The 13th Annual Congress of the Israeli Ophthalmological Society (IOS)

האיגוד הישראלי לרפואת עיניים
ISRAELI OPHTHALMOLOGICAL SOCIETY

הכנס השנתי ה-13
של האיגוד הישראלי לרפואת עיניים

12-13 בנובמבר 2025 | מלון דויד אינטרקונטיננטל, ת"א

Abstract Booklet

מזכירות הכנס:

MEDICALexpo.
Sharing Medical Knowledge

Wednesday, 12 November 2025

	Hall A	Hall B	Hall C
07:15-08:00	Registration and Welcome Coffee		
08:00-09:00	Ocular Oncology	Rapid Fire	Optometrists
09:00-10:30	Pediatric Ophthalmology	Cataract	(09:00-10:00) Nurses
10:30-11:00	Coffee Break & Visit the Exhibition		
11:00-11:30	Chairman's Greetings and Awards **Prof. Elad Moisseiev,** IOS Chairman, Meir Medical Center		
11:30-12:10	Prime Time Session | Sponsored by Roche		
12:10-12:55	Oculoplastics I - With Keynote Speaker		Orthoptists
12:55-13:10	Gold Session | Independent Sponsorship by Medison		
13:10-14:10	Lunch & Exhibition Visit		
14:10-15:10	Neuro-Ophthalmology	Glaucoma	Clinician Scientist
15:10-16:40		Oculoplastics II – With Keynote Speaker	Wellbeing in Ophthalmology | Sponsored by Medtechnica
17:00- 20:00			Residents | Sponsored by Roche

Thursday, 13 November 2025

	Hall A	Hall B	Hall C
07:00-07:50			Imaging Workshop | Sponsored by Roche
07:15-08:00	Registration and Welcome Coffee		
08:00-09:00	Uveitis	Refractive Surgery	Tecnicians
09:00-10:45	Retina	Cornea	
10:45-11:00		Gold Session | Sponsored by Lapidot	
11:00-11:30	Coffee Break & Exhibition Visit		
11:30-12:10	Prime Time Session | Sponsored by Bayer		
12:10-13:10	Oculoplastics III – With Keynote Speaker		Community Ophthalmology
13:10-13:55	Lunch & Exhibition Visit		
13:55-15:55		Best of the Best	
15:55-16:59		IOSCAR – Surgical Film Competition	

OCULAR ONCOLOGY

Ocular Surface Squamous Neoplasia - Review of Literature, Tricks and Tips

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Purpose: Ocular Surface Squamous Neoplasia (OSSN) is a common ophthalmic condition. It encompasses a spectrum of pre-malignant (corneal intraepithelial neoplasia) and malignant (invasive squamous cell carcinoma), depending on the presence of atypical cells originating from the squamous cells in the conjunctival epithelium and their depth. Risk factors include UV exposure, smoking, HPV infection and immunocompromisation as HIV infection and xeroderma pigmentosum.

Methods: We reviewed the current literature, aiming to present updated diagnostic and treatment approaches for OSSN, highlighting clinical examination, imaging techniques, and various therapeutic options, and stating important tricks and tips.

Results: OSSN typically presents as a unilateral, amelanotic limbal lesion. Assessment includes full eye examination. While anterior segment OCT and vital dyes aid in diagnosis, histopathological examination remains the gold standard for diagnosis and treatment. Treatment options include surgical excision, with adjuvant therapies as needed. Topical agents show different success rates as assessed by lesion regression: Mitomycin-C (76-100%), 5-Fluorouracil (82-100%), and Interferon α-2b (81-100%). Interferon α-2b demonstrates the most favorable side effect profile but has limited availability and higher costs. For invasive cases, additional options include brachytherapy, with recurrence rates up to 12%, external radiation or systemic therapy.

Conclusions: Successful OSSN management requires early detection, accurate diagnosis, and appropriate treatment selection. Complete surgical excision with adjuvant therapy as needed remains the primary approach, with choice of adjuvant therapy based on availability, cost, and side effect profile. Long-term local and systemic follow-up is essential for all patients. In case of uncertainty regarding the diagnosis or treatment, the patient should be referred to an ocular oncologist.

Decision-Making Based on Histopathological Features in Children After Enucleation for Bilateral Retinoblastoma

Dr. Tehila Shlomov[1], Dr. Itay Nitzan[1], Prof. Jacob Pe'er[1,2], Dr. Maya EigerMoscovich[1], Dr. Swathi Kaliki[3], Prof. Shahar Frenkel[1,2], *High-Risk Retinoblastoma Collaborative Study Group**
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2. The Faculty of Medicine, Hebrew University of Jerusalem, Jerusalem, Israel
3. The Operation Eyesight Universal Institute for Eye Cancer, LV Prasad Eye Institute, Hyderabad, India

Purpose: To evaluate the presence and impact of high-risk histological features (HRHF) on outcomes in children with bilateral retinoblastoma undergoing upfront unilateral enucleation. While the prognostic significance of HRHP is well-established in unilateral retinoblastoma, their relevance in bilateral cases remains understudied.

Methods: This study included children with bilateral retinoblastoma who underwent upfront enucleation (2011-2020). Those presenting with extraocular involvement were excluded. Data were obtained from 21 centers across 12 countries, including demographic, clinical, and histopathological information. HRHF were defined as the presence of massive choroidal invasion and/or retrolaminar optic nerve invasion. The primary outcomes assessed were metastasis and mortality.

Results: A total of 211 children (mean age: 17.8 ± 18.6 months; 49.8% female) underwent upfront unilateral enucleation. The mean time from presentation to enucleation was 5.8 ± 1.5 months, and the average follow-up was 33.8 ± 41.1 months. Among these children, 91 (43.1%) exhibited at least one HRHF, with 63 (29.9%) having massive choroidal invasion and 57 (27.0%) showing retrolaminar optic nerve invasion. Among children with HRHF, 80/8 (10.0%) who received adjuvant treatment developed metastases compared to 11/2 (18.2%) without adjuvant treatment ($p = 0.347$), and 80/10 (12.5%) vs. 11/4 (36.4%) died ($p = 0.062$). Among children without HRHF, 68/3 (4.4%) who received adjuvant treatment developed metastases compared to 52/2 (3.8%) without adjuvant treatment ($p = 1.000$), and 68/3 (4.4%) vs. 52/3 (5.8%) died ($p = 1.000$).

Conclusions: In children with bilateral retinoblastoma undergoing upfront unilateral enucleation, HRHF were present in 43.1% of cases. Irrespective of the status of the contralateral eye, adjuvant treatment was associated with a non-statistically significant trend toward lower mortality rates among children with HRHF (12.5% vs. 36.4%, $p = 0.062$). Among children without HRHF, outcomes were similar regardless of adjuvant treatment. The role of HRHF in bilateral retinoblastoma requires further investigation.

Primary Enucleation for Intraocular Unilateral Retinoblastoma Can Save Life in Lower-Income Settings

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Purpose: To investigate the outcomes of primary enucleation and adjuvant systemic chemotherapy, when deemed appropriate, on a cohort of children with unilateral intraocular Rb (AJCC 8th edition, cT2 and cT3) from diverse economic groupings.

Methods: A prospective analysis including treatment-naïve Rb patients were presented to 11 centers from 10 countries from January 1 to December 2019 ,31, and were followed-up thereafter. Only children with unilateral intraocular Rb that underwent primary enucleation were included in the present analysis. Systemic metastasis and survival were investigated.

Results: Of the 692 children with Rb, 191 (%27.6) were included in the study cohort. Among them, 24 (12.6%) were from low-income countries (LICs), 89 (%46.6) from lower-middle-income countries (LMICs), 59 (30.9%) from upper-middle-income countries (UMICs), and 19 (9.9%) from high-income countries (HICs). High-risk histopathological features were observed in 110 eyes (57.6%) following enucleation, and 102 of these children (92.7%) received adjuvant intravenous chemotherapy. The three-year survival rate for the entire cohort was 95.0%. Stratified by economic grouping, survival rates were 87.5% (LIC), 96.6% (LMIC), 93.2% (UMIC), and 100% (HIC). Children from LICs demonstrated a higher prevalence of HRHF compared to HICs. Residing in a lower-income country was associated with a higher risk of systemic metastasis and poorer outcomes.

Conclusions: In the present multinational cohort of children with unilateral intraocular Rb who underwent upfront enucleation coupled with adjuvant chemotherapy as needed, overall survival was favorable, especially for children from low-income countries. Prompting early diagnosis, while the tumor remains intraocular can be life-saving, particularly in low-resource settings where primary enucleation and adjuvant chemotherapy can cure unilateral Rb.

A New Treatment in Israel for Retinoblastoma Retinal and Vitreal Relapse

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Purpose: Retinoblastoma, the most common primary intraocular malignancy worldwide, affects babies and toddlers. In 2011/11, intravitreal injections of chemotherapy (melphalan, 30mcg/05/0cc) were introduced by Munier and immediately adopted in Hadassah in 2012/03 for the treatment of vitreal involvement in retinoblastoma. This treatment proved very effective, but also deleterious to the retina. In 2020/01 we switched to injecting topotecan (30mcg/0.05cc), which later proved to be as effective in eradicating tumor cells but had no retinal toxicity. However, some eyes had multiple recurrences after an apparent complete response. Here we describe the first use of a high dose of topotecan (100mcg/0.1cc) for the treatment of recurrent retinal and vitreal disease.

Methods: A case series of children with retinoblastoma active in one eye after previous treatments. All received intravitreal injections of topotecan 100mcg/0.1cc with a cryo probe at the injection site during and immediately after the injection. To prevent a post-injection intraocular pressure (IOP) spike, an anterior chamber tap was performed in the first two injections, and a post-injection ocular massage to lower the IOP was performed thereafter.

Results: Three children (5.04 years old (5 months after the last treatment), 6.01 years (3 months), and 7.06 years (15 months)). All had been previously treated with IAC and IVit Topotecan (30mcg), and with a relapse that included flat retinal lesions and vitreal spheres. After two injections there was no remaining activity. After the first injection, one child reported glare that did not recur after the second injection. Another reported reduction in his visual acuity, which improved after the second injection.

Conclusions: High dose topotecan appears effective and safe for treating retinoblastoma retinal and vitreal relapse in this initial series.

Cataract Surgery in Children with Retinoblastoma: Challenges and Outcomes During a 24-year Institutional Experience

Dr. Rand Zuaiter, Dr. Aseel Gebara, Dr. Hadas Mechoulam, Prof. Shahar Frenkel, Prof. Irene Anteby
Hadassah-Hebrew University Medical Center, Jerusalem

Purpose: This study evaluates the indications, surgical considerations, complications, and outcomes of children with retinoblastoma treated for cataract in our institution.

Methods: Retrospective study of all children diagnosed with retinoblastoma at Hadassah Medical Centre from May 2000 to June 2024 who developed significant cataracts requiring surgical removal during a long-term follow-up.

Results: Among 189 children diagnosed with retinoblastoma (273 eyes), 20 children (24 eyes) developed significant cataract requiring surgery. Median age at cataract surgery was 57 months (range: 5–242 months). The most common cataract type was posterior subcapsular (70.8%). Intraocular lenses were implanted in 62.5% of cases and posterior capsulectomy with anterior vitrectomy was performed in 71.4%. No intraoperative complications were recorded, yet postoperative complications occurred in 12.5% and included retinal detachment (4.2%) and vitreous hemorrhage (8.3%). Cataract development was strongly associated with treatment by external beam radiotherapy (EBRT) and intravenous chemotherapy, while intra-vitreal melphalan ($p = 0.053$, $r^2=0.0137$), brachytherapy ($p = 0.081$, $r^2=0.011$), and intra-arterial chemotherapy ($p > 0.05$, $r^2=0.0026$) showed no strong correlation When improved visual function was the main indication for surgery, 57.1% of eyes showed some visual improvement, though statistically insignificant, likely due to sample size.

Conclusions: Significant cataract necessitating its removal by surgery was seen in 10.6% of children with retinoblastoma. Complications are common and visual improvement is not a realistic goal, however, cataract surgery is indicated when impaired view of the fundus makes tumor management impossible. Treatment modalities such as intravitreal melphalan, intra-arterial chemotherapy (IAC), and brachytherapy show less significant cataract development than other treatment modalities.

Beyond Excision: Long-Term Success of Ocular Surface Squamous Neoplasia Reconstruction with Amniotic Membrane Transplantation

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2. Faculty of Health and Medical Science, Tel Aviv University

Purpose: Complete surgical excision with wide clean margins of ocular surface squamous neoplasia (OSSN) is essential to prevent recurrence. However, reconstructing large defects while preserving the ocular surface integrity remains challenging. This study evaluates the long-term outcomes of amniotic membrane transplantation (AMT) for ocular surface reconstruction following OSSN excision.

Methods: This intervention consecutive retrospective case series from a single-referral center, included OSSN patients who underwent excisional biopsy, cryotherapy, corneal epitheliectomy, and ocular surface reconstruction using either dry cryopreserved or frozen AMT between 2016-2023. Surgery was performed in a dry field with "no touch" technique. A conjunctival incision with 4 mm clinically-free margins was made, followed by alcohol (96%, 20 seconds) assisted corneal epitheliectomy, limbal scraping, and cryotherapy. Reconstruction was performed with AMT covering the entire treated surface and tucked under the conjunctival margins. Patients with histopathologically confirmed invasive squamous cell carcinoma were excluded. Tumor control and complications were assessed.

Results: Nineteen consecutive patients (74% male) were included, with a median age of 69 years (range: 28–88) and a median follow-up of 24.6 months (range: 3.2–57.8). All had limbal involvement (median: 4 clock hours; range: 2–11), and 89.4% had corneal involvement. Pathology revealed low-grade CIN in 26% and high-grade CIN in 74%. Tumor-free margins were confirmed in 53% of cases, while 5% had involved margins and received adjuvant fluorouracil (margin involvement was inconclusive in 42%). AMT was dry-cryopreserved (83%) or frozen (17%). Ocular surface healing was achieved in all patients. At last follow-up, complications included corneal opacity (21%), corneal pannus (5%), limbal stem cell deficiency (10%), and symblepharon (5%). Tumor recurrence occurred in 1 patient (5%), requiring surgical excision and brachytherapy.

Conclusions: AMT is an effective technique for ocular surface reconstruction following OSSN excision, offering excellent tumor control with minimal complications while allowing extensive excision and optimal healing.

Intractable Squamous Cell Carcinoma of the Orbit and Sinus

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Purpose: Invasive squamous cell carcinoma (SCC) of the orbit and sinus represents a highly aggressive malignancy with significant morbidity and mortality. Early recognition and intervention are crucial for improved outcomes, yet some cases demonstrate exceptional resistance to standard treatments.

Methods: A retrospective single case report analysis.

Results: A 73-year-old woman presented with left eyelid swelling persisting for one month, initially misdiagnosed as periorbital cellulitis. Her medical history was significant for myelodysplastic syndrome managed with ruxolinitib and darepoetin, and multiple previous skin cancers (basal cell carcinoma and SCC) treated with MOHS surgery and radiotherapy. Orbital CT imaging revealed a large space-occupying lesion in the medial orbit with frontal sinus invasion. Biopsy confirmed keratinizing squamous cell carcinoma. PET scan demonstrated uptake in both the orbital lesion and lungs, indicating metastatic disease. The patient underwent multiple treatment modalities, including cemiplimab immunotherapy, intensive radiotherapy (33 treatments of 2 Gray), and combination chemotherapy with carboplatin and paclitaxel. Despite aggressive treatment, the disease progressed dramatically, resulting in auto-evisceration of the eye. The tumor expanded to fill the entire left orbit, frontal sinus, protruded through the skin with severe disfigurement. Additionally, new tumor development was noted on the nose, necessitating further radiotherapy. Subsequent treatments included resuming cemiplimab and palliative chemotherapy with CIS and 5FU. The patient's condition deteriorated, culminating in tonic-clonic seizures, after which she was transferred to hospice care.

Conclusions: This case underscores the aggressive nature of orbital and sinus SCC and the significant challenges in treating these non-responsive cases. Despite employing multiple treatment modalities, including immunotherapy, radiotherapy, and various chemotherapy combinations, the disease demonstrated remarkable resistance to treatment. This case highlights the challenges in managing aggressive orbital SCC in patients with complex medical histories and multiple prior skin cancers, particularly when conventional treatments prove ineffective.

