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Ophthalmologicum Balticum 2025
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VABYSMO ▽

"Retina Advancements: Capacity Challenges and Therapeutic Innovations"

Radisson Blu Latvija Conference & Spa Hotel, Riga, Latvia
August 15, 2025, 10.40-11.25

PROGRAM

Chair

Asst. Prof. Juris Vanags / Head of board of Latvian Association of ophthalmologysts, P. Stradins Clinical University Hospital, Latvia

"Experiences with switching to faricimab in Denmark"

Assoc. Prof. Miklos Schneider / University of Copenhagen, senior consultant in medical retina at Rigshospitalet in Copenhagen, Denmark

"Retinal Care in Estonia: Overcoming Treatment Challenges and Harnessing Data for Better Outcomes"

Dr. Páll Kaarel Laas Sigurðsson/ Eye Clinic, Center of Ophthalmology, East-Tallinn Central Hospital, Estonia

"Vabysmo – an innovation for the treatment of retinal disorders"

Sandra Svara/ Roche Latvija SIA, Latvia

VABYSMO ▽ (faricimab)
Essential Information According to the Summary of Product Characteristics
▽ This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions.
Name of the medicinal product
Vabysmo 120 mg/mL solution for injection (Marketing Authorisation Number EU/1/22/1683/001)
Vabysmo 120 mg/mL solution in pre-filled syringe (Marketing Authorisation Number EU/1/22/1683/002)
Pharmaceutical form
Solution for injection.
Therapeutic Indications
Vabysmo is indicated for the treatment of adult patients with:
- neovascular (wet) age-related macular degeneration (nAMD),
- visual impairment due to diabetic macular oedema (DME),
- visual impairment due to macular oedema secondary to retinal vein occlusion (branch RVO or central RVO).

Posology and method of administration
This medicinal product must be administered by a qualified physician experienced in intravitreal injections.
Posology
Neovascular (wet) age-related macular degeneration (nAMD). The recommended dose is 6 mg (0.05 mL solution) administered by intravitreal injection every 4 weeks (monthly) for the first 3 doses. Thereafter, an assessment of disease activity based on anatomic and/or visual outcomes is recommended 16 and/or 20 weeks after treatment initiation so that treatment can be individualised. In patients without disease activity, administration of faricimab every 16 weeks (4 months) should be considered. In patients with disease activity, treatment every 8 weeks (2 months) or 12 weeks (3 months) should be considered. If anatomic and/or visual outcomes change, the treatment interval should be adjusted accordingly, and interval reduction should be implemented if anatomic and/or visual outcomes deteriorate. There is limited safety data on treatment intervals of 8 weeks or less between injections. Monitoring between the dosing visits should be scheduled based on the patient's status and at the physician's discretion, but there is no requirement for monthly monitoring between injections.
Visual impairment due to diabetic macular oedema (DME) and macular oedema secondary to retinalvein occlusion (RVO). The recommended dose is 6 mg (0.05 mL solution) administered by intravitreal injection every 4 weeks (monthly); 3 or more consecutive, monthly injections may be needed. Thereafter, treatment is individualised using a treat -and-extend approach. Based on the physician's judgement of the patient's anatomic and/or visual outcomes, the dosing interval may be extended in increments of up to 4 weeks. If anatomic and/or visual outcomes change, the treatment interval should be adjusted accordingly, and interval reduction should be implemented if anatomic and/or visual outcomes deteriorate. Treatment intervals shorter than 4 weeks and longer than 4 months between injections have not been studied. Monitoring between the dosing visits should be scheduled based on the patient's status and at the physician's discretion but there is no requirement for monthly monitoring between injections.
Duration of treatment. This medicinal product is intended for long-term treatment. If visual and/or anatomic outcomes indicate that the patient is not benefitting from continued treatment, treatment should be discontinued.
Method of administration. For intravitreal use only. Each pre-filled syringe or vial should only be used for the treatment of a single eye. Vabysmo should be inspected visually for particulate matter and discoloration prior to administration, and if present, the pre-filled syringe or vial should not be used. The intravitreal injection procedure should be carried out under aseptic conditions, which includes the use of surgical hand disinfection, a sterile drape and a sterile eyelid speculum (or equivalent).
Pre-filled syringe. The pre-filled syringe contains an excess of volume. The excess volume must be expelled before injecting the recommended dose. Injecting the entire volume of the pre-filled syringe could result in overdose. The injection filter needle (included in the package) should be inserted 3.5 to 4.0 mm posterior to the limbus into the vitreous cavity.
Vial. The injection needle (30-gauge x ½ inch, not included in the package) should be inserted 3.5 to 4.0 mm posterior to the limbus into the vitreous cavity.
Special warnings and precautions for use
Polysorbate content This medicinal product contains 0.02 mg of polysorbate per 0.05 mL dose. Patients with hypersensitivity to polysorbate should not take this medicine.
Traceability
In order to improve the traceability of biological medicinal products, the name and the batch number of the administered medicinal product should be clearly recorded.
Educational materials
Prescribers should be familiar with the patient guide prepared to ensure awareness of signs and symptoms of Intraocular inflammation and endophthalmitis and should provide this to the patient/caregiver explaining these events.
Summary of the safety profile
The most frequently reported adverse reactions were cataract (10%), conjunctival haemorrhage (7%), vitreous detachment (4%), IOP (intraocular pressure) increased (4%), vitreous floaters (4%), eye pain (3%), and retinal pigment epithelial tear (nAMD only) (3%). The most serious adverse reactions were uveitis (0.5%), endophthalmitis (0.4%), vitritis (0.4%), retinal tear (0.2%), rhegmatogenous retinal detachment (0.1%), and traumatic cataract (< 0.1%)
Reporting of suspected adverse reactions
After authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the national reporting system.
Marketing authorisation holder:
Roche Registration GmbH, Emil-Barell-Strasse 1, 79639 Grenzach-Wyhlen Germany.
Prescription medicine.

Detailed information on this medicinal product is available on the website of the European Medicines Agency http://www.ema.europa.eu.
For full product information, please see Vabysmo Summary of Product Characteristics (Last revision date: 05/2025)

Educational risk minimisation material for patients: "Your Vabysmo ▽ (faricimabum) guide" – audio version available on the ZVA YouTube channel: https://www.youtube.com/watch?v=bW2dnWIBMDw

Prepared by: Roche Latvija SIA
Miera iela 25, Rīga, LV-1001, Latvia
Email: riga.info_Latvija@roche.com
Prepared in: July 2025
Reference code: M-LV-00001106

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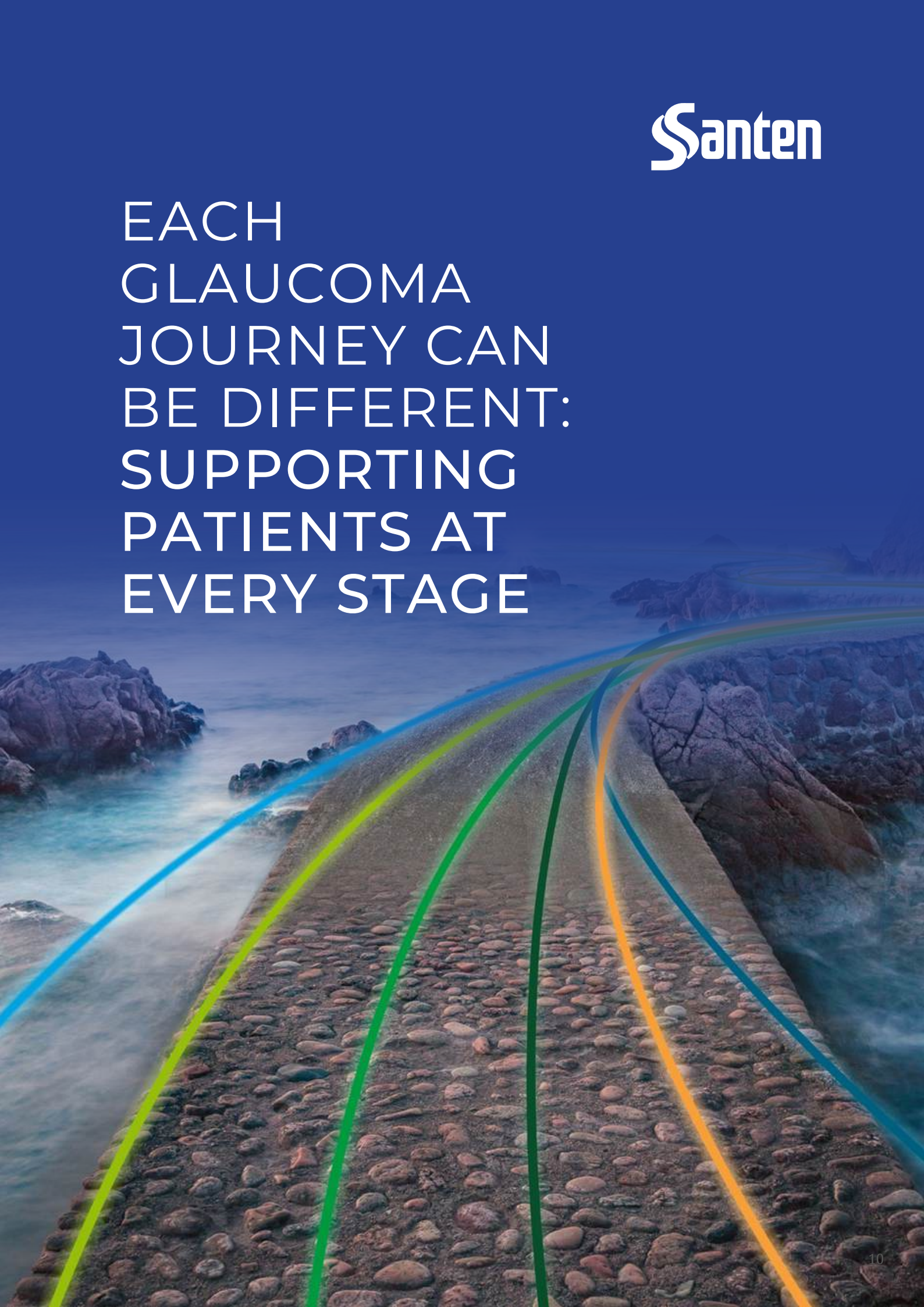
*Based on Alcon IOL worldwide unit sales 2023.

1. Oshika T, Fujita Y, Inamura M, Miyata K. Mid-term and long-term clinical assessments of a new 1-piece hydrophobic acrylic IOL with hydroxyethyl methacrylate. J Cataract Refract Surg. 2020 May;46(5):682-687.

2. Maxwell A, Suryakumar R. Long-term effectiveness and safety of a three-piece acrylic hydrophobic intraocular lens modified with hydroxyethyl-methacrylate: an open-label, 3-year follow-up study. Clin Ophthalmol. 2018;12:2031–2037.

3. Alcon data on file, REF-24222, 2024.

EACH GLAUCOMA JOURNEY CAN BE DIFFERENT: SUPPORTING PATIENTS AT EVERY STAGE



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is the first therapy to demonstrate an OS benefit in metastatic uveal melanoma[1]

KIMMTRAK▼ (tebentafusp) is indicated as monotherapy for the treatment of human leukocyte antigen (HLA)-A*02:01-positive adult patients with unresectable or metastatic uveal melanoma (mUM).[2]

▼ This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions.

KIMMTRAK reduced the relative risk of death by 49% vs control therapy*[3]
KIMMTRAK showed a continued OS benefit at a minimum follow-up of 36 months[4]

Abbreviated Prescribing Information. Name Of The Medicinal Product: KIMMTRAK 100 micrograms/0.5 mL concentrate for solution for infusion One 0.5 mL vial contains 100 micrograms of tebentafusp, corresponding to a concentration before dilution of 200 mcg/mL. **Therapeutic indications:** KIMMTRAK is indicated as monotherapy for the treatment of human leukocyte antigen (HLA)-A*02:01-positive adult patients with unresectable or metastatic uveal melanoma. **Posology and method of administration** Hospitalisation is recommended for at least the first three infusions of KIMMTRAK. The recommended dose of KIMMTRAK is 20 micrograms on Day 1, 30 micrograms on Day 8, 68 micrograms on Day 15, and 68 micrograms once every week thereafter. Treatment with KIMMTRAK should be continued while patient is deriving clinical benefit and in the absence of unacceptable toxicities. KIMMTRAK should be withheld or discontinued to manage adverse reactions. If cytokine release syndrome is suspected, the symptoms should be identified and promptly managed according to recommendations in SmPC. The safety and efficacy of KIMMTRAK in children under the age of 18 years have not been established. KIMMTRAK is for intravenous use. KIMMTRAK requires dilution with sodium chloride 9 mg/mL (0.9 %) solution for injection containing human albumin for intravenous infusion. **Contraindications:** Hypersensitivity to the active substance or to any of the excipients. **Interaction with other medicinal products and other forms of interaction.** Initiation of tebentafusp treatment causes transient release of cytokines that may suppress CYP450 enzymes. The highest drug-drug interaction risk is during the first 24 hours of the first three doses of tebentafusp in patients who are receiving concomitant CYP450 substrates, particularly those with a narrow therapeutic index. These patients should be monitored for toxicity (e.g., warfarin) or drug concentrations (e.g., cyclosporine). The dose of the concomitant medicines should be adjusted as needed. **Undesirable effects** The most common adverse drug reactions in patients treated with KIMMTRAK were cytokine release syndrome (88 %), rash (85 %), pyrexia (79 %), pruritus (72 %), fatigue (66 %), nausea (56 %), chills (55 %), abdominal pain (49 %), oedema (49 %), hypo/hyperpigmentation (48 %), hypotension (43 %), dry skin (35 %), headache (32 %) and vomiting (34 %). The most common adverse reaction that led to discontinuation of KIMMTRAK was cytokine release syndrome.
Very common adverse reactions are cytokine release syndrome, decreased appetite, hypomagnesaemia, hyponatraemia, hypocalcaemia, hypokalaemia, insomnia, headache , dizziness, paraesthesia, tachycardia, hypotension, flushing, hypertension, cough, dyspnoea, nausea, vomiting, diarrhoea, abdominal pain, constipation, dyspepsia, rash, pruritus, dry skin, hypo/ hyperpigmentation, erythema, arthralgia, back pain, myalgia, pain in extremity, pyrexia, fatigue, chills, oedema, Influenza like illness, aspartate aminotransferase increased, alanine aminotransferase increased, blood bilirubin increased, lipase increased, anaemia, lymphocyte count decreased, blood phosphate decreased, blood creatinine increased.
Common adverse reactions are nasopharyngitis, anxiety, taste disorder, arrhythmia, atrial fibrillation, oropharyngeal pain, hypoxia, alopecia, night sweats, muscle spasm, amylase increased, gamma glutamyltransferase increased, white blood cell count increased, blood alkaline phosphatase increased, blood glucose increased.
Uncommon adverse reactions are tumour lysis syndrome, angina pectoris, cardiac failure, electrocardiogram QT prolonged.
CRS, acute skin reactions and cardiac adverse events (AEs) have been reported in patients who received Kimmtrak.[2] The majority of the AEs occurred in the first few weeks after treatment initiation.[3]
*HR=0.51 (95% CI, 0.37-0.71; P<0.001) in favour of KIMMTRAK versus control group (pembrolizumab, ipilimumab or dacarbazine).[3]
1. Gerard C, et al. Immunooncol Technol 2023;19:100386. 2. Kimmtrak. Summary of Product Characteristics. 3. Nathan P, et al. N Engl J Med 2021; 385(13):1196-1206. 4. Hassel JC, et al. N Engl J Med 2023;389(24):2256-2266

Prescription medicine. This material is intended for healthcare professionals. Information prepared 07/2025. Advertiser: Medison Pharma Latvia SIA, Lielirbes iela 17A - 45, Riga, LV-1046. This medicinal product is subject to additional monitoring. Healthcare professionals are asked to report any suspected adverse reactions to the State Agency of Medicines. Website www.zva.gov.lv.
LV-KIMM-002-07/2025 - July 2025

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Retina

Real-world Data of Managing Treatment-Resistant Neovascular AMD with faricimab

Poster

Aiste Varoniukaite

Aim

To evaluate the real-world data of faricimab in treatment-resistant eyes of neovascular age-related macular degeneration (nAMD) patients in Department of Ophthalmology, Hospital of Lithuanian University of Health Sciences Kaunas Clinics.

Methods

A retrospective review of previously treatment-resistant patients treated with faricimab for nAMD performed. All of the patients were previously treated with intravitreal anti-vascular endothelial growth factor (anti-VEGF) injections (IVTI) and treatment-resistant, meaning intraretinal and/or subretinal fluid observed regarding the previous optimal IVT scheduling.

The data included

Background demographics, treatment history regarding the type of anti-VEGF agent, number of IVTI, treatment intervals, best corrected visual acuity (BCVA) in decimal, central subfield thickness (CST) in microns (μ), sub/intra retinal fluid (SRF/IRF) and adverse events.

