDS mit Ranibizumab) ist in der Schweiz nicht zugelassen. Es wird im Rahmen klinischer Studien in der Schweiz an 5 ausgesuchten Zentren angewendet und untersucht.

Financial Interests: None
Grants: Matthias Becker: Roche Pharma (Schweiz) AG (Advisor), Co-founder Ophthorobotics; Katja Hatz: Roche (C), Novartis Schweiz (C), Bayer (C), Allergan/Abbvie (C); Theo Signer: -; Chiara Eandi: Bayer, Novartis, Roche (unrestricted grants/(C)); Thomas Wolfensberger: Roche Pharma (Schweiz) AG (C); Christian Prünte: Alcon, Apellis, Bayer, Novartis, Roche (C)

[8532] Constellation of different retinal lesions in Tuberous Sclerosis: a case report

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Purpose: To describe differing retinal lesions observed in a single case of Tuberous Sclerosis (TS), using multimodal imaging. **Methods:** A 15-year-old teenager diagnosed with TS was referred to our department for an ocular examination. Retinal images performed with Optos California® ultra-widefield retinal imaging system were correlated to fundus autofluorescence and OCT scans acquired with a Spectral Domain Optical Coherence Tomography Spectralis Heidelberg®. **Results:** Best-corrected visual acuity was 20/20, with normal anterior segment and IOP, while fundoscopy revealed different types of retinal anomalies in the mid-periphery of both eyes. The largest type was seen in both fundi as a pale salmon-colored mass, located nasally in the RE and superiorly in the LE, surrounded by a discrete hypofluorescent halo on autofluorescence imaging. The SD OCT revealed a dome-shaped retinal tumor located in the NFL with focal adhesion of the vitreous cortex at the summit, consistent with a non-calcified retinal hamartoma. A small punched-out atrophic patch was also found in the RE. It is an hypoautofluorescent spot, measuring less than 1.5mm, and appears as focal retinal pigment epithelium (RPE) defect on OCT. Additionally, several achromatic pinpoint lesions were observed in the midperiphery of both fundi. They appeared as hyperfluorescent pinpoints in blue light and as focal hyperreflective irregularities of the RPE-photoreceptor complex on the B scan OCT. **Conclusion:** Retinal hamartomas are part of the major diagnostic criteria of TS. However, various other lesser-known retinal manifestations have been reported and identification of these anomalies is helpful in establishing the diagnosis of TS. We describe a case showing different types of retinal lesions on the same fundus, using multimodal imaging. Multimodal imaging helps to achieve a better understanding of the retinal damage. While different types of retinal hamartomas and depigmented RPE atrophies have been well documented as an important finding in TS, to date only one recent case report has pub-

lished OCT scans of the achromatic pinpoint patches. The mechanism behind the development of all these multiple retinal alterations remains to be determined.

Financial Interests: None
Grants: None

[8533] Repeatability of vascular function using dynamic retinal diameter measurements on Zeiss and Imedos devices

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Purpose: To investigate the repeatability of dynamic flicker response and to evaluate its association with the static diameter parameters of the vessels in the peripapillary area (CRA, CRV, AVR) in healthy controls. **Methods:** 20 right eyes of 20 healthy controls (mean age: 35.61 ±SD 13.26 years), who underwent randomly dynamic retinal diameter measurements on Zeiss und IMEDOS devices of Retinal Vessel Analyser were included (Imedos, Jena, Germany). In addition, the baseline static diameter parameters of the vessels in the peripapillary area were evaluated using RVA on Imedos Retinal Vessel Analyser by IMEDOS (Imedos, Jena, Germany). These parameters were further evaluated in relation to the dynamic ones. **Results:** In general, vascular flicker response of arteries was lower compared to venules (p=0.008). These responses tended to be more pronounced in the measurements with the Zeiss device compared to IMEDOS, however without reaching significant values. Also, taking only the flicker response of arteries or venules into account both devices did not differ from each other (p>0.30). The effect of the mean baseline parameters (±SD) of arteries 178.24µm (±18.43) and venules 211.148 µm (±19.245) did not influence the flicker response either for Zeiss or IMEDOS devices (p≥0.07). However, the corresponding ratio AVR 0.84 (±.0.07) correlated significantly with the flicker dilatation response of venules (p=0.018). The order of measurement did not influence the data analyses of arterioles or venules (p≥0.50). **Conclusion:** Our study confirms that flicker response on Zeiss und IMEDOS devices even showing slightly difference did not differ significantly either for arteries or venules, allowing thus using already preformed measurements. Nevertheless, care should be taken in interpretation of these data in the clinical and research setting.

Financial Interests: None
Grants: None

[8539] Electrodiagnostic features in a case of Barraquer-Simons syndrome

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Case presentation: Acquired partial lipodystrophy known as Barraquer-Simons syndrome is a rare disorder with unknown origin. Diagnosis is based on typical clinical findings of symmetric subcutaneous fat loss over the face followed by fat loss in the upper half of the body. Systemic involvement is common and includes nephropathy, myopathy, deafness, epilepsy, and intellectual disability. The presented case aim to describe the electrodiagnostic features in a case of Barraquer-Simons syndrome.
A 69-year-old women was firstly referred due to bilateral peripheral drusen-like deposits in the retina associated with atrophic areas and isolated pigmentary changes with a "bone-spicule" configuration by otherwise normal visual acuity (BCVA: OU 1.0) and visual field testing (Goldmann Perimetry). Based on only slightly reduced scotopic b-wave amplitudes of ffERG a preexisting uveitis, was postulated. However, blood testing ruled any possibility of uveitis out.
Retrospective general data accumulation, revealed already at age of 7 years a suspicion of partial lipodystrophy as part of a metabolic syndrome. Due to the signs of insulin resistance, at age 49 years, the patient was diagnosed with diabetes.
In a follow-up referral 12 years later, the fundus examination and visual acuity showed slightly progressive changes. Clinical symptomatology and electrodiagnostic readings remained stable. Results of the scotopic ffERG revealed still slightly reduced b-wave amplitudes. Her visual fields appeared unremarkable. Detailed fundus wide-field color- and autofluorescence imaging confirmed the slight extension of the preexisting isolated pigmentary changes with a "bone-spicule" configuration and underlined atrophic- und drusen-like areas in the periphery, to be slowly progressive.
OCT imaging of the macula revealed the yellowish deposits on imaging to resemble pseudo-drusen. Within the 12 years follow-up these revealed localized disruption of ellipsoid zone continuity corresponding to the development of atrophic areas on fundus imaging. The diagnosis of hereditary retinopathy as part of Barraquer-Simons syndrome was established.
Conclusion: In the presented case, based on the electrophysiological findings, the retinal dystrophy associated with Barraquer-Simons syndrome seems to be slowly progressive by origin. Nevertheless, care should be taken, as several cases noted development of choroidal neovascular membranes with potential visual threatening consequences.

Financial Interests: None
Grants: None

[8542] Wirksamkeit, Wirkdauer und Sicherheit von Faricimab bei diabetischem Makulaödem (DMÖ): 2-Jahres-Ergebnisse der Ph3-Studien YOSEMITE und RHINE This abstract will be presented in Free Paper Session, Thursday 8:00–10:00

Katja Hatz[1]; Patricio G. Schlottmann[2]; John A. Wells[3]; Zdenka Haskova[4]; Shaun Mohan[4]; David Silverman[5]; Yannan Tang[4]; Hugh Lin[4]
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Fragestellung: 1-Jahres-Daten der Phase-3-Studien YOSEMITE/RHINE (Y/R) zufolge kann eine duale Hemmung von Ang-2/

VEGF-A mit dem bispezifischen Antikörper Faricimab die Gefässstabilität bei DMÖ fördern und die Wirkdauer auf bis zu Q16W verlängern, wie im Arm mit personalisierten Therapieintervallen (PTI) beobachtet. Im 2. Jahr von Y/R wird die Langzeit-Wirksamkeit und -Sicherheit von Faricimab bewertet.
Methodik: In den randomisierten, doppelblinden, 100-wöchigen Studien YOSEMITE (NCT03622580) und RHINE (NCT03622593) mit Dosierungsintervallen bis zu Q16W wurden DMÖ-Patienten 1:1:1 zu Faricimab (FAR) 6,0 mg Q8W nach 6, FAR 6,0 mg PTI (Q4W bis Q16W) nach 4 oder Aflibercept (AFL) 2,0 mg Q8W nach 5 initialen Q4W-Dosen randomisiert. Primärer Endpunkt war die mittlere BCVA-Veränderung vs. Baseline (BL) nach 1 Jahr, gemittelt über die Wochen (W) 48, 52 und 56.
Ergebnisse: In YOSEMITE (n=940) und RHINE (n=951) wurde der primäre Endpunkt erreicht. Die nach 1 Jahr erzielten Visusverbesserungen wurden im 2. Jahr aufrechterhalten: Die mittlere BCVA-Veränderung vs. BL mit FAR Q8W (+10,7/+10,9 ETDRS-Buchstaben in Y/R) oder FAR PTI bis zu Q16W (+10,7/+10,1) war mit AFL Q8W (+11,4/+9,4) vergleichbar. Dabei erhielten > 60% der Patienten im PTI-Arm in W96 eine Q16W- und nahezu 80% eine ≥ Q12W-Dosierung. Sowohl die 1- als auch 2-Jahres-Daten zeigten Vorteile mit FAR Q8W hinsichtlich der CST-Reduktion vs. AFL Q8W. Bis W100 erreichte ein grösserer Patientenanteil mit FAR Q8W/PTI die Abwesenheit eines DMÖ (CST< 325µm) und das Fehlen intraretinaler Flüssigkeit vs. AFL Q8W, während das Fehlen subretinaler Flüssigkeit über die Studien und Behandlungsarme hinweg ähnlich waren. FAR war in beiden Studien gut verträglich (geringe Anzahl intraokularer Entzündungsereignisse, keine retinale oder okklusive retinale Vaskulitis).
Schlussfolgerungen: YOSEMITE und RHINE zeigten, dass mit einem Faricimab-Dosierungsintervall von bis zu Q16W robuste Visus- und anatomische Verbesserungen, sowie eine verlängerte Wirkdauer über 2 Jahre aufrechterhalten wurden. Die auf dem treat-and-extend-Regime basierende Dosierung im PTI-Arm unterstützt die Hypothese, dass die duale Ang-2/VEGF-A-Hemmung die Gefässstabilität und die Langzeit-Wirksamkeit über derzeitige Anti-VEGF-Therapien hinaus fördern und eine alternative Behandlungsoption für die heterogenen Bedürfnisse der DMÖ-Patientenpopulation bietet.