Epidemiology, Diagnosis, and Outcomes of Ocular (Choroidal and Orbital) Metastasis: Retrospective Cohort Study from a Tertiary Center

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Purpose: Ocular metastases are the most common ocular tumors. It is most frequently associated with breast cancer in females and lung cancer across both sexes.

Methods: This is retrospective 19-year cohort study from a single tertiary referral center in Israel. Data was collected on demographics, clinical features, imaging, treatment modalities, and ocular and systemic outcomes. Survival analysis was performed using Kaplan-Meier, log-rank, and Cox regression to identify predictors of mortality based on the collected data.

Results: The cohort included 71 patients: 59 with choroidal mets and 10 with orbital involvement. The mean age at ocular mets was 59 years old (SD 15), with 62% female. Ocular or visual symptoms were present in 90.1% of patients, including blurred or decreased vision, diplopia, and eye pain, among others, while 9.9% were asymptomatic. Ocular mets were the first cancer manifestation in 19% of cases. Breast cancer was the most common primary cancer (44%), followed by lung cancer (35%). Treatment modalities included systemic and local therapys. Concomitant brain mets were present in 35%, while bone mets were the most common systemic spread (62%). Complete regression was achieved in 8.3% of cases, while 58% experienced sufficient mets shrinkage, 19% showed no change, and 15% had disease progression. The mean follow-up from systemic malignancy diagnosis was 6.3 years (SD 5.0) and 2.74 years (SD 2.35) from ocular mets diagnosis. Cox regression identified orbital mets as a significant predictor of higher mortality (HR = 95% ,3.093 CI: 8.606–1.112, p = 0.031). Primary cancer type, gender, multifocal involvement, and age at ocular or systemic mets diagnosis were not significant predictors of mortality.

Conclusions: This study highlights the clinical characteristics, diagnostic approaches, and treatment outcomes of ocular mets in an Israeli population. In our cohort, orbital mets were found to be a predictor of higher mortality.

Melanocytoma of the Optic Disc: Risk Factors for Growth and Visual Loss

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2. Sheba Medical Center, Ramat Gan, Israel

Purpose: Optic disc melanocytoma is a rare benign tumor of the optic nerve head, typically asymptomatic, but sometimes associated with vision loss and tumor growth. This study aims to examine the growth patterns and associated factors impacting visual outcomes in a cohort of Israeli patients.

Methods: A retrospective review of 21 patients diagnosed with optic disc melanocytoma, between January 2009 and March 2024, was performed. Patient data were collected, including age, gender, medical conditions, visual acuity, and tumor characteristics (size, location, reflectivity). Tumor growth and related ocular changes were monitored over an average follow-up of 64 months using color fundus images, ultrasonography, and optical coherence tomography (OCT).

Results: At presentation, most patients had good visual acuity (85.7% with 20/20–20/40 vision). Tumor growth occurred in 52.4% of cases, with an increase in tumor thickness observed in 11 patients. Central location and pigmented vitreous seeds were significantly correlated with tumor growth. The study found no significant associations between systemic conditions or vascularization with vision loss or tumor growth.

Conclusions: This study highlights the potential for tumor growth in optic disc melanocytoma, especially in those with central tumors or pigmented vitreous seeds. Although most lesions remain stable, these features warrant close monitoring to prevent vision loss. Our findings support more frequent follow-up for patients with these risk factors, contributing to better patient management and outcomes.

RAPID FIRE

A Non-Surgical Approach to Traumatic Cicatricial Lagophthalmos

Yael Lustig, Daphna Landau
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Purpose: Severe oculofacial burns can cause periocular complications, including lagophthalmos and ectropion, leading to exposure keratopathy and potential vision loss. These complications arise from scar contraction, tissue retraction, and cicatricial changes. -5Fluorouracil (-5FU), an antimetabolite that inhibits fibroblast proliferation and reduces scar formation, shows promise in managing hypertrophic scars and contractures.

Methods: We present the case of a young patient who sustained extensive facial burns when his vehicle was hit by a missile. The patient presented six months post injury with bilateral cicatricial lower eyelid ectropion, retraction of all four eyelids and secondary lagophthalmos with corneal exposure.

Results: The patient was treated with three sessions of 5-FU injections to all four eyelids with marked improvement in eyelid position near complete resolution of the lagophthalmos.

Conclusions: This case highlights 5-FU's potential as an effective non-surgical treatment for cicatricial lagophthalmos and ectropion. Its anti-fibrotic properties likely reducde scar contracture and improved eyelid mobility. Early 5-FU use may delay or reduce the need for surgery. Further studies are needed to standardize its use in periocular burns.

Recurrent Hyphema in a 9 Month Old Infant with Unique Diagnosis and Management

Ram Cohen, David Varssano, Daphna Mezad Koursh
Tel Aviv Sourasky Medical Center

A case of a 9 month old infant who was admitted to our clinic a month after undergoing an examination under anaesthesia (EUA) and anterior chamber exploration for hyphema and suspected blunt ocular trauma to his right eye in a different institution. During the initial exploration, a dark area was observed, suggestive of temporal cyclodialysis, although no signs of overt trauma were identified.

Upon presentation to our clinic, the patient exhibited a recurrent episode of hyphema, prompting a referral for a second surgical exploration. This revealed a large blood clot covering the temporal iris, with fibrin fibers obstructing the visual axis. Hemorrhage aspiration uncovered irregular bright vascular tissue that was actively bleeding and could not be separated from the underlying normal iris tissue. A tissue sample was sent for pathological analysis.

A comprehensive workup was performed, revealing additional lesions on his scalp and armpits, suspected to be juvenile xanthogranuloma (JXG).

Pathological results from his iris lesion confirmed the same diagnosis. Based on these findings, treatment with sub-conjunctival and topical corticosteroids was initiated. Only modest improvement was achieved, prompting the escalation to systemic corticosteroids and hourly topical steroid therapy.

In an effort to reduce the long-term burden of steroid therapy and mitigate potential side effects, an anti-VEGF intravitreal injection was administered.

Following this intervention, the remnants of the xanthogranuloma were resolved completely. The patient was subsequently followed up due to residual correctopia secondary to posterior synechia and mild cataract formation. Current management focuses on rehabilitation of visual acuity and prevention of amblyopia.

This case highlights a unique presentation of anterior chamber JXG in a very young patient, causing recurrent and persistent hyphemas, and necessitating prolonged systemic and topical treatment. It is one of the few documented cases in which a combination of corticosteroid therapy and an anti-VEGF injection was utilized to achieve complete resolution.

Successful Conservative Management of Traumatic Orbital Meningoencephalocele in a Young Child

Dr. Shalev Fried, Prof. Ofira Zloto, Dr. Reut Singer
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Purpose: Orbital meningoencephalocele following penetrating trauma is a rare and complex condition that typically requires surgical intervention. We report a case of successful conservative management in a pediatric patient, contributing to the limited literature on non-surgical approaches.

Methods: A 3-year-old male sustained a penetrating orbital injury from a mixer dough hook, extending into the brain tissue (Figure A). Initial management involved foreign body removal through a multidisciplinary approach with oculoplastic and neurosurgical teams. Post-operative imaging (CT and MRI) and clinical follow-up assessed visual acuity, ocular motility, proptosis, and cerebrospinal fluid (CSF) leakage.

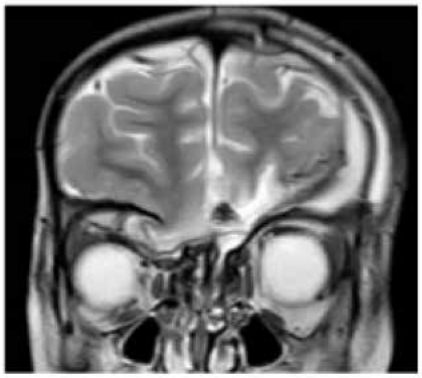
Results: Following foreign body removal, the patient developed progressive pulsatile proptosis, oculorrhea, and elevated intraocular pressure (Figure B), necessitating lateral canthotomy and cantholysis. Imaging revealed orbital roof and medial wall fractures with meningoencephalocele (Figure C). Planned reconstructive surgery was postponed due to meningitis. Given subsequent clinical improvement, conservative management was pursued. At 6-month follow-up, the patient exhibited complete resolution of ocular motility restriction, significant proptosis improvement, and normal visual acuity. No surgical intervention was required (Figure D).

Conclusions: This case highlights that conservative management may be a viable option for select cases of traumatic orbital meningoencephalocele, particularly when early clinical improvement is observed. While surgical intervention remains the standard approach, our findings suggest that careful monitoring and non-surgical treatment can lead to favorable outcomes in pediatric patients, potentially avoiding the risks of complex orbital reconstruction.

A.

B.

C.



D.

Corioretinitis Sclopetaria Retinal Detachment and PVR in Bilateral Traumatic Combat Injury

Dr.Itay Magal
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Purpose: Chorioretinitis Sclopetaria usually accompany with VH. We present a unique case of Chorioretinitis Sclopetria with small Retinal Detachment and late PVR.

Methods: We present a rare case of Choriretinitis Sclopetaria with small retinal detachment that progressed to severe PVR.

Results: 20 years old male was admitted to ER with multiple metal bodies in his body as a result of explosion. VA RE 24/6 LE HM RE Blast injury FTMH and multiple small metal foreign bodies in the orbit and eye lids (PPV and SF6) LE Large Metal Foreign Body penetrates the Nasal Posterior Sclera VH+3.5 with Sclopetaria and Retinal Detachment. 1st Surgery: LE Foreign body removal from orbit and sclera (no scleral perforation) and encircling Scleral Buckle. VH dissolved and VA gradually improved to 15/6 PVR progressed from the Sclopetaria edge (Nasal Retina) to macule and eventually produced FTMH FTMH was surgically closed but we had to reoperate few times D/T PVR recurrency.

Conclusions: We didn't expect PVR to be so aggressive because usually there is no PVR with Chorioretinitis Sclopetaria. In retrospect we should have intervein earlier to treat the PVR.

Injection of SF6 into the Anterior Chamber for Managing Hypotony; A Case of IOP Roller-Coaster

Liat Mendel Veig, Rita Ehrlich
Wolfson Medical Center, Holon

Purpose: A 74 year old African male with advanced Pseudoexfoliation glaucoma and a history of multiple surgeries presented to the emergency room with reduced vision, clinically significant hypotony (IOP= 2mmHg) and choroidal detachments. He had a scarred, non-functional bleb, and had been prescribed Intraocular pressure (IOP) lowering drops one-month prior due to an IOP of 30 mmHg. His anterior chamber was deep and quiet. Since conservative management did not improve IOP, ciliary shutdown was suspected.

Methods: A novel method1 was employed in which 100% pure Sulfur hexafluoride (SF6) gas was injected into the anterior chamber (AC) at the slit lamp. The purpose of this injection was to create reverse pupillary block by obstructing the outflow of aqueous humor.

Results: During the gas expansion phase, the patient's IOP gradually increased to 38 mmHg prompting the reintroduction of IOP lowering treatment. A few weeks later, the gas bubble had fully absorbed, and the IOP stabilized at 9 mmHg, without treatment.

Conclusions: Injection of SF6 gas into the anterior chamber shows promise in treating hypotony and choroidal detachments, even in eyes with deep anterior chamber.

Endothelial Graft Surprise

Asaf Achiron, Carmel Shinar
Tel-Aviv Sourasky Medical Center, Tel-Aviv

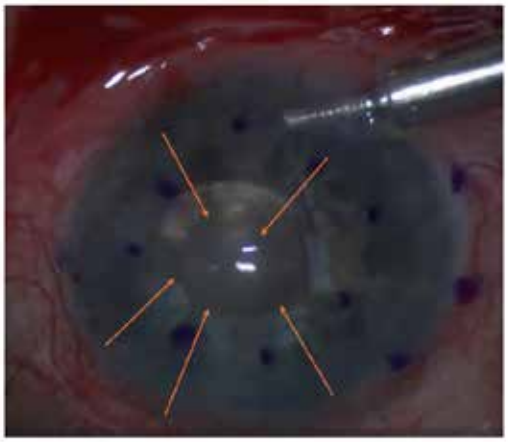
Purpose: To report on three cases of surprises observed during endothelial graft transplants surgery:
1. Silicon in the AC
2. Lens fragments in the AC
3. Vitreous in the AC

Methods: Videos of the cases

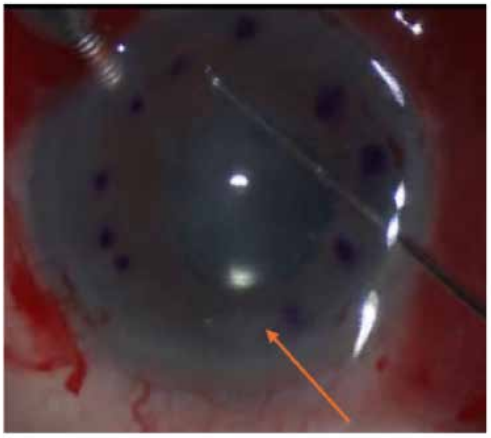
Results:
In case 1: silicone removal was essential for graft attachment
In case 2: the lens fragment was the cause of corneal edema
In case 3: only after an anterior vitrectomy was the graft able to unfold properly

Conclusions: Recognizing and handling surprises during endothelial graft surgery is essential for successful outcome.

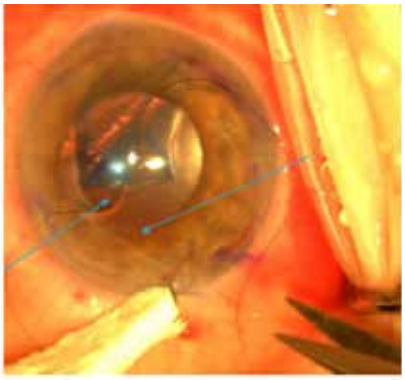
Case 1: Silicone in the AC



Case 2: Lens fragment in the AC



Case 3: Vitreous in the AC and the graft cannot be unfolded



Continuous External Pressure Technique for Descemet Membrane Endothelial Keratoplasty in Vitrectomized Eyes: The "Don't Let Go" Technique

Yamit Cohen-Tayar, Amir Abd-Alkader, Irir Bahar, Eitan Livny
Rabin Medical Center, Petah Tikva

Purpose: Descemet membrane endothelial keratoplasty (DMEK) in vitrectomized eyes presents a formidable surgical challenge, as the compromised counter-pressure of the iris-lens diaphragm impedes proper shallowing of the chamber, rendering the unfolding and centration of the DMEK graft challenging. To address this challenge, surgeons often pivot to descement's stripping automated endothelial keratoplasty. The superior visual outcomes associated with DMEK, fast rehabilitation and low rejection risk, prompted exploration of tailored DMEK techniques after vitrectomy. This study describes a novel technique, which consists of continuous application of external pressure on the corneal surface while unfolding, orienting and lifting the graft by gas.

Methods: A case series of eight eyes from patients with an average age of 68±13 who underwent DMEK surgery with the novel continuous pressure technique is described. Outcomes were assessed for each eye before surgery and in a one-year follow-up. Data was analyzed using a student t-test.

Results: All corneas cleared up well following surgery and remained clear for the twelve-month follow-up duration. The implementation of the continuous pressure technique allowed proper unfolding and centration of DMEK grafts in all of these challenging cases with minimal maneuvers to the grafts. Best corrected visual acuity following surgery improved significantly from an average of logMAR 1.05 to logMAR 0.37 (P-value 0.003) with no intra- or post-operative complications.

Conclusions: The application of the "Don't let go" technique for DMEK in vitrectomized eyes is relatively easy to perform and was proven effective. The technique requires no additional instrumentation such as Pars-plana infusion, synthetic diaphragm insertion to the anterior chamber, or direct contact with the graft as suggested by other authors for DMEK in vitrectomized eyes.

Preserflo Meets Morcher: Overcoming Challenges in Ocular Trauma

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Purpose: Managing glaucoma in eyes with prior penetrating keratoplasty (PKP) and artificial iris implantation presents unique challenges. Patients with previous ocular surgeries are at increased risk of complications, including elevated intraocular pressure (IOP), endothelial cell loss, and anatomical restrictions. The PreserFlo MicroShunt is a minimally invasive glaucoma surgery (MIGS) device designed to lower IOP with reduced complications compared to traditional filtering procedures. However, its implantation in eyes following PKP and artificial Morcher iris implantation has not been previously reported.