Results

25 eyes (20 patients) were included with mean of 2.52±1.19 faricimab IVTI. Mean age was 77.08±10.67 years (min. 55, max.91), 17 were women (58.6%) and 8 men (27.6%). Patients received in total a mean of 30.6±17.44 anti-VEGF IVTI every 8.68±1.22 weeks (min. 6.18, max.11.57) prior to switching to faricimab. In 2022 the mean number of IVTI was 5.50±1.64, in 2021 – 5.36±1.33. Most were treated with either aflibercept and bevacizumab combination (34.5%) or ranibizumab and bevacizumab combination (37.9%). The mean BCVA did not significantly improve from 0.35±0.34 before switching to faricimab to 0.37±0.29 4 weeks after the first faricimab IVTI ($p>0.05$). After one IVTI of faricimab all eyed demonstrated reduction in CST with the mean CST significantly decreasing from 317.54±89.24 μ to 265.76±48.39 μ in 4 weeks ($p=0.001$). Prior to switching to faricimab 8 eyes (33.33%) had IRF, 9 eyes (37.50%) SRF, 5 eyes (20.84%) both IRF and SRF and 2 eyes were dry (8.33%) (n=24). After the first faricimab IVTI after 4 weeks a complete dryness was observed in 8 eyes (40%), IRF in 5 eyes (25%), SRF in 6 eyes (30%), both IRF and SRF in 1 eye (5%) (n=20) respectively. No intraocular inflammation cases were registered.

Conclusions

Real-world data of treatment-resistant patients treated with faricimab IVTI in tertiary university hospital in Lithuania demonstrated substantial decrease in CST in nAMD patients. An increased number of patients achieved complete dryness after 4 weeks of the switching to faricimab which is important in possible reduction on hospital visits, longer intervals between injections and good anatomical structural outcomes. A need of possibility to swich patient treatment between agents are important consideration for future nAMD management in Lithuania.

Patients with retinal dystrophies in Hospital of Lithuanian University of Health Sciences Kaunas clinics: clinical and genetic evaluation

Oral

A.Gelzinis, A. Krucaite, V.J. Balciuniene, R. Zemaitiene

Lithuanian University of Health Sciences, Department of Ophthalmology, Lithuania

Purpose

To evaluate the genotype of patients with retinal dystrophies phenotype observed in Hospital of Lithuanian University of Health Sciences (LUHS) Kaunas Clinics.

Methods

The study included all patients who presented to the Department of Ophthalmology of Kaunas Clinics of LUHS Hospital in 2020 - 2024 due to suspected retinal dystrophy and for whom genetic testing was performed. The patients underwent a comprehensive ophthalmological examination: best corrected visual acuity (BCVA), refractometry, tonometry, biomicroscopy, ophthalmoscopy, perimetry, ERG, optical coherence tomography, fundus photography and autofluorescence.

Results

148 patients were tested. In terms of inheritance type, autosomal recessive mutations were the most common, with some cases remaining unsolved. All identified gene mutations and clinical data will be presented.

Conclusion

The genetic landscape of the Lithuanian patients' group is similar to the results of other European genetic studies of inherited retinal dystrophies, with the most common affected genes being ABCA4, EYS, RP1, USH2A and RHO.

Diagnosis of melanoma - what does it mean?

Oral

Delis Linntam, Artur Klett

Melanoma affecting ocular and periocular structures encompasses distinct subtypes with markedly different biological behavior, prognoses, and management strategies. This presentation highlights the clinical courses of cutaneous melanoma with uveal metastasis, primary conjunctival melanoma, and primary uveal melanoma with three illustrative cases.

Cutaneous melanoma is the most prevalent of the three. Early-stage cutaneous melanoma has an excellent prognosis, with 5-year survival rates exceeding 90% for localized disease. However, once metastatic, prognosis worsens significantly, especially with ocular involvement, which typically signals advanced systemic spread. Recent advances in systemic immunotherapy and targeted therapy have dramatically improved outcomes in advanced cases, offering meaningful survival benefits even in metastatic spread, including cases with uveal involvement.

Conjunctival melanoma is a rare ocular surface malignancy with variable outcomes; its 10-year disease-specific survival is estimated at 70–80%. Local recurrence rates can be high, and the tumor has a notable potential for both lymphatic and hematogenous dissemination. Management typically includes wide local excision with adjuvant therapies, and in some cases, sentinel lymph node biopsy or systemic treatment, particularly in advanced disease.

Uveal melanoma, the most common primary intraocular tumor in adults, differs fundamentally in origin and behavior. Despite effective local treatments (primarily brachytherapy), up to 50% of patients develop metastaases. Prognosis after metastasis remains poor, with median survival of 6–12 months. Emerging systemic therapies have yet to achieve the same impact seen in cutaneous melanoma.
By contrasting these three cases, this presentation emphasizes the prognostic diversity among melanoma subtypes involving the eye and the evolving role of systemic therapy, underscoring the need for subtype-specific surveillance and multidisciplinary collaboration in ophthalmic oncology.

Three challenging retinoblastoma cases

Oral

Delis Linntam, Katrin Eerme, Artur Klett

Retinoblastoma management has evolved beyond life-saving interventions to focus increasingly on globe preservation and, critically, the salvaging of useful vision. This presentation discusses three complex pediatric retinoblastoma cases treated at East Tallinn Central Hospital, with an emphasis on strategies aimed at visual function preservation. Each case illustrates the diverse challenges involved – not only in tumor control but also in managing amblyopia risk, intraocular complications, and long-term visual outcomes.

We highlight the importance of early diagnosis and coordinated amblyopia therapy in optimizing visual development. The cases demonstrate how successful outcomes often require combining multiple local treatment modalities – including systemic chemotherapy, intra-arterial and intravitreal chemotherapy, laser photocoagulation, cryotherapy, and plaque brachytherapy – tailored to tumor location, size, and response. We also address the necessity of repeated treatments, individualized monitoring schedules, and the long-term commitment required for effective follow-up.

These cases reflect the complexity of retinoblastoma care and underscore the importance of a vision-focused, multidisciplinary approach in pediatric ocular oncology.

Optical coherence tomography angiography vascular differences in migraine patients

Oral

Elina Miglane[1], Kristine Baumane[2,3]

[1]Latvian American Eye Center, Riga, Latvia [2]Riga Eastern Clinical University Hospital, Riga, Latvia
[3]University of Latvia, Riga, Latvia

Background

Migraine is a common primary disabling headache disorder, with an overall prevalence of 14.7% in the general population. It is characterized by recurrent attacks of moderate to severe pain, lasting for 4 to 72 hours, preceded or accompanied by focal neurological and generalized symptoms. Although the pathophysiology of migraine is not fully understood, the complex interaction of vascular and neural factors is fundamental. Optical coherence tomography angiography (OCTA) are imaging technologies for vascular micro-visualization of the macula and optic nerve. Advances in non-invasive ophthalmic imaging could potentially be the most available diagnostic measurement for migraine.

Aim

To evaluate microvascular changes in the retina and optic nerve in migraine patients and healthy individuals.

Methods

The study group included 68 patients aged 18 to 40 years. Patients were divided into three groups: the first group contained patients with migraine with aura (20 patients, 40 eyes), the second group contained patients with migraine without aura (17 patients, 34 eyes) and the third group included a control group of healthy individuals (31 patients, 62 eyes). Patients underwent OCTA examination of the macula and optic nerves of both eyes. In addition - age, sex, best corrected visual acuity, aura symptoms, number of headache days per month - were fixed. The obtained data were analyzed using the IBM SPSS Statistics version 25.0.

Results

Patients with migraine with aura had statistically significantly lower macular superficial vascular central perfusion density (cPD, p=0.03) and central vascular density (cVD, p=0.01), compared to healthy subjects. Optic nerve disc (RND) peripapillary perfusion, foveolar avascular zone (FAZ) showed no statistically significant difference between groups in any of the comparisons. However, looking at the measurement data of FAZ, can be observed that these scores are slightly lower in the control group.

Conclusion

The obtained data shows that OCTA could be used as an objective and rapid tool in the detection of macular microvascular changes in migraine patients with aura, but not in migraine patients without aura. The reduction of perfusion density and vascular density of the superficial macular vessels could be used as tools to identify migraine with aura related changes, but additional studies are needed.
Acknowledgements. Disclosure of any conflict of interest or funding.

Radiation Retinopathy Following Uveal Melanoma Radiotherapy: Experience in the Hospital of Lithuanian University of Health Sciences Kaunas Clinics Ophthalmology Department in 2018-2022

Oral

I. Kaukenaite, G. Miniauskiene, J. Trumpaitis

Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Ophthalmology, Kaunas, Lithuania

Objective

This study aims to share clinical experience in diagnosing and managing radiation retinopathy (RR) in patients with uveal melanoma (UM) following radiotherapy. It explores the incidence of RR, its associations with clinical and dosimetric factors, and evaluates treatment effectiveness.

Methods

A total of 76 patients diagnosed with UM and treated with radiotherapy at the Ophthalmology Department of the Hospital of Lithuanian University of Health Sciences Kaunas Clinics between 2018 and 2022 were retrospectively analyzed. Patient demographics, tumor characteristics, and dosimetric parameters were evaluated. The presence of RR was recorded at baseline and at the final follow-up. In subjects who underwent intravitreal anti-vascular endothelial growth factor (anti-VEGF) therapy, best corrected visual acuity (BCVA) and central retinal thickness (CRT) were measured at baseline and at multiple follow-up intervals: 1, 3, 6, 12, 18, 24, 30, and 36 months.

Results

Over an average follow-up duration of 28.99 ± 15.93 months, RR was observed in 44.7% of cases, with an average onset of 20.97 ± 9.65 months post-radiotherapy. Patients who developed RR were significantly younger (58.74 ± 14.07 years) than those who did not (64.12 ± 11.81 years) ($p = 0.037$). Additionally, RR was more prevalent in tumors located in the macular and peripapillary regions ($p = 0.047$ and $p = 0.01$, respectively). During anti-VEGF therapy, BCVA remained stable, while CRT significantly decreased at 1, 3, 6, 12, and 24 months post-treatment ($p < 0.05$). The clinical manifestations of RR were significantly reduced at the final follow-up compared to baseline ($p < 0.05$).

Conclusion

Nearly half of the patients developed RR following UM radiotherapy, with a higher incidence among younger individuals and those with tumors in the macular and peripapillary regions. Treatment with intravitreal anti-VEGF injections was associated with stable BCVA and significant reductions in both CRT and RR clinical signs.

Macular telangiectasias: from imaging to intervention

Oral

Ieva Simkiene

Vilnius University Hospital Santaros Clinics, Vilnius, Lithuania

We aim to provide an overview of macular telangiectasias (MacTel), including their clinical presentation, imaging features, and potential intervention strategies. MacTel is a rare macular disease characterized by foveal capillary abnormalities, loss of outer nuclear layers, and ellipsoid zone changes. In advanced cases, it may progress to a full-thickness macular hole or retinal neovascularization. There are three types of MacTel, with type 2 being the most common. A multimodal imaging approach—optical coherence tomography (OCT), optical coherence tomography angiography (OCTA), fundus autofluorescence (FAF), and fluorescein angiography (FA)—is crucial for accurate diagnosis, helping to differentiate MacTel from other macular pathologies and subtypes. It is essential to distinguish MacTel from more common conditions such as retinal vein occlusion, diabetic retinopathy, and age-related macular degeneration. Treatment options vary based on the type, stage, and presence of retinal neovascularization. Interventions such as laser photocoagulation, intravitreal anti-vascular endothelial growth factor injections, and corticosteroids may be beneficial in selected cases. However, no treatment has proven universally effective or superior. This presentation will emphasize imaging findings and therapeutic approaches, focusing on the distinction between MacTel subtypes.

Macular telangiectasias: from imaging to intervention

Poster

Ieva Simkiene, Jolita Badariene, Gabriele Tarutyte, Rimvydas Asoklis, Leopold Schmetterer

Aims

To evaluate whether systemic arterial stiffness, measured by the cardio-ankle vascular index (CAVI), is associated with changes in the retinal microvasculature in individuals with metabolic syndrome (MetS).

Methods

In this prospective cross-sectional study, we included 203 eyes from 110 patients with MetS (median age 54 (49, 59), 56% female) and 187 eyes from 99 patients without MetS (median age 52 (50, 55), 56% female). Participants had clear media, no ocular disease, and no prior ocular surgery or trauma. Patients underwent a health check, including CAVI and retinal optical coherence tomography angiography OCT-A (AngioVue, OptoVue, Framont, CA, USA). Retinal capillary density at the superficial and deep vascular plexuses (SVP and DVP) at a 6 × 6 mm square of the central macular area was measured. Linear regression models were used within each group to evaluate associations.

Results

Within the MetS group, higher CAVI values were significantly associated with lower perfusion density and vessel density in the SVP (β = -0.347, p = 0.001; β = -0.188, p = 0.031). The same associations were observed in DVP (β = -0.617, p = 0.002; β = -0.288, p = 0.006).

No significant associations were observed in the non-MetS group (P > 0.05). Foveal avascular zone (FAZ) area, perimeter, and circularity index were not significantly associated with CAVI values in either group.

Conclusions

Higher systemic arterial stiffness values were significantly associated with retinal vascular parameters in both SVP and DVP within the MetS group. Changes in retinal microvasculature in this group may reflect early systemic vascular dysfunction.

Submacular Hemorrhage Treatment: Experience and Outcomes from East Tallinn Central Hospital

Oral

Joonas Pent, Veiko Reigo

East Tallinn Central Hospital Eye Clinic, Tallinn, Estonia

Submacular hemorrhage can cause severe vision loss, with an especially devastating impact on eyes that previously had good vision. The condition is usually a complication of polypoidal choroidal vasculopathy, neovascular age-related macular degeneration, or trauma. If left untreated, the visual prognosis is generally poor. Some authors suggest that fewer than 15% of patients achieve a visual acuity of 0.1 or better.

In addition to the underlying disease, the decrease in vision is thought to be caused by impaired diffusion between the retinal pigment epithelium and photoreceptors due to a thick blood clot, toxic effects on photoreceptors from liberated hemosiderin and iron from lysed blood, and mechanical shearing from contracting fibrin that has infiltrated between the inner and outer segments of the photoreceptors.

Small hemorrhages can be managed with anti-vascular endothelial growth factor injections. In cases of more extensive hemorrhage, prompt displacement of the blood clot from the macula may help reduce potential damage. This can be achieved, with varying degrees of success, using different methods, including pneumatic displacement, intravitreal or subretinal tissue plasminogen activator (tPA) injection, and vitrectomy - often requiring a combination of these techniques.

The aim of this presentation is to describe the course and outcomes of a small series of patients treated and followed for submacular hemorrhage at East Tallinn Central Hospital. Although subretinal tPA injection is technically the most demanding, in our experience, it appears to be the most effective method for displacing the blood and reducing further damage to the macular photoreceptors.

Treatment of Retinal Diseases in Lithuania – Challenges and Opportunities

Oral

Vilma Jurate Balciuniene

Ophthalmology Department, Lithuanian University of Health Sciences

Retinal diseases remain a leading cause of visual impairment in Lithuania, with age-related macular degeneration (AMD), diabetic retinopathy (DR), and retinal vein occlusions (RVO) representing the most prevalent and vision-threatening conditions, reducing the quality of life. In Lithuania, the treatment landscape for these conditions has evolved considerably, yet notable challenges persist. This presentation explores the current state of retinal disease management in Lithuania, highlighting advancements in diagnostic tools, the implementation of intravitreal pharmacotherapies, and the integration of teleophthalmology. Despite clinical advancements, significant challenges persist—ranging from disparities in access to care, delayed diagnoses, and regional inequalities in specialist availability, to limitations in reimbursement policies for newer pharmacologic agents and imaging technologies. This talk will analyze national epidemiological trends, real-world treatment outcomes, and systemic barriers within the healthcare infrastructure. In parallel, it will highlight opportunities for progress, including expanding the role of teleophthalmology, strengthening screening programs, enhancing multidisciplinary collaboration, and aligning national protocols with European guidelines. By addressing these aspects, the presentation aims to inform policy and clinical strategies that can improve long-term retinal health outcomes across Baltic states.

The Treatment of Long-Standing Full-Thickness Macular Hole (FTMH)

Oral

Līga Radecka

Riga East University Hospital, Latvia

The goal of this presentation is to show the postoperative results of long-standing full-thickness macular hole (FTMH) surgery using three different ILM peeling techniques: standard ILM peeling (15 patients), temporal-inverted ILM flap (15 patients), and ILM “plug-in” (10 patients).

This is a retrospective study conducted at Riga East University Hospital, Latvia.

The analysis will include a comparison of data among all three groups. The data to be analysed includes:

1. Macular Hole Closure Type at 6 months postoperative.
2. Best Corrected Visual Acuity (BCVA) (measured in ETDRS letters): Preoperative vs. 6 months postoperative.
3. Metamorphopsia Score (M-CHARTS Type II): The metamorphopsia score before surgery and 6 months postoperative.

Bilateral circumscribed choroidal hemangioma. A case report.

Oral

Maris Oll, Katrin Hannus, Delis Linntam

Eye Clinic, East Tallinn Hospital, Estonia

Circumscribed choroidal hemangioma (CCH) is a benign vascular choroidal tumour, classically presents as a sporadic unilateral orange-coloured lesion that can be difficult to visualize on fundoscopy because the colour of the tumour often blends with the surrounding normal choroid.

This tumour can be asymptomatic or present with symptoms of floaters, photopsias or vision loss. Bilateral presentation is extremely rare and mostly associated with Sturge-Weber syndrome. The aim of our presentation is to describe the case about bilateral CCH that occurred in an otherwise healthy individual.

Our case report highlight the importance of distinguishing CCH from other choroidal lesions: nevus, melanoma, metastasis, lymphoma. While CCH may be difficult to distinguish clinically from other neoplastic lesions using indirect ophthalmoscopy, multimodal imaging highlights essential clues for diagnosis.

Subretinal hemorrhage. What is the best treatment option?

Oral

Martynas Speckauskas

Department of Ophthalmology, Hospital of Lithuanian University of Health Sciences Kaunas Klinikos, Kaunas, Lithuania

In case of submacular hemorrhage (SH) irreversible degeneration of photoreceptors begins after 24 hours. Prevalence of SH – 24:1.000.000. Because of the rare appearance and requirement of quick actions, treatment of this disease remains challenging.