Grants: None
Financial Interests: None

[8547] The assessment of the reliability of different fundus image quality labeling protocols among graders with different backgrounds

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Purpose: For the training of machine learning (ML) algorithms, correctly labeled ground truth data are inevitable. In this pilot study, we assessed the performance of graders with different backgrounds in the labeling of retinal fundus image quality using two different modalities.
Methods: Color fundus photographs were labeled using a Python-based tool using four image categories: excellent (E), good (G), adequate (A) and insufficient for grading (I). We enrolled 8 subjects (4 with and 4 without medical background, groups M and NM, respectively) to whom a tutorial was presented on image quality requirements. We randomly selected 200 images from a pool of 18,145 expert-labeled images (50/E, 50/G, 50/A, 50/I). As an alternative method, the performance of the grading was timed and the agreement was assessed also using 14 labels in order to obtain a more objective analysis.
Results: The median time (interquartile range) for the labeling task with 4 categories was 987.8 sec (418.6) for all graders and 872.9 sec (621.0) vs. 1019.8 sec (479.5) in the M vs. NM groups, respectively. Cohen's weighted kappa showed moderate agreement (0.564) when using four categories that increased to substantial (0.637) when using only three by merging the E and G groups. By the use of 14 labels, the weighted kappa values were 0.594 and 0.667 when assigning four or three categories, respectively.
Conclusion: Image grading with a Python-based tool seems to be a simple yet possibly efficient solution for the labeling of fundus images according to image quality that does not necessarily require medical background. Such grading can be subject to variability but could still effectively serve the robust identification of images with insufficient quality. This emphasizes the opportunity for the democratization of ML-applications among persons with both medical and non-medical background. However, simplicity of the grading system is key to successful categorization.

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[8549] The assessment of intense physical strain on acute chorioretinal changes in senior sportsmen

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Purpose: Regular mild to moderate exercise is important in healthy aging and has been described to lead to a lower incidence of cataract, glaucoma or age-related macular degeneration. We assessed the acute chorioretinal changes in senior athletes following short intense physical strain as assessed by optical coherence tomography (OCT) imaging in order to elucidate the effect of physical activity on the retina. **Methods:** Seventeen eyes of 17 healthy senior sportsmen (mean age 67.9 ± 7.4 years, 11 males and 6 females) were recruited for the study conducted at Semmelweis University, Department of Ophthalmology. The subjects performed a stepwise incremental exercise trial until exhaustion

(vita maxima) or reaching a peak of maximum physiological age-related systolic blood pressure (calculated as 220/min - age) on a cycle ergometer. Macular scanning with a spectral domain (SD) OCT device was performed before and 1, 5, 15, 30 and 60 minutes after the exercise. The SD-OCT images were exported and segmented by our custom-built OCTRIMA 3D software and the thickness of the choroid and 7 retinal layers was measured. One-way ANOVA analysis was performed followed by Dunnett post hoc test. The level of significance was set at 5%. **Results:** A significant thinning of the total retina was observed 1 minute post exercise which was followed by a significant thickening at 5 minutes (-1.56±1.1µm, p=0.000 and +1.05±1.0µm, p=0.012, respectively), with thickness values returning to baseline afterwards. The same significant trend was observed at the composite layer of the outer retina consisting of the outer plexiform and outer nuclear layer and the outer segment (-0.7±0.3µm, p=0.000 and +0.7±0.5µm, p=0.000 for 1 and 5 minutes, respectively). The outer region of the GCL+IPL complex showed also a significant thinning at 1 minute (-0.5±0.4µm, p=0.000). There was neither any significant change in choroidal thickness nor any correlation with the thickness changes of the intraretinal layers. **Conclusions:** Our results point towards an acute effect of strong physical strain in senior sportsmen mainly involving the outer retina, independent of the choroidal vasculature. The observed trend is somewhat less pronounced, although seemingly similar to our previous observations in young sportsmen and warrants further research regarding its role in the healthy ageing of the retina.

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[8556] Analysis of papillary and macular retinal blood flow in healthy young probands using Laser Speckle Flowgraphy

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Purpose: To assess papillary and macular retinal blood flow in healthy young probands using Laser Speckle Flowgraphy (LSFG). **Material and methods:** This prospective single-center study was

conducted at the Department of Ophthalmology at the University Hospital Zurich, Switzerland. Only young healthy men without ocular or systemic diseases were enrolled during a period from May to November 2021. We included patients aged ≥ 18 years with corrected visual acuity (VA) of 0.0 logMAR or better in both eyes and intraocular pressure (IOP) of 21 mmHg or lower. Subjects exceeding a spherical equivalent (SE) of ± 6 diopters (dpt) were excluded. Retinal blood flow in the macular and the papillary region was recorded using the Nidek LSFG RetFlow device (Nidek Company, Ltd., Hirioshi-cho, Japan). Laser power was set to 0.5 Millivolts (mV). Colored heat maps of the recorded papillary and macular area were generated by the RetFlow device. For each heat map, mean blur rate (MBR) was calculated as a parameter to determine relative blood flow velocity being correlated with the anatomical blood flow rate. **Results:** Final analyses included 84 eyes of 42 probands. Mean age was 21.9 years (± 1.5, range: 20 to 29). Mean corrected VA was -0.1 logMAR (± 0.05, range: -0.2 to 0.0), mean IOP was 15.4 (± 2.5, range: 8.5 to 18.5), mean SE was -0.3 dpt (± 1.2, range: -5.0 to 1.2). Mean papillary MBR was 37.44 (± 7.9, range: 22.5 to 53.5), and mean macular MBR was 27.8 (±9.7, range: 6.4 to 57.7). **Conclusion:** This study provides both papillary and macular retinal blood flow data in a healthy young male population. Further investigations are required to assess the validity of MBR as parameter for a combined evaluation of papillary and macular retinal blood flow.

Financial Interests: None; **Grants:** None

[8561] Macular hole closure with medical treatment, a case report

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Purpose: Full-thickness macular holes (FTMHs) are foveal neurosensory defects, which affects all layers above the retinal pigment epithelium. It leads to decrease in central visual acuity and seriously affects the visual quality of affected patients. The spontaneous closure rate has been described between 4% and 11.5% when not wider than 250um, whereas the closure rate after vitrectomy has been reported between 91% to 98%. Emerging evidence suggests, that topical treatment can accelerate the closure time and may avoid surgical intervention. **Methods:** We would like to present a case, in which surgical intervention was avoided by treating the patients topically before a vitrectomy was performed, although intervention was already planned. **Results:** A 64 years old female Patient was administered to our retinal surgery clinic with FTMHs on the right eye. The initial visual acuity was 0.5. The optical coherence tomography showed a wideness below 250um. The Patient was instructed to apply Pred forte 3x/d and Azopt 4x/d until the next appointment. In the follow-up six weeks later, optical coherence tomography showed closed FTMHs with remaining subretinal fluid. The visual acuity improved to 0.8. Pars plana vitrectomy was avoided. **Conclusion:** Topical therapy could be used during the time from first manifestation and diagnosis up to the date of preplanned intervention. Optical coherence tomography could then be used preoperatively to decide if intervention is still needed. Further prospective randomized studies are needed to fully explore the therapeutically effects of topical therapy, which could lead better treatment and avoidance of unnecessary interventions.

Financial Interests: None, **Grants:** None

External Disease | Cornea

[8389] Antioxidative & anti-inflammatory effects of mallow extract in the treatment of dry eye disease

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Inflammation is a key driver for clinical symptoms in dry eye disease (DED), such as itching, foreign body sensation, redness and pain. The release of pro-inflammatory mediators is triggered by a hyperosmolar environment due to loss of tear volume. Leukotrienes and prostaglandins produced by 5-lipoxygenase (5-LOX) and cyclooxygenase-2 (COX-2), respectively, are key mediators in inflammation. First line treatment for mild to severe DED is mostly based on eye drops that contain hyaluronic acid (HA) whose rheological profile provides ideal properties for lubrication of the corneal surface and stabilization of the tear film. However, rheology of eye drops is negatively influenced by HA concentration as evidenced by concentration-dependent increase of viscosity and thus often leading to blurry vision. Furthermore, most HA-only treatments only refer to a substitution of tear fluid without anti-inflammatory properties. Visiodoron Malva® eye drops – authorized as a medical device for the treatment of DED – contains an ethanolic extract of Malva sylvestris L. flos (MS) that accounts for a reduction of surface tension thereby facilitating the wetting of the ocular surface without any vision impairment. We report about novel investigations in vitro to explore the putative potential of MS in DED treatment to prevent inflammation and oxidative stress and the ability to promote wound healing. MS concentration-dependently inhibited 5-LOX- and COX-2 activity in vitro (IC50: 22.7 and 23.3 µg/ml). In an ORAC (oxygen radical absorbance capacity) assay the scavenging efficiency of MS was high against peroxyl- and peroxynitrite radicals (IC50: 30.3 and 23.3 µg/ml), medium against hydroxyl radicals (308 µg/ml) and low against superoxide radicals (>1,000 µg/ml). Furthermore, we show that a combination of HA and MS offers ideal physicochemical properties for tear film stabilization and advanced corneal surface lubrication compared to a common HA-only treatment. Notably, in HA-containing eye drops plus MS extract, surface tension was significantly reduced compared to a HA-only product by determination of the rheological profile

with concentration-dependent effect of MS extract. These data suggest that MS might exert an effective contribution in DED treatment by anti-inflammatory and radical scavenging actions. MS might be further helpful promoting regeneration following ocular damage in DED. However, further investigations are needed to study bioavailability and efficacy in vivo.