Methods: We present a case of a post-trauma eye with a history of PKP and artificial Morcher iris implantation, requiring surgical intervention for uncontrolled glaucoma. The patient exhibited elevated IOP despite maximal medical therapy. Given the clinical and anatomical challenges posed by prior surgeries, the PreserFlo MicroShunt was selected as the preferred surgical option. The procedure, intraoperative considerations, and postoperative outcomes were documented, with a focus on visual rehabilitation and long term IOP control.

Results: Following PreserFlo implantation, the patient demonstrated a significant reduction in IOP, with stabilization achieved by the last follow-up. No major intra- or post-operative complications were observed. The patient experienced no significant hyphema, post-surgical infection, or choroidal effusion, underscoring the safety profile of the implant in complex post-surgical eyes.

Conclusions: This is the first report of a PreserFlo MicroShunt implantation in an eye with prior PKP and Morcher iris implantation. It highlights PreseFlo's potential as a viable surgical option for post-surgical glaucoma management. While the device offers advantages such as minimal invasiveness and reduced risk of fibrosis, individualized surgical planning and close postoperative follow-up remain critical in such cases. Further studies are needed to evaluate long-term endothelial survival and efficacy in similar patients.

Evaluation of Fundus Photography for ER Headache Patients

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Purpose: This study aims to evaluate the contribution of fundus photos in the diagnosis of etiologies of headaches in patients presenting to the emergency department (ED). Furthermore, to examine the ability of ED physicians to identify abnormal fundus photos.

Methods: This study examines the medical history, symptoms, and signs of patients presenting to ED with acute and severe headache complaints from 2022 to 2024. Fundus photographs were captured using the DRS Plus camera (Padova, Italy). These photographs were assessed in a double-blind manner by both the ED physicians and ophthalmologists. A dilated pupil examination was conducted and documented for comparison A statistical analysis was performed.

Results: The ED team and the ophthalmologist both correctly diagnosed papilledema in 79 out of 80 patients using the fundus camera. In one patient, the ED ruled out papilledema, while the interpretation of the fundus photo was inconclusive and direct fundoscopy detected papilledema. Additionally, 36% (29) of the patients had incidental findings on the fundus photo: vascular anomalies in 5% (4), high cup-to-disc ratio in 7.5% (6), retinal bleeding in 12.5% (10), and drusen in 9% (7).

Conclusions: The fundus camera enables evaluation of the fundus photos and compares them to direct professional exam. It is easy to perform, and ED physicians interpret the photos to normal and abnormal and easily identified papilledema. This documentation contributes to clinical assessment and enables fast and accurate diagnosis of papilledema other abnormal findings may be revealed.

An Unusual Case of Spontaneous Globe Luxation and Exophthalmos Without Overt Cause

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Purpose: Globe luxation is a rare and potentially distressing phenomenon. It can be spontaneous or due to trauma. There are a number of factors which are associated with spontaneous globe luxation including: thyroid eye disease (TED), floppy eyelids and shallow orbits.

Methods: A retrospective case report.

Results: A 77-year-old female, presented to the ER with progressive painless proptosis of her right eye and binocular diplopia for a two-day duration. On exam, there was spontaneous luxation of the right globe (Figure 1); gentle digital pressure was applied to return the globe. Relevant medical history includes hypothyroidism and polymyalgia rheumatica and she has been taking 10 mg of prednisone for many years. On examination, optic nerve functions are preserved. Cover tests demonstrate a large alternate exotropia and left hypertropia. Eye movements are full without any pain. Right eye proptosis with slight eyelid retraction and slight lid lag was inspected. No resistance to retropulsion is noted. Conjunctivas are quiet and corneas are clear. A neurologic exam was normal. Thyroid stimulating hormone (TSH), free T3 and free T4 were all within normal limits. Computed tomography and magnetic resonance imaging scans revealed long orbits with significant fat expansion, stretched extraocular muscles and optic nerve, without enlargement. Bilateral exophthalmos (more severe on the right eye), similar to a previous scan from two years ago, was seen. No orbital space occupying lesion or fat stranding was seen (Figure 2). The patient was discharged after a temporary tarsorrhaphy for further ambulatory evaluation before definitive treatment is considered.

Conclusions: This is a rare presentation of an older patient presenting with spontaneous globe luxation in the absence of TED. Long-term steroid use may be a cause of severe orbital fat proliferation, which when combined with floppy eyelids can lead to this rare occurrence at this age.

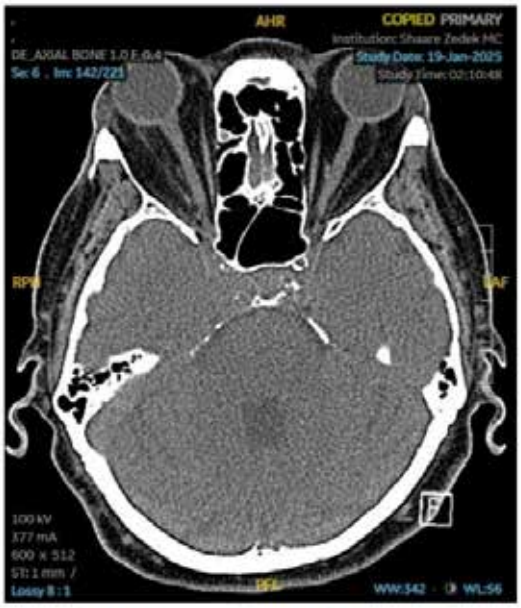

Figure 2: Computed tomography of the orbits.

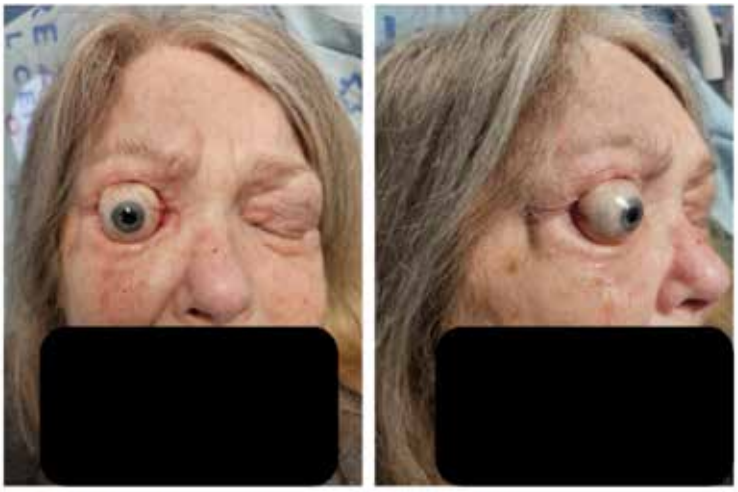

Figure 1: Spontaneous globe luxation at presentation.

Application of Topical Rho Kinase Inhibitors for the Treatment of Fuchs' endothelial corneal dystrophy: A Case Series

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Purpose: Corneal edema, poses significant clinical risks including visual impairment and loss of corneal clarity. Fuchs' endothelial corneal dystrophy (FECD), a progressive degenerative disease, causes gradual endothelial loss, resulting in corneal edema, impaired vision, and eventual blindness if untreated. Ripasudil, a Rho kinase (ROCK) inhibitor, initially demonstrated efficacy in increasing aqueous humor outflow for treating glaucoma. Meanwhile, its potential in managing corneal edema remains under investigation.

Methods: This case series presents three patients with FECD who were treated with Ripasudil after conventional treatments failed to improve corneal edema.

Results: The first case, a 68-year-old female presented with central corneal edema and a central corneal thickness (CCT) of 632 µm. Initial management with a Hyper-CL therapeutic contact lens and prednisolone 1% did not yield significant improvement. However, after 11 months of Ripasudil therapy, her CCT reduced to 601 µm, with notable improvements in best-corrected visual acuity (BCVA), and corneal haze, and a slight increase in intraocular pressure (IOP). Similarly, in the second case, a 69-year-old male with central and inferior stromal edema initially presented with a CCT of 686 µm and a BCVA of 0.3 logMAR. After the sodium chloride 5% regimen proved ineffective, Ripasudil treatment over four months resulted in a reduction of CCT to 595 µm and an improvement in BCVA to 0.0 logMAR. Lastly, the third case involved a 71-year-old female with central stromal edema, initially showing a CCT of 730 µm and a BCVA of 0.50 logMAR. Six weeks of sodium chloride treatment were unsuccessful, but after six months of Ripasudil therapy, her CCT decreased to 560 µm, with BCVA improving to 0.22 logMAR.

Conclusions: Collectively, these cases suggest that Ripasudil has potential efficacy in reducing corneal edema and enhancing visual outcomes in patients with FECD, offering a promising alternative when standard treatments are ineffective.

Using Intraoperative OCT During DSAEK Transplantation in a Case of Severe Corneal Opacity

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Purpose: To demonstrate the benefits of using intraoperative OCT during DSAEK with corneal opacity.

Methods: A video showcasing the use of intraoperative AS-OCT during corneal transplantation surgery.

Results: A 76-year-old female underwent corneal transplantation in the left eye due to pseudophakic bullous keratopathy. The cornea was edematous and opaque, making it impossible to visualize the graft's position relative to the cornea. Intraoperative OCT was utilized throughout the procedure to ensure precise positioning and centering of the graft.

Conclusions: Intraoperative OCT is a valuable tool in DSAEK transplantation, particularly in cases where corneal opacity impairs visualization.

The Role of Intrastromal Antibiotic Injections in Managing Deep Stromal Bacterial Keratitis: A Case Study

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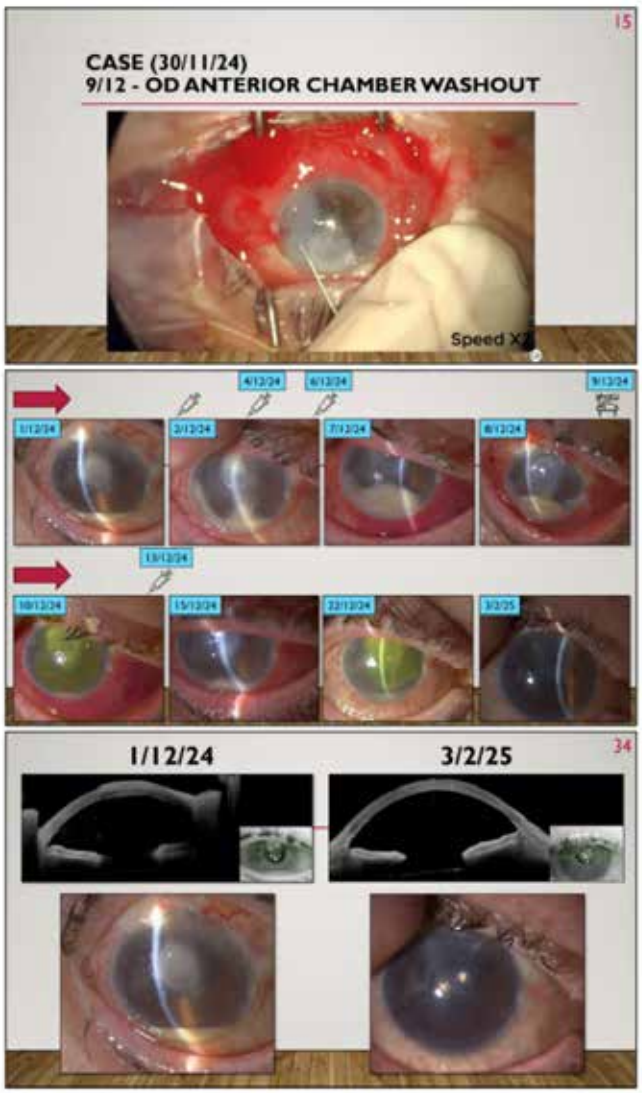
Purpose: Purpose Empiric broad-spectrum topical antibiotics remain the gold standard for bacterial keratitis. However, their efficacy is limited in treating deep stromal infections due to suboptimal corneal penetration. Intrastromal antifungal injections have been widely used in fungal keratitis, yet the use of intrastromal antibiotics for bacterial keratitis is scarcely documented. This case study highlights the potential of intrastromal antibiotic injections in managing deep stromal bacterial infections, particularly in cases involving biofilm-forming pathogens resistant to topical treatments.



Methods: A 76-year-old male with a complex ocular history, including NVAMD, advanced POAG, and multiple ocular surgeries, presented with ocular pain and visual acuity deterioration in the right eye. Clinical findings included corneal edema and an opaque stromal abscess with hypopyon. Aqueous and vitreous humor samples were negative, but corneal scrapings revealed Streptococcus pneumoniae. Despite initial management with topical antibiotics, the infection persisted. Intrastromal injections of Vancomycin and Fortum were administered around the abscess using a 30-gauge needle, with a total of four injections given approximately every 72 hours, including during an anterior chamber washout.

Results: This treatment approach led to a gradual resolution of the infection and hypopyon, as well as scarring of the abscess.

Conclusions: Conclusion Intrastromal antibiotic injections may serve as a valuable adjunctive therapy for deep stromal bacterial keratitis, particularly in cases refractory to topical treatment. This approach allows for targeted drug delivery, overcoming the limitations of topical antibiotic penetration. However, standardized guidelines for antibiotic selection, dosing, and safety profiles are necessary to mitigate risks and optimize outcomes.

Optical Biometric Parameters Predicting Intraoperative Floppy Iris Syndrome (IFIS): Real-World Data

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Purpose: To compare ocular biometric measurements between the general population and individuals who developed intraoperative floppy iris syndrome (IFIS) during cataract surgery.

Methods: Retrospective cohort analysis of patients who underwent phacoemulsification cataract surgery in one tertiary medical center. Biometric data was collected using the IOLMaster700 © in a pre-operative evaluation. Participants who underwent cataract surgery were categorized into two groups: individuals who developed IFIS and individuals who did not develop IFIS. The biometric parameters were then analyzed and compared between the two groups.

Results: A total of 7,386 cataract surgeries were evaluated. Approximately 3% (n=226) of eyes experienced IFIS. Pupil diameter was significantly smaller in patients with IFIS compared to those without IFIS in our study cohort ($p < 0.001$). In addition, lens thickness was notably larger ($p < 0.001$), anterior chamber depth (ACD) and aqueous depth p were shallower ($p < 0.01$) in the IFIS group. Patients with IFIS in the first eye demonstrated an increased risk for IFIS in the fellow eye ($p<0.01$). Following subgroup analysis, we found that patients with pupil diameter < 2.4 mm, ACD < 2.9 mm, and lens thickness> 4.6 mm had a 21% incidence of IFIS (OR: 9.06, 95% CI 5.38-15.28, $p<0.001$).

Conclusions: Our study provides insights into anatomic risk factors associated with IFIS. Correlations identified between biometric measurements and IFIS risk contribute to a comprehensive risk stratification. These findings may guide surgeons in risk assessment and proactive measures before cataract surgeries, especially in individuals with a history of IFIS.

PEDIATRIC OPHTALMOLOGY

Ahmed Glaucoma Valve Implantation vs. Trabeculotomy as Initial Intervention for Primary Congenital Glaucoma - Long Term Follow-Up

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Purpose: To compare the outcomes between initial AGV implantation and trabeculotomy in children with primary congenital glaucoma (PCG).

Methods: This retrospective cohort study was conducted on patients with PCG who underwent either trabeculotomy or AGV implantation between 1998 and 2022 at Soroka University Medical Center. Outcome measures included intraocular pressure (IOP) change, cup-to-disc ratio, corneal clarity, additional surgeries, ocular hypotensive medication use, and the occurrence of adverse events over 36 months of follow-up. Primary success was defined as a postoperative IOP of 21–5 mmHg without additional surgeries or serious sight-threatening complications.

Results: A total of 83 eyes from 55 patients were included: 34 in the AGV group and 49 in the trabeculotomy group. The primary success rate was significantly higher at all time points of the follow-up period in the AGV group compared to the trabeculotomy group ($p=0.014$). Trabeculotomy was associated with a significantly higher risk of surgical failure compared to AGV implantation (HR: 3.23; 95% CI: 1.35–7.71; $p = 0.008$). Only 2 eyes in the AGV group underwent additional surgeries, compared to 25 in the trabeculotomy group ($p<0.001$).