Aim

To review current treatment options of SH and to present a case series of patients treated by subretinal injection of recombinant tissue plasminogen activator (rtPA).

Methods

Analysis of literature revealed currently most common used methods of SH treatment beeing anti-vascular endothelial growth factor (anti-VEGF) intravitreal injection, combination of pneumatic displacement (PD) and intravitreal anti-VEGF, combination of PD, anti-VEGF and rtPA intravitreal injection, or combination of pars plana vitrectomy (PPV), PD, intravitreal anti-VEGF and subretinal rtPA injection. Different studies give conflicting results and all four treatment options still are under scientific investigation.

Four cases of patients who were treated by PPV, PD, intravitreal anti-VEGF and subretinal injection of rtPA (25 microgram of Actilyse®, Boehringer Ingelheim International GMBH, Germany) in the Department of Ophthalmology, Hospital of Lithuanian University of Health Sciences Kaunas Klinikos were analyzed. Three females aged 67 – 73 years were diagnosed with SH caused by age-related macular degeneration complications (duration of SH 1 day, 2 days and more than one month) and one 35 years old male with 7 days SH after blunt eye injury.

Results

rtPA is known for its direct action to blood clot degradation by catalyzing conversion of plasminogen into plasmin. Despite promising theoretical benefits of tPA there is no agreement of the best injection method and dosage in SH.

In all four of our cases we observed blood clot degradation, but visual acuity improvement was limited: from 0.02 to 0.04 in the first case, from 0.02 to 0.1 in the second case, from light perception to 0.06 in the third case and 0.3 in traumatic case.

Conclusion

Small dosage subretinal rtPA injection is effective in management of SH, but functional outcome is limited by causative pathology. Outcomes should improve when more treatment data in multicenter studies will be collected.

Device-Dependent Variability in Choriocapillaris OCTA Quantification: A Multi-System Analysis

Oral

Nataliya Semenova, Anna Stulova, Vladimir Akopyan

Lomonosov Moscow State University, School of Medicine, Department of Ophthalmology

Optical coherence tomography angiography (OCTA) is increasingly used to assess choriocapillaris (CC) blood flow, yet comparability across devices remains poorly understood. Visual evaluation of OCTA images from different devices shows considerable variability. This suggests that the technical specifications and algorithms of each machine play a significant role in the visualization results and, consequently, the quantitative evaluation.

Aim

To compare quantitative parameters of choriocapillaris blood flow using OCTA systems from different manufacturers.

Materials and methods

In this cross-sectional study, central OCTA with seven different machines (HRA+OCT Spectralis; DRI OCT Triton (software versions IMAGEnet 6 1.36 and 1.38); Mocean 4000; Revo NX130; Avanti; Solix) was performed for 13 volunteers (10 females, 26[24;27] years). Image binarization was performed using the Phansalkar method in ImageJ software. Instead of resizing the images, which differed in size and resolution across machines as done in previous studies, we adjusted the binarization window. After the image processing standard choriocapillaris flow parameters were calculated: FD number, FD density, and mean FD size. Correlation analysis was performed to compare these quantitative parameters from images obtained by the different OCT machines.

Results

The binarization window was calculated for each device, based on the assumption that it should cover the intercapillary space (24 μm converted in pixels considering the scanned area size and transverse resolution) plus 1 pixel.

Correlation was found only for two pairs of comparisons. The evaluation results from DRI OCT Triton and Spectralis machines correlated in terms of FD density (r=0.813, p=0.048). A very strong correlation was discovered for the FD number (r=0,955, p=0,017) and FD density (r=0,912, p=0,033) parameters between Avanti and DRI OCT Triton. Notably, no correlation was found between two different software versions of DRI OCT Triton.

Conclusion

The lack of correlation between images of the same eye from different devices highlights considerable variation in OCTA visualisation across manufacturers. Despite all technical progress, the results may not accurately represent the actual anatomy. Therefore, quantitative evaluations using contemporary commercial OCT devices should be approached with caution.

Aicardi syndrome

Poster

Sandra Ose, Vita Sperga, Sandra Valeiņa

9 y.o female. Prenatally- corpus callosum agenesis. After birth- at 5 months- infantile spasms, with developmental delay. Sitting at 9.5 mo, walking-16 mo, talking-4 y.o. Fundoscopic examination: bilateral choreoretinal dystrophy, non-elevated, and without vessels crossing over their surface, consistent with multiple chorioretinal lacunae

2023:MRI: diffuse cortical dysplasia, corpus callosum agenesis.

NGS WES TRIO: no significant findings.

Diagnosis: based on the clinical findings-Aicardi syndrome

Aicardi syndrome is an extremely rare genetic disorder. Almost all people with Aicardi syndrome are females. Individuals with Aicardi syndrome have agenesis of the corpus callosum, chorioretinal lacunae and seizures

Cataract

Unveiling Cataract Progression: Insights from Metabolome Analysis

Oral

Arturs Zemitis[1,2], PhD. Juris Vanags[1,2], Jingzhi Fan[3], assoc. prof. Kristaps Klavins[3], prof. Guna Laganovska[1,2]

[1]Riga Stradins University, Department of Ophthalmology, Riga, Latvia [2]Pauls Stradins Clinical University Hospital, Clinic of Ophthalmology, Riga, Latvia [3]Institute of Biomaterials and Bioengineering, Faculty of Natural Sciences and Technology, Riga Technical University, Riga, Latvia

Purpose

To elucidate the metabolic alterations driving cataract maturation by profiling the aqueous humour metabolome across a spectrum of lens opacification severities.

Methods

Aqueous humour was collected from 192 cataract patients, stratified by lens hardness according to the SPONCS classification. Targeted metabolite quantification was performed via hydrophilic interaction chromatography–liquid chromatography coupled with high-resolution mass spectrometry (HILIC–LC-HRMS). Data were processed and interpreted through MetaboAnalyst 5.0 to identify pathway enrichments and intergroup metabolic distinctions.

Results

Pathway enrichment revealed four key perturbations correlating with increasing cataract hardness:

1. Taurine and hypotaurine metabolism: Marked depletion of taurine undermined glutathione recycling, elevating cellular NAD+ demand.
2. Tryptophan catabolism: Enhanced flux through the kynurenine pathway—driven by NAD+ scarcity, interferon-γ, and UV-mediated IDO induction—was evident in advanced cataracts.
3. Mitochondrial β-oxidation: Upregulated short-chain fatty acid β-oxidation suggested an adaptive surge in lipid import into mitochondria to sustain heightened energetic needs.
4. Pyrimidine metabolism: Altered nucleotide turnover pointed to downstream effects on redox balance and lens cell homeostasis.

Conclusion

Our findings delineate a concerted metabolic reprogramming in cataract progression, characterized by compromised antioxidant defences and enhanced energy production pathways. Targeting these disrupted enzymatic routes—particularly taurine replenishment, IDO modulation, and mitochondrial lipid handling—may yield novel pharmacological strategies to delay or mitigate lens opacification.

Surgical Management of Dislocated Lenses: Impact on Visual Acuity, Complications, and Patient Recovery

Oral

Edijs Ustāns

Dislocated lenses, whether traumatic, spontaneous, or iatrogenic, present a significant challenge in ophthalmic surgery. This study reviews various surgical techniques for managing lens dislocation, including anterior vitrectomy and pars plana vitrectomy with intraocular lens (IOL) fixation, anterior chamber IOL implantation, and scleral or iris-sutured IOL placement. Outcomes are analyzed in terms of postoperative visual acuity, incidence of complications such as retinal detachment, cystoid macular edema, and IOL decentration, as well as overall patient recovery time. The findings indicate that while all techniques offer the potential for substantial visual rehabilitation, the choice of procedure and surgeon expertise critically influence complication rates and recovery.

Comparison of posterior cortex cataract prevalence between patients that have never been exposed to dangerously high doses of radiation and Chornobyl ex clean-up workers

Oral

Dr. E. Grīsle, Prof. G. Laganovska, Dr. A. Zemītis, Dr. I. Markeviča, Doc. M. Zolovs

Aim

Various literature sources report that exposure to dangerously high doses of radiation can cause severe damage to human body tissues and organs, including the eye. It is suggested that high levels of radiation can cause migration of lens fibers towards the posterior cortex and lead to development and increased prevalance of posterior subcapsular cataract. This research was carried out to evaluate whether this hypothesis is true.

Methods

The research included eyes which were divided in 3 groups: 20 eyes of healthy individuals that had never been previously exposed to dangerously high doses of radiation, 20 eyes of Chornobyl ex clean-up workers who worked only in the city but were not sent to work on the roof of the reactor and 13 eyes of Chornobyl ex clean-up workers who worked on the roof of the reactor. Patients in the research were all in age group 55 – 70 years old. Linear regresion test was conducted to compare lens thickness, lens posterior cortex thickness and the percentage of the posterior cortex occupies of the whole lens across research groups. Age was used as a covariance in order to control the effect of patient age in comparing the data. All statistical analyses were performed using Jamovi statistical software (https://www.jamovi.org) with a significance level of $\alpha = 0.05$.

Results

Linear regresion test showed that there is a statistically significant difference in posterior lens cortex thickness as well as the percentage it occupies of the whole lens between healthy individuals and people who worked only in Chernobyl city ($p<0,001$). However, there was no statistically significant difference in these two parameters between people who worked on the roof of the reactor and helathy non-exposed patients. There was no statistically significant difference in lens thickness between neither of the groups.

Conclusions

Exposure to extremely high doses of radiation can cause migration of lens fibers towards the posterior cortex of the lens and increase the prevalence of posterior subcapsular cataract.

One Size Doesn't Fit All: Choosing the Right Lens for the Cataract Patient

Oral

MD, PhD Ēriks Elksnis

Latvian American Eye Center; Riga Stradins University, Department of Ophthalmology

Modern cataract surgery demands a personalized approach to intraocular lens (IOL) selection, as the traditional 'one size fits all' strategy fails to address the diverse anatomical, optical, and lifestyle needs of patients. Successful outcomes depend on understanding the range of presbyopia-correcting IOLs available, including trifocal and extended depth-of-focus (EDOF) designs, and matching them not only to clinical measurements but also to the patient’s personality type and visual expectations. By integrating these factors, individualized lens selection can maximize postoperative satisfaction and quality of vision.

The Importance of Accurate IOL Power Calculation for Premium Lenses in Complex Cataract Surgeries: Addressing Challenges and Advancements

Oral

Ingrīda Kozlovska

This presentation will address the challenges of IOL power calculation in patients with irregular corneas and those who have undergone previous refractive laser surgery. Accurate IOL power calculation is crucial for achieving optimal outcomes in complex cataract surgeries involving premium intraocular lenses. Advances in technology and a personalized approach significantly enhance results and patient satisfaction.

First Experience of Performing Femtosecond Laser-Assisted Cataract Surgery in a Post-Radial Keratotomy Eye

Oral

M. Solomatins, I. Solomatins, A. Solomatins, J. Gertnere
The Dr Solomatin eye center, Riga, Latvia

Purpose
To report the first experience of performing femtosecond laser-assisted cataract surgery on an eye previously treated with radial keratotomy (RK).

Setting
A 71-year-old female patient presented with decreased visual acuity in the left eye. Radial keratotomy had been performed on both eyes in 2000. Cataract surgery was performed on the right eye two years prior. Type 2 diabetes was diagnosed three years ago.
Best-corrected visual acuity (BCVA): OD 0.9, OS 0.05 (near vision not known).
Slit-lamp examination revealed a brunescent cataract and pseudoexfoliative syndrome in the left eye.

The Ziemer Z8 femtosecond laser and the Alcon Centurion phaco machine were used for the procedure. IOL power was calculated using the Zeiss IOL Master.

Methods
Femtosecond laser-assisted cataract surgery was performed on the left eye. The main incision was made directly through a keratotomy scar. For intraocular lens (IOL) power calculation, a mathematical average was taken between the Barrett True-K (LVC RK mode activated, myopic setting selected), and empirical values from SRK-T (+2.5 D) and Hoffer Q (+1.5 D) formulas.

Results
The surgery was uneventful.
BCVA at 3 months post-op: OD 1.0, OS 1.0 (with +3.0 D addition for near vision).

Conclusions
No leakage was observed from the keratotomy scars following femtosecond laser vacuum application.
Creating the main incision directly through a keratotomy scar did not result in wound leakage.
Using a mathematical average of different IOL calculation formulas provided an accurate refractive outcome close to plano.
Femtosecond laser-assisted cataract surgery is a safe and predictable technique for eyes previously treated with RK.

Cornea

Beyond Vision Correction: The Untold Power of Excimer Laser

Oral

Dr.A.Solomatin, V. Kezika

Purpose
To evaluate and present the therapeutic applications of excimer laser technology in ophthalmology beyond refractive correction, with a primary focus on phototherapeutic keratectomy (PTK) for anterior corneal pathologies.

Setting
This study and presentation are intended for an audience of ophthalmic surgeons, corneal specialists, and clinical researchers at a professional medical conference focused on laser technology and ocular surface disease.

Methods
This presentation reviews current evidence, and case reports on the use of excimer laser therapy in treating corneal pathologies. Specific attention is given to techniques such as phototherapeutic keratectomy (PTK) for corneal dystrophies, ,recurrent erosions and superficial opacities. Mechanisms of action, laser-tissue interactions, and treatment protocols are discussed in detail.

Results
Clinical data demonstrate that excimer laser therapy via PTK can effectively remove superficial corneal opacities, smooth irregular surfaces, and relieve symptoms associated with painful recurrent corneal erosions. The outcomes show significant improvements in corneal clarity, visual acuity, and patient comfort, with a low incidence of complications.

Conclusion
While widely known for reshaping corneas in refractive surgery, the excimer laser holds powerful therapeutic value in managing corneal disease. Recognizing and adopting these broader applications can greatly enhance patient outcomes and expand the role of laser technology in ophthalmologic care.

Rare Complications of Refractive Surgery: Cases from Clinical Practice

Oral

Jana Gertnere, Igor Solomatins, Andreis Solomatins, Maksims Solomatins
The Dr Solomatin eye center, Riga, Latvia

Objective
To present and analyze rare complications of refractive surgery based on personal clinical experience over a 25-year period. The goal is to explore possible causes and discuss strategies for prevention.

Methods
A retrospective review was conducted using data from previously performed refractive procedures. Cases involving rare complications were identified and analyzed for contributing factors and outcomes.

Results
Rare complications included:
Corneal ectasia following LASIK, FEMTO-LASIK, and SMILE: 16 cases.Diffuse lamellar keratitis (DLK): 10 cases. Interface fluid syndrome (IFS): 2 cases. Flap-related complications: 5 cases. Late-onset haze after PRK: 2 cases. Latent epithelial basement membrane dystrophy (EBMD): 4 cases. Toxic keratopathy: 1 case.

Conclusions
Comprehensive preoperative diagnostics and the incorporation of advanced diagnostic tools can significantly reduce the incidence of complications. Proper patient selection, thorough medical history taking, and identification of coexisting ocular conditions are critical. The use of modern femtosecond laser technology further decreases the risk of complications such as postoperative corneal ectasia when compared to traditional microkeratome LASIK techniques.

Evaluation of safety and efficacy and refractive outcomes for low-to-moderate and high myopia patient groups, treated with EVO ICL phakic intraocular lens implants form year 2018 to 2022.

Poster

Dr. Olita Lūse[1], Dr. Ilze Šveiduka[2]
[1]LAAC [2]RAKUS, LAAC

Phakic Intraocular Collamer Lens (EVO ICL) is a refraction correction method which can correct wide range of refractive error: from -0.5 Dsph to -18.0 Dsph of myopia, from +0.5 Dsph to +10.0 Dsph of farsightedness, and up to 6.0 Dcyl for astigmatism correction in combination with either “+” or “-” spherical values.

This is a retrospective, comparative, non-interventional case series of patients who underwent ICL implantation surgical treatment from year 2018 to 2022. The objective of the study was to compare outcomes in myopia correction, in patients with different levels of nearsightedness. Included myopic patients were categorized into 2 groups: one with low to moderate myopia (preoperative manifest refraction sherical equivalent <-6.0D) and another - high myopia group (refraction spherical equivalent ≥-6.0D). To evaluate safety and efficacy of ICL method, postoperative UCDVA and BCDVA was analyzed and compared to preoperative data.

Results of this case series show that patients in both groups had good postoperative clinical efficacy and safety.

Correction of Corneal Scar-Induced Astigmatism Using Femtosecond Laser-Assisted Limbal Relaxing Incisions: A Case Report

Poster

M. Solomatins, I. Solomatins, A. Solomatins, J. Gertnere
The Dr Solomatin eye center, Riga, Latvia

Purpose
To report a clinical case of corneal scar-induced astigmatism corrected with femtosecond laser-assisted limbal relaxing incisions (LRIs).

Setting
A 71-year-old male presented with decreased visual acuity in the right eye. He had undergone cataract surgery in both eyes, followed by intraocular lens (IOL) dislocation in the right eye, requiring IOL exchange and iris suture fixation. A corneal scar subsequently developed, resulting in irregular astigmatism and reduced visual acuity.

Preoperative Best-Corrected Visual Acuity (BCVA)
OD: 0.2 cc +2.25 D sph with -4.00 D cyl @125° = 0.3
OS: 0.9 (no correction)

Methods
Femtosecond laser-assisted LRIs were performed on the right eye using the Ziemer Z8 platform. Two arc-shaped incisions were made along the steep meridian, with parameters determined by a nomogram.

Results
The procedure was uneventful.