Financial Interests: Employment by a company
Grants: None

[8390] Euphrasia planta tota extract revealed a variety of anti-inflammatory properties

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Euphrasia officinalis, a traditional herbal medicine is used in the treatment of irritated eyes for indications like allergic or non-infectious conjunctivitis and catarrhal inflammation accompanied by symptoms like redness, swelling, pain and increased lacrimation. Detailed investigations of pharmaceutical mode of actions for Euphrasia are very scarce. With this study we present a variety of pathways, effectively targeted by the treatment of Euphrasia planta tota (EPT), demonstrating its anti-inflammatory properties in vitro. Dry extracts from EPT were prepared according to V.3c HAB. Anti-oxidative effects were investigated by the DPPH radical scavenging assay. Cyclooxygenase-2 (COX-2), 5-lipoxygenase (5-LO) and matrix metalloproteinase (MMP) activity was analyzed by enzyme inhibition assays. Activation of nuclear factor kappa B (NF-kB) was analyzed in a reporter assay with the human Jurkat T-cell line. We investigated the anti-oxidative effects of EPT, showing its preventive capability of tissue damage by reduction of oxidative radicals. Furthermore, we demonstrated effective enzyme inhibition of the inflammatory mediators COX-2 (IC50: 7.6 µg/ml) and 5-LO (IC50: 27.9 µg/ml), which play a major role in pain and inflammation. We also revealed a decreased activity of several MMPs, which are common drivers for the inflammatory cascade in eye irritation by degrading inflamed tissue. And we show a concentration-dependent inhibition of NF-kB translocation (IC50: 50.7 µg/ml), generally involved in regulation of immune response and inflammation. Altogether, these mechanisms targeted by EPT are contributing to a general anti-inflammatory response and preventing oxidative damage, which ultimately promotes the wound-healing process of the affected tissue in irritated eyes.

Financial Interests: Employment by a company
Grants: None

[8401] Spontane Hornhautperforation bei therapieresistenter MPO-ANCA-assoziierter Kleingefässvaskulitis

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Spontane Hornhautperforationen im Rahmen der peripheren ulzerativen Keratitis (PUK) sind bereits in der Literatur beschrieben. Die Abklärung einer systemischen Grunderkrankung ist dabei für die Therapie essentiell. Eine MPO-ANCA-assoziierte Kleingefässvaskulitis gehört zu den möglichen ursächlichen Grunderkrankungen. Es handelt sich dabei um eine Autoimmunkrankheit, die mittels Immunsupressiva behandelt wird. Als mögliche Therapie einer rezidivierenden PUK sind neben Kortison auch Biologika wie z.B. Rituximab möglich, welches gemäss Literatur ein gutes Ansprechen zeigt. In dem vorgestellten Fall eines Patienten mit PUK bei ANCA-positiver Kleingefässvaskulitis konnte trotz maximaler Therapie eine spontane korneale Perforation nicht verhindert werden. Eine tektonische perforierende Keratoplastik à chaud war daher unumgänglich.

Financial Interests: None
Grants: None

[8403] Wellenfront-geführte transepitheliale phototherapeutisch-refraktive Keratektomie (transPTK/PRK) nach Keratoplastik

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Fragestellung/Hintergrund: Nach Keratoplastik (KP) liegt häufig ein unbefriedigendes subjektives Visusergebnis vor. Dies hängt meist mit Anisometropie-Beschwerden, hohem Astigmatismus und/oder Fehlern höherer Ordnung zusammen und wird bei KL-Intoleranz manifest. Bislang gibt es keine Studien zu Wellenfront-geführten Excimer-Behandlungen nach Keratoplastik, da erst neueste Generationen von Aberrometern stark aberrierte Hornhäute exakt messen können. **Methodik:** In einer prospektiven Beobachtungsstudie wurde bei 8 Patienten nach KP und visuell unbefriedigender Situation eine Wellenfront-geführte transepitheliale phototherapeutisch-refraktive Keratektomie durchgeführt. Einschlussbedingungen waren im Speziellen eine regelrechte Hornhautsensibilität und eine suffiziente Tränenproduktion. Präoperativ, einen Monat und vier Monate postoperativ erfolgte eine Bestimmung des bestkorrigierten Brillenvisus (BSCVA), des unkorrigierten Visus (UCVA), eine okuläre Aberrometrie und eine korneale Tomographie. Die statistische Auswertung erfolgte mit SPSS 25.0. P-Werte kleiner 0,05 wurden als signifikant definiert. **Ergebnis:** Ein und 4 Monate nach Wellenfront-geführter trans-PRK/PTK zeigten alle Patienten einen signifikanten Visusgewinn mit Abnahme des manifesten Astigmatismus. Zudem konnte eine signifikante Reduktion des sphärischen Äquivalents, der Fehler höherer Ordnung und Fehler niederer Ordnung beobachtet werden. Es wurden keine unerwünschten Ereignisse im Sinne von Abstoßungen oder Wundheilungsstörungen gefunden. **Schlussfolgerung:** Für Patienten mit einer Kontaktlinsenintoleranz

und nur unbefriedigender Brillenkorrektur nach KP stellt die Wellenfront-geführte transepitheliale PRK/PTK ein vielversprechendes Verfahren zur Visusrehabilitation dar.

Financial Interests: Consultant with business interests
Grants: None

[8407] Prototype of transparent full-face mask is perceived as beneficial when compared to commonly available personal protective equipment

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Purpose To investigate the perception and performance of the espire facemask prototype by medical personnel in comparison to current personal protective equipment (PPE). **Methods** Twenty health care workers from a primary care facility were included in the user testing. General characteristics of the participants including age, gender, specialization, and wearing glasses were recorded. In a standardized setting, the participants were asked to dress the institution's standard PPE and the espire prototype and to perform a series of tasks with the time monitored by the investigator. The participants filled in standardized questionnaires grading their perception of the PPEs. **Results** Median age of participants was 32.5 (min 25.0; max 59.0) years, nine male, eleven female. Eighteen out of twenty participants (90%) expect the espire facemask to be beneficiary to working in health care compared to the commonly available masks. Equally, 90% of the participants (eighteen out of twenty) stated that they were willing to use espire in the relevant working context. The task to tie and loosen a knot was performed three times wearing the espire prototype and three times wearing the combination of FFP-2, FFP-1 and safety goggles, which constitutes the standard PPE for consultation of infectious patients. The median time measured to fulfil the task was 23.5 (min 14; max 33) s for standard PPE and 21 (min 12; max 32) s for espire. The degree of trust in the safety of espire was evaluated as a median of 8 (min 6; max 10) on a scale from 0 to 10 (0 = low, 10=high), while the trust in the safety of the standard PPE yielded a median of 5 (min 3; max 10). Comfort of espire was assessed as 8 (min 3; max 10) and the standard PPE with 6 (min 1; max 10) respectively. **Conclusion** The prototype of the full face mask espire was perceived as beneficial when compared to commonly available personal protective gear, including the domains of perceived safety and comfort. It demonstrated to be non-inferior in the execution of dexterity tasks.

Financial Interests: Employment by a company/competing company
Grants: None

[8408] iOCT-assistierte DSAEK-Tamponade bei spontaner Hornhautperforation mit sekundärer Filterkissenbildung bei Pelluzider Marginaler Degeneration

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Dieser Fall beschreibt einen 50-Jährigen Patienten, der im Rahmen einer pelluciden marginalen Degeneration (PMD) eine spontane Hornhautperforation in der infero-temporalen Hornhautzirkumferenz limbusnah mit sekundärer Filterkissenbildung erlitten hatte. Der Defekt konnte im Verlauf, nach initialer Versorgung mit Histoakrylkleber, mittels iOCT-gesteuerter DSAEK-Tamponade gedeckt werden. Im Verlauf konnte eine im Defektbereich anliegende DSAEK-Lamelle festgestellt werden und das Filterkissen hat sich zurückgebildet. Der Patient konnte 2 Wochen nach dem Eingriff seine Kontaktlinse wieder tragen und seine vorherige Sehkraft erreichen. Die iOCT-assistierte DSAEK-Tamponade stellt eine wertvolle Alternative bei Hornhautperforationen mit komplexer Ausgangsituation dar und könnte bei bestimmten Fällen erfolgreich angewendet werden.

Financial Interests: None
Grants: None

[8413] Radiofrequency diathermy as a treatment of lipid keratopathy in a radial keratotomy incision.

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Title: Radiofrequency diathermy as a treatment of lipid keratopathy in a radial keratotomy incision. **Purpose:** We report a case of lipid keratopathy in a radial keratotomy incision that was successfully managed with radiofrequency diathermy of the feeder vessel responsible for the lipid deposition. **Methods:** The procedure was performed by a senior cornea specialist (KH) utilizing a radiofrequency diathermy probe (Klöti, Oertli ®, Switzerland) under topical anesthesia in the operating room. **Results:** No perioperative or postoperative complications were noted. Following the procedure, the lesion showed significant decrease in lipid deposits and opacification along with disappearance of the neovascular feeder vessel. **Conclusions and importance:** Radiofrequency diathermy of feeder vessels represents an effective and safe alternative treatment option for treating lipid keratopathy. This is a first ever report of lipid keratopathy inside a radial keratotomy incision that was successfully managed by radiofrequency diathermy.

Financial Interests: None
Grants: None

[8417] Intrastromal Ring Segment Implantation Results In Corneal Mechanical Strengthening Visualized With Optical Coherence Elastography

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Purpose: To quantify the mechanical impact of intracorneal ring segment (ICRS) implantation of different dimensions in an ex vivo eye model. **Setting:** OPTIC team, Computer Vision Laboratory, ETH Zurich, Switzerland and ELZA Institute, Dietikon/Zurich, Switzerland
Methods: A total of 30 enucleated porcine eyes were obtained and assigned either to ICRS implantation (thickness 300µm, angle 120°, 210° or 325°), tunnel creation only or virgin control. For mechanical evaluation, each eye globe was mounted on a customized holder and intraocular pressure (IOP) was increased in steps of 0.5 mmHg from 15 to 17 mmHg, simulating physiologic diurnal IOP fluctuations. At each step, an optical coherence tomography volume scan was recorded. Deformations between subsequent scans, as well as the locally induced axial strains were analyzed using a vector-based phase difference method. The effective E-modulus was derived from the overall induced strain as a measure of global mechanical impact.
Results: ICRS implantation increased the effective E-modulus from 146 and 163 kPa in virgin and tunnel-only eyes to 149, 192 and 330 kPa in eyes that received a 5 mm optical zone ICRS with 120°, 210° and 325° arc length, respectively, and to 209 kPa in a 6 mm optical zone ICRS with 325° arc length. The most consistent effect was a shift towards positive strains in the posterior stroma by 0.1 to 0.46 ‰ (factor 1.15 to 2.15) after ICRS surgery.
Conclusions: ICRS implantation reduces the overall tissue strain under the load of the IOP and provokes posterior tissue relaxation. This effect is more dominant the longer the arc length and the smaller the optical zone of the ICRS is. ICRS have not only a geometrical, but also a mechanical impact on corneal tissue. This behavior might have clinical implications when ICRS implantation is performed in biomechanically weakened keratoconus corneas.