Conclusions: AGV as an initial procedure appears to be safe and more effective than trabeculotomy for the treatment of PCG in this select population, with fewer additional surgeries.

Temporal Changes in Retinopathy of Prematurity; A Population-Based Study Between 1995 and 2021

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Purpose: The aim of this population-based study was to evaluate the temporal changes in the incidence of retinopathy of prematurity (ROP), and the demographic and clinical factors associated with ROP from 1995 to 2021.

Methods: Data from the Israel national very low birthweight infant database was used. Following exclusions, the final study population comprised 16,257 infants born at 23-29 weeks. The independent effect of variables associated with ROP was assessed using multivariable logistic regression analysis. P-values for trend were determined applying the Cochran-Armitage Trend Test.

Results: The rates of ROP decreased from 32.9% in the years 1995-2000 to 16.0% in 2017-2021 ($p<0.0001$). In comparison to the reference epoch (1995-2000), the adjusted odds ratio (OR) [95% confidence interval] for ROP, were significantly lower in 2001-2006 (OR 0.68[0.59-0.77]), in 2011-2007 (OR 0.36[0.31-0.42]), in 2012-2016 (OR 0.36-0.26]0.31]), and in 2017-2021 (OR 0.32[0.27-0.39]). Sepsis (OR 1.67[1.52-1.83]), surgically treated necrotizing enterocolitis (NEC) (OR 1.86[1.49-2.32]) and surgically treated patent ductus arteriosus (PDA) (OR 1.88[1.56-2.27]) were independently associated with ROP. Among the infants with sepsis, surgically treated PDA or surgically treated NEC, the rates of ROP increased in the 2017-2021 epoch.

Conclusions: The odds for ROP decreased by over two-thirds throughout the period 1995-2021, although the decline was attenuated in the recent decade. In view of the independent association found between surgically treated PDA or NEC and ROP, and the increasing rates of ROP in these infants, further studies may elucidate whether earlier ROP screening and possibly earlier therapeutic interventions may be appropriate for these infants.

Epidemiology of Pediatric Allergic Conjunctivitis in Israel

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2. Sourasky Medical Center

Purpose: Background Allergic conjunctivitis is a common ocular disorder in children, frequently accompanying atopic conditions such as asthma, allergic rhinitis, and atopic dermatitis. Despite its clinical impact, epidemiological data in Israel remain limited. This study aims to characterize pediatric patients diagnosed with allergic conjunctivitis using data from Clalit Health Services.

Methods: A retrospective analysis was performed on the medical records of 32,698 children (aged 0-18 years) diagnosed with various types of allergic conjunctivitis. Evaluated parameters included gender, age at diagnosis, coexisting ocular and systemic conditions, geographic distribution, prescribed treatments, and healthcare utilization patterns.

Results: Males accounted for 63.7% of diagnosed cases, with a mean age at diagnosis of 8.7 years (range: 0.08-18). Asthma was the most common systemic comorbidity (40.3%), followed by allergic rhinitis (25.6%), ADHD (14.2%), and other atopic disorders (13.9%). Regionally, the highest prevalence was observed in the Central area (38.8%), followed by the Southern region (30.4%), Haifa (18.3%), and the Northern region (12.0%), with Eilat reporting the lowest incidence (0.33%). Ocular comorbidities, treatment approaches, and healthcare utilization costs will also be presented (currently being analyzed).

Conclusions: This large-scale analysis offers a comprehensive overview of pediatric allergic conjunctivitis in Israel, revealing significant gender and regional disparities alongside a high burden of systemic comorbidities. While the inherent limitations of big data studies necessitate cautious interpretation, these findings provide valuable insights into patient characteristics and healthcare utilization. Such insights are critical for informing targeted public health initiatives, optimizing resource allocation, and guiding future research in this population.

Parental Compliance with Preschool Vision Screening Test: A Prospective Study

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** These authors contributed equally to this work*

Purpose: To assess the barriers to parental compliance with preschool vision screening tests and the recommended follow-up eye care.

Methods: This prospective study included children aged 3–6 years attending 46 preschools. Parents were asked for consent for their children to participate in a vision screening test. Parents whose child did not participate due to lack of parental consent and parents whose child failed the screening test were contacted by telephone and given a standardized questionnaire to identify potential barriers to compliance.

Results: A total of 1,511 children (mean age 4.76 years} 0.76, 51.3% boys) were eligible for vision screening. Consent was given by the parents of 1295 children (85.7%). Lack of consent in children who had never been examined by an ophthalmologist was primarily due to unawareness of the screening test or other logistical reasons (117 cases, 92.1%). Of the children screened, 140 (11.1%) failed the test and 80.0% of their parents adhered to the recommended follow-up eye care. Parents who followed the screening vision test recommendations were more likely to be native language speakers (82.8% vs. 58.8% mothers and 88.9% vs. 60.0% fathers; $p = 0.049$ and 0.015, respectively). There was a higher chance of at least one parent being native-born if recommendations were followed (90.6% vs. 58.8%, $p = 0.004$). All other factors tested were insignificant.

Conclusions: Parental consent and cooperation with vision screening test and its recommendations were high. Migrant families are more likely to face challenges in following vision screening test recommendations, underscoring the need tailored approaches for specific populations.

Wait Times in Pediatric Ophthalmology Clinics: Insights from a Tertiary University Hospital

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2. Ruth and Bruce Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel
3. Tel-Aviv University-Faculty of Medicine, Tel-Aviv, Israel
4. Department of Ophthalmology, Rambam Health Care Campus, Haifa, Israel

Purpose: To analyze wait time (WT) trends at Pediatric Ophthalmology and Strabismus (POS) service clinics.

Methods: Retrospective observational study utilizing electronic health records (EHRs) from POS clinics at a tertiary university-affiliated hospital in Israel, during April 2016-June 2023. Data were collected by the qFlow real-time patient tracking system. Primary outcome measures were WTs trends.

Results: Data consisted of 19,018 patients, and the final cohort was 11,320 patients (49.51% female). Median age was 6 (IQR: 7) and median WT was 34.14 (IQR: 16.52-60.35) minutes. WT decreased during the pandemic ($p<0.001$). WT across different eye clinics at the POS service differed ($p<0.001$). Average WTs differed throughout the day: gradually decreasing from front desk opening until accepting patients, gradually increasing before noon, and followed by a gradual decrease. WTs fluctuated throughout the year with no clear pattern (31 minutes in May vs. 37 minutes in July, $p<0.001$). There was a significant, weak, negative correlation between patients' lateness and WT, suggesting late arrivals were admitted quicker ($R=-0.23$, $p<0.001$). Mean WT was not associated with gender ($p=0.93$) or religion ($p=0.11$).

Conclusions: WTs remained stable over the years. WTs at the POS service were significantly influenced by the time of day, month, type of clinic, and arrival time relative to the set appointment. WTs were significantly decreased during the COVID-19 epidemic. Personalized clinic schedules and adjusting for the complexity of needing both an orthoptist and ophthalmologist, may shorten WTs and encourage patients to avoid early arrivals.

The Progression of Premyopia Under Low-dose Atropine Eye Drops

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Purpose: To evaluate the effect of low dose atropine eye drops (LDA: %0.01) on the progression of premyopia as a precursor to myopia.

Methods: A retrospective study including children between 6-9 years presenting with premyopia. As part of our routine clinical practice in the past 3 years, we have offered LDA treatment for premyopic patients. The decision to accept LDA treatment is made by their legal caregiver. The children in our study were followed for 36 months at 6 month intervals for visual acuity, cycloplegic spherical equivalent refraction (SER) using cyclopentolate 0.1% and a complete ophthalmologic exam. Risk factors were assessed for myopia progression include family history of myopia, number of outdoors activity hours, and time of near work. We compared the premyopia progression of children treated with and without LDA (Control group). Statistical significance was defined as $p<0.05$.

Results: Fifty-six premyopic children with a mean age of 7.3±2.6 years in the LDA group, and 7.2±1.6 years in the Control group. The mean baseline refraction (LE) (before starting the eye drops) was - 0.1±0.5 diopters(D) and + 0.1±0.7D in the LDA group and Control group, respectively (p-ns). At the 12-month follow-up, SER was -0.2±0.5D and -0.4±0.7D for the LDA and control group, respectively. The changes in SER from baseline to one-year follow-up were, -0.16±0.53 and -0.75±0.71 for the LDA and Control groups, respectively ($p=0.4$).

Conclusions: In children age 6-9 years, LDA eye drops slowed the progression of premyopia. We suggest that myopia management should commence earlier in the premyopic phase.

Insights from Rural Ethiopia: Trends and Prevalence of Myopia Among South Ethiopian Children

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Purpose: Myopia is a common refractive error with significant implications for individuals and public health. In recent years, there has been a global surge in myopia prevalence. This study aims to examine myopia prevalence among a pediatric tribal population in southern Ethiopia over two periods: 2012-2019 and 2024, assessing the impact of environmental, educational, and post-pandemic factors.

Methods: Data were collected from 1,611 first-grade children (2012-2019) and 274 children (2024). Data included gender, age, visual acuity (VA) in each eye, and full refractive data. Myopia was defined as ≤ -0.50D in either eye, and prevalence was analyzed by period, gender, and location.

Results: This cross-sectional study reflects the prevalence and demographic patterns of myopia among first-grade schoolchildren in rural tribal southern Ethiopia. Between 2012-2019, myopia prevalence was low (1.4%). In 2024, myopia prevalence further decreased to 0.73%. Analysis of myopia prevalence showed an increase in mean age from 10.23 years (IQR: 5.75-12) in 2012-2019 to 13.64 years (IQR: 13.64-13.65) in 2024. VA improved over time, with 98.2% of participants in 2024 exhibiting normal vision in their better-seeing eye, compared to 70.5% in 2012-2019. There was no significant association between myopia prevalence and either gender or geographic distribution.

Conclusions: Myopia prevalence remained very low, likely due to limited formal education, a predominantly rural lifestyle, and extensive sunlight exposure. Notably, there was no significant post-COVID shift in myopia rates, reflecting the region's distinctive way of life. Pastoral tribal kids live mostly outdoor, herding the cattle with minimal access to tablets and smartphones, and many areas lack electricity. These findings highlight that traditional outdoor lifestyles may serve as a natural defense against myopia, reinforcing the importance of implementing vision care programs tailored specifically for rural communities.

Evaluating the Effect of a New Myopia Control Spectacle Lens Among Children in Israel: 24-Month Results

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6. Myopia Center, Petach Tikva, Israel
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Purpose: To investigate the effectiveness of a novel spectacle lens designed to slow the progression of myopia in children.

Methods: In this prospective, randomized, double blind clinical trial, one hundred twenty-six Israeli children aged 6-13 years with spherical equivalent (SER) refractive errors of –0.5 to –6.25 diopters (D) were randomized into either the Shamir Myopia Control (SMC) lens design group or the conventional single-vision spectacle lenses (SVL), the control group. Outcomes measured were changes in axial length and cycloplegic refraction as well as subjective rating of visual experience over a period of 24 months.

Results: After 24 months, in the subgroup of 6-10 year- olds, AL progression was slowed by 0.28mm (43%, $p < .001$) while SER progression slowed by 0.53 D (43%, $p < .05$) respectively. Similarly, for the subgroup of children with 2 myopic parents AL progression was slowed by 0.18mm (31%, $p < .001$) while SER progression was slowed by 0.55 D (43%, $p < .001$) respectively. For the entire group AL progression was slowed by 0.17mm (34%, $p < .01$) while SER was progression was slowed by 0.27 D (26%, $p < .05$). These results were similar to the results obtained at 12 months (AL slowed by 0.11mm (~35%) and SER slowed by 0.16 D (25%). Subjective visual experience reported in the -12 and -24month questionnaire revealed no difference between the SMC and SVL groups, and average daily wearing hours were also not different between the groups: 16.44 hours and 15.92 hours, respectively.

Conclusions: After 24 months follow up, SMC lenses were effective in slowing the progression of SER and AL, especially for younger children and those having 2 myopic parents. The subjective rating of visual experience and the daily duration of use reported by the SMC group at 12 and 24 months was similar to that of the SVL.

Association of Myopia with Anxiety and Mood Disorders in Adolescents

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Purpose: Myopia is a growing global health concern, yet its potential association with adolescent mental health remains underexplored. This study examines the relationship between myopia severity and the prevalence of anxiety and mood disorders in a large, nationwide adolescent cohort.

Methods: This cross-sectional study analyzed medical records of Israeli adolescents aged 16–20 years undergoing pre-military evaluations from 2011 to 2022. Myopia severity was categorized based on non-cycloplegic right eye spherical equivalent (SEQ) as mild (−0.75 ≥ SEQ > −3.00 D), moderate (−3.00 ≥ SEQ > −6.00 D), and severe (SEQ ≤ −6.00 D). Anxiety and mood disorders were diagnosed by psychiatric consultants per ICD-10 criteria. Logistic regression models estimated odds ratios (ORs) and 95% confidence intervals (CIs) for anxiety and mood disorders across myopia severity, adjusting for sociodemographic and anthropometric factors.

Results: Among 891,501 adolescents (57.7% male; mean age 17.2 ± 0.7 years), 279,419 (31.3%) had myopia, including 172,062 (19.3%) mild, 85,310 (9.6%) moderate, and 22,047 (2.5%) severe cases. Anxiety and mood disorders were more prevalent in adolescents with myopia than in those without (1.2% vs. 0.9% and 0.6% vs. 0.4%, respectively; P < .001 for both). The prevalence of both conditions increased progressively with myopia severity, with the highest rates observed in adolescents with severe myopia (P < .001). In adjusted models, the ORs for anxiety increased from 1.38 (95% CI, 1.31–1.46) in mild to 1.93 (1.73–2.15) in severe myopia, while the ORs for mood disorders ranged from 1.27 (1.17–1.37) to 1.81 (1.54–2.13). These associations remained significant across sexes, in adolescents with best-corrected visual acuity ≥6/9, and in those with no other health impairments.

Conclusions: Severe myopia is associated with higher rates of anxiety and mood disorders in adolescents. This dose-dependent relationship suggests that psychological support may be beneficial in select circumstances.

Isolated Infantile Onset High Myopia: A Case Series with Long-Term Follow-Up

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Purpose: Describe the natural course of isolated infantile onset high myopia (IIOHM) based on a long-term follow-up.

Methods: A retrospective cohort design was used. The clinical database of a single medical center was reviewed to identify all patients diagnosed with high myopia [equal or lower than a spherical equivalent (SE) of -5.0 diopters (D)] in both eyes under 5 years of age, from January 2007 to August 2021. Exclusion criteria were (1) follow-up of less than a year; (2) anisometropia of more than 3.0D, (3) astigmatism of more than 3.0D and (4) any systemic or ocular diseases that are associated with high myopia. Medical records were reviewed, and data were collected at presentation and every follow-up examination thereafter.

Results: Nineteen patients (38 eyes) were found eligible (10 boys, 52.6%). The mean age at presentation and follow-up were 2.6±1.2 and 6.3±1.6 years, respectively. There was an increase in the myopia between presentation and the end of follow-up [-8.4D (IQR -10.3, -6.4) vs. -9.5D (IQR -12.5, -7.5), respectively, p=0.003]. The median change in refraction was -0.6D (IQR -3.0, 0.5). Among the eyes that exhibited deterioration in the myopia (19 eyes), there was a negative correlation between the SE at presentation and the amount of progression during follow-up (P=0.01, rs=-0.54). There was no statistically significant difference in myopia progression between the age groups 2-5 and 6-8 years nor between 6-8 and 9-12 years of age. There was a trend towards a higher increase in myopia between 9-12 and 2-5 years of age (p=0.08). Mean best corrected visual acuity (BCVA) at the end of follow-up was 6/7.5. None of the patients had BCVA worse than 6/12 in both eyes. Three patients (15.8%) had BCVA worse than 6/12 in only one eye. A total of 9 patients (47.4%) had strabismus. None of the patients developed other potential complications secondary to high myopia.