Postoperative BCVA at 2 weeks
OD: 0.6 cc +1.75 D cyl @145° = 0.9 OS: 0.9 (no correction)
The patient reported high satisfaction with the visual improvement but did not attend the scheduled follow-up visits beyond two weeks.

Conclusions
Femtosecond laser-assisted LRIs are a safe and effective method for correcting corneal astigmatism caused by scarring.
This case demonstrates that even in complex scenarios involving multiple prior intraocular surgeries, significant improvement in visual acuity can be achieved with precise femtosecond laser-guided incisions.
The procedure is minimally invasive, offers rapid visual recovery, and may reduce or eliminate the need for additional refractive correction in selected patients.
Optimal outcomes depend on careful patient selection, accurate nomogram-based planning, and appropriate postoperative management.
Results may be further enhanced with adjunctive corneal refractive procedures such as LASIK or PRK when necessary.

Keratoconus and sleep apnea

Oral

Mari Tamsalu, MD, FEBO

This presentation aims to evaluate the associations between obstructive sleep apnea (OSA) and both periocular and ocular disorders.

Keratoconus and OSA are two seemingly distinct disorders that have shown emerging evidence of a potential connection. Keratoconus is a progressive, non-inflammatory corneal ectasia characterized by thinning and cone-shaped protrusion of the cornea, leading to visual impairment. OSA involves repeated episodes of upper airway collapse during sleep, resulting in disrupted sleep patterns and intermittent hypoxia.

Recent studies suggest a higher prevalence of OSA among individuals with keratoconus. While the underlying mechanisms are not fully understood, obesity and elevated activity of matrix metalloproteinases (MMPs) have been proposed as potential contributing factors.

In conclusion, a better understanding of the relationship between these conditions may support earlier diagnosis and more effective management, ultimately improving patient outcomes.

A semi-allogenic limbal transplantation

Oral

Mikk Pauklin

A 43-year old female patient was referred to the Eye Clinic of Tartu University Hospital, Tartu, Estonia due to severe photophobia and conjunctival hyperemia in both eyes in November 2021. Her local ophthalmologist had treated her for ocular inflammation with different antibiotics, corticosteroids and antiviral medications for 3 months without any improvement.

Her visual acuity had decreased to 0,7 in the right eye and 0,4 in the left eye, an epithelial defect was present in the right eye and an uneven corneal surface in the left eye.

Initially an infection or autoimmune disease was suspected, but a more likely reason for her complaints was chemical injury that lead to the development of total limbal stem cell deficiency in both eyes. Despite topical treatment with serum eye drops, insulin eye drops, several amniotic membrane transplantations and temporary tarsorraphy, a complete corneal conjunctivalization developed in both eyes, leading to legal blindness.

An allogenic limbo-conjunctival transplantation using donor tissue from her identical twin sister was performed in the right eye in September of 2024. I will present one-year follow-up of the case.

Keratoplasty in LUHS Hospital Kaunas Clinics: experience and challenges

Oral

Prof. Reda Žemaitienė, MD, PhD [1,2], Paulina Steniulytė, MD [1,2], Lina Grybauskaitė[2], Raminta Liubinaitė[2]

[1]Department of Ophthalmology, Lithuanian University of Health Sciences Kaunas Clinics, Kaunas, Lithuania
[2]Lithuanian University of Health Sciences, Kaunas, Lithuania

Keratoplasty, or corneal transplantation, is one of the most commonly performed transplant procedures worldwide. It remains the primary treatment for patients with corneal diseases such as keratoconus, corneal dystrophies, scarring due to trauma or infections, and endothelial dysfunctions. This surgical intervention restores vision, alleviates pain, and improves the quality of life for individuals whose corneas have become opaque or structurally compromised.

Globally, approximately 200,000 corneal transplants are performed each year. The availability of donor corneas varies significantly by country. In Lithuania, approximately 60 corneal transplants are performed annually. However, in 2024, the number increased to 80, with our institution performing 62 of them, accounting for 77.5% of all keratoplasties in the country. Over the last decade, 373 corneal transplantations were performed at Kaunas Clinics, highlighting our institution's significant experience in corneal transplantation.

Since introducing Descemet Stripping Automated Endothelial Keratoplasty (DSAEK) in 2019 and Descemet Membrane Endothelial Keratoplasty (DMEK) in 2024, we have observed significant improvements in patient outcomes and visual recovery.

Despite these advancements, several challenges remain. Although there was a shortage of donor corneas in the past, this issue has largely been resolved, and the current waiting list is relatively short. However, the availability of donor corneas still plays a crucial role in meeting demand. Additionally, one of the postoperative complications, post-keratoplasty glaucoma, remains a significant concern, as it can impact long-term graft survival and visual prognosis.

To further assess these trends, we have conducted a retrospective analysis of our decade-long data, focusing on IOP control after corneal transplantation, surgical management success of post-keratoplasty glaucoma, and graft survival. Over the past 10 years, a total of 18 trabeculectomies, 9 cyclophotocoagulations, 5 canaloplasties, and 2 Ahmed valve implantations were performed in our clinic for post-keratoplasty glaucoma management. Trabeculectomy was the most frequently performed procedure, while canaloplasty demonstrated excellent outcomes. This analysis provides deeper insights into surgical advancements and future directions for improving post-keratoplasty glaucoma in our practice.

Glaucoma

Genetic Screening for Primary Congenital Glaucoma in Latvia: A Cohort-Based Study

Oral

Eva Elksne[1,2,3], Baiba Lace[4,5], Janis Stavusis[4], Anastasija Tvoronovica[4], Pawel Zayakin[4], Eriks Elksnis[6,7], Arturs Ozolins[8,9], Ieva Micule[4,10], Sandra Valeina[1,3], Linda Gailite[9, 11], Inna Inashkina[4]

[1]Department of Ophthalmology, Children's Clinical University Hospital, Vienibas gatve 45, Riga, Latvia. [2]Department of Doctoral studies, Riga Stradins University, Dzirciema 16, Riga, Latvia. [3]European Reference Network on Rare Eye Diseases (ERN-EYE) [4]Latvian Biomedical Research and Study Centre, Ratsupites 1 k-1, Riga, LV-1067, Latvia [5]Riga East University Hospital, Hipokrata 2, LV-1038, Latvia [6]Latvian American Eye Centre, A.Deglava 12a, Riga, LV-1009. [7]Department of Ophthalmology, Riga Stradins University, Dzirciema 16, Riga, Latvia. [8]Department of Surgery, Pauls Stradins Clinical University Hospital, Pilsonu 13, Riga, Latvia. [9]Faculty of Medicine, Riga Stradins University, Dzirciema 16, Riga, Latvia. [10]Department of Medical Genetics and Prenatal Diagnostics, Children's University Hospital, Vienibas gatve 45, LV-1004, Riga, Latvia [11]Scientific Laboratory of Molecular Genetics, Riga Stradins University, Dzirciema 16, Riga, Latvia.

Objectives

The aim of the study was present the preliminary results of molecular genetic investigation for primary congenital glaucoma (PCG) in a Latvian cohort.

Methods

Twenty probands with clinically diagnosed PCG and 36 family members enrolled in the study. Genetic testing was conducted using genomic DNA from peripheral blood by next generation sequencing (NGS).

Results

All individuals included in the study were of European descent and had no known family history of PCG. All probands received a diagnosis within their first year of life, with a female-to-male ratio of 1:1.2. Bilateral cases accounted for 20.0% of the cohort. No pathogenic variants in the CYP1B1, LTBP2, TEK, MYOC, FOXC1, FOXC2, PITX2 genes were detected among the probands. However, a heterozygous missense variant, c.4357C>A (p.Pro1453Thr), in the PXDN gene was identified in one proband and her parent. This variant was classified as benign with uncertain clinical relevance.

Conclusions

NGS revealed no pathogenic variants in genes related to PCG among the affected individuals. These initial findings indicate that CYP1B1 is unlikely to play a predominant role in the development of PCG in this group. Future research involving expanded national cohorts and collaborative efforts across the Baltic region will be crucial to deepen our understanding of the genetic underpinnings of PCG in this population.

OCT Angiography Changes After Gonioscopy-assisted Transluminal Trabeculotomy in Patients with Pseudoexfoliative Glaucoma

Oral

***Gunta Blezura-Udre*[1,2]**

[1]Riga East University hospital [2]University of Latvia

Gonioscopy-assisted transluminal trabeculotomy (GATT) is one of the minimally invasive surgical techniques. It aims to circumferentially incise the inner wall of Schlemm's canal, to connect it directly to the anterior chamber. Trabeculotomy can restore flow of the patient's natural drainage system. The aim of this study is to compare optic nerve and macular vascularisation before and after GATT by OCT angiography. Currently, there are no studies available on optic nerve and retinal vascular changes in pseudoexfoliative glaucoma patients after GATT. The correlation between changes in intraocular pressure and optic nerve blood supply is being investigated.

When the Uncommon Strikes Early: A Case of Bilateral Juvenile Open Angle Glaucoma

Oral

Kristin Saan, Marko Pastak

Eye Clinic of Tartu University Hospital

This clinical case involves a 13-year-old boy who was referred to clinic in 2020 by a local ophthalmologist due to elevated intraocular pressure (IOP) levels and myopia, which were discovered during a routine check-up. Additional tests revealed thinning of the retinal nerve fiber layer and the retinal ganglion cell layer on optical coherence tomography, as well as changes in visual field tests. The patient was started on topical glaucoma medications and prescribed glasses. Despite maximum treatment, his visual acuity fluctuated, and IOP levels remained above normal. Consequently, surgery with the Preserflo MicroShunt was planned for the left eye in 2021. In 2022, the same procedure was performed on the right eye; however, due to bleb fibrosis in the right eye, a second operation with the Preserflo MicroShunt was necessary. Following this intervention, the IOP levels stabilized within normal limits. In 2024, the patient was referred to a medical geneticist, who conducted a next-generation sequencing gene panel analysis. The results indicated that the patient had a heterozygous positional change in the MYOC gene, which is known to cause primary juvenile open-angle glaucoma. This case underscores the importance of early detection and appropriate intervention for pediatric patients with glaucoma.

Application of Ocular Ultrasound Biomicroscopy (UBM) Method in the Cases of Secondary Glaucoma

Oral

Elīza Briede

Overview of Ocular Ultrasound Biomicroscopy and it's role in cases of secondary glaucoma would be reviewed. Different several cases of secondary glaucoma would be presented, including images and video of the UBM examination.

Surgical Treatment of Secondary Glaucoma: An Analysis of Patients Operated with Various Surgical Methods at Riga East University Hospital from 2021 to 2024

Oral

asoc. Prof. Kristine Baumane

The presentation will cover the most common causes of secondary glaucoma, treatment challenges, surgical treatment methods used, the number of patients operated on, and the results obtained at the Ophthalmology Clinic of Riga East University Hospital between 2021 and 2024.
Special attention will be paid to cases of secondary glaucoma such as eyes with silicone oil after pars plana vitrectomy, cases of Ellingson syndrome, neovascular glaucoma cases after central retinal vein occlusion, and their possible surgical solutions.

Dual-Device Strategy in Complex Glaucome: A Case of Combined Preserflo and Baerveldt Implantation

Oral

Kaarel Kree, Marko Pastak

Tartu University Hospital, Eye Clinic

We present an 80-year-old patient with refractory glaucoma and a history of multiple trabeculectomies. A novel combined approach using Baerveldt and Preserflo implants in a single procedure achieved effective IOP control. The Preserflo was inserted into the Baerveldt tube to modulate early flow and extend posterior filtration. This case highlights the potential of dual-device implantation in complex glaucoma.

Baerveldt Implant or Preserflo MicroShunt? Evaluating Early Outcomes in Glaucoma Surgery

Oral

Marko Pastak, Mari Parksepp, and Aleks Kree

Tartu University Hospital, Eye Clinic

The aim of this study was to compare the early outcomes of the Baerveldt BG101-350 glaucoma implant and the Preserflo MicroShunt in patients with glaucoma. In this retrospective comparative case series, we analyzed 257 eyes treated with the Baerveldt BG101-350 glaucoma drainage device (Group A) and 160 eyes treated with the Preserflo MicroShunt (Group B) between 2022 and 2024. Clinical outcomes assessed included intraocular pressure (IOP), the number of antiglaucoma medications prescribed, best-corrected visual acuity, and the incidence of complications. Success rates were estimated using Kaplan–Meier survival analysis. Mean preoperative IOP was significantly reduced at various follow-up time points in both groups ($p<0.03$). The cumulative probability of success at 6, 12, and 18 months was 93%, 90%, and 88%, respectively, in Group A, compared to 88%, 82%, and 78% in Group B. Both the Baerveldt BG101-350 implant and the Preserflo MicroShunt effectively lowered intraocular pressure and can be considered viable options for primary filtering surgery in patients with glaucoma.

First postoperative results of canoloplasty ab interno in Pauls Stradiņš clinical university hospital: a case series

Oral

dr. Līva Čaikovska[1,2], doc.Juris Vanags[1,2], dr. Dairis Meiers[1,2], prof.Guna Lagnovska[1,2]

[1]Pauls Stradins Clinical University Hospital, Riga, Latvia [2]Riga Stradins University, Riga, Latvia

Financial disclosure

none

Objective

To assess the initial first postoperative outcomes of ab-interno canaloplasty (ABiC) using the iTrack microcatheter (Nova Eye Medical, Fremont, CA, USA) in the Ophthalmology Department at Pauls Stradiņš Clinical University Hospital, Riga, Latvia in three patients diagnosed with open-angle glaucoma (OAG).

Methods

Three eyes from three patients (average age 73±6.0 years; 2 males and 1 female) underwent ABiC as a standalone surgical procedure. All patients had previously undergone cataract extraction in the affected eye and were managing OAG with at least two different intraocular pressure (IOP) lowering medications prior to the intervention. At baseline visit data from patient's IOP, visual acuity, visual field test, gonioscopy and optic coherence tomography were observed. Postoperative follow-ups were conducted on day one, at two weeks, and at one month following the surgery. The iTrack microcatheter and a surgical goniolens were used to complete a full 360-degree intubation and viscodilation of Schlemm's canal.

Results

Preoperative mean IOP was 33 ± 3.5 mmHg, and average visual acuity was 0.2 ± 0.1. The mean deviation on visual field testing was -7.68 ± 2.7 dB prior the surgery. IOP measurements post-surgery were as follows: 31 ± 12.0 mmHg at day one, 28 ± 5.0 mmHg at two weeks, and 20 ± 5.0 mmHg at one month. Visual acuity did not change after the surgery in all patients. All patients received topical antibiotics and steroid-containing eye drops for two weeks postoperatively. A significant decrease in IOP and a reduction in glaucoma medications were observed in two out of the three patients, while one patient continued treatment with IOP lowering eye drops. Postoperative complications included corneal edema in all patients (3/3) at day one, hyphema in one patient (1/3) at day one, and acute conjunctivitis in one patient (1/3) at two weeks, which was successfully managed with antibiotic eye drops.

Conclusion

The iTrack ABiC technique represents a promising minimally invasive surgical option for treating OAG. It has the potential to effectively lower IOP and reduce the need for glaucoma medications. However, further studies are necessary to establish its long-term safety and efficacy. Considering that ab interno canaloplasty is not universally appropriate for all patients with OAG, further research is warranted to refine the criteria for patient selection. Identifying precise anatomical and clinical indicators that predict favorable outcomes is essential to optimize surgical efficacy and ensure appropriate patient stratification.

Young Ophthalmologist

Postoperative results of PreserFlo Ab-Externo MicroShunt glaucoma surgery in Pauls Stradiņš Clinical University Hospital: a case series

Oral

Dr.Alberts Veitners[1,2,3], Doc.Juris Vanags[1,2], Prof.Guna Laganovska[1,2]

[1]Pauls Stradins Clinical University Hospital, Riga, Latvia [2]Riga Stradins University, Riga, Latvia
[3]Latvian American Eye Center, Riga, Latvia

Financial disclosures
None.

Objective
To assess the postoperative outcomes of glaucoma surgery using the PreserFlo Ab-Externo MicroShunt (Santen Inc., Emeryville, CA, USA) in the Ophthalmology Department of Pauls Stradiņš Clinical University Hospital, Riga, Latvia in seven patients diagnosed with open-angle glaucoma (OAG).

Methods
Seven patients diagnosed with open angle glaucoma (2 males and 5 females; average age of 72±11 years old) underwent ab-externo glaucoma surgery using the PreserFlo MicroShunt. Six of the patients underwent the treatment in one eye, whereas one patient had the procedure done in both eyes, bringing the total number of surgical operations performed to eight. Three of patients had previously undergone cataract surgery in the affected eye, while four of the patients hadn't had cataract extraction done prior to the glaucoma surgery.

The PreserFlo MicroShunt was used to perform an ab-externo glaucoma surgery. Measurements of patient's IOP were acquired preoperatively, as well as on day one following surgery, and in subsequent follow-up visits 1 week, 1 month, 3 months, 6 months, 1 year, and 1.5 years after the surgery.

Results
Preoperatively, the average IOP was 27 ± 13 mmHg.
Average IOP measurements across all patients, taken in follow-up visits, were: 10.2 ± 5.0 mmHg on day one, 10.6 ± 5.0 mmHg at 1 week, 11.5 ± 5.0 mmHg at 1 month, 11.8 ± 4.0 mmHg at 3 months, 12.1 ± 3.0 mmHg at 6 months, 13.1 ± 3.0 mmHg at 1 year, and 13 ± 4.0 mmHg at 1.5 years after the surgery.

All patients received a treatment regimen of antibiotic and steroid containing eyedrops for two weeks following the surgery. One of the patients had an IOP of 6.0 mmHg 2 days after the procedure, which was managed by performing a revision of the surgery site and filling of the anterior chamber with Healon viscoelastic material.
All patients presented with a significant decrease in IOP immediately following the surgery, and an IOP within the normal range consistently across all follow-up visits.