Financial Interests: None. No commercial relationship; Inventor/Developer of the topic or a competing topic
Grants: Supported by the Swiss National Science Foundation (Ambizione PZ00P2_174113 to SK)

[8421] The Antibacterial Efficacy of High-Fluence PACK Cross-Linking can be Accelerated

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Purpose: To determine whether high-fluence photoactivated chromophore for keratitis cross-linking (PACK-CXL) can be accelerated. **Setting:** The Ocular Cell Biology Group, Center for Applied Biotechnology and Molecular Medicine and the Institute of Medical Microbiology, University of Zurich, Switzerland.
Methods: Solutions of a clinical strain of Staphylococcus aureus obtained from an infected eye and 0.1% riboflavin were prepared and irradiated at 365 nm ultraviolet (UV)-A using intensities and fluences ranging from 9 to 30 mW/cm2 and 5.4 to 15 J/cm2, respectively, representing nine different accelerated PACK-CXL protocols. Irradiated and unirradiated bacterial solutions were plated and inoculated on agar plates. The number of colony forming units (CFU) was counted and bacterial killing ratios (BKRs) were calculated. **Results:** The mean BKR for Staphylococcus aureus with 0.1% riboflavin solutions after an irradiation applying total fluences of 5.4 J/cm2, 10J/cm2, and 15 J/cm2 using accelerated protocols were 45.78%-50.20%, 80.01%-84.13%, and 97.21%-99.91%, respectively. As controls without riboflavin, the corresponding mean BKR were 15.59%-18.07%, 24.59%-43.19%, and 60.68%-69.09%, respectively.
Conclusion: Compared to standard PACK-CXL protocol, accelerated high-influence protocols could achieve similarly high levels of BKR, indicating that the Bunsen-Roscoe law of reciprocity is respected to the antibacterial effects of PACK-CXL. Further optimization of technical settings and the use of different enhancers may help reducing bacterial cornea infections by accelerated PACK-CXL.

Financial Interests: None; **Grants:** None

[8428] The effect of a video tutorial to improve patients' keratoconus knowledge – a randomized controlled trial and meta-analysis of published reports

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Objective: To investigate whether a video tutorial, highlighting important aspects of keratoconus provided prior to a scheduled follow-up consultation, has a specific effect on patients' knowledge after the consultation. **Methods and Analysis:** Single center, randomized controlled trial registered on ISRCTN registry (number ISCTN75317089). Consenting eligible keratoconus patients were randomly assigned to either receive a conventional face-to-face consultation (control group) or to an additional video tutorial (interventional group) on definition, risk factors and treatment options provided prior to the consultation. The main outcome measure was the difference of knowledge assessed by a questionnaire after the consultation. Of each participant, clinical characteristics, highest educational level and medical background were obtained. We also performed a meta-analysis of published reports assessing knowledge improvement by video-based patient education. **Results:** We assigned 22 patients to the interventional and 21 patients to the control group. Mean age was 29.0 years (SD 11.6), 8/43 (18.6%) were female and median disease duration was 2.5 years (interquartile range: 2-5years). Compared to the control group, knowledge was 12.0% (95%CI: 5.8%-18.2%; $p < 0.001$) higher in the interventional group. Subjects with a university

degree scored 6.8% (95%CI: 3.8%-13.3%; p = 0.038) higher. There was no interaction between video information and university degree. Other parameters were not associated with patient knowledge. The meta-analysis of 566 subjects enrolled in 6 studies revealed a standardized mean difference in favor of video-based education of 0.47 (95% CI: 0.30-0.64; p < 0.004) **Conclusion:** The results suggest that supplementary video information embedded in the clinical management of keratoconus, helps conveying relevant disease knowledge.

Financial Interests: None
Grants: None

[8435] Unilateral, idiopathic corneal stroma cyst in a 14-year old boy – A case report

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We present a rare case of a unilateral corneal stromal cyst with Descemet defect of a patient referred to the University Hospital Bern. The boy was referred by his ophthalmologist because of a suspected diagnosis of a necrotizing scleritis. The patient complained of a foreign body sensation in the right eye without any other symptoms or trauma. Atropine 0.01% eye drops had been applied bilaterally since two years for myopia prophylaxis. The right cornea showed a cystic formation with intact epithelium in the peripheral, superotemporal part without any other pathologies, especially no signs of inflammation. The OCT scan of the cornea showed a defect of the endothelium and the Descemet's membrane and a thinning of the corneal stroma impressing as a cyst. Topic steroids -started by the referring ophthalmologist- were stopped as no inflammation was present. Screening for rheumatic disease was unremarkable, keratoconus was ruled out with corneal topography. Treatment with atropine was continued as no such side effects had been reported. On follow-up examinations the stromal cyst as well as the Descemet defect became smaller. We instructed the patient to avoid contact sport and pressure on the eye. This case shows that atraumatic, isolated, localized, non-inflammatory corneal cysts with spontaneous Descemet defects can occur and can regress without any active intervention.

Financial Interests: None
Grants: None

[8449] Conjunctival foreign body granuloma after pterygium excision and conjunctival adaptation by polyglactin 910 sutures

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[1] Pallas-Kliniken, Olten; [2] Viollier AG, Basel

Purpose: Polyglactin 910 (Vicryl®) is reported as a widely used and well tolerated suture material in ocular surgery. In this report a case of unusual granulomatous reaction against polyglactin 910 (Vicryl®) after pterygium surgery is described. Material and **Methods:** Clinical and histological findings of the observed case are described. **Results:** A 58-year old female patient underwent surgical removal of her pterygium after a 4-years history of frequent itching, pain and occasional corneal congestion. The pterygium was excised and the conjunctiva was readapted with 8-0 polyglactin single sutures. After development of a dehiscence the conjunctiva was readapted again with 8-0 polyglactin sutures. Since the conjunctiva developed again persistent swelling, protrusion and proliferation around sutures a revision with a free conjunctival transplant was performed 24 days later. Pathohistological analysis of the resected tissue around the sutures presented typical findings of foreign body granulomas. **Conclusion:** Generally, polyglactic sutures are reported to be a well tolerated and seem not to cause typical granulomatous reactions. Few reports on granulomatous reactions exist in the dermatosurgical or ophthalmic literature with this suture material. It might have been overlooked in cases with complicated conjunctival healing.

Financial Interests: None
Grants: None

[8451] Artificial iris with a built-in lens implantation in trauma caused by an aerial drone

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Our case reports the use of artificial iris prosthesis with a built in IOL in combination with penetrating keratoplasty in a case of ocular trauma caused by a drone. A 34-year-old male was injured by a recreational drone propeller that sliced his right eye in half. On examination in the emergency department a deep penetrating horizontal corneoscleral and iris wound with expulsion of cristalline lens was detected. The patient underwent immediate surgery under general anaesthesia and the initial wound was sutured. The patient was left aphakic. The post operative visual acuity was limited to hand movements. One month after the injury, an exploratory vitrectomy was performed. During the surgery, suprachoroidal haemorrhage was drained and retinal detachment was repaired. Chorioretinal rupture due to sclopetary retinopathy was observed and retinectomy with endolaser retinopexy around 360° were equally performed. Silicone oil was used for tamponade. Three months later, silicone oil was removed, and further anterior segment reconstructive surgery was planned. Since there was an important iris defect with corneal scarring, a full thickness penetrating keratoplasty with scleral fixation of iris prosthesis was chosen. A foldable acrylic hydrophobic iris prosthesis model C1 (Ophtec B.V., Groningen, Netherlands) which includes a mounted intraocular lens was fixated to the sclera using 3 corneoscleral Hoffman pockets. This surgery was performed 18 months after the initial traumatism. No intraoperative or immediate post-operative complications were observed. The patient is aesthetically satisfied. Current visual acuity 4 months after the procedure is 0.32 with a stenopeic hole, the artificial iris-IOL implant is well centered and no signs of intraocular inflammation or graft rejec-

tion are observed. Our case represents a successful implantation of an artificial iris implant with a built in IOL sutured to sclera in a case of complex ocular trauma. To our knowledge it is the first use of this type of model in a traumatic case. We conclude that this implant serves well in need of combined surgery with corneal grafting. In addition, our case raises awareness about dangers of recreational drone use and potential devastating ocular traumatism.

Financial Interests: None
Grants: None

[8463] Double trouble – a rare infectious keratitis case

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We present a rare case of a non-tuberculous mycobacterial (NMT) and concomitant microsporidial keratitis. A 38 years old contact lens wearer was referred to the Department of Ophthalmology of the University of Bern in Mai 2021. She had been treated in the last 10 months by multiple ophthalmologists because of a keratitis in the right eye. Previous treatments consisted of various combinations of antibiotic eye drops, steroid eye drops and antiherpetic systemic therapy. Between October 2020 and Mai 2021 four corneal scrapings were performed which showed no conclusive results. At the time of presentation at our institution a large, central, full-thickness corneal infiltrate was found. The superficial part of the infiltrate was strikingly yellow. Considering the complex history and the extensive corneal infiltration we decided to perform a perforating keratoplasty (PK) "à chaud". The removed corneal tissue was analyzed by the infectiology and pathology department of the University Hospital of Bern and by the Swiss Tropical and Public Health Insitute. A concomitant microsporidiae and mycobacteria marinum infection was confirmed. Additional history taking revealed that the patient owned an aquarium which was the most probable source of the opportunistic mycobacteria marinum infection. Retrospectively the yellow infiltrate was a hint towards the mycobacterial infection – mycobacterium marinum is known to produce a yellow pigment when exposed to sunlight. A postoperative treatment with systemic albendazole and fumagillin eyedrops against the microsporidiae could be stopped after one month. The antimicobacterial treatment was started with amikacin and tobramycin fortified eyedrops, systemic clarythromycin was added when the patient developed scleral nodules and corneal micorabscesses. 10 months after PK, the eye is quiet. A phakoemulsification and IOL implantation will be performed because of a cataract formation.