Conclusions: IIOHM tends to remain stable in at least the first decade of life with good visual prognosis. Attention should be given mainly to amblyopia and strabismus during follow-up and to larger refractive changes towards the second decade of their lives.

CATARACT

Effect of Pupil Size and Corneal Spherical Aberrations on Premium Lenses' Optical Performance

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Purpose: To analyze the effects of pupil size and corneal spherical aberrations on premium intraocular lenses (IOLs).

Methods: The study involved in vitro wavefront acquisition of multiple IOLs, including Eyhance (Johnson & Johnson), Isopure (BVI), Luxsmart (Bausch & Lomb), RayOne EMV (Rayner), Vivity IQ (Alcon), ATLara (Zeiss), RayOne trifocal (Rayner), PanOptix (Alcon), Finevision (BVI), and ATLisa Tri (Zeiss). This data was acquired using the NIMO TEMPO system (Lambda-X, Nivelles, Belgium). Through-focus Modulation Transfer Function (MTF) curves were computed for 168 synthetic numerical eye models, with apertures ranging from 2 to 5.5 mm (in 0.5 mm increments) and corneal spherical aberrations spanning from -0.49 to 0.91 µm (in 0.07 µm increments).

Results: Each premium lens behaves differently under various optical conditions. Refractive Extended Depth of Focus lenses show a significant dependence on pupil size and corneal spherical aberrations, with a notable myopic shift observed in vitro, particularly in the LuxSmart lens. Diffractive lenses, even those described as pupil-independent, such as the ATLisa Tri, exhibit dependence on pupil size, especially under very small or very large pupil conditions.

Conclusions: The in vitro behavior of EDOF and multifocal lenses depends on corneal spherical aberrations and pupil size, and these factors must be considered when selecting a lens, as the behavior also varies with each IOL design. This consideration is particularly important when planning the implantation of premium IOLs after refractive corneal surgery, where corneal spherical aberrations may be pathological.

Detecting Alzheimer's Disease Through Raman Spectroscopy of Cataract-Extracted Lenses

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Purpose: Alzheimer's disease (AD) is characterized by accumulation of amyloid-β (βA) in the brain, which can also be detected in the eye. Here we propose the use of Raman spectroscopy imaging (RSI) based novel photonic sensing and analysis to measure in-vivo AD biomarkers in the eye.

Methods: Lens material was collected from 52 patients: 47 controls and 5 AD patients. Thirty-nine cortical lens samples were obtained during phacoemulsification cataract surgery, and 13 whole lenses were collected from extracapsular cataract extraction (ECCE) procedures. All samples were analysed using Raman spectroscopy to detect Aβ accumulation. Additionally, lenses from AD mouse models and wild-type mice were examined by RSI in vitro and in vivo. The measurement by RSI is non-invasive, analysing molecular composition by measuring light scattering, detecting vibrational energy shifts, and providing detailed chemical and structural information without damaging the sample. Validation was performed by mass spectrometry and immunostaining to confirm Aβ accumulation.

Results: Included 25 men 27 women, ages 52-92y (mean 74.5y). The 5 AD patients were clinically diagnosed. RSI revealed significantly higher Aβ accumulation in the lenses of AD patients as compared to healthy controls. In mice, RSI did not reveal Aβ accumulation in mice ages 6-12 months.

Conclusions: RSI successfully detected Aβ accumulation in the lenses of AD patients, but not in healthy controls, suggesting its potential for non-invasive early diagnosis of AD patients. Further research is needed to explore its use in vivo in humans. The mouse model can assist in better understanding of disease monitoring during follow-up.

IOL Power Calculation Accuracy in Patients with Keratoconus: Network Meta-Analysis and Systematic Review

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Purpose: To assess the accuracy of various intraocular lens (IOL) calculation formulas in patients with keratoconus (KCN) through a systematic review and quantitative synthesis of the published evidence through a network meta-analysis design.

Methods: The study was pre-registered in PROSPERO (CRD42023483119). PubMed, Embase and CENTRAL electronic databases were systematically searched for studies comparing IOL power calculation formulas in eyes with KCN. The percentage of eyes with a predicted error (PE) within ±0.50 D and ±1.00 D, the mean PE and the mean absolute error (MAE) were compared using a random effect model in Bayesian network meta-analysis.

Results: Nine retrospective clinical trials were included, totalling 623 eyes and 25 calculation methods. The Barrett True-K formula for KCN with measured posterior cornea (BTK MPC) achieved the highest ranking for the percentage of PE within ±0.50 D and ±1.00 D, mean PE, and MAE, with surface under the cumulative ranking (SUCRA) of 97% ,95% ,95% and 95%, respectively. Subgroup analysis showed that for the predictability rates within ±0.50 D and ±1.00 D, the best ranking formulas were: Emmetropia Verifying Optical (EVO) (85%) and BTK MPC (78%), respectively, in mild KCN; BTK with predicted posterior cornea (PPC) (85%) and MPC (88%), respectively, in moderate KCN; and Kane KCN for both metrics in severe KCN (84% and 95%, respectively).

Conclusions: The BTK MPC formula ranked highest across various metrics, suggesting its superior accuracy for IOL calculations in KCN. The optimal formulas may differ based on KCN severity, with current evidence suggesting potential advantage of Kane KCN for severe cases.

Refractive Outcomes Following Low Astigmatism Correction Guided by Toric Calculator Recommendations

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Purpose: Toric correction of 1.0 diopter is currently not FDA approved. We aimed to examine refractive outcomes in patients who underwent cataract extraction with a prescribed toric correction of 1.0 diopter as recommended by universally acknowledged toric calculators.

Methods: Retrospective study of patients who underwent cataract extraction with a toric intraocular lens (IOL) correction of 1.0 diopter in the IOL plane as recommended by a universally acknowledged toric calculator (the Barrett Universal II). Electronic patient charts were screened for preoperative and postoperative data, including visual acuity, refraction, biometry measurements and corneal tomography. The refractive outcomes of the study cohort were compared to a control group consisting of individuals with low astigmatism who had undergone cataract extraction employing a non-toric monofocal lens and another control group of eyes implanted with a standard toric IOLs (1.5-3.75 correction).

Results: 30 eyes with low toric IOLs were compared to 28 monofocal IOLs and 47 standard toric IOLs. The trimmed (tr) mean centroid prediction error in refractive astigmatism was similar between low and standard toric groups (0.04D@165 vs. 0.04D@63, p=0.241), as was the postoperative refractive astigmatism centroid (0.08D@104 vs. 0.13D@86, p=0.104). Low toric IOLs had lower tr-mean centroid and absolute postoperative refractive astigmatism than monofocal IOLs (0.08D@104 vs. 0.49D@175, p<0.29 ,0.001D vs. 0.84D, p=0.001). Simulation showed improved outcomes with low toric IOLs in the monofocal group: lower centroid astigmatism (0.11D @ 135, p=0.001) and absolute residual astigmatism (0.54D, p=0.009).

Conclusions: Correction of 1.0 diopter in the IOL plane proves as effective as correcting higher astigmatism with standard toric IOLs. Moreover, it yields superior refractive outcomes compared to patients eligible for this correction but fitted with monofocal lenses.

Examiner Awareness of Surgical Axis Affects Toric Intraocular Lens Misalignment Assessment: A Prospective Study

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Purpose: To investigate whether prior knowledge of the intended surgical axis affects postoperative Toric intraocular lens (IOL) misalignment measurements and to evaluate potential observer bias in clinical practice.

Methods: In this prospective study, 82 eyes of 82 patients undergoing cataract surgery with Toric IOL implantation were included. One examiner was aware of the intended surgical axis (non-blinded), while another was blinded to this information. At 1–4 weeks postoperatively, both examiners measured the IOL axis alignment by aligning the slit-lamp beam with the lens markings. Digital image analysis (ImageJ) was employed in the majority of cases for an objective assessment. Misalignment was defined as the difference between the postoperative IOL axis and the target axis recorded at the end of surgery.

Results: The blinded group

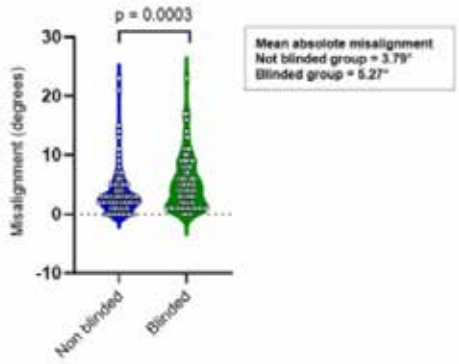

Figure 1. Violin plot showing the distribution of absolute misalignment from the surgical axis in Toric IOL measurements, comparing blinded vs. non-blinded examiners.

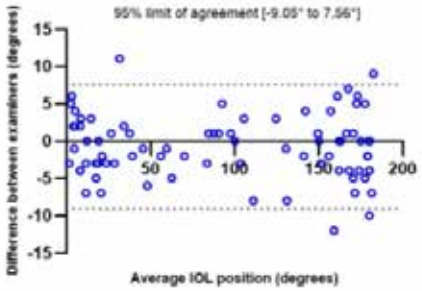

Figure 2. Bland-Altman plot illustrating the differences in postoperative Toric IOL axis measurements between blinded and non-blinded examiners. The dashed lines denote the limits of agreement (LoA), which range from -9.05° to +7.56° and indicate considerable variability.

exhibited significantly greater misalignment than the non-blinded group ($p = 0.0003$) (Figure 1). The overall mean difference in misalignment between these two groups, accounting for lens rotation direction, was 3.33° (95% CI: 2.73–3.92, $p < 0.0001$). Bland-Altman analysis (figure 2) showed wide limits of agreement between examiners' IOL axis assessments, ranging from -9.05° to +7.56°, while discrepancies were especially pronounced at higher and lower alignment axes. Subgroup analysis by astigmatism type (with the rule, against the rule, and oblique) demonstrated relatively consistent findings, with examiners aware of the surgical axis reporting smaller deviations.

Conclusions: Examiner awareness of the intended surgical axis can significantly influence the measurement of postoperative Toric IOL misalignment, potentially introducing systematic bias. These findings underscore the importance of using blinded or objective measurement strategies to ensure accurate assessment and optimize patient outcomes.

Comparing the Outcome of an EDOF IOL (Lucidis 108M) to a Diffractive IOL (FineVision)

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Purpose: To compare postoperative refractive and visual outcomes in patients undergoing cataract surgery with implantation of an extended depth of focus (EDOF) intraocular lens (Lucidis 108M) versus a diffractive multifocal intraocular lens (FineVision).

Methods: In this prospective study, patients who underwent cataract surgery between January 2022 and August 2024 received either the Lucidis 108M (EDOF) or FineVision (multifocal) IOL. All procedures were performed by the same surgeon at a single center. Inclusion criteria were age >40 years, axial length between 21 and 25 mm, and expected postoperative astigmatism ≤1.5 diopters. Baseline parameters and intraoperative parameters were compared between the two groups. Postoperative refractive outcomes (sphere, cylinder, axis, and spherical equivalent) and visual acuities (UDVA and CDVA) were assessed. In addition, monocular, distance-corrected defocus curves were generated by sequentially introducing lenses from +1.0 D to –3.0 D under controlled lighting. Subgroup analyses based on residual astigmatism.

Results: Seventeen patients were included per group, yielding 24 eyes in the FineVision group and 25 eyes in the Lucidis group. Baseline characteristics were similar between groups. Postoperative UDVA (0.84 ± 0.27 vs. 0.77 ± 0.24, p = 0.25) and CDVA (0.96 ± 0.15 vs. 0.97 ± 0.15, p = 0.77) did not differ significantly. Refractive parameters, including sphere, cylinder, axis, and spherical equivalent, were also comparable. Monocular defocus curves for both IOL types largely overlapped; however, in eyes with a residual cylinder of –0.5 D, the FineVision group achieved significantly better visual acuity at specific defocus levels. Cumulative analysis revealed a higher proportion of FineVision eyes reached UDVA of 0.6 or better and CDVA of 1.0 or better.

Conclusions: Both the EDOF Lucidis 108M and diffractive multifocal FineVision IOLs provided comparable overall refractive and visual outcomes after cataract surgery, with subtle advantages observed for FineVision in certain subgroups. These findings suggest that IOL selection should be tailored to individual patient needs and visual demands.

Fighting for the Bag: Visual Outcomes of Capsular Bag Scleral Fixation with Ahmed Segments and Flanges in Patients with Zonular Weakness—A Retrospective Case Series

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Purpose: For the past few decades, in-the-bag intraocular lens (IOL) implantation has been the standard of care in cataract surgery. However, achieving this goal is more challenging in patients with significant zonular weakness. To address this challenge and preserve the anatomical structure of the capsular bag, we employed a novel surgical technique of scleral fixation of the bag using Ahmed segments with flanges. We report the surgical technique and the visual outcomes of capsular bag scleral fixation using Ahmed segments and flanges in patients with severe zonular weakness.

Methods: Patients with zonular weakness who underwent cataract surgery and had the capsular bag fixated to the sclera using an Ahmed segment with flanges, were included. Medical records were reviewed, and pre- and postoperative data were collected. One or two Ahmed segments were used, fixated to the sclera with 6-0 polypropylene sutures, positioned 1.5 mm from the limbus, in addition to capsular tension ring implantation. The primary outcome was postoperative uncorrected visual acuity. Secondary outcomes included corrected visual acuity, refractive outcomes, IOL position, and postoperative complications.

Results: Twenty-one eyes of twenty patients were included in the study, with a mean age of 75 years and 57% male participants. In fourteen (67%) eyes, zonular weakness was secondary to pseudoexfoliation syndrome. Ocular trauma was the second most common cause (10%). The average follow-up period was 228 days. At the final follow-up, all IOLs were centered and showed no significant tilt. The mean uncorrected visual acuity was 20/50, and the mean spherical equivalent was -0.69D. One patient experienced toxic anterior segment syndrome, one patient developed cystoid macular edema, and two patients experienced a deterioration of pre-existing glaucoma following surgery.

Conclusions: Capsular bag fixation using Ahmed segments and flanges is an effective and feasible technique, even in complex cases. It ensures the stability of both the capsular bag and the IOL, allowing patients to achieve the best possible visual acuity under challenging circumstances.

The Impact of Preferred Music on Stress, Pain, and Anxiety Levels During Cataract Surgery

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Purpose: Our research aims to examine both subjectively and objectively the impact of listening to preferred music during cataract surgery on patients' stress, anxiety, and pain levels. This study aims to provide insights into music's potential benefits as a non-invasive intervention in ophthalmic surgical settings.

Methods: This randomized study involved patients undergoing uncomplicated cataract surgery. Participants rated their stress, anxiety, and pain levels using questionnaires before and after surgery. Blood pressure, heart rate, and oxygen saturation were measured before, during, and after the procedure. Half of the patients listened to their chosen music upon entering the operating room and during the surgery, while the other half did not. All operations were performed by four experienced cataract surgeons. The study design and methodology allowed for direct comparison of music's impact on both subjective patient experiences and objective physiological responses during cataract surgery.

Results: A total of 126 patients were recruited, with 72 (57.1%) being female. The average age was 72.3 (SD=8.2) years. 61 patients (48.4%) listened to their chosen music during surgery. In the evaluation of subjective measures, an increase in feelings of stress, anxiety, and pain was observed, with a greater magnitude in the group of patients who did not listen to music during surgery. The differences in anxiety (-0.44 vs 0.69, P=0.02) and stress (-0.05 vs 1.06, P=0.03) levels between the groups, compared to preoperative reports, were found to be statistically significant. In contrast to the subjective measures, no significant differences were observed in the average values of the objective measures between the groups.

Conclusions: We found that listening to preferred music during cataract surgery can reduce the subjective perception of stress, anxiety, and pain. However, objective hemodynamic measures did not demonstrate the same trend. Therefore, music may serve as a non-invasive method for relaxation in the operating room.

The “Suspension Suture” - A Novel Technique for Intraocular “Bunny” Lens (IOL) Fixation Using Polytetrafluoroethylene (PTFE) Sutures

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Purpose: Intraocular lens (IOL) dislocation occurs when the IOL shifts from its intended position, leading to visual disturbances such as blurred vision and glare. This can result from various factors, including pseudoexfoliation syndrome or prior ocular surgeries. In cases where capsular support is inadequate, scleral fixation is required to stabilize the IOL. Traditional multiple-suture techniques can cause uneven haptics tension or IOL folding, affecting optical integrity and visual outcomes. To address these challenges, we present a novel single continuous PTFE suture technique for 4-point scleral fixation, aiming to enhance lens stability, reduce surgical complexity, and improve postoperative outcomes. This study evaluates the feasibility and early outcomes of our new approach in five patients.