Conclusion
The PreserFlo Ab-Externo MicroShunt is a novel device, requiring careful tissue dissection and placement. So far it has shown encouraging results in its ability to effectively reduce IOP and reliance on glaucoma medication in OAG patients. Further studies would be warranted to confirm the device's ability to consistently manage IOP, as well as its safety and efficacy over the long term.

Corneal endothelial cell density changes after cataract phacoemulsification surgery

Oral

Anete Kristiana Zaržecka [1,2], Doc. Ēriks Elksnis [1,2,4], Prof. Guna Laganovska [1,3,4]

[1]Riga Stradiņš university, Latvia [2]Latvian American Eye centre, Latvia
[3]Pauls Stradiņš Clinical University Hospital, Latvia [4]Scientific research supervisor

Objectives

To determine the extent of corneal endothelial cell density (ECD) loss following a cataract phacoemulsification surgery and the impact of pre-existing systemic and ophthalmic comorbidities.

Materials and methods

A retrospective data review was performed by randomly selecting medical histories of patients who had undergone both eye cataract phacoemulsification. Endothelial microscopy data were obtained during the pre-operative assessment performed before the study and contraleteral eyes surgery. The available data on sistemic or local comorbidities were registered.

Results

445 patient histories were included in this study. The median time between the surgeries was 0,94 years. The loss of ECD in the non-operated eye aligned with predictions from prior research, while the reduction in the operated eye was significantly greater. ECD loss was significantly higher in patients with diabetes mellitus (400,91 vs 269,98; p = 0,013). Pseudoexfoliative syndrome as well as glaucoma also cause endothelial cells to be more succeptible (498,57 vs 340,56; p<0,05) and (487,56 vs 361,74; p=0,01) respectively. In cases of mature cataract the ECD loss was greater (504,32 vs 359,59; p=0,02). Although the ECD loss was greater in patients with pre-existing corneal dystrophy, the difference was not statistically significant (p=0,285).

Conclusions

Cataract phacoemulsification surgery causes significant corneal endothelial cell density loss. Additional risk factors such as preexisting glaucoma, pseudoexfoliative syndrome and mature cataract, as well as diabetes mellitus aggravate it and should be kept in mind when planning surgical approach to minimise the possible complications and improve outcomes.

OCT Angiography and Advanced Glycation End Products in Diabetic Patients

Oral

Beate Pēterfelde

My work focuses on the relationship between advanced glycation end products (AGEs) and retinal microvascular changes in diabetic patients, assessed with OCTA imaging.

I will present findings from a study involving type 1 and type 2 diabetes patients, examining how AGEs risk levels correlate with OCTA parameters such as vessel density, foveal avascular zone (FAZ) area, and flow in the outer retina and choriocapillaris, among others.

While AGEs are known markers of systemic vascular damage, their association with detailed retinal microcirculation changes remains poorly understood. This study is one of the few to explore these correlations using OCTA, a non-invasive imaging method that offers quantitative insight into retinal vasculature. Understanding these links may help identify early retinal changes before clinical signs of diabetic retinopathy appear. The findings support further exploration of AGEs and OCTA as potential tools for early risk stratification in diabetic eye disease.

Riga East Clinical university hospital. CO2 Laser vs Conventional Surgery in Blepharoplasty: A Comparative Study

Oral

Dineja Veinberga

This study explores the comparative aspects of CO2 laser-assisted blepharoplasty and conventional scalpel-based techniques, focusing on surgical methodology, intraoperative management, and postoperative considerations. Conducted at Riga East Clinical University Hospital, the analysis aims to examine the potential advantages and limitations of laser technology in oculoplastic procedures. Key parameters assessed include operative precision, intraoperative and postoperative complications, healing time, scarring, and patient satisfaction. Special attention is given to surgical precision, tissue interaction, and recovery dynamics. The study emphasizes the importance of technique selection based on individual patient characteristics and surgical goals.

Xanthelasmas or first symptom of hematologic pathology? Erdheim Chester disease – rare diagnosis not to miss

Oral

Elina Parkassevitš

Resident of Ophthalmology in East Tallinn Central Hospital

We are presenting a clinical case of 47 years old woman, who arrived to emergency department with unilateral S-shaped upper eyelid edema and hyperemia with yellow discoloration. In last 2 years clinical appearance varied from mild bilateral upper eyelid puffines to prominent eyelid edema, pruritus and mucous yellowish discharge from both eyes. MRI showed bilateral lacrimal gland enlargement with infiltrative edema in periorbital area. The biopsy from enlarged lacrimal gland revealed focal xanthomatous infiltrate, which was CD69 marker positive. As a result, diganosis "non-Langerhans type histiocytosis" was suggested. Promptly after she was referred to haematologist and became treatment at earliest convinience.

The present case shows the importance of identifying right diagnosis, highlights the role of ophthalmologist in recognition of a first sympotms of systemic disease and reffering the patient to specialist for further management.

Ultra widefield imaging findings of retinal periphery in patients with age related macular degeneration

Oral

Dr. Elīna Pašuna[1], Prof. Guna Laganovska[2]

[1]Resident of Ophthalmology in East Tallinn Central Hospital [2]Scientific research supervisor

Objectives

Age-related macular degeneration (AMD) is a leading cause of irreversible visual impairment among the elderly population worldwide. While the hallmark features of neovascular (wet) AMD are classically centered in the macula—growing evidence suggests that retinal changes may extend beyond the central posterior pole. Recent advances in retinal imaging, particularly ultra-widefield (UWF) imaging, have enabled clinicians and researchers to visualize the peripheral retina with unprecedented clarity.

This study aims to describe and sort the peripheral retinal findings observed on ultra-widefield imaging in patients with wet AMD and comparing with control individuals without AMD diagnosis. By identifying common peripheral changes and incidence in both groups, we seek to expand the current understanding of AMD as a panretinal condition.

Materials and methods

A retrospective study was performed using medical records, widefield and ultra-widefield fundoscopic images and OCT images of 106 eyes of patients with wet AMD who previously were examined and received anti-VEGF therapy with Bevacizumab in Pauls Stradiņš Clinical University hospital. Medical records, fundoscopic images and OCT images of 97 eyes of patients without AMD, who previously were examined were used. Images were taken using Clarus 700 ultra-widefield fundus camera (up to 200° field of view) and OCT Heidelberg Spectralis camera for clarification purposes. For image areal analysis Boston grid system was used. Microsoft Excel and IBM SPSS 29.0 were used for data analysis.

Results

The mean age of the patients with wet AMD (cases) was 76,7 ± 7,1 years and 73,3 ± 8,3 years in control group. 18,4% and 15,5% (cases, control) had type II diabetes, 47,7%, 33,4% had dyslipidemia and 5,3%, 6,1% had myopia gravis. Peripheral drusen were found in 26,6%, 17,2% (mid-periphery, far-periphery) of eyes of cases and in 15,5%, 11,1% in controls. Neovascularization and geographic atrophy were only seen in mid-periphery in 7,8% of cases. Hyperpigmentation was detected in 37,5% and 19,1% in mid-periphery, 31,2% and 23,2% in far-periphery for cases and controls, respectively. Hypopigmentation was seen in 15,6% of cases and in 4,7% of controls in mid-periphery. Senile reticular pigmentary change was predominantly seen in 34,4% of controls in mid-periphery, while in 26,6% of cases. Chorioretinal atrophy was seen in 6,2% of controls. Hemorrhagic lesions were detected in 12,5% of cases and in 4,7% of controls. Chi-Square test showed statistically significant association between AMD status and peripheral neovascularization ($p=0,041$), drusen ($p=0,025$), hyperpigmentation ($p<0,001$), hypopigmentation ($p=0,064$), with higher prevalence in the case group compared to controls. Significant association was found between peripheral drusen and dyslipidemia ($p<0,001$).

Conclusions

Peripheral retinal changes are more prevalent in eyes affected by neovascular age-related macular degeneration (AMD) compared to eyes without AMD. Using ultra-widefield (UWF) imaging, we identified a

Ultra widefield imaging findings of retinal periphery in patients with age related macular degeneration

higher incidence of peripheral drusen, hyperpigmentation, hypopigmentation, neovascularization and geographic atrophy in the AMD group, suggesting that AMD extends beyond the macula and should be considered a panretinal disease. The clinical significance of peripheral changes in AMD remains incompletely understood, and therefore, further studies are recommended.

Recurrent Keratoconus

Oral

Emilija Kovieraitė, Prof. Dalia Žaliūnienė, Prof. Vytautas Jašinskas, Dr. Indrė Matulevičiūtė, Dr. Ugnė Rumelaitienė

The Department of Ophthalmology, Lithuanian University of Health Sciences Kaunas clinics, Lithuania

Summary

Keratoconus is a progressive degenerative eye disease in which the cornea begins to thin and bulge, changing to a conical shape. Patients with advanced forms of keratoconus, undergo deep anterior lamellar keratoplasty or penetrating keratoplasty. Keratoconus recurrence after corneal transplantation although is rare but has been confirmed histologically. Various causes of recurrent keratoconus are described in the literature. It is debated whether donor or host tissue is responsible for the recurrence of the disease. Two clinical cases will be presented that illustrate the development of recurrent keratoconus after penetrating keratoplasty, diagnostic and treatment options, and possible outcomes of the disease. Early diagnosis of recurrent keratoconus is important to stop the progression of the disease and improve refractive outcomes using available treatment methods.

Intraocular Pressure Fluctuations After Gonioscopy-Assisted Transluminal Trabeculotomy and Trabeculectom

Oral

Dr. Ieva Briede, Dr.Eliza Briede

Riga East Clinical University Hospital

Objectives

Glaucoma is a chronic, progressive optic neuropathy often associated with elevated intraocular pressure (IOP), and in cases where pharmacological or laser therapy is insufficient, surgical intervention is required. Two commonly used surgical techniques are Gonioscopy-Assisted Transluminal Trabeculotomy (GATT) and Trabeculectomy (TE). While both are effective in reducing IOP, postoperative IOP fluctuations are frequently observed and may negatively impact visual outcome, particularly in advanced glaucoma. This study aims to compare the extent and frequency of IOP fluctuations following GATT and TE, and to identify potential risk factors associated with these changes.

Materials and Methods

A prospective, comparative study will be conducted at the Ophthalmology Clinic of Riga East Clinical University Hospital. Patients undergoing either GATT or TE will be assessed preoperatively and 1, 7, and 30 days postoperatively. Data collection will include patient demographics, medical history, glaucoma characteristics, and previous treatments. IOP will be measured using I-Care tonometry; anterior chamber angle parameters will be evaluated using Heidelberg Engineering ANTERION OCT; and subjective pain levels will be assessed using a numerical rating scale. Episcleral venous fluid wave will be evaluated during GATT procedure. Data will be analyzed statistically using IBM SPSS Statistics 25.0

Results and Conclusions

This prospective study is currently in the data collection phase. Comparative analysis of intraocular pressure fluctuations and their potential risk factors in patients undergoing GATT and TE will be conducted upon completion of the follow-up period. The final results, including statistical analysis and interpretation, will be presented at the Forum Ophthalmologicum Balticum 2025. The study is expected to provide new insights into early postoperative IOP dynamics and inform surgical decision-making and postoperative management strategies in glaucoma patients.

Exploring the Diagnostic Value of OCTA (Optovue Solix Fullrange) and Fundus Imaging in Diabetic Retinopathy: A Comprehensive Assessment of Early Changes in Microcirculation

Oral

Renāte Plaude

I will present about the diagnostic value of OCTA and Fundus imaging for patients with diabetic retinopathy. I will analyze early changes in retinal microcirculation.

The Quiet Threat: Scleromalacia Perforans in Granulomatosis with Polyangiitis

Oral

Sintija Mihelsone

Background

Scleromalacia perforans (SP) is a rare, severe form of anterior necrotizing scleritis characterized by painless scleral thinning and necrosis without overt inflammation. It is most often associated with long-standing rheumatoid arthritis but may also occur in other systemic autoimmune diseases such as granulomatosis with polyangiitis, lupus, and Behçet disease. SP is driven by a type III hypersensitivity reaction involving immune complex deposition and vascular damage, leading to full-thickness scleral necrosis and uveal exposure. We report a rare case of SP in a patient with granulomatosis with polyangiitis, highlighting the ocular manifestation of this systemic vasculitis and management considerations.

Case presentation

A 68-year-old female presented to the Eye Emergency Department at Pauls Stradiņš Clinical University Hospital on March 20, 2025, with concerns about an unusual area of scleral discoloration in her left eye, first noticed in the mirror two weeks earlier. She reported mild irritation, intermittent redness, and mucous discharge from the same eye over the past year. The symptoms were painless, and her vision remained unaffected.

Her medical history included granulomatosis with polyangiitis (GPA), primary arterial hypertension, hyperlipidemia, and type 2 diabetes mellitus. Regular medications included Triveram 40 mg/10 mg/10 mg once daily, Gliclada 30 mg once daily, CellCept 500 mg two tablets twice daily, Mycophenolate mofetil 1000 mg twice daily, and Medrol 4 mg daily.

On examination, best corrected visual acuity was 0.9 in the right eye and 0.7 in the left. Intraocular pressure measured with iCare tonometry was 12 mmHg in the right eye and 10 mmHg in the left. Slit-lamp examination revealed mild conjunctival injection in the left eye and a 10 × 15 mm area of scleral thinning with exposed uveal tissue in the upper nasal quadrant beneath the upper eyelid. The area of scleral thinning was not covered by conjunctiva. No other abnormalities were noted in the anterior or posterior segments of the eye.

Laboratory investigations showed mild leukocytosis (10.02×10^9/L), elevated lactate dehydrogenase (LDH, 279 U/L), and an increased C-reactive protein (CRP, 8.0 mg/L). The patient was started on Ducressa eye drops (dexamethasone 1 mg/mL and levofloxacin 5 mg/mL) four times daily, and Ikervis (ciclosporin 0.1%) twice daily to control inflammation and prevent infection. Systemic corticosteroid therapy with Medrol was initiated at 16 mg daily, tapered to 8 mg after two weeks, and then maintained at 4 mg daily.

Due to uveal exposure and a high risk of globe perforation, the patient was referred to East Tallinn Central Hospital for surgical intervention. The scleral defect was managed with an amniotic membrane graft, mucous membrane graft, and conjunctival coverage. Following surgical intervention, patient remains under close ophthalmic supervision with weekly assessments. The scleral defect remains stable, and the grafted area is healing well without signs of infection or recurrence. She continues topical treatment with Ducressa eye drops once daily, Ikervis once daily, and systemic therapy with Medrol, tapered according to the prescribed schedule.

The Quiet Threat: Scleromalacia Perforans in Granulomatosis with Polyangiitis

Conclusion

Scleromalacia perforans is a rare and vision-threatening complication of systemic autoimmune disease that can progress silently until the structural integrity of the eye is severely compromised. In such cases, where there is full-thickness scleral thinning and uveal exposure, timely surgical intervention with grafting is the only effective option to preserve the globe. Defect coverage can be achieved using a range of graft materials, including amniotic and mucous membranes, sclera, conjunctiva, cornea, dermis and even synthetic materials. Systemic disease control is equally important, as active disease may impair wound healing and increase the risk of graft failure.

Pupillometry Reveals Autonomic Adjustments During Diving Reflex in Face Immersion Apnea

Poster

Rizzuto V.[1,9] , Montanari R.[2], Mesin L.[3], Bortolozzo-Gleich M. H.[4], Laurino M.[5], Bonneh Y.[6], Yellin D.[7], Laganovska G.[8,9], Vanags J.[8,] , Gemignani A.[10,11]

[1]School of Advanced Science, University of Camerino, Camerino, Italy [2]Institute of Pharmacology, Heidelberg University Hospital, 69120 Heidelberg, Germany [3]Department of Electronics and Telecommunications, Mathematical Biology and Physiology, Politecnico di Torino, Turin, Italy [4]Instituto de Neurociencias UMH-CSIC (Alicante), Avenida Santiago Ramón y Cajal s.n., 03550, Spain [5]Institute of Clinical Physiology, National Research Council, Pisa, Italy [6]School of Optometry and Vision Science, Faculty of Life Science, Bar Ilan University, Ramat Gan, Israel [7]Department of Brain Sciences, Weizmann Institute of Science, Rehovot, Israel [8]Clinic of Ophthalmology, P. Stradins Clinical University Hospital, Riga, Latvia [9]Department of Ophthalmology, Riga Stradins University, Riga, Latvia [10]Department of Surgical, Medical and Molecular Pathology and Critical Care Medicine, Pisa, Italy [11]Department of Neuroscience, University of Pisa Hospital, Pisa, Italy

Abstract

The human diving reflex (DR), an innate defensive reflex triggered during periods of apnea, concurrently activates both the sympathetic and parasympathetic branches of the autonomic nervous system to regulate physiology against challenging demands. Despite pupil dilation and constriction being antagonistically controlled by the two autonomic branches, the effect of the diving reflex on pupil diameter fluctuations is still unknown. Thus, we compared participants' pupil diameter fluctuations while breathing or performing apnea either with (Wet) or without (Dry) face immersion in cold water. We found that pupil diameter fluctuations in both apneic conditions are associated with lower power in the low-frequency band (< 0.25 Hz) while in the Wet condition, a reallocation of power towards higher frequencies (> 0.25 Hz) occurs, together with an increased entropy, contrary to the remaining conditions. This indicates a shift in autonomic balance and an increased complexity of pupil fluctuations during the diving reflex. Our findings present pupil dynamics as a valuable entry point to the exploration of autonomic adjustments for this reflex.