Financial Interests: None
Grants: None

[8469] Lamellar Posterior Corneal Graft (DSAEK) in Aphakic and Aniridic Patient: a Case Report with a Single Eye

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Purpose: report a case of posterior lamellar graft (DSAEK) in an aphakic and aniridic patient with a single eye. This case was challenging because when performing the graft, the lack of support (iris and lens) was an important technical difficulty that necessitated the use a new surgical approach. **Method:** 74 year old woman with a single aniridic and aphakic right eye. Medical history included in the right eye: intracapsular cataract extraction and deep sclerectomy and in the left eye: extracapsular cataract extraction, perforating ocular trauma followed by an evisceration. Preoperative BUVA was limited to counting fingers at 0.5m and BCAV was evaluated to 6% (and was 10% 5 years before). Pachymetry had increased from 479 mum in 2017 to 920 mum in 2020. The patient reported subjectively a decreasing of her vision. Slit lamp evaluation was able to identify remaining vitreous close to the endothelium. Cornea was free of neovascularization with a total hypoesthesia. Fundus was not assessable. Intraocular pressure was 13 mmHg. Surgery was performed under general anesthesia according to a technic reported by Muraine et al. in 2019. The preparation of the DSAEK with a Moria Microkeratome included a special cutting of the graft with two "ears" that were placed in the corneal stroma and stitched to maintain the graft during the tamponade with a mix of air and SF6 (50/50%) for 24 hours. Thickness of the graft was 135 mum with a diameter of 7.5mm. **Results:** the surgery was successful. 14 days after the surgery, another tamponade was necessary because 20% of the graft was detached. 15 months after the surgery, the BUVA was counting fingers at 0.5m and the BCVA was 6% with +8.75(-1.5@90°). The patient was subjectively comfortable with her vision. Corneal pachymetry was 620 mum. Fundus evaluation exhibited atrophy of the retina with optic nerve excavation. **Conclusions:** In this special case a penetrating keratoplasty would probably had a poor survival rate, with a high risk of rejection and endothelium decompensation because of many risk factors: aphakia, aniridia and total corneal hypoesthesia. This abnormal eye with multiple surgeries had also a high risk of postoperative shut down. According to all of these elements, posterior lamellar graft was the best choice and a special surgical approach was necessary to be able to fix the graft to the posterior corneal stroma. In this case the surgery was fortunately a success, if not the patient risk becoming blind.

Financial Interests: None
Grants: None

[8473] Retrocorneal membranes and corneal decompensation after complicated intraocular surgeries: a case series

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[1] Pallas Klinik, Olten; [2] Viollier, Allschwil, CH

Introduction: Retrocorneal membranes may result from epithelial ingrowth, fibroblastic or keratocytic downgrowth, fibreous metaplasia or a combination thereof. **Case Series:** Herein we report the clinical history and immunohistochemical findings of five patients with unilateral retrocorneal membranes and corneal decompensation that have developed after complicated cataract surgery (n=5), intraocular lens exchange (n=3), descemet automated endothelial stripping (DSAEK; n=1) and/or descemet membrane endothelial keratoplasty (DMEK; n=1). The majority of the membranes revealed a high reflectivity in anterior-segment optical coherence tomography. All membranes were removed during DMEK or DSAEK surgeries that had to be performed due to corneal decompensation. Immunohistochemical staining of the membranes revealed positivity for cytokeratin 7 (CK7), smooth-muscle actin (SMA) and vimentin, and negative staining for cytokeratin (CAM5.2) and transmembrane CD34 protein. **Conclusions:** In our patients all membranes occurred after previous complicated intraocular surgeries and were associated with corneal decompensation. Based on immunohistochemical findings the membranes presumably originated from metaplastic endothelium. Surgical removal was successful in all patients.

Financial Interests: None
Grants: None

[8545] Changes in anterior segment morphology and intraocular pressure after cataract surgery in non-glaucomatous eyes

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Purpose: To evaluate changes in anterior segment (AS) anatomy and intraocular pressure (IOP) after cataract surgery in non-glaucomatous eyes using anterior segment optical coherence tomography (AS-OCT). **Methods:** This retrospective case series study included 64 eyes of 64 consecutive patients who underwent phacoemulsification with intraocular lens (IOL) implantation. AS parameters and IOP were assessed and compared before and 6 months after surgery. AS imaging was performed using the Casia SS-1000 AS-OCT (Tomey, Nagoya, Japan). AS measurements included anterior chamber depth (ACD), anterior chamber width (ACW), anterior chamber volume (ACV), angle opening distance at 500 µm anterior to the scleral spur (AOD500), angle recess area 750 µm from the scleral spur (ARA750), lens vault (LV), trabecular iris space area at 500 µm from the scleral spur (TISA500) and trabecular iris angle at 500 µm from the scleral spur (TIA500). IOP was measured using Goldmann applanation tonometer (Model AT Changes in anterior segment morphology and intraocular pressure after cataract surgery in non-glaucomatous eyes 900 C/M; Haag-Streit, Bern, Switzerland). AS parameters and IOP changes relationship was also evaluated. **Results:** All AS parameters increased significantly after surgery ($p < 0.05$). Both AOD500 and ACD changes were positively correlated with preoperative LV. The mean IOP significantly decreased from 14.91 mmHg (± 2.8s SD) to 12.91 mmHg (± 3.13 SD) ($p < 0.001$). Changes in IOP negatively correlated with preoperative ACW values ($r=-0.533$; $p=0.001$). **Conclusions:** Cataract surgery led to a significant widening of the anterior chamber angle and IOP lowering. Further investigations are needed to better understand if ACW may be a new independent predictive factor for postoperative IOP reduction.

Financial Interests: None
Grants: None

[8550] Utilisation du smartphone pour la sémiologie clinique de la dystrophie épithéliale de Cogan

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Objectif: Montrer que l'on peut faire des photographies de qualité au moyen d'appareils simples à l'ère de l'imagerie multimodale couteuse. **Méthode:** Les clichés du segment antérieur d'un patient montrant une dystrophie cornéenne de Cogan ont été réalisés à l'aide d'un simple smartphone monté préalablement sur une lampe à fente Haag-Streit®. Pour une meilleure résolution, le diffuseur de la lampe à fente a été relevé, permettant ainsi un éclairage diffus de la structure à visualiser. Les lésions ont été ensuite corrélées avec des coupes OCT de segment antérieur de Spectralis Heidelberg®. **Résultat:** A l'aide d'un adaptateur smartphone montés sur les oculaires de la lampe à fente, nous avons pu recueillir des clichés biomicroscopiques de qualité montrant une épithéliopathie microkystique de Cogan. A fort grossissement, on visualise aisément les différentes caractéristiques cliniques de la maladie. La corrélation avec l'OCT du segment antérieur permet de reconnaitre les aspects cliniques et physiopathologiques des 3 types de lésions : les aires en carte de géographie (map) correspondant au dédoublement de la membrane basale épithéliale qui desquame, les vésicules intraépithéliales microkystiques multilobées (dots) formées de zones d'épithélium entravé dans son processus de desquamation par les duplications de la membrane basale et les lésions en empreinte digitale (fingerprints) correspondant à l'épithélium mal adhérent qui se plicature et cicatrise, formant des motifs arciformes parallèles. **Discussion:** L'imagerie est à la base de l'accessibilité à l'observation des structures oculaires et guide l'ophtalmologiste dans sa démarche diagnostique et son geste chirurgical. Avec la possibilité de sauvegarder les clichés, la documentation photographique, sa finalité d'archive, de comparaison évolutive dans le temps des pathologies, d'évaluation objective des

réponses thérapeutiques, de communication scientifique ou didactique, joue un fort rôle dans la pratique clinique et comme base explicative pour le patient. Elle permet en outre au clinicien de réétudier et reconnaître des détails passés inaperçus lors d'une première observation. La photographie devient alors un prolongement de la mémoire beaucoup plus précis. A l'ère du progrès constant en imagerie ophtalmologique, certes performant mais couteux, notre présentation tend à montrer qu'il est possible d'obtenir une photo du segment antérieur de qualité à l'aide de matériel simple pour un usage clinique quotidien.

Financial Interests: None
Grants: None

Neuroophthalmology | Strabology

[7892] Penetrating transorbital injuries with sharp objects: Minor traumas with major consequences

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Background: Transorbital penetrating injuries are rare but can cause ophthalmoplegia and severe life-threatening intracranial injuries to the brain, brainstem, or internal carotid artery. They often present dramatically with an obvious trauma and extensive collateral damage to surrounding structures. However, some injuries are subtle, with a seemingly trivial trauma and little or no obvious damage to the surrounding tissues. **Case description:** We present two rare cases of penetrating transorbital traumas with a sharp object leading to ophthalmoplegia. The first case presents a 55-year-old patient with binocular double vision and ptosis of the left eyelid after accidentally sticking a cable tie into the orbital cavity directly lateral to the left eyeball. The examination findings were consistent with the diagnosis of an incomplete oculomotor palsy without pupillary involvement. A CT scan of the head showed air entrapment near the lateral rectus muscle of the left eye as an indication of the penetrating trauma but was otherwise normal. We concluded that this patient had suffered a direct penetrating trauma to the left oculomotor nerve caused by the cable tie. The second case presents an 18-year-old patient with a painful right eye and double vision upon awakening. He reported that he might have fallen into a bush the night before after excessive alcohol consumption. Examination revealed a right conjunctival laceration above the lateral rectus muscle, right abduction and elevation deficit, right ptosis, and a dilated right pupil suggestive of an incomplete third and sixth nerve palsy. A CT scan of the head showed air entrapment between the right lateral rectus muscle and the lateral orbital wall, imbibition of the lateral periorbital fat, and an aneurysm of the right internal carotid artery within the cavernous sinus. Surgical exploration did not reveal any avulsion of the lateral rectus muscle. We concluded that a penetrating injury with an unknown object, possibly a branch, resulted in a sixth and incomplete third nerve palsy and a traumatic aneurysm of the internal carotid artery. Discussion/ **Conclusion:** Although penetrating injuries are rare causes of third and sixth nerve palsies, they must be considered if the patient's history suggests it. These case reports highlight the fact that seemingly minor traumas reported by the patient may conceal serious orbital or intracranial injuries with potentially life-threatening complications.