Methods: Five patients (ages 63-82) with dislocated IOLs due to pseudoexfoliation syndrome and prior vitreoretinal procedures underwent IOL removal or exchange, followed by -4point scleral fixation using our newly developed single continuous 6/0 PTFE suture technique. This technique uses a single uninterrupted suture, ensuring even distribution of tension across all four haptics, thereby preventing IOL tilt or folding. The new IOLs were precisely centered along the axis between two pairs of sclerotomies, placed 7 mm apart, promoting self-centration and enhanced long-term fixation stability.

Results: At one-month follow-up, all IOLs remained well-centered, with no significant intraoperative or postoperative complications. Three patients demonstrated notable improvements in best corrected visual acuity (BCVA), progressing from counting fingers or hand motion to 0.1-0.32, while two patients maintained stable vision without further decline.

Conclusions: Our new single continuous PTFE suture technique for 4-point scleral fixation offers a simplified, efficient, and effective alternative to conventional IOL fixation methods. By providing stable lens centration, reducing surgical complexity, and minimizing complications, this approach has the potential to significantly improve outcomes in complex lens dislocation cases.

Going Off-spectrum: Use of Infra-red Illumination in Cataract Surgery

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Purpose: To present initial outcomes of cataract surgery performed using infra-red illumination, which has been incorporated into a 3D head-mounted display (HMD) system.

Methods: A retrospective analysis of consecutive cataract cases performed using the infra-red 3D HMD system, including surgical outcomes and surgeons' impressions of performing cataract procedures using infra-red illumination.

Results: Sixteen eyes of 16 patients were included. All procedures were uneventful. There were no postoperative complications. Best-corrected visual acuity improved from 0.35 [0.20] logMAR to 0.10 [0.13] logMAR ($p<0.001$) with a mean improvement of 2.5 [1.6] ETDRS lines.

Conclusions: Use of infra-red illumination was safe and effective in cataract surgery.

OCULOPLASTICS I

Long Term Recurrence Rates of Thyroid Orbitopathy After Full Tepezza Treatment Course for Thyroid Eye Disease

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Purpose: Teprotumumab (TEPEZZA) is the first FDA approved treatment for Thyroid Eye Disease (TED) and its significant impact on disease activity and proptosis reduction are widely published. Real world long term follow-up to guide treatment strategies is still lacking.

Methods: A retrospective clinical case series of active TED patients who were treated with TEPEZZA 8 cycles in two tertiary medical centers. Their baseline characteristics (sex, age, smoking habits) as well as pretreatment clinical activity levels (CAS), Proptosis, visual acuity and motility were further documented before and after completion of 8 cycles of TEPEZZA and after 12-16 months from the last cycle.

Results: In 14 of 14 eyes of 7 patients that completed 8 cycles of TEPEZZA, there was a good clinical response to TEPEZZA treatment with significant reduction in CAS, alongside with regression in proptosis as compared to pre-treatment measurements. These findings are in accordance to previously published clinical studies on the positive effects of TEPEZZA in TED's patients. Nevertheless, 9 eyes of 5 patients, who completed the full TEPEZZA treatment course sustained significant recurrence of proptosis 12-16 months after completion of full treatment course and in some even exceeding their pre-treatment hertel measurements. In 5 patients the CAS levels remained low and indicative of non active TED and in 2 patients there was a rise in CAS indicating an active disease level.

Conclusions: Among TED patients with moderate to severe active disease and significant proptosis who were treated with full course of TEPEZZA and primarily achieved significant reduction in proptosis and regressed to non active disease the significant proptosis reduction effect dissipated after 12-16 months in 64% eyes during a long term follow-up. These recurrence rates of proptosis are significantly higher than previously widely reported in TEPEZZA clinical trials and the OPTIC studies that included pooled long term data.

Autoantibody-Negative Thyroid Eye Disease: A Presumed Subgroup with Unknown Pathogenesis

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Purpose: To investigate the clinical characteristics of patients with clinical evidence of thyroid eye disease (TED) who lack systemic thyroid dysfunction (hyperthyroidism or hypothyroidism) and whom all autoantibodies typical of endocrinopathy are negative.

Methods: A retrospective analysis of all patients evaluated at the multidisciplinary thyroid eye clinic at Sheba Medical Center between 2018 and 2024. Patients with clinical TED but negative endocrinologic and serologic findings (presumed TED, Group 1) were compared to TED patients with confirmed thyroid dysfunction and positive autoantibodies (Group 2).

Results: A total of 369 patients (224 females, 61%; mean age 49 years) were included. Of these, 26 (7%) had presumed TED, and two additional patients developed autoantibodies during follow-up. Male gender was significantly more prevalent in Group 1 (57% vs. 26%, P=0.001). No significant differences were observed between groups in age, visual acuity, color vision, inflammatory signs, diplopia, or exophthalmos. Similarly, changes in visual acuity, intraocular pressure, and exophthalmos between initial and final visits did not differ significantly. Patients in Group 1 were less likely to undergo medical or surgical treatment (P=0.057). TSI levels in Group 2 decreased by an average of 421% over a mean follow-up of 28 months.

Conclusions: This research identified a distinct subset of patients with clinical and radiologic features of TED but without thyroid dysfunction or detectable autoantibodies, comprising 7% of all TED cases. Further research is needed to uncover novel autoantibodies or alternative mechanisms underlying TED pathogenesis in this population.

NEURO-OPHTHALMOLOGY

Hypoperfusion States are Risk Factors for Non-Arteritic Anterior Ischemic Optic Neuropathy

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Purpose: While cardiovascular risk factors (such as hypertension, diabetes mellitus, and obstructive sleep apnea) are well-established risk factors for NAION, the association between NAION and states of hypoperfusion is underexplored. We intended to investigate this potential association.

Methods: This retrospective case-control study analyzed all electronic medical records of Clalit Health Services (CHS) from 2001 to 2022. Patients diagnosed with NAION were matched in a 1:4 ratio by year of birth and sex, using propensity score analysis to adjust for various comorbidities. Events of hypoperfusion occurring in the month prior to the diagnosis of NAION were categorized into two physiological mechanisms: decrease in SVR or a decrease in cardiac output due to cardiac dysfunction or diminished preload (attributed to hypovolemia). Conditional logistic regression was used to explore differences between the groups.

Results: A total of 1,374 patients diagnosed with NAION and 5,496 matched controls were included in the study. We found a nearly 6.5-fold increase in the likelihood of NAION in association with events of hypoperfusion that occurred in the month period leading to the diagnosis of NAION (odds ratio [OR] 95% ;6.48 confidence interval [CI]: 5.05-8.32). In particular, the group of patients with cardiac dysfunction (OR 6.47; 95% CI: 4.63-9.04) and the group with hypovolemia (OR 6.1; 95% CI: 4.08-9.13) emerged as having the most substantial risk factors. The group with decreased SVR (OR 4.64; 95% CI: 2.84-7.59) was also strongly related with NAION. Cerebrovascular accident emerged as an independent significant risk factor for NAION (OR 16.1; 95% CI: 10.8-24).

Conclusions: Hypoperfusion states are significant, independent risk factors for NAION.

Fluorescein Angiography Poorly Differentiates Between Mild Cases of True Versus Pseudo-Papilledema

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Purpose: Fluorescein angiography (FA) has been reported to be an effective tool in the diagnosis of papilledema. We sought to assess its reliability in mild cases, particularly the ability to differentiate true vs pseudo-papilledema.

Methods: A retrospective review was conducted to identify any case within the past 10-years that underwent FA for assessment of mild papilledema, defined as fundus features corresponding to Frisen grade one or two. All included cases had undergone a workup to allow for a clear diagnosis of either true or pseudo-papilledema. The FA scans were presented to five senior retina specialists who were asked to rate for the presence of leakage, staining, microaneurysms, and capillary dilation in each scan on a five-point Likert scale. The specialists were masked to all other clinical information regarding the patient, including the final diagnosis.

Results: Imaging of thirty-eight eyes (nineteen patients) was included in the study. There was an equal distribution of true vs pseudo-papilledema. Interclass correlation scores (ICC) for leakage, staining, microaneurysms and capillary dilation were 0.479, 0.261, 0.037 and 0.141 with p-values of <0.001, <0.001, 0.224 and 0.001 respectively. Fleiss kappa scores for inter-rater agreement on the presence of true optic disc swelling based on the presence of leakage, staining, microaneurysms and capillary dilation were 0.24, 0.201, -0.056 and 0.098 with p-values of 0.001, 0.006, 0.444 and 0.094 respectively.

Conclusions: FA is a poor tool for the differentiation of mild true vs pseudo-papilledema.

Steroid Treatment Limits Permanent Esotropia Following Idiopathic Sixth Nerve Palsy in Children

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Purpose: Many cases of pediatric sixth nerve palsy are not accompanied by other ophthalmic or neurological abnormalities, often presenting after a viral illness, immunization or without a recognizable cause. Most of these palsies resolve completely within a 6-month period; however, some of these palsies are expected to recur. It is currently unclear what is the risk of recurrence and whether interventions, such as steroid treatment during the acute event shorten recovery time, reduce the risk of recurrence, and limit development of permanent esotropia.

Methods: A retrospective analysis of all consecutive cases of idiopathic pediatric sixth nerve palsy treated at Schneider Children's Medical center from 2016 – 2024. Analyzing recurrence rate, steroid treatment effects and permanent sequelae.

Results: 28 children (16 girls, 57%) with idiopathic isolated sixth nerve palsy, all unilateral (22 left side, 79%), were included in this study. Mean age at initial presentation was 2.7 ± 2.3 years. All palsies resolved completely after 3.2 ± 3.1 months. Ten children (36%) had recurrent sixth nerve palsy (50% girls, 90% left side), always on the same side, after a mean period of 9.9 ± 5.3 months. Sixteen children (57%) received oral steroids (Danalone) during their initial presentation. Rate of recurrence was not statistically different in children treated (44%) compared with children not treated (25%, p=0.43). However, rate of residual esotropia larger than 10 prism diopters was greater in children not treated with steroids. Only one child (6%) had large residual esotropia after steroid treatment, compared with six children (50%) that were not treated with steroids (p=0.02).

Conclusions: Approximately a third of idiopathic pediatric sixth nerve palsies will recur on the same side, usually within a year of initial presentation. Steroid treatment during the acute event does not seem to reduce the risk of recurrence; however, significantly limits development of large angle esotropia and the need of its surgical correction.

Diagnostic Accuracy of Ophthalmology Residents in Neuro-ophthalmology

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Purpose: To evaluate the accuracy of neuro-ophthalmological diagnosis of ophthalmology residents throughout all years of residency and determine what factors correlate with an incorrect diagnosis.

Methods: Consecutive medical records containing the information of all patients seen in the emergency department (ED) from December 27, 2022, to March 3, 2023, were examined retrospectively. The resident's neuro-ophthalmological diagnostic accuracy was noted and compared to diagnostic accuracy in all other subspecialties, divided into two major categories: "agree" and "disagree" compared to the follow-up diagnosis by an attending. Factors that could predict a lower diagnostic accuracy were also examined.

Results: In the analysis, 305 records of patients with eye conditions from all ophthalmological subspecialties were included. Residents were less accurate in their diagnosis of neuro-ophthalmological cases (67.5%) in comparison to non-neuro-ophthalmological cases (84.8%) (p=0.008). A higher agreement rate was seen during the week (86%) compared to the weekend (74.2%) (p=0.012) and in years 3 (90.5%) and 4 (87.3%) compared to the first, 71.4%, and second, 80.2%-year residents (p=0.025). and there was no significant difference in diagnostic accuracy based on the patient's arrival hour (p=0.222) or if the patient was referred by an attending physician (p=0.859).

Conclusions: In this study, we found that residents have a higher medical mistakes rate in neuro-ophthalmological diagnoses and the high inaccuracy rate was correlated with a lack of clinical experience. These results suggest the need for educational changes to address young ophthalmology residents' needs in order to improve patient safety.

Mesenchymal Stem Cell Therapy for Severe Steroid-Resistant Optic Neuritis: A Case Report

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Purpose: Optic neuritis is an inflammatory condition of the optic nerve that can result in significant visual loss. While corticosteroids, plasma exchange (PLEX), intravenous immunoglobulins (IVIG)and immunomodulatory treatments are standard therapies, some cases show progressive deterioration despite intervention. Mesenchymal stem cell (MSC) therapy has shown potential for neuroprotection and repair. This case highlights a young patient with severe optic who achieved substantial visual recovery following MSC treatment.

Methods: Case report.

Results: A previously healthy 15-year-old male presented with ataxia and left hemianopsia. MRI revealed a few demyelinating lesions in the cerebral white mater including a large lesion in the right optic radiation. Initial treatment with high-dose steroids and PLEX led to recovery of hemianopsia but still under PLEX cycles and tapering of prednisone he presented with No light perception in his left eye with a new enhancement of the left optic nerve. Anti-MOG and anti-aquaporin-4 antibodies were negative. Despite additional therapy with IV steroids, PLEX, IVIG and rituximab (MabThera®), there was minimal improvement. Given the severity of vision loss and lack of response to conventional treatments, he underwent MSC therapy via both blood and intrathecal spinal administration. Following MSC treatment, the patient demonstrated significant visual improvement. His visual acuity improved from NLP to 6/12 in the affected eye, with substantial recovery of his visual fields.

Conclusions: This case highlights the potential of mesenchymal stem cell therapy as a novel treatment modality for severe optic neuritis. The dramatic visual recovery observed emphasizes the need for further investigation into stem cell-based neurodegenerative strategies in ophthalmology. We will review the literature and experience with this treatment.

Is OCT Helpful in Diagnosing Papilledema in Children?

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Purpose: Distinguishing true papilledema from pseudo-papilledema, such as optic disc drusen, is crucial due to the potentially life-threatening implications of papilledema. Optical coherence tomography (OCT) is commonly used for assessing optic disc edema in adults, but its effectiveness in children is uncertain due to limited studies and a lack of standardized reference values. Additionally, the significance of peripapillary hyper-reflective ovoid mass-like structures (PHOMS) on OCT remains unclear. The study aims to assess whether retinal nerve fiber layer (RNFL) thickness measurements can differentiate between papilledema and pseudo-papilledema in pediatric patients and to evaluate the prevalence of PHOMS as a potential diagnostic marker.

Methods: We retrospectively reviewed the medical records of pediatric patients (ages 3-18 years) evaluated for suspected papilledema at a tertiary medical center between January 2016 and December 2023. All patients included in the study underwent OCT at initial assessment before any intervention, including lumbar puncture. OCT Images were acquired using Spectralis© OCT (Heidelberg Engineering Inc, Heidelberg, Germany), with enhanced depth imaging (EDI) used to assess optic disc drusen (ODD) and PHOMS. Additional diagnostic tests, including ocular ultrasound and fundus autofluorescence, were recorded when available.

Results: Among 523 patients records retrieved by MDClone© search, 84 patients met inclusion criteria: 49 with papilledema and 35 with pseudo-papilledema. Patients with papilledema had significantly higher RNFL thickness, with the superior quadrant showing the highest diagnostic accuracy (AUC: 0.926). PHOMS prevalence did not significantly differ between groups.

Conclusions: Peripapillary RNFL thickness, particularly sectoral and worst-eye measurements, is a reliable non-invasive tool for differentiating papilledema from pseudo-papilledema in children. However, OCT alone is insufficient, emphasizing the need for clinical correlation.

Efficacy of Hyperbaric Oxygen Therapy for Retinal Artery Occlusion: A 20-Year Retrospective Analysis

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Purpose: Retinal artery occlusion (RAO), including central (CRAO) and branch (BRAO) occlusions, is a vision-threatening emergency with no consensus on optimal treatment. Treatments include conservative measures such as ocular massage, anterior chamber paracentesis, and hyperventilation, as well as emerging interventions like thrombolysis with tissue plasminogen activator (tPA). Hyperbaric oxygen therapy (HBOT) has been long proposed to enhance oxygen delivery to ischemic retinal tissues and limit neuronal damage. While some studies suggest benefits, its effectiveness remains debated. This study evaluates HBOT's impact on visual acuity (VA) outcomes in RAO patients.