Introduction

Pupillary physiology extends beyond a simple light-evoked reflex, reflecting complex neurological pathways related to changes in ambient illumination, autonomic activity, and cognitive functions [1, 2, 3, 4, 5, 6, 7, 8, 9] . Moreover, pupil diameter can be monitored non-invasively, serving as a proxy for studying oscillatory responses of the autonomic nervous system [3, 38].

In the absence of external stimuli, mood changes, or fixation adjustments, the pupil exhibits spasmodic, cyclical, and bilaterally synchronous fluctuations known as hippus (or pupil unrest) [10]. The frequency of hippus ranges from 0.047 to 2 Hz [11], with most studies finding a peak frequency around 0.3 Hz [10], and the magnitude of pupil diameter variations ranging from not detectable (usually with naked-eye observation) to over 0.5 mm [12] .

The roles of the parasympathetic nervous system (PNS) and sympathetic nervous system (SNS) in regulating iris function and overall pupil diameter are well-documented [9, 13, 14, 41]. The PNS controls the constriction pathway through the iris sphincter muscle, while the SNS governs the dilation pathway via the radial-oriented iris dilator muscle, associated with excitement and the fight-or-flight response [9, 13, 14]. Despite these distinct pathways, the central nervous system can control both in unison [15]. The locus coeruleus activates the sympathetic dilation pathway and inhibits the parasympathetic constriction pathway at the Edinger-Westphal nucleus [14, 15] .

Pupillometry Reveals Autonomic Adjustments During Diving Reflex in Face Immersion Apnea

Pupillary measurements can thus serve as neurological markers for autonomic, mesencephalic, and even neocortical activity related to attention [42]. As pupil diameter is influenced by the dynamic interplay of SNS and PNS inputs, hippus may arise from their continuous neurological interaction [10, 16, 18] .

Despite these insights, the exact mechanisms behind hippus remain elusive, with variable frequency reports and lacking precise definition [16, 10, 19, 20, 21, 22, 23].Indeed, the dynamics of pupil diameter show nonlinear properties which result in complex behavior [23, 24, 25, 27, 28, 39] . Moreover, pupillary fluctuations have been found to correlate with respiratory activity, cardiac activity, breathing patterns , and resting-state cortical activity [18, 21, 23, 28, 40, 74], suggesting a shared neural control of these processes.

The diving reflex (DR) is an autonomic response in humans, evolutionarily originated in vertebrates and conserved in mammals [29, 30, 31]. DR triggers a coordinated set of physiological changes, including bradycardia and peripheral vasoconstriction, engaging both the sympathetic and parasympathetic nervous systems [30, 32]. Its primary function includes the preservation of vital oxygen reserves, prioritizing perfusion to critical organs such as the heart and brain [33]. The DR is significantly influenced by the activation of facial cold receptors [30]. Indeed, cold water immersion amplifies the DR response by inducing profound bradycardia and vasoconstriction, thus conserving oxygen during underwater activities [34, 35] .

Given the simultaneous recruitment of SNS and PNS by the DR and their roles in regulating pupil diameter, we investigated whether pupil diameter fluctuations are modulated during DR. To address this question, five free divers participated in an experiment where they performed either controlled breathing or apnea (breath-holding), with and without face immersion in cold water. Pupillary measurements were taken to assess changes in pupil dynamics across these conditions.

The pupillary signals were analyzed in two frequency bands, with specific contributions to the autonomic balance associated with pupillary control assigned to each band: low-frequency (LF, 0.04-0.25 Hz) primarily reflecting SNS contribution, and high-frequency (HF, 0.25-2 Hz) reflecting PNS contribution.

Our results indicate a stronger contribution of the PNS, and a weaker contribution of SNS, to pupil diameter fluctuations, accompanied by increased complexity during DR in face-immersion apnea.

Methods

Participants. The study enrolled 5 healthy male volunteers aged between 30 and 63 years, all of whom were emmetropic and had no comorbidities or medication intake.

Inclusion criteria were: nonsmokers, light caffeine and alcohol consumers, drug-free for at least 2 months with no history of cardiovascular, pulmonary, or neurological/psychiatric diseases.

Participants reported no history of ocular surgeries, ocular traumas, ocular infections, or previous uveitis and provided informed consent for their participation in the experiment. They were categorized based on their experience level in freediving into two distinct groups: “Advanced” and ”Beginner.” The criteria for each group were defined by the duration of freediving experience, maximum static apnea duration, and maximum depth reached in water. Advanced participants had more than three years of freediving experience, could

Pupillometry Reveals Autonomic Adjustments During Diving Reflex in Face Immersion Apnea

sustain static apnea for over three minutes, and reached freediving depths exceeding 25 meters. In contrast, Beginner participants had less than three years of experience, with static apnea durations below three minutes and depths reached below 25 meters.

All experimental procedures were performed according to the ethical guidelines of the Local Ethical Committees of Pisa University with resolution n. 69/2024 of 17/12/2024 and all athletes gave their informed consent.

Fig 1. Experimental setup. a) Overview of the setup showing, from left to right, a custom-designed operating table with a headrest for head stabilization, a pupillometer with an infrared camera (IRC), an oximeter for measuring oxygen saturation and heart rate, and a transparent glass basin filled with water maintained at a constant temperature of 15°C, monitored via an internal thermometer. Anesthetic eye drops were used for the Wet condition. b) Illustration of the positioning of subjects, who were instructed to lie face down on the operating table with their heads centered and stabilized using the headrest. The eye tracker was positioned beneath the subjects' faces, and a calibration system was employed. Inset shows an IRC capture of the eye in Wet condition through the water-filled transparent basin.

Design, materials, and measurements. Subjects were instructed to perform controlled breathing, consisting of 4 seconds of inspiration followed by 6 seconds of expiration (Breathing) (6 respiratory cycles per minute), a dry breath-hold (Dry), and a breath-hold with the face submerged in a glass basin of water at 13 degrees Celsius (Wet). In the Breathing condition, an audio track of deep ventilatory noises was given via an audio track to indicate the target respiration rate (inspiration 4 seconds, expiration 6 seconds) at the beginning of the trial for the training, without any change of visual presentation for 3 minutes. Pupillometry was performed using the BioEye eye-tracking solution (https://braineye.com/how-it-works/ and Supplementary), in which acquisition software application was installed on a Xiaomi 9 smartphone, connected to a BioEye's near-infrared (NIR) camera specifically built for optimizing pupil acquisition by preserving wavelengths that

Pupillometry Reveals Autonomic Adjustments During Diving Reflex in Face Immersion Apnea

enhance the pupil-to-iris contrast in the obtained image. The device emitted a constant infrared light with a wavelength of 850 nm.

We chose the BioEye device for its portability and adaptability, allowing us to customize it for underwater pupillometry at various depths. Initial tests were conducted in a pool to refine the setup, enabling reliable data collection underwater. This portable solution facilitated the transition from preliminary trials to the main experiment, where participants immersed their faces in the water, aligning with the conditions needed to study the diving reflex.

Simultaneously, an integrated NIR camera (optimized for best sensitivity at a wavelength centered at 850 nm) recorded changes in pupil diameter at around 30 frames per second (fps). Heart rate (BPM) and peripheral oxygen saturation data were collected using Gima oxy-2 and Gima oxy-3 pulse oximeters by sampling at 0.1 Hz. An experimental setting was created to minimize movement artifacts caused by contractions and body movements. Each subject was asked to lie horizontally on a customised operating table with a device for head stabilization and to focus on a fixation point located 40 cm in front of them into the eye-tracker structure. Head immobilization was carefully monitored during the course of each experiment. Two to three performances were recorded for each subject for each of the three different experimental conditions (Dry, Wet, Breathing). In the Wet condition, participants submerged their faces in a transparent basin filled with water, keeping their eyes open without using a diving mask. They were instructed to focus on the outline of the eye-tracker. To avoid excessive blinking underwater, drops of topical anesthetic (Benoxinato Cloridrato Intes 4 mg/ml eye drops) were instilled into the ocular surface. Considering that water temperatures affect bradycardia [36], the water in the basin was maintained at a constant temperature of 13 °C, measured with a mercury thermometer, and the water was changed and mixed to reach the target temperature for each trial. The experiment was conducted in a room with controlled lighting (lumen = 70 ± 5).

Apnea metrics. Values related to apnea performance metrics in Tab 1, such as apnea time in different conditions, peripheral oxygen saturation at the end of apnea, and average pupil diameter, were obtained by considering all subject performances and then calculating the mean unless otherwise specified.

Pupillometry inclusion criteria. Pupillometry traces were analyzed quantitatively to exclude traces exhibiting acquisition errors and artifacts. Specifically, a subject's performance was excluded if the median pupil score (obtained via Bioeye software) was less than 8, as per the criterion specified by Bioeye (defined by the sharpness of the iris-to-pupil contrast in the obtained image, for which the threshold value >= 8 indicates an excellent separation level between the darker pupil and its iris peripheral surround). Additionally, for each performance, one of the two eyes was selected for analysis based on the acquisition of the cleanest data, determined by comparing the lower standard deviation of iris measurements between the two eyes.

Pupil-size pre-processing and spectral analysis. The signals related to pupil diameter in the three conditions were processed to estimate their power content in different frequency bands. All analyses were performed using Matlab software (version 2023a). The spectral bands considered were as follows: 0.04-0.25 Hz and 0.25-2 Hz, denoted as low and high frequency, respectively. This subdivision was chosen after a review of the literature, based either on provided compelling evidence [10] or on overlapping ranges with the most often used subdivisions [39] (see Discussion). Given the non-uniform sampling of the signals collected by the eye

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tracking used, we proceeded as a first step to resample each signal at a constant frequency of 30 Hz, using piecewise cubic interpolation (pchip option in Matlab). Blinks were removed from the pupil diameter signal, and the resulting trace was interpolated (again using a piecewise cubic interpolation) to construct a continuous signal (joining the otherwise separated segments of epochs without blinks). Subsequently, data were band-pass filtered between 0.04 and 2 Hz (Chebyshev type II filter, with 0.5 dB of maximum ripple and 25 dB of minimum attenuation below 0.02 Hz and above 2.5 Hz). The power spectral density (PSD) was estimated by Welch's method, performed on temporal windows of 10 seconds (Tukey window with cosine fraction of 0.1) with 50 percent overlap. Then, the power associated with the signal for each band was obtained by integration.

Analysis of complexity. Approximate Entropy (ApEn) is a popular index of complexity introduced to obtain stable information from short and noisy signals [43]. However, careful choice of the parameters is recommended, as ApEn depends on many factors, i.e., the sampling frequency, the embedding dimension, the tolerance (under which a recurrence is identified), the epoch duration, and the presence of low-frequency trends [26]. For this reason, ApEn was here computed with a small embedding dimension (i.e., 2), after removing low-frequency trends and resampling the signals at about 3 times their bandwidths. Specifically, low and high-frequency components were obtained by filtering the already cleaned and band-pass filtered pupil diameter time series (low-frequency component obtained by using a Chebyshev low-pass type II filter, with 0.5 dB of maximum ripple and 20 dB of minimum attenuation, with a transition band between 0.24 and 0.27 Hz; high-frequency component was defined as the difference between the signal and the low-frequency component). Then, the two components were resampled at 0.8 and 8 Hz, for the low and high frequencies, respectively. The tolerance was fixed at 20% of the standard deviation of the processed signal. Moreover, the modified ApEn proposed in [26] was computed on the same signals: it chooses the tolerance in order to select a number of recurrences equal to a percentage of the total samples (10% was chosen in this work). This way, compared to the classical ApEn, the effect of self-recurrences is much reduced and stable indications in a larger range of parameters have been documented [26] .

Statistical analysis. To compare percentages of power spectral density and approximate entropy values in the 3 experimental conditions, one-way analysis of variance (ANOVA) was used after testing for normality (Shapiro-Wilk test). As we performed multiple observations on the same subjects, we used nested statistical testing to account for the reduced degree of freedom. In case of statistical significance, this was followed by a multiple comparison test (Tukey-Kramer test), providing adjusted p-values for pairwise comparisons. The alpha level was set at 0.05.

Results

In Table 1, participants are characterized according to their expertise level and apnea performance. The study involved 5 male subjects: 3 advanced and 2 beginners, with an average age of 39.2 ± 13.91 years (mean ± standard deviation). They achieved an average Dry apnea duration of 139 ± 15.13 seconds and an average Wet apnea duration of 150.8 ± 29.86 seconds. Despite the low levels of SaO2 they reached at the end of apnea (87,53 % ±10,9 % in Dry, 93,03 % ± 6,73 % in Wet) no subject had any medical and/or neurological complication as a consequence of the apnea.

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Table 1: Summary of Apnea Results

Subject	Sex	Age	Exp. Level	Duration of Dry Apnea (s)	Duration of Wet Apnea (s)	Avg. PD during Breathing (mm)	Avg. PD during Dry Apnea (mm)	Avg. PD during Wet Apnea (mm)	Min SpO_2 in Dry Apnea (%)	Min SpO2 in Wet Apnea (%)
1	M	63	Advanced	140 ± 17	175 ± 49	3.65 ± 0.29	3.23 ± 0.43	3.59 ± 0.35	69.33 ± 7.09	81.5 ± 6.92%
2	M	40	Advanced	163 ± 20	180	4.13 ± 0.62	3.66 ± 0.51	3.66 ± 0.24	89.33 ± 3.21	95 ± 5.20%
3	M	33	Advanced	140 ± 20	160 ± 20	4.45 ± 0.67	4.48 ± 0.44	3.58 ± 0.32	87	93.67 ± 1.53%
4	M	30	Beginner	126 ± 15	126 ± 46	5.09 ± 0.69	5.52 ± 0.59	3.88 ± 0.15	96 ± 3.0	96 ± 2.83%
5	M	30	Beginner	126 ± 11	113 ± 11	4.52 ± 0.31	4.48 ± 0.31	3.98 ± 0.09	96 ± 1.73	99

Table Legend for Abbreviations

Duration of Apnea: Represents the mean values of apnea performance for the subject under wet and dry conditions in seconds ± standard deviation.

PD (Pupil Diameter): Indicates the pupil diameter value expressed in millimeters ± standard deviation.

Min SpO2 (Minimum Peripheral Oxygen Saturation): Denotes the minimum value of peripheral oxygen saturation at the end of apnea, expressed in percentage ± standard deviation.

During apnea performances, in both Dry and Wet conditions (Fig 2a-b), participants' heart rate showed a decrease-increase pattern, that is reaching a minimum from resting values to then increase around original levels before performance end [mean ± S.E.M. (BPM): start: 66.9 ± 1.5, middle: 62.3 ± 1.8, end: 68.2 ± 2.3], consistent with other descriptions [33, 46, 47]. As expected, this was accompanied by a reduction in SpO2 during the course of the performance, with pupil diameter showing the typical hippus [10].

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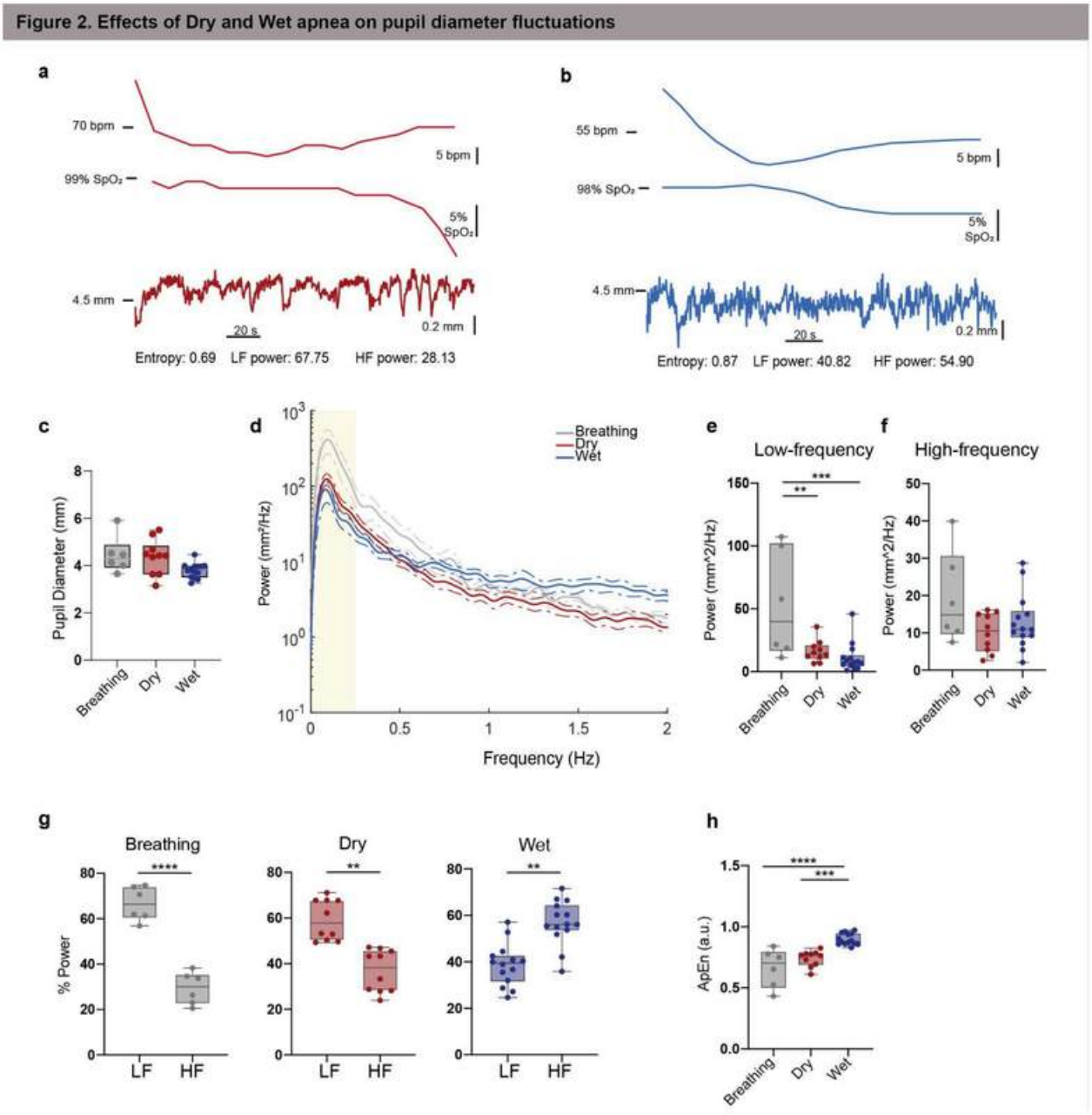

Fig 2. Effects of Dry and Wet apnea on pupil diameter fluctuations a) Example parallel recording of heart rate (upper panel) and oxygen saturation (middle panel) associated with pupil diameter fluctuations and its characterisation (bottom panel) during apnea in Dry condition. b) Same as a for apnea in the Wet condition. c) Average pupil diameter in the three experimental conditions . d) Power spectral density (PSD) semi-log plot of pupil diameter fluctuations in the three experimental conditions ± S.E.M (broken lines). Shaded area indicates the selected sympathetic frequency band. e) Statistical comparison of Power contained in the low- frequency band in the three conditions. Each data point represents a single performance. f) Same as e for the high-frequency band. g) Comparison of %Power between low- and high-frequencies for each experimental condition. h) Comparison of Approximate Entropy in the three experimental conditions. LF= low-frequency; HF= high-frequency.