Financial Interests: None
Grants: None

[8173] Evaluation of the therapeutic efficacy of perceptual learning using the Bartimeus-Training in the clinic

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Purpose Perceptual learning tasks have been developed to improve visual acuity even in adults. One such task is the Bartimeus training (BT), a drawing task which is performed at home in 12 sessions of 30 Minutes duration. We applied BT in selected patients in whom visual acuity did not improve by other means (glasses, patching). Here we aim to retrospectively assess visual improvement in patients who underwent BT at our institution in relation to patient age and diagnosis. **Material and Methods** Retrospective chart analysis of patients having undergone BT and with presence of consent. Visual acuity prior to and following BT was analyzed, as were diagnosis and age at BT. Distance acuity corresponds to single letter acuity (SLA), while near acuity corresponds to crowding acuity (CA). Significance was assessed with a paired t-test. A value of $p < 0.05$ was considered significant. Increase in lines of acuity were assessed based on LogMar. **Results** 13 patients with a mean age of 7 years (range: 3.9-10.75). Overall acuity improved significantly post BT. 2 patients aged 6 years with deprivation amblyopia following surgery of a congenital cataract and one 5-year-old with Retinitis Pigmentosa did not benefit from BT. The highest improvement of 5 lines CA was seen in a 9-year-old with a recent onset amblyopia due to corneal scarring. In deprivation amblyopia, a 7-year-old with anterior polar cataract improved by 3 lines SLA, another 6-year-old with bilateral aphakia following congenital cataract improved OU by 2 lines CA. In 7 eyes with refractive amblyopia CA improved on average by 1.5 lines (0-3,5). In strabismic amblyopia (4 eyes) CA improved by 1 (n=1) or 2 lines (n=1), and SLA by 1,75 lines (n=1) with an overall increase of 5 lines after 2 further cycles of the BT. The fourth eye with strabismic amblyopia was in a patient with additional bilateral hyperopic amblyopia who underwent BT binocularly and showed no effect on the esotropic eye. One patient with neurological nerve fibre-ganglion cell layer loss showed a 1 line increase CA. **Conclusions** BT resulted in improved acuity in 75% of the participants who had not shown further improvement with conventional treatment. The effect seemed largest in recent

onset amblyopia and refractive amblyopia followed by strabismic amblyopia. BT is a cheap, noninvasive method that may help improve visual outcomes. Further studies with larger numbers are needed to assess optimal timing and length of treatment.

Financial Interests: None; **Grants:** None

[8454] Unilateral corneal arcus and conjunctival vessel alterations in cranial autonomic dysregulation: a case report

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Background: Cranial autonomic dysregulation is a common symptom of patients suffering from cluster headache or migraine. The peripheral vascular dysfunction may increase the risk for ischemic or hemorrhagic strokes, myocardial infarction, retinal vasculopathy, cardiovascular mortality, and peripheral artery diseases. Furthermore, it may also manifest with ocular symptoms, e.g., increased lacrimation, conjunctival injection, and facial swelling. **Case presentation:** We here report a case of a 54-year-old woman with migraine and ocular signs of a vascular dysregulation that have led to persisting changes of conjunctival vessels and to a corneal arcus. In the ophthalmological examination during an attack, we found a swollen and ptotic upper eyelid on the right with conjunctival chemosis and hyperemia. Even in the attack-free intervals, the slit lamp exam revealed a conjunctival hyperemia with vessel abnormalities (caliber changes) of the right eye. Furthermore, a unilateral corneal arcus on this eye was found. Pupils were isocor and both reactive to light, and fundoscopy was unremarkable. An MRI of the orbit with MR-angiography of the carotid artery showed periorbital swelling and enhancement on the right side. There were no signs of intraorbital vascular malformation, carotid cavernosus fistula, abscess, or atherosclerotic changes of the vessels. Laboratory investigations were unremarkable, in particular screening for thyroid disease, rheumatologic disease, and sarcoid disease were within normal limits. **Conclusions:** Autonomic vascular dysregulation may not only cause headaches but also persisting changes of ocular tissues, e.g. conjunctival vessel alterations and a corneal arcus.

Financial Interests: None
Grants: None

[8455] Myopia Management in Your Daily Routine – a Survey Analysis among Real World Paediatric Ophthalmologists

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Purpose: Assessment of diagnostic and therapeutic strategies currently used in routine practice for myopia management in Europe. **Methods:** Online survey study including 43 questions. The questionnaire was sent to members of the European Paediatric Ophthalmology Society (EPOS). Following items and respective questions were inquired: I. Profession and workplace of the survey participants. II. Preventive measures and recommendations for myopia management, a) regarding reading distance and near work, b) optical tools i.e. application of MiyoSmart®, near additions or contact lenses, and c) the application of Atropine eye drops. III. Application of additional diagnostic tools. **Results:** 48 individuals completed the survey. 87.5% (n=42) of the respondents affirmed to generally give advice about myopia prevention and management strategies. Almost all study participants (n=41; 85.4%) recommend outdoor time as a preventive measure. The recommendation regarding near distance is given a little less frequent, with 28 (58.3%) participants confirming they do recommend "safe" reading distance, and 13 (27.1%) negating this. 8 (16.7%) survey participants do recommend using near addition glasses, while 36 (75.0%) do not. Similarly, 35 (72.9%) respondents do not apply MiyoSmart® glasses and other 8 (16.7%) recommend or do apply them. 14 (29.2%) participants recommend myopia reducing contact lenses while 30 (62.5%) do not; and 29 (60.4%) confirmed to apply atropine eye drops to slow myopia progression while 14 (29.2%) do not prescribe these eye drops. The majority of respondents (n=25; 52.1%) prescribes atropine 0.01% eye drops. **Conclusions:** Prevention and therapeutic management of childhood myopia is an essential part in daily routine of paediatric ophthalmologists. Large agreement was found for the protective role of outdoor time (85.4%). The only common therapeutic approach is the daily administration of atropine eye drops (60.4%).

Financial Interests: None
Grants: None

[8460] Favourite long-term outcome after combined therapy of extended clivus meningioma

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Purpose: To report the long-term results of neurosurgical and radiation therapy in a patient with a complex clivus meningioma invading the orbit. **Material and methods:** This report includes clinical, neuroophthalmological and retinal nerve fibre layer measurements, visual field results and MRI follow-up results of long-term follow-up in the observed case. **Results:** A 56-year-old female patient was referred with unclear deterioration of visual acuity in her left eye. History was uneventful beside chronic rheumatoid arthritis and hyperopic astimatism. Best corrected Snellen visual acuity was 0.8 in her right (OD) and 0.5p in the left eye (OS). Further workup revealed a clivus meningioma with extension into the left orbit and middle cranial fossa. After a partial neurosurgical resection of the tumour, visual acuity further deteriorated to 0.05 and decreased further to the detection of hand movements under partial brain radiation (18 Gy sessions until a total dose of 54 Gy). Consecutively a concentric restriction of the

visual field occurred. Within the follow-up of 18 months visual acuity improved to a level of 0.5p OS and visual field scotomas partially decreased. Three years after therapy, visual acuity was 0.6p OS, although partial optic atrophy and loss of retinal nerve fibre layer were present. The motility of both eyes and binocular function was unaffected. **Conclusion:** The present case demonstrates that extended meningiomas with a seemingly poor prognosis may end up with relatively favourite outcome under current options of neurosurgical and radiation combination therapy. The follow-up further underlines that progressed intermediate functional loss may present considerable recovery.

Financial Interests: None; **Grants:** None

[8462] Acute retrobulbar optic neuritis without tomographic signs of direct nerve affection in a case of paranasal pansinusitis

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Purpose: Optic nerve involvement is an infrequent complication of pansinusitis that can be associated to direct mechanical or inflammatory affection in most cases. Yet, few observations have been reported without identification of direct optic nerve affection, as in the case reported here. **Methods:** The patient was admitted and underwent thorough ophthalmological, ENT and radiological examinations including SD-OCT, fluoresceine angiography, endonasal endoscopy, magnetic resonance tomography and cranial/orbital computer tomography. **Results:** A 44-year-old male patient was referred for unexplained blurred vision on the right eye (OD). Best corrected visual acuity (BCVA, Snellen) was 1.0 in both eyes. Anterior segments were normal. Funduscopy revealed a prominent, slightly hyperaemic optic disc OD. Further neurological, ENT and MRI examinations revealed a pansinusitis on the right without signs of direct optic nerve affection. Treatment was commenced with amoxicillin 875 mg with clavulanic acid 125 mg, both 2x daily. After two days BCVA had deteriorated to 0.6p OD. The patient was admitted and received in addition prednisolone 100 mg/d intravenously. Repeated imaging by CT again did not present any signs of direct optic nerve affection. Under this regimen visual acuity improved to 1.0 OD after four days. Prednisolone was stepwise reduced within the next 12 days. Endonasal surgery of the ethmoidal cells and sinus maxillaris was performed. Final BCVA was 1.0 OD after eight months. The optic disc OD was slightly pale and some pericentral visual field defects remained. **Conclusion:** The presented case exemplifies that vision threatening optic nerve affection may occur in cases with pansinusitis even without obvious radiological signs of orbital or optic nerve affection. Strictly monitored pharmacological combination of antibiotics and corticosteroids may be effective in avoiding severe visual damage.