Methods: This retrospective cohort study included 231 patients diagnosed with non-arteritic RAO, treated at a tertiary medical center (January 2001–May 2023). Patients were categorised into HBOT-treated (n=134) and non-HBOT (n=97) groups. The primary outcome was the change in best-corrected visual acuity (BCVA) from presentation to final follow-up. Secondary outcomes included percentage of patients with vision improvement ≥3 lines and percentage of patients achieving final VA ≤0.3 logMAR.

Results: Among 231 patients, mean age was 68.36 ± 15.26 years. Initial BCVA was worse in the HBOT group (2.16 ± 0.72 logMAR) than in the non-HBOT group (1.23 ± 1.04 logMAR, $p<0.001$). Following treatment, BCVA improved to 1.48 ± 1.06 logMAR in the HBOT group ($p<0.001$) and 1.06 ± 1.01 logMAR in the non-HBOT group ($p<0.001$). 51.5% of HBOT patients improved by ≥3 lines, compared to 16.5% in the non-HBOT group ($p<0.001$). 30.6% of HBOT patients achieved final VA ≤0.3 logMAR, while this was observed in 43.3% of non-HBOT patients ($p=0.065$). In the HBOT group, worse BCVA at presentation and earlier treatment correlated with greater VA improvement ($p=0.002$ and $p<0.001$ respectively), and more HBOT sessions were associated with better outcomes ($p<0.001$). Older age and CRS presence were linked to poorer prognosis ($p<0.001$).

Conclusions: HBOT is a safe and effective treatment for acute RAO, particularly with early intervention.

GLAUCOMA

Comparison of Online Circular Contrast Perimetry with Standard Automated Perimetry in Clinic and Home Setting

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Purpose: Background: Online circular contrast perimetry (OCCP) is a novel, validated perimetry application that allows visual field testing on any computer or tablet without additional hardware. Purpose: To evaluate the diagnostic accuracy and user experience of 24-2 OCCP performed on a computer screen, and to compare its performance with Standard Automated Perimetry (SAP).

Methods: This prospective cohort study included adults and children with glaucoma or neuro-ophthalmological disorders. Participants underwent SAP testing using the Humphrey Visual Field Analyzer in a clinical environment, followed by two OCCP tests in-clinic and one or two OCCP tests at home within 2 weeks. Global visual field indices, including mean deviation (MD), pattern standard deviation (PSD) and visual field index (VFI) were compared.

Results: A total of 66 patients were included. These were comprised of 35 patients with glaucoma and 31 patients with neuro-ophthalmological disorders (including 12 children). At baseline, there was strong agreement between SAP and OCCP parameters, with intraclass and Pearson correlation ranging from 0.70 to 0.97 for MD, PSD, and VFI ($p < 0.001$). Agreement was excellent in the pediatric subgroup, with correlations ranging from 0.81 to 0.97. Repeatability of OCCP was strong, with intraclass and Pearson correlations of MD over time ranging from 0.77 to 0.87 for in clinic testing ($p < 0.001$), and moderate to strong (0.57, $p=0.1$; to 0.85, $p<0.001$) for at home testing. At-home results were affected by a low participation rate for the second at-home test (n=9).

Conclusions: OCCP provides a convenient, accurate, and user-friendly alternative to traditional SAP, enabling effective home-based visual field testing. This approach holds promise for expanding access to glaucoma and neuro-ophthalmological care, particularly for longitudinal monitoring and in resource-limited settings. OCCP is user-friendly and accurate for perimetry in children. Patients may require additional support to achieve desired adherence to at-home monitoring protocols.

Evaluating Compliance in Glaucoma Treatment: Big Data Analysis of Prescription Patterns and Influencing Factors

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Purpose: Glaucoma is a major cause of irreversible blindness, with treatment relying on intraocular pressure-lowering eye drops. However, patient noncompliance remains a challenge, influenced by clinical and demographic factors. Understanding prescription patterns and adherence behaviors through big data analysis can help optimize treatment strategies. This study aimed to evaluate compliance with anti-glaucoma eye drop medications in a large health service cohort, focusing on prescription-fulfillment patterns and influencing factors.

Methods: An initial cohort of all Maccabi Health Services patients with glaucoma diagnoses aged 18 years and older was assessed, resulting in 109,425 patients. The final dataset included 79,752 patients with a minimum follow-up of 365 days after the diagnosis date. Compliance with anti-glaucoma eye drop medications was assessed by comparing prescription fulfillment rates within predefined time gaps (1–3 months) and calculating cumulative percentages of fulfilled prescriptions. Statistical regression analysis was performed to evaluate the compliance rate while controlling for confounders.

Results: Of the 79,752 glaucoma-included patients, 40,200 (50.4%) purchased at least one prescription during the follow-up period and were further analyzed. Most patients had fulfilled more than 80% of their total given prescriptions. Patients ≥70 years and patients with additional comorbidities exhibited increased compliance. Frequent IOP monitoring and alterations in prescribed medications were also linked to improved compliance rates. Cox regression revealed higher hazard ratios for compliance failure among patients with reduced clinical monitoring or fewer follow-ups. Survival analysis highlighted a progressive increase in noncompliance over time, with stricter prescription fulfillment gaps resulting in higher failure incidences.

Conclusions: Glaucoma patients exhibit high compliance with therapy, influenced by clinical and demographic factors. Frequent monitoring and personalized interventions, such as treatment adjustments and targeted follow-ups, may enhance compliance and improve long-term outcomes for glaucoma patients.

Treatment Approaches for Large Traumatic Cyclodialysis Clefts in Phakic Eyes: A Systematic Review

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Purpose: Cyclodialysis clefts (CDCs) are relatively rare and serious ocular pathologies arising from a detachment between the ciliary body and the scleral spur, frequently resulting in hypotony and risk of escalation to maculopathy. The most common causes of CDC are blunt trauma and iatrogenic injuries. Large clefts in phakic eyes are particularly challenging to treat due to limited knowledge on the optimal treatment approach.

Methods: A systematic review.

Results: We reviewed all reports published since 2000 that were written in English and appeared in peer-reviewed journals. The review included 40 cases describing the treatment of a large cyclodialysis cleft (defined as ≥ 180° or 6 clock hours) in phakic eyes resulting from non-iatrogenic trauma in patients over 14 years old. Cases were excluded if they lacked documentation of cleft extent, post-repair intraocular pressure (IOP), or sufficient details on the surgical repair technique. Mean age was 39.8 years (range 15-66 years), seven were females (17.5%) and two unmentioned (5%). Average IOP prior to intervention was 3.95 mmHg. The treatment methods included: vitrectomy ± lensectomy ± cryopexy ± tamponade (13/40), direct cyclopexy (12/40), scleral buckle ± lensectomy (3/40), a combination of scleral buckle and vitrectomy ± lensectomy ± cryopexy ± tamponade (3/40), pneumatic cyclopexy ± cryotherapy ± lensectomy (3/40), sulcus capsular tension ring or intraocular lens ± lensectomy (40/3), internal/external laser (2/40) and cryotherapy (1/40). Thirty-six cases achieved successful cleft closure with a single operation. Two cases of direct cyclopexy and two cases of pneumatic cyclopexy ± cryotherapy ± lensectomy required reintervention.

Conclusions: Several treatment options are available for managing a large traumatic cyclodialysis cleft in a phakic eye. A structured and systematic approach is essential when reporting such cases to enhance treatment success in this rare pathology.

Risk of Vision Loss After Different Glaucoma Surgeries in Very Advanced Fixation-involving Disease

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Purpose: The prevalence of vision loss after glaucoma surgery in very advanced disease remains largely indeterminate owing to differences in methodology across different studies. The object of this study was to evaluate the risk of all cause vision loss in these patients, specifically from glaucoma progression.

Methods: Charts of patients with very advanced glaucoma who underwent glaucoma surgery were included in the analysis. Visual field inclusion criteria were based on available tests. For a 24-2 field a mean deviation (MD) of less than -15 dB with involvement of at least two fixation points was required. For a 10-2 field involvement of both hemispheres or of one hemisphere with involvement of at least one fixation point was required. The main outcome measure was defined as loss of 2 Snellen lines six months after surgery. Severe vision loss was defined as glaucoma-related irreversible vision loss below 1.0 logMAR. Subgroup analysis was performed for risk factors related to vision loss.

Results: A total of 174 eyes of 150 patients were included in the analysis. Average age was 70 (SD = 11.8). Average visual field mean deviations were -23.2 (SD=4.5) for 24-2 and -17.4 (SD=7.5) for 10-2. Surgeries performed were Gonioscopy-assisted transluminal trabeculotomy (GATT) (30.5%), Trabeculectomy (27.6%), PreserFlo microshunt (21.3%), Ahmed glaucoma valve (AGV) (14.4%), Xen (5.7%) 45 and iStent (0.6%). At 6 months, 20.1% of patients experienced vision loss of 2 lines or more. Glaucoma related vision loss was 6.3%, and severe vision loss occurred in 4.3%. A diagnosis of angle closure glaucoma and worse mean deviation on 24-2 and 2-10 fields were associated with higher risk of vision loss at 6 months post- surgery. Worse mean deviation on 10-2 visual field was associated with severe vision loss.

Conclusions: The incidence of severe irreversible vision loss after glaucoma surgery in patients with very advanced disease is an uncommon but concerning phenomena. Worse mean deviation at baseline is associated with a higher risk of surgery related vision loss.

Surgical Outcomes of Gonioscopy-Assisted Transluminal Trabeculotomy (GATT) Over Long Follow-Up

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Purpose: Purpose: Gonioscopy-assisted transluminal trabeculotomy (GATT) is a minimally invasive, ab-interno, conjunctival-sparing surgical technique for glaucoma management. We conducted a retrospective study to evaluate the long-term efficacy of GATT in patients with follow-up of up to five years.

Methods: Methods: This study included patients who underwent GATT with or without cataract extraction with a minimal follow-up of 730 days. Surgical success was defined as achieving a final IOP ≤18 mmHg with either a 30% reduction from baseline on the same or fewer glaucoma medications, or an IOP within 1 mmHg of baseline on fewer medications. Re-operation for IOP control was considered a failure.

Results: Eighty-five eyes of 73 patients were included in the analysis. Mean age was 67 (± 15.2) years, and average follow-up was of 3.2 years. Eighteen patients (22 eyes) underwent SOLO GATT, while 55 patients (63 eyes) underwent GATT combined with cataract extraction. Seventy five percent of the patients in the study had moderate or severe glaucoma. The mean preoperative IOP was 24.6 mmHg (± 4.3), which decreased to 14.2 mmHg (± 3.7) at final follow-up. The average number of glaucoma medications decreased from 3.1 (± 1.2) preoperatively to 1.4 (± 0.9) postoperatively. The overall success rate was 65%. The success rate for combined surgeries was 58%, and the success rate for SOLO-GATT surgeries was 71%. Five patients required additional IOP-lowering surgery, including two Ahmed glaucoma valve (AGV) implantations, two re-GATT surgeries, and one trabeculectomy.

Conclusions: Conclusion: GATT achieved sustained IOP and medication reduction with up to five years of follow up. GATT was effective in different types of glaucoma and across all severities.

5Fluorouracil (5FU) Injection During Cataract Surgery for Patients with Previous Trabeculectomy: A Comparative Case Series

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Purpose: Approximately 50% of patients undergoing trabeculectomy will require cataract surgery within the first 5 years. Approximately a third of trabeculectomies fail after cataract surgery, due to inflammation causing fibrosis of filtration area. 5FU injections can be used during cataract removal or thereafter to decrease fibrosis.

Methods: This is a retrospective study reviewing patients with a functioning trabeculectomy and later cataract surgery. Patients were included between 2013 and 2024. Patients records were reviewed for demographic information, time from trabeculectomy to cataract extraction, IOP and use of glaucoma medications.

Results: 23 patients with a prior trabeculectomy underwent cataract extraction, 12 patients received a 5FU injection during cataract extraction, 11 did not. 55% (12) were male. The patients in the 5FU group were 73.5±7.8 years old, and in the non-5FU group ere 69.1±10.1 years old (p=0.23). Cataract extraction occurred 33 months on average after trabeculectomy in the 5FU group, and 19 months on average in the non-5FU group (p=0.019). 33% (4) of patients in the 5FU and 45.5% (5) of patients in the non-5FU group received anti-glaucoma drops prior to cataract extraction. 6 months following cataract extraction, the 5FU group had a 3.18mmHg reduction in IOP, while the non-5FU group had a 0.33mmHg increase in IOP (p=0.08). Only 16% (2) patients in the 5FU group had an increase in glaucoma medications VS 27.2% (3) in the non-5FU group. At 12 months 16% (2 patients) in the 5FU group and 33% in the non-5FU group had increased IOP above target level.

Conclusions: Use of 5FU resulted in a greater IOP-reduction 6 months post cataract surgery, with fewer medications needed to keep IOP controlled. 5FU injection at the time of cataract extraction keeps a trabeculectomy functioning and is safe without significant side effects.

OCULOPLASTICS II

Simplification of Reconstructive Eyelid Surgery Using Processed Dry Fascia Lata

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Purpose: To report a series of reconstructive eyelid surgeries using processed fascia lata and to demonstrate that this method simplifies and shortens the operation time and also allows for isolation of the injury zone and acceleration of further rehabilitation of patients.

Methods: Data from 8 patients) 9 lids) who had medial, lateral canthal ligament defects, upper and lower eyelids serious defects after Frozen section of eyelid malignant tumors removal. All reconstructions were with use processed FL. It was used to replace both the medial and lateral canthal ligaments as well as to replace the tarsus.

Results: The pathologic diagnosis was basal cell carcinoma in all patients. The follow-up time was 12-24 months. There was no tumor recurrence, infection, or graft rejection. All patients achieved good eyelid movement and function and were satisfied with their cosmetic contour.

Conclusions: Processed FL is a good material to repair most eyelid defects. It is easy to use and effectively maintains eyelid movement and function with satisfactory postoperative effects. Eyelid reconstruction using dry fascia lata simplifies and speeds up the operation, as well as reduces the size of additional damage and translates the accepted step-by-step operations into a single procedure. This method leads to an easier recovery period with a good and quick cosmetic effect.

The Effect of Hyaluronidase on Postoperative Ecchymosis and Surgery Duration in Upper Eyelid Blepharoplasty: A Prospective, Randomized, Double-Blinded Study

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Purpose: Hyaluronidase, enzyme facilitating tissue diffusion, has shown promise in enhancing local anesthesia efficacy in surgical applications. This study prospective, randomized, double-blinded aims to evaluate its effect on surgical efficiency and postoperative outcomes in upper eyelid blepharoplasty, a common oculoplastic procedure.

Methods: This study enrolled 44 patients (85 eyelids) undergoing upper eyelid blepharoplasty. 8 (18.2%) patients were males and mean age 63.04±9.35 years. Patients with prior eyelid surgeries or additional interventions were excluded, and anti-aggregates were discontinued preoperatively. Patients were randomized into two groups receiving local anesthesia (bupivacaine 0.5%, lidocaine 2%, epinephrine 1:100,000) with or without hyaluronidase. Postoperative ecchymosis was graded by blinded evaluators using modified Hester et al. classification, and surgical duration was recorded. Statistical analyses included χ^2 tests for categorical variables and t-tests for quantitative comparisons. The relationship between numerical variables was assessed using either the Spearman correlation coefficient.

Results: 31 eyelids were included in the group without Hyaluronidase in the local anesthesia and 54 eyelids were included in the hyaluronidase group. The hyaluronidase group showed significantly shorter surgical durations compared to the control group (26.46 ± 11.84 vs. 34.00 ± 10.97 minutes; p=0.025). Postoperative ecchymosis scores were similar between groups (1.13 ± 0.781 vs. 1.065 ± 0.616; p=0.346). Ecchymosis grading and surgical duration were not correlated (r=0.1; p=0.3). No adverse effects were reported.