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Average pupil diameter across single performances (Fig. 2c) tended to be significantly smaller in Wet than in Dry and Breathing conditions (absolute medians' difference (mm): Breathing - Dry=0.08; Breathing - Wet= 0.54; Dry - Wet= 0.62) [One-way ANOVA: $F(2,27)= 4.03$, $p= 0.0293$], however post-hoc analysis only indicated tendencies for pairwise differences [p(Breathing vs Dry)= 0.9576, p(Breathing vs Wet)= 0.0720, p (Dry vs Wet)= 0.0634], likely due to the relatively low sample size.

To examine whether apneic conditions would alter the hippus compared to breathing, we calculated the Power Spectral Density (PSD) of pupil diameter fluctuations in the three conditions (Fig 2d). In the low-frequency band (Fig 2e), we found that both Dry and Wet apnea contained significantly lower power than Breathing [Nested one-way ANOVA: $F(2,27)= 8.95$, $p= 0.001$; Tukey's multiple comparison: p (Breathing vs Dry)= 0.0054, p (Breathing vs Wet)= 0.0009, p (Dry vs Wet)= 0.8272], indicating a diminished contribution of SNS when breath-holding. However, power in the high-frequency band was not different (Fig 2f) [Nested one-way ANOVA: $F(2,27)= 2.25$, $p= 0.147$].

Despite this statistical similarity, we noticed that the power in Wet was more sustained across the high-frequency band compared to the remaining conditions. Thus, we hypothesized that a redistribution of power between low- and high-frequencies could have occurred in Wet apnea. To test this hypothesis, we extracted the fractions of power for low- and high-frequencies over the total power within the 2Hz range, and compared such fractions as percentage of power (%Power) for each condition (Fig 2f). As hypothesized (Fig 2g), we found that while a significantly higher %Power was contained in the low-frequency band for Breathing [Nested t-test: $F(1,10)= 77.46$, $p< 0.0001$] and Dry [Nested t-test: $F(1,8)= 11.39$, $p = 0.0097$], Wet exhibited the opposite pattern instead, with the high-frequency band containing significantly %Power compared to the low-frequency band [Nested t-test: $F(1,8)= 15.09$, $p = 0.0046$].

Together these data indicate that apneic conditions reduce the power of low-frequency pupil fluctuations associated with the SNS, and that in cold water face-immersion apnea a reallocation of power towards higher frequencies occurs, suggesting an increased contribution of the PNS.

Since apnea and face contact with cold water are known to prime the DR, and that tendencies in BPM and SpO2 recapitulate the expected DR phenotype, our results suggest that activating the DR affects pupillary dynamics. This consists in an increased contribution to pupil control of the PNS component in response to face-immersion apnea, along with a reduction in the SNS one. Importantly, this effect can be largely attributed to cold water contact with the skin of the face given that pupil dynamics do not significantly differ between Dry and Breathing conditions in terms of allocation of power in the two frequency bands.

Next, we hypothesized that the DR priming in the Wet condition would have reduced the complexity (i.e., lower entropy) of hippus, due to the stereotypical nature of reflexes that would take over the control of pupil diameter fluctuations. However, the Approximate Entropy associated with hippus in Wet condition was significantly higher than in Breathing and Dry conditions [Nested one-way ANOVA: $F(2, 27) = 19.89$, $p <0.0001$; Tuckey's multiple comparison: p (Breathing vs Dry)= 0.196, p(Breathing vs Wet) <0.0001, p (Dry vs Wet)= 0.0003] (Fig. 2h), indicating an increase in complexity with DR instead.

Overall, these findings indicate that the human DR significantly impacts the dynamics of pupillary

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fluctuations. The decreased low-frequency power and higher entropy, along with the shift towards high-frequency power in Wet apnea, suggest an autonomic shift and heightened complexity of pupillary behaviour during the DR.

Discussion

The DR involves a series of physiological responses to immersion that override the basic homeostatic reflexes and is found in all air-breathing vertebrates [29, 30, 31] . The most noticeable effects are on the cardiovascular system, which displays peripheral vasoconstriction, slowed heart rate, redirection of blood to the vital organs to conserve oxygen, release of red blood cells stored in the spleen, sometimes leading to heart rhythm irregularities in humans [30]. When compared to cold facial stimulation and breath-holding alone, these responses produce a greater effect than the sum of individual responses [34, 35]. This motivated us to design the study and analyze the performance of subjects between Dry and Wet conditions.

Our measures of BPM variations during apnea, the peripheral oxygen saturation at the performances' end, which tended to show higher values for Wet than for Dry , along with a more extended duration of apnea in the Wet compared to Dry, strongly suggest DR activation. The observed trends, albeit non-significant, support the notion that cold facial immersion can enhance the DR [34, 44]. This is congruent with Wet performances, which exhibited a significantly stronger pupil behavior modulation (i.e., autonomic shift) compared to Dry ones or Breathing (Fig 2d-g).

Pupillary fluctuations and choice of frequency bands. Hippus, a spontaneous oscillation of the pupil, is believed to be driven by the continuous antagonism between the PNS and the SNS [2, 10] . Given that both the PNS and SNS are recruited by the DR, we hypothesized that pupillometry could reveal its impact on pupillary dynamics. Our results demonstrated significant changes in pupillary behavior during apnea, more extensive with face immersion in cold water. In this condition, we observed an overall reallocation of power in high-frequency at the expense of low-frequency components of pupil diameter fluctuations (Fig 2g), accompanied by a more erratic hippus, as indicated by increased Approximate Entropy (Fig 2h).

Much effort has been made in attempting to classify specific frequency bands of pupillary fluctuations in relation to other physiological processes such as respiration, cardiac dynamics, and emotional autonomic components [10, 18, 21, 23, 28, 39, 49]. In our study, we classified the bands by assigning the sympathetic contributions to the 0.04-0.25 Hz band and the parasympathetic contributions to the 0.25-2 Hz band. This was based on a prior review of the literature that we carried on, which included studies on the division of signal bands, like heart rate and skin conductance, in relation to pupillary fluctuation [10, 18, 20, 22, 23, 39, 50, 51, 52, 53, 54]. To overcome the wide variety of frequency band assignments, we attributed higher value to the interventionist approach. Specifically, Turnbull et al.'s work found a reduction of energy in the previously reported hippus range of 0.24-1 Hz after the application of tropicamide, a parasympathetic blocking agent [10]. This provided us with a lower frequency limit for the parasympathetic system. Since other works found relevant parasympathetic effects beyond 1Hz [21, 10], we selected high frequency (HF) 0.25-2 Hz as the parasympathetic contribution to pupillary fluctuation. As a consequence, lower frequencies (< 0.25 Hz) were attributed to the sympathetic one.

Although there is much debate regarding the biological attribution of pupillary fluctuations at low frequencies [10, 18, 21, 23, 28], at such frequencies, pupillary, respiratory, and cardiac dynamics may be co-modulated. As

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initially hypothesized by Borgdorff and later supported by subsequent studies [18, 21 23, 28, 64], the autonomic modulation of pupillary fluctuation is reflected in the oscillations classically attributed to the autonomic control of cardiorespiratory activity. Also, by recording other autonomic parameters with ECG and skin conductance, Schumann et al. [18] demonstrated a strong correlation between vagal heart rate variability and the pupillary unrest index, which estimates the deviation of pupillary diameter at low frequencies (< 0.15 Hz). Moreover, in the same study, subjects breathed deeply at 6 respiratory cycles per minute (0.1 Hz), the same respiratory frequency used in our experiment. This could be the reason underlying higher power around 0.1 Hz in our Breathing condition (Fig. 2d). Moreover, we observed that, in the low-frequency range, the Breathing condition contained higher power than apneic conditions. This suggests that the modulation of pupillary dynamics in response to respiratory and cardiovagal influences is altered during apnea, particularly under Wet conditions where the DR is more pronounced.

In Onorati et al. [21], besides finding a significant correlation between respiratory dynamics, pupillary diameter, and heart rate variability within the low-frequency band, authors explored pupillary dynamics in high and very high frequencies (0.45-5 Hz) to assess affective states and autonomic correlates. They found significant correlations between high-frequency pupillary fluctuations and emotional states, highlighting the influence of central autonomic control on pupillary dynamics. In our study, such influences may have affected pupil dynamics predominantly in the Wet condition, which was the only instance characterized by a proportional elevation of high-frequency power at the expense of the low-frequency power (Fig 2*g*). A characterisation of emotional states in future studies may enable disentangling their effect on pupil dynamics in our task.

Central neural substrates underlying autonomic shift in pupil control. Noble and Hochman [66] proposed a network model explaining how the control of respiration provides a powerful voluntary modulation of central autonomic networks [67, 68, 69]. In their model, they suggest that pulmonary afferents project to the nucleus tractus solitarius (NTS), in turn projecting to the locus coeruleus (LC), which regulates pupillary fluctuations [15]. By involving a complex neural network that integrates respiratory and cardiovascular systems, the NTS is central to the DR [32, 33]. Key inputs from facial cold receptors, carotid chemoreceptors, baroreceptors, and atrial stretch receptors project to the NTS, which then communicates with respiratory, cardiac parasympathetic, and vasomotor centers, producing responses such as bradycardia and peripheral vasoconstriction. In the framework proposed by Noble and Hochman [66], the connection between NTS and LC modulates anxiety, arousal, and attention through extensive projections to central autonomic structures. In the case of the pupil, our results show a change in autonomic balance during DR. In principle, this could be provoked by a reduction in LC output, which would directly affect the modulation of the sympathetic pathway, and that could indirectly release the inhibition acting upon the Edinger-Westphal nucleus.

Despite the high likelihood that the DR could affect pupil diameter fluctuations as originally hypothesized, our experiment also produced an unexpected result.

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Complex Autonomic Interplay During the Diving Reflex

Our study reveals a significant shift in autonomic control during the diving reflex, reflected by changes in LF and HF components in pupillometry data. This shift challenges the traditional view of reciprocal sympathetic-parasympathetic regulation. Specifically, the increase in entropy and reallocation of power towards higher frequencies in the Wet condition suggests a heightened parasympathetic response, alongside a more complex interplay of excitatory and inhibitory mechanisms within the pupillary control brain nuclei during apnea.

This increase in ApEn in the Wet condition is particularly noteworthy. While many biological signals, including pupil diameter, exhibit non-stationary and non-linear behavior[27], making their underlying determinism challenging to identify, measures of signal complexity such as ApEn provide deeper insights beyond the linear assumptions of Fourier analysis. Unexpectedly, the entropy of pupil diameter fluctuations increased during the Wet condition, when the diving reflex (DR) is presumed to be stronger. If we assume that reflexes are among the most hardwired (i.e., less plastic) neural and behavioral processes, this result was counterintuitive since we would have expected less erratic behavior of the pupil when recruited by the DR.

Indeed, higher entropy in apnea contrasts with findings in Schumann et al. [18], who reported that during deep breathing tests, both the pupillary unrest index and RMSSD of heart rate variability increased proportionally, but the complexity of pupillary dynamics decreased. Their results suggest that deep breathing, stimulating the parasympathetic system, makes fluctuations more predictable, therefore less complex. Despite absence of breathing, our results show that strengthening the parasympathetic component relative to the sympathetic one is associated with higher complexity instead. This discrepancy with our results might be due to different experimental settings and the unique nature of DR, which involves the co-activation of sympathetic and parasympathetic systems for multiple body functions [32,33]. On the contrary, such co-activation is perhaps negligible during breathing. Indeed, with cold water face immersion, some authors have proposed that the strong and simultaneous activation of both limbs of the autonomic nervous system can prime an 'autonomic conflict,' which may account for cardiac arrhythmias in healthy volunteers [65] .

In line with Montano et al. [75], who demonstrated that low-frequency and high-frequency oscillations in HRV reflect dynamic interactions between sympathetic and parasympathetic systems, our findings suggest that these rhythms in pupillometry share a similarly mixed origin and interact continuously, rather than acting as purely antagonistic forces. This supports Malliani et al.'s [76] perspective that autonomic regulation is not a simple opposition between sympathetic (LF) and parasympathetic (HF) influences, but rather a complex, integrated system in which both work in tandem to maintain physiological equilibrium.

Moreover, since the LC exerts a phasic control over pupil fluctuations, and that the shift in autonomic balance could be due to a modulation of its activity, a weaker phasic input to downstream nuclei could be responsible for the higher complexity we observed, for example, by being effective only at random intervals. Another finding seems to contrast with the current results. Laurino et al. [46] observed decreased entropy in the cardiac system by analyzing heart rate variability during apnea, which is at odd with our increase in the pupil.

To reconcile this with our finding, we propose that the DR may exert differential, hierarchical control across various body functions: While the cardiac system becomes more regulated and ordered, reducing entropy, the pupillary system shows a more disorganized response, increasing entropy instead. This would confirm the

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hypothesis that the DR can prioritize the regulation of vital functions like the heartbeat over others with minor roles as a form of allostatic control.

Limitations and future directions. The accommodative demand might have influenced pupillary dynamics [71, 72, 73], particularly in the Wet condition, causing a significant hyperopic shift. Despite this, Turnbull et al. [10] found no correlation between accommodative demand and the pupil dilation ratio or hippus energy ratio, suggesting refractive error is not a major factor in the study of the parasympathetic component of hippus. However, future studies should include larger and more diverse samples to explore individual variability in response to the DR.

The use in this work of controlled-breathing condition (0.1 Hz, 6 breaths per minute) may lead to an underestimation of the real differences with apneic conditions. This slow breathing pattern significantly affects the PNS, maximizes heart rate variability, and dramatically enhances cardiorespiratory synchronization [66], therefore elevating power in the parasympathetic range. Consequently, the true impact of the DR on autonomic responses and pupillary dynamics might be even more pronounced than what we observe. Normal-, as opposed to controlled-, breathing may thus be a valid condition for future comparisons as it could reduce such inter-systemic synchronization.

Also, recent research highlights the relevance of high-frequency pupillary dynamics in assessing affective states and autonomic correlates [21], underscoring the need to consider emotional states when studying pupillary fluctuations. Incorporating psychometric tests in future studies could explore the emotional and cognitive aspects of the DR. Indeed, some authors have identified changes in neural processing of emotional stimuli and brain oscillations due to prolonged apnea [62, 63], further underscoring the complex interplay between autonomic regulation and pupillary behavior in apneic conditions.

Conclusions

Our study indicates that the DR is a valuable model for investigating autonomic responses through pupillary dynamics. Indeed, we observed significant shifts in pupillary dynamics during the DR, characterized by reduced low-frequency power. With a stronger DR, a significant shift in the parasympathetic-sympathetic equilibrium influencing the pupil occurs. This shift is accompanied by an increased complexity of hippus. To fully understand the biological significance of these findings, future research should explore how autonomic, emotional, and cognitive dynamics correlate with pupillary fluctuations under challenging apnea conditions. Integrating multiparametric acquisitions, such as ECG, EEG, and psychometric tests, will be thus crucial for advancing our understanding of the interactions between autonomic regulation, emotional states, and pupillary behavior.

Authors contribution

RV conceived the study; RV designed and performed the experiments; MR, ML, BGMH and LM analysed the data; RV and MR drafted a first version of the manuscript; BY and YD provided the pupillometer and developed the software; ML, LM, BY, YD, LG, VL and GA revised the draft and provided guidance; GA supervised the study. All authors read and approved the final version of the manuscript and agree to be accountable for all aspects of the work, ensuring that questions related to accuracy or integrity are appropriately investigated and resolved.

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Acknowledgments
The authors wish to thank Y-40 and Instructor Marco Mardollo for their guidance and logistical support in the apnea experiment. Additionally, the authors would like to express their gratitude to *Medicina Subacquea e Iperbarica "Piergiorgio Data", Scuola Superiore Sant'Anna - Istituto di Fisiologia Clinica*, and *Area di Ricerca del CNR di Pisa* for their valuable support.