Financial Interests: None
Grants: None

[8466] Sinus-Anomalien mit idiopathischer intrakranieller Hypertension (IIH): Schwierige Indikationsstellung und Stenting / Falldarstellung

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Fragestellung: Das IIH ist eine schwierig zu diagnostizierende und noch schwieriger zu behandelnde intrazerebrale Pathologie, interdisziplinär angesiedelt zwischen Neurologie, Neuroophthalmologie und Neurochirurgie. Wir zeigen einen typischen Fall und die Schwierigkeiten bei der letztlichen Indikationsfindung. **Methodik:** Wir sahen eine 28jährige Frau mit neu aufgetretener Anisokorie li>re, linksseitigem Flimmern und retrobulbärem Druckgefühl, autophoner Pulsation, holozephalem Kopfschmerz, arterieller Hypertonie, Hyperthyreose und Obesitas permagna. Kopfschmerzen seit dem 11. Lj und Krampfanfall mit Reanimation mit 16 Monaten; verzögerte senso-motorische und sprachliche Entwicklung in der früheren Anamnese. Bei der Untersuchung fanden sich gute Visus- und Gesichtsfeldbefunde bei ausgeprägtem beidseitigen Papillenödem. Das CT und MRT zeigten das typische Bild eines idiopathischen intrakraniellen Hypertonus, eine Empty Sella und Schlitzventrikel; in der MR-Angiographie venöse Anomalien mit Stenosen des proximalen Sinus transversus am Übergang zum Sinus sigmoideus bds. **Ergebnis:** Nach Blutdruckregulierung und Lumbalpunktion fiel der erhöhte intrakranielle Druck und die Kopfschmerzen besserten sich, es zeigten sich jedoch Gesichtsfeld-Ausfälle und hypometrische Sakkaden links. Die Patientin wurde daraufhin durch die Augenklinik in der Neuroradiologie vorgestellt. Nach einseitiger Ballondilatation (im ersten Schritt vor einer Stent-Applikation) der li. Sinus transversus sahen wir eine deutliche Abschwellung der Sehnervenköpfe; Augendruckgefühl, Flimmern und Kopfschmerzen verschwanden. Das Körpergewicht wird weiter erfolgreich reduziert. **Diskussion:** Die therapeutischen Optionen der IIH sind im Allgemeinen komplex und nicht sehr erfolgreich. In besonderen Fällen aber, bei Stenosen im Bereich der venösen Sinus, ergibt sich als seltene Ausnahme die optimale Therapie-Möglichkeit der Dilatation oder Stenting. Diese minimal invasive, neuroradiologische Intervention hat eine gute Prognose. **Schlussfolgerung:** Angesichts der diagnostischen und therapeutischen Herausforderung bei IIH stellt die seltene Konstellation mit venösen Stenosen im Bereich der Sinus eine Erkrankung mit sehr guter Prognose dar. Diese Befunde sollten besonders beachtet und die Patienten konsequent zur interdisziplinärer Behandlung weitergeleitet werden.

Financial Interests: None
Grants: None

[8495] Investigating the Influence of Age on Eye Movements during Reading in Early Elementary School-aged Children

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Purpose: Eye movement disorders have been observed in many eye diseases, such as amblyopia or developmental dyslexia. The detection of pathologic eye movement behavior is difficult and requires more data for comparison. Therefore, the main purpose of this study is to evaluate the influence of age on eye movements while reading. **Methods:** 127 normally-sighted children aged 7-12 were recruited from grades 2-5. The children were asked to read two texts of The New International Reading Speed Test (IReST) of similar difficulty aloud. While reading the eye movements were recorded by the eye-tracking technology (SMI RED 250). The eye movements parameters extracted from 118 children, namely reading speed (words/minute), number of saccades, number of fixations, reading errors and influence of school grade. **Results:** We showed a significant influence of age in all eye movement parameters. The main finding of this study is that younger children performed more saccades, a higher number of fixations per word, more reading errors while taking more time to read the text than older children in higher grades. **Conclusion:** This study highlights the need for an age-appropriate normative database for eye movements during reading.

Financial Interests: None
Grants: None

[8560] Retinal periphlebitis might be a marker for subphenotype in multiple sclerosis

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Purpose: Multiple sclerosis (MS) is known as both white and gray matter autoimmune inflammatory disease with heterogenous immune mechanisms. Perivascular inflammatory lesions as well as meningeal lesions can be detected with special 3T MRI sequences in the brain in MS. Retinal periphlebitis (RPP) is a long-known entity in a subgroup of MS patients. **Methods:** We present 3 female and 3 male relapsing-remitting MS patients with RPP and discuss the wide variability of the retinal venous inflammatory findings. The course of MS is also analysed in these patients. **Results:** RPP may not be initially diagnosed, because patients may not have visual symptoms. If no dilatated fundus exam is performed, the peripheral and sectorial lesions could be unseen. Avascular areas may be a complication of retinal vein inflammation. This could trigger neovascularisation and fundus LASER therapy may be needed. As various disease modifying therapies in MS target different parts of the autoimmune response, the better understanding of the retinal vein affection may contribute to the understanding of the disease as this may be a separate immunopathological phenotype. **Conclusion:** Considering various modes of action in choosing MS immunotherapy, very limited clinical markers are currently available for individualizing treatment. Distinct autoantigenic targets and different prevailing immune responses may be involved in patients with RPP. RPP might serve as a MS subphenotype marker that potentially may influence treatment choices in MS. Further analysis is needed

Financial Interests: None
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Orbits I Lids I Lacrimal System

[7854] Clinical, Radiological and Histopathological Disease Pattern of Adult and Juvenile Orbital Xanthogranulomatous and Rosai-Dorfman Disease – a 21-year Retrospective Study

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Purpose: Adult orbital xanthogranulomatous disease (XG) includes a diverse group of rare orbital and ocular adnexal inflammatory disorders. The juvenile Xanthogranuloma and Rosai-Dorfman present also similar symptoms. The latency period until diagnosis may prolong the start of therapy. In addition, inappropriate treatment prior to its correct diagnosis may lead to progression of the disease. Improving knowledge of these rare diseases might improve the longterm outcome of the patients. **Methods:** This retrospective study aimed to evaluate the diagnostic path based on the patients' clinical, radiographical, and pathological disease patterns with Erdheim-Chester Disease (ECD), Ocular Adnexal Xanthogranulomatous Disease, and Rosai-Dorfman Disease using 21 years of data. For this study, which was conducted as part of a multidisciplinary collaboration between the Department of Ophthalmology, the Department of Pathology and Molecular Pathology, and the Department of Neuroradiology of the University Hospital of Zurich (University of Zurich, Switzerland), database searches were performed by two principal investigators (N.A.H and K.C.) in the electronic medical management system KISIM (Cistec AG, Zurich, Switzerland), the database of the Institute of Pathology (PathoPro Software, Institute of Medical Software, Saarbrücken, Germany), and the local Picture Archiving and Communication System (PACS) (IMPAX EE R20, release XV, Agfa Healthcare, Mortsel, Belgium). Results 19 patients (6 male, 13 female) out of 30 patients showed ocular involvment with a mean age of 30.5 ± 13 years (median age, 25 years; age range, 18-63 years). The four subtypes of Adult Xanthogranulomatous Disease according to the degree of systemic involvement

were: adult-onset xanthogranuloma (AOX) (3), adult-onset asthma and periocular xanthogranuloma (AAPOX) (none), necrobiotic xanthogranuloma (NXG) (3), and Erdheim-Chester disease (ECD) (6), plus juvenile Xanthogranuloma (4) and Rosai-Dorfman (3). **Conclusion:** A multidisciplinary approach analyzing all case-specific features, including medical history, intraoperative findings, and, especially histopathologic and radiologic features, is crucial for an appropriate early diganosis and treatment.

Financial Interests: None
Grants: None

[8409] Retrospective comparison of the Myopia Master® and the Lenstar LS 900® axial length measurements in children with myopia

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Purpose In our myopia clinic axial length measurements were previously obtained with the Lenstar LS 900® (HAAG-STREIT AG, Switzerland), but in April 2020 the Myopia Master® (OCULUS, Germany) was acquired as this device allows to display progression curves in relation to normative values which helps in myopia management decisions. In an intermediary phase, patients who had already been scheduled for AL measurements with the Lenstar LS 900® also received a measurement of axial length with the Myopia Master® to ensure that the axial length data could already be incorporated in the future progression curves and optimize clinical decision making. Here we aim to retrospectively compare ocular biometry measurements of axial length in patients with myopia using Myopia Master® and Lenstar LS 900® to assess whether measurements differ or could be used interchangeably. Methods We retrospectively collected axial length measurements obtained within a 3 week period with both Myopia Master® and Lenstar LS 900® data from April 2020 onward. A paired t-test was used to compare the differences between the two measurements and a Bland-Altman analysis was applied to visualize the agreement between the measurements of the two instruments. Results A total of 61 eyes from 31 myopic patients were identified (59% male, 41% female). The mean age of the patients was 11.34±3.25 years, with a range of 6 to 18 years. Mean axial length measured was 24.69 mm (SD 1.28mm) with the Myopia Master® and 24.69 mm (SD 1.30) with the Lenstar LS 900®. The average difference of the axial length measurement between the two biometers was 0.00063mm which was not significant (P=0.9293). Conclusion The ocular biometry measurements of the axial length taken by Myopia Master® and Lenstar LS 900® can be used interchangeably since the biometric parameters showed no clinically relevant differences and good agreement.

Financial Interests: None
Grants: None

[8467] Surgical Procedure of a Large Orbital Cyst and Perioperative Management During and After Pregnancy

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Purpose: 29 y women, refugee from Erithrea, underweighed, presents with a giant orbital cystic lesion. Imaging reveals suspicion of a rare orbital Echinococcus cyst. Further history shows hepatitis and also a pregnancy of 8 weeks and opens discussion of best surgical and anti-parasitic management for mother and child. **Methods:** We present the important preoperative interdisciplinnary planning in a pregnant patient, the surgical procedure, and the risk of a surgical excision of a giant orbital Echinococcus cyst. **Discussion:** Early surgery was strongly pushed by the infectiologist. Antiparasite medication was planned to administrate around the surgery to prevent spreading. As the eye was already blind and risks of surgery and medication for mother and unborn were high, we planned surgery after birth and and since the mother was underweighed and weak after birth we waited 4 months so it was also possible to breast feed. The decision was taken together with the patient and the future mother and familiy. It revealed to be reasonable for the patient and the baby as the patient reacted with serious vomiting to the antiparacit treatment. Surgical approach was through a lateral and anterior orbitotomy. Approaching the most vulnerable area of the cystic attachment to the dura as a last step as the rupture is expected at this place. Once the lesion is ruptured, the further dissection is more difficult and the systemic spreading starts and needs to be minimized by keeping it planned. Therefore antiparasit therapy was started already 3 days before surgery. **Conclusion:** We show, that in this case postponing surgical excision of an orbital Echinococcus cyst till after birth and breast feeding is preferable for the patient and the baby.