Competing interests
Authors declare no competing interests.

Fundings
None.

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Assessment of the impact of intravitreal anti-VEGF therapy on radiation-induced maculopathy and associated visual acuity changes in patients with choroidal melanoma

Oral

Dr. Eva Mediņa, Dr. Dairis Meiers, prof. Guna Laganovska

Objectives

Choroidal melanoma, though rare, is the most common primary malignant tumor of the eye. The standard treatment modality is radiation therapy, particularly plaque brachytherapy utilizing ruthenium-106 (Ru-106). A notable complication of this therapy is radiation-induced maculopathy, with nonischemic macular edema being the earliest clinical manifestation. Intravitreal anti-VEGF injections, such as Bevacizumab, are commonly prescribed to manage maculopathy. The objective of this study was to assess macular thickness and best corrected visual acuity changes (BCVA) in patients who developed radiation maculopathy, both prior to and following intravitreal Bevacizumab treatment.

Materials and Methods

Eight patients with radiation-induced maculopathy were evaluated. Central macular thickness was measured using optical coherence tomography (OCT) and to measure BCVA ETDRS chart was used. Data analysis was conducted with MS Excel and IBM SPSS, and statistical comparisons were performed using the Wilcoxon test.

Results

A total of 5 men and 3 women were included in the analysis, with a mean age of 68.9 years. The mean central macular thickness prior to intravitreal treatment was 545.0 μm (IQR = 156), while the mean thickness after treatment was 382.5 μm (IQR = 61). A statistically significant difference in macular thickness was observed between pre- and post-treatment measurements ($Z = -2.521$; $p = 0.012$). The mean BCVA prior to intravitreal treatment was 0.38 (IQR = 0.37), while after the treatment it was 0.35 (IQR = 0.59). No statistically significant difference was found between pre- and post-treatment measurements ($Z = 0.42$; $p = 0.67$).

Conclusions

In conclusion, while radiation therapy remains a valuable treatment for uveal melanoma, it is associated with potential vision-threatening ocular complications. Effective management depends on early detection, timely intervention, and expert medical care. A comprehensive understanding of the pathogenesis, risk factors, and treatment strategies for radiation-induced complications enables collaboration between patients and healthcare providers to optimize outcomes and preserve ocular function. Radiation maculopathy, often leading to secondary vision loss, is a significant complication of plaque radiotherapy for choroidal melanoma. Intravitreal anti-VEGF therapy effectively reduces radiation-induced macular edema but does not provide visual acuity improvement.

Other

Riga East Clinical university hospital. Intraorbital Lymphomas: A Retrospective Analysis of Biopsy-Proven Cases at Riga East University Hospital 2020-2024

Oral

Dr. Iveta Mežatuča, dr. Alina Ļišnova, dr. Dineja Veinberga.

Intraorbital lymphomas, though rare, can clinically mimic common inflammatory conditions such as dacryocystitis, often leading to delayed diagnosis and treatment. A retrospective analysis of biopsy-confirmed cases at Riga East Clinical University Hospital from 2020 to 2024 demonstrates that in cases unresponsive to standard antibacterial therapy and with atypical progression, early imaging—particularly CT scans—and biopsy are essential. Prompt identification of malignant processes enables timely initiation of oncological management, which significantly impacts patient outcomes and overall prognosis.

Implantable Collamer Lens: Thinking Outside the Box

Oral

MD, PhD Ēriks Elksnis

Latvian American Eye Center; Riga Stradins University, Department of Ophthalmology

Introduction

Implantable Collamer Lenses (ICLs) are commonly used to correct high myopia and astigmatism. However, their use as secondary implants following penetrating keratoplasty (PK) remains rare. This case demonstrates the successful use of a toric ICL (TICL) to optimize visual outcomes in a patient with significant post-PK astigmatism.

Case Presentation

A 55-year-old male with stage IV keratoconus in the right eye underwent PK combined with phacoemulsification and intraocular lens (IOL) implantation. Although initial postoperative visual acuity improved, blunt ocular trauma led to wound dehiscence and irregular astigmatism. After stabilization of the refractive status, a TICL was implanted to correct residual refractive error. This resulted in marked improvement in both uncorrected (UDVA) and corrected distance visual acuity (CDVA), restored binocular vision, and significantly enhanced the patient's quality of life.

Conclusion

TICL implantation can be a valuable option for managing high anisometropia and residual astigmatism in post-PK patients. Further studies are needed to assess its long-term impact and to better understand the full potential of ICLs in complex post-keratoplasty eyes.

Paediatric Cases of Autosomal Recessive LHON in Estonia

Oral

Eva Roomets

Tallinn Children´s Hospital, Estonia

Background

Leber hereditary optic neuropathy (LHON) is an inherited progressive optic neuropathy usually caused by mitochondrial DNA mutations. Stenton et al. (2021) identified autosomal recessive LHON caused by biallelic DNAJC30 gene mutations, with c.152A>G being the most common pathogenic variant. Notably, the p.Tyr51Cys variant exhibits a significant prevalence disparity, accounting for approximately 27% of genetically diagnosed LHON families in the Eastern European founder population, compared to 5% in non-founder populations. Paediatric-onset LHON, occurring before age 12, is uncommon and typically presents with a more variable clinical course and a more favourable visual prognosis compared to adult-onset LHON.

Materials and Methods

The clinical manifestations and therapeutic outcomes of two paediatric patients of Eastern European ancestry diagnosed with autosomal recessive LHON-related vision loss are presented.

Results

Genetic testing for the three most common mitochondrial LHON pathogenic variants was negative. On suspicion of arLHON, genetic testing was continued with the next-generation sequencing (NGS) of the nuclear DNA, identifying a homozygous pathogenic variant in DNAJC30 c.152A>G, p.(Tyr51Cys). Idebenone treatment commenced approximately 4.5 months after the initial presentation for one patient, and approximately 11 years after for another, with treatment follow-up times of 1 year and 2 years, respectively

Conclusions

In children with acute or subacute, simultaneous, or sequential vision loss that is unresponsive to immunomodulatory treatment, LHON should be considered as a possible diagnosis. Our cases emphasize the diagnostic advantage of sequencing DNAJC30 in parallel with the mitochondrial DNA, especially in Eastern European descent patients.

Eyelid basal cell carcinoma: a case report

Oral

Ilze Samite, Sintija Mihelsone, Guna Laganovska

Department of Ophthalmology, Pauls Stradins Clinical University Hospital

Background

Basal cell carcinoma (BCC) is the most common eyelid malignancy, accounting for over 90% of malignant eyelid neoplasms. One of the known risk factors of BCC is intense exposure to UV radiation. More than 50% of BCC of the eyelid initially occur on the lower lid. The age of tumor emergence is typically 60–80 years. Although metastasis is rare, BCC of the eyelids has a high risk of recurrence.

Case report

A 77 year old woman was sent to PSCUH ophthalmic oncologist through the green coridor with suspicions of a malignant eyelid tumor. Complaints were about a lower lid neoplasm for over a year. Patient admitted it increasing in size. On observation, a right eye lower lid nodular 9 mm formation with madarosis and lid distortion was seen. A modified Hughes procedure was done when removing and reconstructing the eyelid. Three months after the surgery slight ectropion was seen; patient was happy with the outcome.

Conclusion

BCC is usually not fatal, but if it is not diagnosed for a long time, the function and the appearance of the eyelid will be destroyed. Therefore, early diagnosis and surgery promise better treatment outcomes including functionality and esthetic outcomes.

0.05% atropine for myopia treatment in Estonia: twelve - month treatment effect and tolerability

Oral

Kadi Palumaa[1], Delis Linntam[1], Teele Palumaa [1, 2, 3]

[1]East Tallinn Central Hospital Eye Clinic, Estonia [2]Department of Ophthalmology, Emory University, Atlanta, Georgia, United States [3]Estonian Genome Centre, Institute of Genomics, University of Tartu, Tartu, Estonia

Introduction

Low-dose atropine is effective in halting myopia progression. The introduction of atropine treatment has been delayed in Estonia because a commercial product is unavailable.

However, since January 2023, the East Tallinn Central Hospital pharmacy has produced low- dose atropine eye drops. Here, we present the 12-month treatment response and tolerability data of the first 33 patients, from January 2023 until May 2024.

Material and methods

Cycloplegic spherical equivalent refraction (SER) was measured at baseline and 3, 6, 9 and 12 months. Axial length (AL), photopic pupil size, and near point of accommodation were measured at baseline and 1 week, 1, 3, 6, 9 and 12 months after treatment initiation. Side effects were documented at every visit.

Results

In total, 33 patients (66 eyes) were treated with 0.05% atropine. The median age was 11.8 years (interquartile range, IQR 9.8 to 12.7) and the median SER –5.0 dioptres (D) (IQR –6.6 to –3.0). With 9 months, the AL increased on average by 0.02±0.11 mm (mean ± standard deviation). Of the 66 eyes, AL increased in 36 and decreased in 27 eyes. SER changed on average by 0.00±0.31 D, SER decreased in 29 and increased in 27 eyes. In 5 eyes (8%), myopia progressed ≥0.5 D. The average photopic pupil diameter at baseline was 3.82±0.60mm, and it was larger at all follow-up visits, including at 9 months (4.59±0.93, $p<0.001$, paired t-test). The near point of accommodation receded from a median of 8 cm (IQR 7 to 9 cm) at baseline to 11 cm (IQR 9 to 13 cm) at 1 week and was restored to 9 cm (IQR 8 to 10 cm) by month 9. One week after treatment initiation, 73% of patients reported enlarged pupils, 48% had photophobia, and 42% had difficulty doing near work. The respective figures at one month were 48%, 33%, and 18%. At 6 months, 10% had enlarged pupils, no one reported photophobia or near-work difficulty. Three patients (9%) were transferred to 0.025% or 0.01% atropine as accommodation impairment interfered with schoolwork. All resumed treatment with 0.05% atropine 3 to 9 months after initial treatment initiation.

Discussion

This is the first characterisation of 0.05% atropine treatment in Estonia. On average, over 12 months, there was no significant change in AL or SE. While 48% of patients reported side effects at one month, only 9% required temporary transfer to lower concentration atropine drops. The results of the 12-month follow-up visit will allow comparison with published data from other studies. In May 2025 there are 72 children, who receive treatment with 0,05% atropine drops.

Short- and long-term outcomes of children treated for retinopathy of prematurity in North Estonia in 2007–2023

Oral

Katrin Eerme

Objective
To describe the development of children treated for ROP in North Estonia between 2007 and 2023 at the corrected age of two years, the ocular outcome at one and five years after treatment, and to compare the outcome of two treatment groups – laser and anti-VEGF.

Method
The subjects were all children treated for ROP in cooperation with Tallinn Children's Hospital and East Tallinn Central Hospital during the observed period. Data were collected from the clinical databases of the hospitals. The Stata18 program was used to organize and analyze the data. Descriptive statistics methods were used to describe the distribution of the sample and results, and classical tests and multiple regression analysis were used to examine the relationship between the treatment method and the results. The study was coordinated with the Human Research Ethics Committee of the Estonian National Institute for Health Development.

Results
160 children were treated for primary ROP between 2007 and 2023. 107 (66.9%) of the subjects had received laser treatment alone (laser group) and 53 (33.1%) children had received anti-VEGF therapy alone or in combination with laser (anti-VEGF group). The anti-VEGF drug used was Bevacizumab as an intravitreal injection. The subjects in the anti-VEGF group had a lower gestational age and birth weight than the subjects in the laser group and had more severe early illnesses characteristic of premature infants. By the time of data collection, 80 children in the laser group and 32 in the anti-VEGF group had completed the corrected age of two years using the Bayley Test for Developmental Assessment, version 3. The mean composite scores for cognitive and speech development were higher in the laser group compared to the anti-VEGF group. Taking into account differences in gestational age and early health problems between groups weakened the evidence for an association between treatment method and children's developmental outcomes.

The study included 319 eyes, of which 214 (67.1%) were treated with laser alone, 40 (12.5%) with combined anti-VEGF/laser therapy, and 65 (20.4%) with anti-VEGF alone. Immediate post-treatment disease resolution was achieved in all eyes in the anti-VEGF and combined groups, and no subsequent surgery was performed in these groups. In the laser-only group, 16 (7.5%) had ROP progression to 4 or 5 stage, and 15 (7.0%) eyes underwent surgery later. Refraction was assessed at both one and five years in 197 non-operated eyes. One year after treatment, most eyes were hyperopic. By the fifth year after treatment, the proportion of eyes with severe hyperopia had decreased in all treatment groups. Five-year post-treatment visual acuity was determined in 218 eyes. Six eyes treated with laser alone were blind. Visual acuity greater than 0.63 was present in more than half of the eyes treated with laser alone, approximately one-third of the eyes treated with combination therapy, and one-quarter of the eyes treated with anti-VEGF alone. Visual acuity in more than half of the eyes treated with anti-VEGF alone ranged from 0.40 to 0.63.

Conclusions
The study provides an overview of the near and far vision outcomes of ROP patients treated in Northern

Short- and long-term outcomes of children treated for retinopathy of prematurity in North Estonia in 2007–2023

Estonia between 2007 and 2023 and compares the treatment methods used. Although children treated with anti-VEGF had a two-year lag in cognitive and speech development at corrected age compared to children treated with laser alone, this was more likely related to the lower gestational age and higher number of early health problems in this study group. No eyes treated with anti-VEGF required surgical treatment due to progression of ROP. Also, one year later, eyes treated with anti-VEGF had less severe hyperopia compared to eyes treated with laser. By the fifth year after treatment, hyperopia had resolved with both treatment methods.

Orbital wooden foreign body in a 59 year old male

Poster

Artur Klett MD PhD, Joonas Pent MD, Juri Ivanov MD, Kristel Harak MD, Kristel Pulges MD

East Tallinn Central Hospital Eye Clinic, Tallinn, Estonia

Introduction

Trauma sustained during field work can be deceiving in appearance. Therefore, thorough history taking and understanding the exact mechanism of injury are of great importance. Sometimes the entry site of a foreign body can close spontaneously, concealing a larger, contaminated cavity of inflammation behind the globe.

Report

A 59-year-old male patient was presented to the attending eye surgeon after trauma that had occurred during wood harvesting. The patient had bent over and accidentally pricked his right eye with a branch. On examination, a small wound was noted on the temporal conjunctiva, which was sutured. As there were no initial signs of inflammation, the patient was discharged with topical and systemic antibiotics. Three days later, the patient returned with orbital cellulitis. A CT scan of the orbits was performed, but the wooden foreign body was unfortunately misinterpreted as orbital emphysema. The wound was reopened, a sample was taken for microbiological analysis and the site was rinsed with vancomycin solution. As no clinical improvement was observed over the following days, the wound was reopened again. The lateral rectus muscle was detached, and intraconal wooden foreign bodies were discovered and removed. A silicone drain was placed to allow further rinsing during the follow-up period. Fortunately, the patient healed well without any eye motility disorders.

Conclusion

Stab wounds can sometimes lead to unexpected complications. Understanding the mechanism of trauma provides valuable information, and multidisciplinary radiological evaluation is essential to avoid overlooking hidden foreign bodies in seemingly simple wounds.

Refractive Surgery in the Presbyopic Age. Our Approach.

Oral

Lina Krėpštė

In our presentation, we will share our clinic's experience with refractive surgery in the presbyopic age group, focusing on both laser procedures (Presbyond, monovision) and clear lens exchange. Across all our clinics, we have performed decent amount of surgeries for presbyopic patients. I will discuss our approach to selecting the appropriate procedure for the right candidate. Emphasizing patient selection, we will highlight the characteristics of individuals who are best suited for these types of surgeries, addressing common concerns and expectations related to presbyopic patients.

Surgical Treatment for Correcting Myopic Strabismus Fixus of Different Severity

Oral

Mari Levin

Purpose

To demonstrate the surgical treatment results of moderate and severe myopic strabismus fixus (MSF).

Methods

A retrospective chart review of 3 patients who underwent surgery for correcting MSF between 2013 and 2020. All patients underwent complete ophthalmologic and orthoptic examination, globe dislocation angles were analyzed using computerized tomography, pictures of the eyes in diagnostic positions of gaze were taken before and after surgery. Forced duction test was performed intraoperatively. 2 patients with unilateral moderate MSF underwent joining 1/3 of lateral and 1/3 of superior rectus muscle bellies without splitting them and medial rectus recession. 1 patient with extremely severe bilateral MSF underwent partial Jensen's procedures with large medial rectus recessions.

Results

The minimum follow-up period was 4.5 years. Preoperatively, axial lengths ranged from 29.0 to 37.4mm, globe dislocation angle from 148º to 228º, esotropia from 50 to >120PD and hypotropia from 25 to 90PD. In all patients abduction and supraduction improved after surgery. One patient with moderate MSF is maintaining orthotropia, the other had 12PD hypotropia at the last follow-up. In the third patient we improved the globe dislocation angle, restored foveal fixation in primary position but he remained with residual 50PD esotropia and 30PD hypotropia despite maximal surgery.

Conclusion

Lateral and superior rectus muscle joining procedure with medial rectus recession is an effective treatment for moderate MSF. Surgical management of patients with both eyes fixed in the extreme esotropic and hypotropic position is a challenge.

Complications after periocular aesthetic procedures

Oral

Reili Rebane, Margarita Rebrov, Artur Klett
East Tallinn Central Hospital Eye Clinic, Turman Eye Clinic

Periocular aesthetic procedures have become increasingly popular in recent years. As the periocular region is unique and delicate, special attention must be given to prevent complications. These complications can range from minor and temporary to potentially sight-threatening.

We present 10 cases of complications following periocular surgery and rejuvenation procedures and discuss their management.

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