Financial Interests: None
Grants: None

Pathology I Intraocular Tumors Others

[8412] Regredienz retinaler Hamartome beim Neugeborenen

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Hintergrund Die Tuberöse Sklerose (tuberous sclerosis complex, TSC) ist eine autosomal-dominante neurokutane Erkrankung. Die Diagnose wird klinisch oder molekulargenetisch (Mutationen

im TSC1 oder TSC2 Gen) gestellt. Infolge des Defekts dieser Tumorsuppressorgene kommt es zu einer Multisystemerkrankung, die vor allem an Haut, ZNS, Herz und Nieren manifest wird und dort zu Funktionsstörungen führen kann. Die häufigste ophthalmologische Manifestation sind retinale Hamartome, die zugleich eines der ‚minor' Diagnosekriterien darstellt. Basierend auf der Pathophysiologie erfolgt die Therapie mit dem mTOR-Inhibitor Everolimus bei verschiedenen Indikationen (cerebrale Riesenzellastrozytome, renale Angiomyolipome, Epilepsie im Zusammenhang mit TSC, kardial obstruierende Rhabdomyome). **Methode** Retrospektive Falldarstellung eines Kindes mit TSC. **Resultate** Bei einem Neugeborenen mit hochgradigem Verdacht auf TSC aufgrund massiver, bereits pränatal nachgewiesener kardialer Rhabdomyome bestätigte sich die Diagnose bei cerebralen Tubera mit neonatalen Krampfanfällen und molekulargenetischem Nachweis einer Mutation im TSC2 Gen. Es erfolgte daher die Zuweisung zum ophthalmologischen Konsil. Das rechte Auge zeigte keinen pathologischen Befund. Am linken Auge wurden ein bis in die Makula reichendes, etwa fünf Papillendurchmesser großes, deutlich prominentes Hamartom am temporal superioren Gefässbogen und ein flacheres, kleines Hamartom am nasal inferioren Gefässbogen diagnostiziert. Aufgrund der ausgeprägten Rhabdomyome mit Behinderung der Ausflusstrakte wurde eine off-label Behandlung mit Everolimus im Alter von 11 Tagen begonnen, um einen drohenden kardiochirurgischen Eingriff zu umgehen. Drei Wochen nach Therapiebeginn zeigten sich beide okuläre Hamartome deutlich regredient. Im Alter von 4.5 Monaten wurde die Everolimustherapie aufgrund der Regredienz der kardialen Rhabdomyome gestoppt. Die retinalen Hamartome präsentierten sich stabil ohne Komplikationen. Die visuelle Entwicklung zeigt sich, wie auch die Gesamtentwicklung des Säuglings, nicht altersentsprechend bei pharmakoresistenter Epilepsie. **Diskussion** Retinale Hamartome sind häufige Manifestationen der TSC und beeinflussen meist nicht die visuelle Entwicklung. Sie stellen keine Indikation einer Therapie mit mTOR-Inhibitoren dar. Jedoch ist unter Therapie mit mTOR-Inhibitoren bei extraokulärer Indikation auch eine Regredienz der retinalen Hamartome sichtbar, was dieser Fall sehr eindrücklich darstellt.

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[8442] Efficiency analysis of a gene therapy approach for AMD in non-virally transfected IPE cells from human, pig and rabbit comparing long-term gene and protein expression

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Purpose: Anti-VEGF drugs are an efficient therapy for neovascular age-related macular degeneration (nAMD); however, life-long therapy and costs are still challenging. We developed an ex vivo gene therapy to treat nAMD in which autologous iris pigment epithelial (IPE) cells are non-virally transfected using the Sleeping Beauty (SB100X) transposon system to overexpress the anti-angiogenic Pigment Epithelium-Derived Factor (PEDF). Here, IPE cells isolated from pig (p), rabbit (rb) or human (h) donor eyes were transfected directly ("P0") or after 3 weeks of culture ("P1") and compared for PEDF expression to be used in preclinical efficiency studies. **Methods:** After isolation, h/p/rbIPE cells were electroporated and transfected using the Neon Transfection System with 0.03 and 0.47µg of the transposase and the pFAR4-ITRs CMV PEDF BGH plasmid, seeded (n=5) with 10k (P1) or 50k (P0, P1) cells; cultured in DMEM/Ham's 12 with 10% (P1) or 20% FBS (P0) until confluence (reduction to 1% FBS). PEDF expression was determined with RT-qPCR and secretion was monitored with ELISA at 21d (pIPE, hIPE P1) or 42d (rbIPE, hIPE P0) and 82d. Proliferating cultures (rbIPE: 5/7 (P0), 3 (P1); pIPE: 5 (P1); hIPE: 4 (P0); 1 (P1)) were maintained until cells detached; analyses were performed every 3rd week. **Results:** PEDF expression was similarly increased (p=0.38) in rabbit and pig cells at all time points (21d: pIPE 10k=702k, pIPE 50k=805k; 42d: rbIPE 50k=930k; 82d: pIPE 10k=502k, pIPE 50k=108k fold change). Protein levels of transfected cells increased significantly compared to non-transfected controls ($p < 0.0001$). rbIPE cells tended to secrete more PEDF than pIPE and hIPE, but had a higher SD. Determined amounts of PEDF for 10k P1 cells (21/42d) were: rbIPE=275±492 (n=15); pIPE=11±10 (n=15); hIPE=13±13 (n=5); for 50k P1 cells (21/42/82d): rbIPE=74±109 (n=15); pIPE=16±20 (n=24) and 8±9 (n=9); for 50k P0 hIPE cells (53d): 2±1 ng/h/104cells. **Conclusion:** PEDF gene expression and protein secretion were significantly increased after transfection without differences between species and they showed comparable distributions. However, rbIPE cells were challenging to maintain viable in culture, limiting its usability, while pIPE and hIPE could be maintained and analyzed for >82d offering a reliable long-term efficiency model.

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[8472] Successful treatment with combined corneal patch graft, Tenon's plasty and conjunctival autograft of refractory radiation-induced scleral necrosis following Ruthenium brachytherapy for ciliary body melanoma. A case report.

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Purpose: To report the successful management of a 47-year-old female patient who had been treated elsewhere with Ruthenium brachytherapy for a ciliary body melanoma and who presented with a recurring progressive scleral necrosis and uveal prolapse following a previous autologous lamellar scleral and conjunctival graft. **Methods:** The patient was referred at the Ocular oncology Unit (AS) of the Jules Gonin Eye Hospital in Lausanne (CH). The surgery was performed, in collaboration with the Cornea Unit (KH), under general anesthesia. After meticulous dissection of the conjunctival tissues surrounding the site of scleral necrosis,

a 12 mm corneal graft was prepared and sutured over the area of scleral thinning with several interrupted 8-0 vicryl sutures. Lamellar thinning of the graft was performed adjacent to the limbus in order to avoid a Dellen formation. Subsequently, the Tenon's capsule from the infero-nasal orbit was advanced to cover the patch graft with the goal of providing a vascular supply. This Tenon's pedicle graft was then covered with a conjunctival autograft. **Results:** Three months after the intervention, there was no progression of the scleral melt and the corneal patch graft was well-secured and covered by the Tenon's capsule and conjunctiva. **Conclusion:** In patients with radiation-induced refractory scleral necrosis and uveal prolapse, a combined treatment with corneal patch graft, Tenon's advancement and conjunctival autograft may represent a safe and effective therapeutic option.

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[8541] Genotype-phenotype spectrum in patients with novel variants in the ADAMTSL4 gene

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Purpose: To describe patients with lens abnormalities (isolated ectopia lentis, IEL, OMIM #225100; ectopia lentis et pupillae, OMIM #225200; and spherophakia), and to delineate their underlying genetic causes, including novel pathogenic variants. **Methods:** Patients received a comprehensive ophthalmological examination and metabolic and cardiac workup. Genetic testing was performed using whole genome or whole exome in the index patient, followed by a variant filtering process to detect possible disease-associated variants in genes described in association with abnormal lens formation and connective tissue diseases. Segregation analysis was performed by Sanger sequencing in all parents. **Results:** Five patients from three unrelated non-consanguineous families were included. Clinical spectrum varied from isolated ectopia lentis (2/5), ectopia lentis et pupillae (2/5), and isolated spherophakia (1/5). Age at first diagnosis was document within the first months of life in all patients. Due to stagnation of visual development, lentectomy was performed in 4/5 patients between ages 1.5 and 5 years with favorable functional outcome. Interestingly, one patient with solely mild spherophakia still showed a preserved visual acuity of 1.0 (Snellen) at age 11 years, while the sibling had undergone lentectomy on the right eye at age 5 years. None of the children showed abnormal metabolic, cardiac, or clinical marker of a general connective tissue disease. All but one of the affected patients were compound heterozygous for pathogenic variants in the autosomal recessive ADAMTSL4 gene. In one patient, a likely pathogenic and a variant of unknown significance was identified in this gene. Their unaffected parents were heterozygous carriers in all families. **Conclusions:** Biallelic mutations in the ADAMTSL4 gene are the single most common cause of isolated lens luxation in children. Our cohort demonstrated a broad phenotypic spectrum ranging from spherophakia to ectopia lentis and pupillae. Accordingly, symptoms may vary from none to severe visual impairment if untreated. In contrast to other lens luxations, there is no systemic association. We suggest that all children with early onset ectopia lentis and or spherophakia without signs of connective tissue diseases should be screened for mutations in the ADAMTSL4 gene.

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