Conclusions: The addition of hyaluronidase to local anesthesia in upper eyelid blepharoplasty significantly reduced surgical time, potentially improving procedural efficiency. However, its lack of effect on postoperative ecchymosis suggests further research is needed to elucidate the mechanisms underlying these findings.

Modified Jones Procedure Entropion Repair, Case Study

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Purpose: The study evaluates the use of Modified Jones' retractor plication as a primary procedure for the repair of involutional lower lid entropion in the absence of horizontal lid shortening.

Methods: Retrospective case series study.

Results: 34 consecutive entropion cases (2019-2024) passed Modified Jones Procedure Surgery. Only 2 recurrences were registered.

Conclusions: These data provide strong evidence that, in the absence of horizontal shortening of the lower eyelid, a successful outcome is likely after Modified Jones retractor plication.

Impact of Tube Size and Comorbidities on Outcomes of Conjunctivodacryocystorhinostomy with Jones Tube Insertion

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Purpose: Conjunctivodacryocystorhinostomy (CDCR) with Jones tube insertion remains an established intervention for persistent epiphora due to proximal canalicular obstruction. Although effective, the procedure is frequently complicated by tube displacements, granulation tissue formation, and recurrent obstruction. This study aimed to evaluate clinical outcomes, delineate risk factors for surgical failure, and assess the impact of tube dimensions and comorbidities.

Methods: A retrospective study was performed on 40 patients who underwent endoscopic CDCR between 2015 and 2024. Data collected included demographics, comorbidities (diabetes, hyperlipidemia, asthma), tube dimensions, smoking status, ocular findings, tube patency, resolution of symptoms, and postoperative complications. Surgical success was defined as both anatomical patency of the lacrimal drainage system and complete resolution of epiphora without the need for additional intervention.

Results: The overall success rate was 72.5% (29/40). Postoperative complications comprised of granulation tissue formation in 20% of cases, tube displacement in 17.5%, and recurrent obstruction in 15%. Use of larger tubes (≥4 mm) significantly reduced the incidence of displacement (5.6% vs. 27.3% for smaller tubes, p=0.03) and showed a favorable trend toward higher overall success rates (83.3% vs. 63.6%, p=0.07). Preoperative dry eye was associated with an increased incidence of postoperative complications (66.7%, p=0.04), and the presence of blepharitis was associated with a greater likelihood of repeat surgery (62.5%, p=0.04). Additionally, smoking status trended with an increased risk of formation of granulation tissue (p=0.06).

Conclusions: Larger Jones tubes were associated with a reduced risk of displacement and improved overall outcomes following CDCR. Preoperative dry eye and blepharitis emerged as significant predictors of adverse events, underscoring the importance of comprehensive preoperative evaluation and management of comorbid conditions. Prospective studies are warranted to validate these findings and further optimize long-term treatment protocols.

Ocular Involvement in Eyelid Traumatic Lacerations: The Role of Lacrimal Drainage System Involvement

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Purpose: Eyelid lacerations involving the Lacrimal Drainage System (LDS) are suspected to correlate with more severe ocular injuries, but direct comparisons are limited in the literature. This study aims to evaluate whether LDS involvement in eyelid lacerations is associated with increased ocular injury severity and whether it independently impacts clinical outcomes compared to other eyelid margin-involving injuries.

Methods: A retrospective cohort study was conducted on 418 patients presenting with eyelid traumatic lacerations at Meir Medical Center (2015-2023). Patients were categorized based on LDS involvement. A comparison was conducted between ocular injury severity in LDS and non-LDS cases. Additionally, a subgroup comparison was conducted between patients with LDS involvement and those with margin-involving lacerations without LDS damage.

Results: LDS involvement was documented in 32 cases. Mechanism of injury significantly differed between groups ($p < 0.01$), with animal-related injuries (28.1% vs. 4.4%) and falls (25.0% vs. 19.2%) more frequent in the LDS group. LDS involvement was associated with higher rates of orbital fractures (18.8% vs. 3.1%, $p < 0.01$), conjunctival involvement (54.8% vs. 19.0%, $p < 0.01$), corneal lacerations (6.5% vs. 0.3%, $p = 0.013$), and hyphema (16.1% vs. 2.8%, $p < 0.01$). Multivariate analysis identified full-thickness lacerations ($OR = 19.95$, $p < 0.01$) and conjunctival involvement ($OR = 3.14$, $p = 0.013$) as significant predictors of LDS injury. Visual acuity outcomes did not differ significantly between groups. Comparing LDS involvement to margin-involving lacerations without LDS damage revealed no significant differences in ocular injury severity.

Conclusions: LDS involvement in eyelid lacerations is associated with a higher incidence of ocular injuries and orbital wall fractures, However, it does not independently worsen visual or clinical outcomes beyond other margin-involving injuries. Full-thickness lacerations, particularly those with conjunctival involvement, are key predictors of LDS injury. Given these findings, LDS involvement should raise suspicion for more severe ocular and orbital trauma, warranting urgent and thorough ophthalmic evaluation to optimize management of complex eyelid and ocular injuries.

Outcomes of Conjunctivodacryocystorhinostomy (CDCR) Procedures: A Retrospective Analysis

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Purpose: This study retrospectively analyzes the outcomes and complications of conjunctivodacryocystor hinostomy (CDCR) procedures performed for proximal lacrimal obstruction, focusing on the efficacy of the surgery and associated risks.

Methods: A total of 23 eyes who underwent CDCR between February 2014 and May 2020 were included. Data on demographics, surgical approach, and postoperative outcomes were collected. The primary outcome was the resolution of epiphora, while secondary outcomes included complications such as tube dislocation, inflammation.

Results: The mean patient age was 44 years (range: 15-80), with 70% being female. The success rate, defined as resolution of epiphora, was 85%. The mean follow-up period was 24 months. The most common complications were tube extrusion (20%) and intrusion (15%), followed by infection (10%), granulation tissue formation (10%), and dryness/irritation (25%). Postoperative symptom scores showed significant improvement, with the MUNK scale score decreasing from 4.9 preoperatively to 1.3 postoperatively.

Conclusions: CDCR is an effective surgical intervention for proximal lacrimal obstruction, demonstrating high success rates and patient satisfaction.

Frontalis Sling Surgery - Pediatric versus Adult Population: Characteristics and Outcomes

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Purpose: Frontalis sling surgery is a common method for ptosis correction for both pediatric and adult populations. This study aims to compare the characteristics and outcomes of this surgery in these two populations.

Methods: A retrospective cohort study. Patients who underwent frontalis sling surgery between the years 2009 and 2024, with complete medical chart data, and have at least a 1-month follow-up period were included. Age, gender, ptosis type, type of sling, complications, and re-surgery were analyzed.

Results: A total of 62 patients were included, A higher rate of sling extrusion was observed among the adult group (0% of pediatrics vs. 14% of adults, chi-square, p=0.013). A higher number of previous sling surgeries were found to be positively correlated (r = 0.672) with overall postoperative complications.

Conclusions: Adults experienced higher rates of complications such as sling extrusion and dry eye. Moreover, an increased number of previous sling surgeries was associated with a rise in postoperative complications.

Clinical Entities and Ophthalmic Complications Associated with Isolated Facial Nerve Palsy in Adults - A Large Population Study

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Purpose: Facial nerve palsy (FNP) involves paralysis/ weakness of the seventh cranial nerve, impacting facial expression and eye function. It can cause significant ophthalmic complications, including lagophthalmos, corneal epithelial defects, conjunctival injection, epiphora, and ptosis. 1.The causes are varied, ranging from idiopathic and infectious to traumatic, neoplastic, and iatrogenic. 2. This study aimed to determine the prevalence of different underlying etiologies of FNP, assess the frequency of related ocular complications and interventions, and explore potential correlations between specific diagnoses and eye complications.

Methods: This retrospective study analysed data from the "Clalit Health Services" database between 2002 and 2024, identifying 78,248 patients with FNP. The study assessed demographic data, etiological factors, ophthalmic complications, and treatment procedures. It evaluated the prevalence of various clinical entities and their relationship to specific ophthalmic complications.

Results: The study focused on 77,220 patients with isolated FNP, excluding 1,022 patients with other concurrent cranial nerve palsies and 6 patients with congenital facial asymmetry. Among the participants, 38,814 (50.3%) were female, with an average age of 53.04 ± 19.15 years. Commonly associated clinical conditions included ischemic CVA (14.5%), intracranial haemorrhage (13.2%), otitis media (7.7%), otitis externa (5.7%), HZV (5.6%), vasculitis (4.9%), influenza vaccine (2.6%) and COVID19 vaccine (1.1%). The prevalence of risk factors was as follows: BMI over 25 (64.8%), hypertension (28.3%), smoking (27.7%), diabetes mellitus (31.7%), and childbirth (0.7%). Ophthalmic complications noted

Complication	Frequency (n)	Percent (%)
Dry eye syndrome	14137	18.3
Lagophthalmos	2305	3.0
Corneal ulcer	1811	2.3
Keratopathy, unspecified	1258	1.6
Ectropion	1110	1.4
Corneal scar	599	0.8
Dacryostenosis	580	0.8
Lid ptosis	574	0.7
Clonic hemifacial spasm	238	0.3
Epiphora	119	0.2
Disorders affecting eyelid function	9	0.0
Corneal neovascularization (pannus)	14	0.0
Neurotrophic keratoconjuctivitis	5	0.0
Corneal perforation	13	0.0

Procedure	Frequency (n)	Percent (%)
Botox injection	914	1.2
Adjusment of lid position	734	1.0
Blepharoptosis repair	691	0.9
Ectropion repair	350	0.5
Gold weight	83	0.1
Rhytidectomy	53	0.1
Punctum repair	71	0.1
DCR	105	0.1
Corneal transplant	111	0.1
Lid retraction repair	29	0.0
Cornea repair	24	0.0

were dry eye syndrome (18.3%), lagophthalmos (3%), corneal ulcers (2.3%), unspecified keratopathy (1.6%), and ectropion (1.4%). Treatment methods included botulinum toxin injections (1.2%), lid position adjustments (1.0%), blepharoptosis repairs (0.9%), and ectropion repairs (0.5%). Additionally, 23% of the cohort experienced recurrent FNP.

Conclusions: This pioneering study examined an extensive cohort of individuals suffering from FNP, encompassing both central and peripheral origins. It uniquely highlights the prevalence of ocular complications and details the associated medical interventions.

Vaccine	Frequency (n)	Percent (%)
Tetanus and Diphtheria	231	0.3
Hepatitis A+B	50	0.1
Meningococcus	18	0.0
Rabies	15	0.0
Pneumococcus	278	0.4
Influenza	1984	2.6
MMR	8	0.0
COVID 19	849	1.1
Others	69	0.1

Trachoma and Nasolacrimal Duct Obstruction in Ethiopia: A Case-Control Study

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Purpose: Trachoma, caused by Chlamydia trachomatis, remains a significant public health issue in endemic regions such as Ethiopia. While much attention has focused on trachomatous trichiasis (TT) and blindness, less is known about non-trichiasis sequelae such as nasolacrimal duct obstruction (NLDO). This study investigates the association between trachoma-related conjunctival scarring and NLDO requiring dacryocystorhinostomy (DCR).

Methods: A case-control study was conducted at Boru Meda Hospital and the University of Gondar Eye Center in Ethiopia. A cohort of patients were evaluated for clinical signs of trachoma. Those presenting with NLDO/dacryocystitis underwent external DCR. Histopathologic evaluation of lacrimal sac tissue was performed. Data on demographics, clinical signs, and prior trachoma exposure were analyzed to assess associations between trachoma and NLDO.

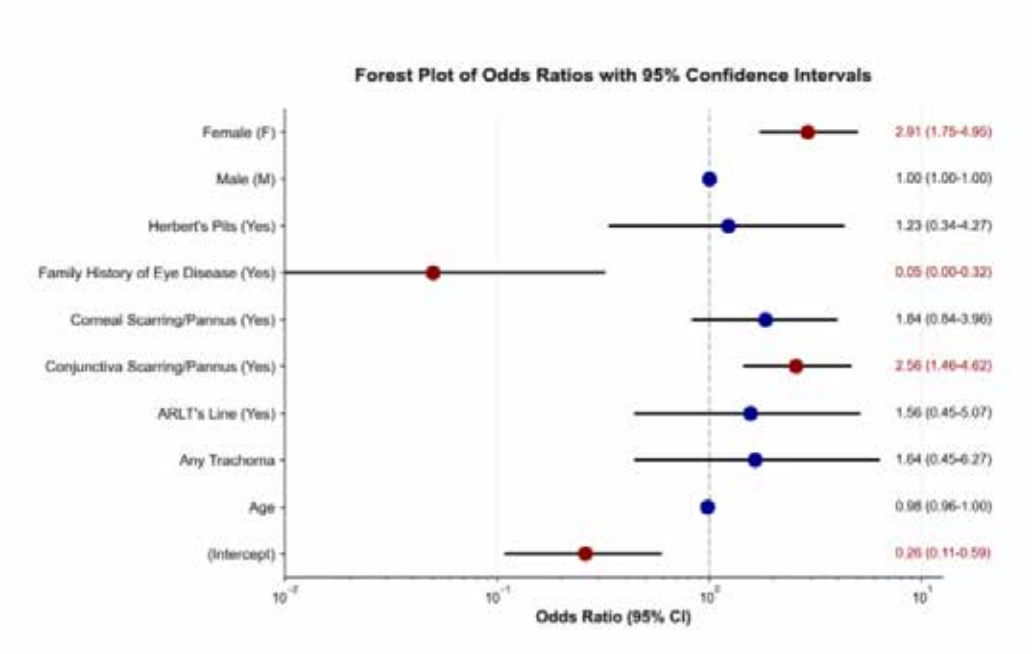
Table 1. Demographic and Clinical Characteristics of Cases and Controls

Characteristic	Cases (n = 114)	Controls (n = 254)	p-value
Female	77 (67.5%)	106 (41.7%)	<0.001
Age (median [IQR])	42.00 [28.00, 55.00]	42.00 [32.00, 58.00]	0.217
Family History of Eye Disease (%)	1 (0.9%)	21 (8.3%)	0.004
History of Smoking (%)	0 (0.0%)	15 (6.0%)	0.004
ARLT's Line (%)	23 (9.1%)	23 (9.1%)	0.352
Trichiasis (%)	10 (8.8%)	16 (6.3%)	0.387
Blepharitis (scurf) (%)	53 (46.5%)	110 (43.3%)	0.573
Rosacea (TBVs) (%)	8 (7.0%)	38 (15.0%)	0.04
Conjunctiva Scarring/Pannus (%)	86 (76.1%)	142 (55.9%)	<0.001
Corneal Scarring/Pannus (%)	17 (15.2%)	17 (15.2%)	0.502
Herbert's Pits (%)	12 (10.5%)	12 (10.5%)	0.319
Trachoma (%)	16 (14.2%)	21 (8.3%)	0.093
Trachoma Grade (%)			0.113

Results: A total of 114 DCR cases and 254 controls were included. Females were more likely to undergo DCR than males (67.5% vs. 41.7%, $p < 0.001$). Conjunctival scarring was significantly more prevalent in NLDO cases compared to controls (76.1% vs. 55.9%, $p < 0.001$). Logistic regression identified conjunctival scarring as an independent predictor of DCR (OR = 2.56, $p = 0.001$), while a family history of trachoma-related eye disease was associated with lower odds of requiring DCR (OR = 0.05, $p = 0.008$). Other trachoma-related findings, such as Arlt's line, Herbert's pits, and corneal scarring, were not significantly associated with DCR.

Conclusions: This study provides

evidence linking trachoma-related conjunctival scarring to NLDO. These findings highlight the need for expanded trachoma management strategies beyond blindness prevention, incorporating lacrimal system evaluation and surgical intervention for NLDO. Further research is warranted to explore histopathologic changes and long-term outcomes.



Congenital Blepharoptosis: Comparison of Two Surgical Approach Results - Final Study Results

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Purpose: Congenital blepharoptosis presents within the first year of life either in isolation or as a part of many different ocular or systemic disorders. Surgical repair is challenging, and recurrence necessitating more than one operation is not uncommon.

Methods: retrospective clinical analysis comprised 92 children (age range 0;17) with eyelid ptosis, 28 underwent frontalis sling operation while 64 underwent levator resection. All patients underwent surgical corrections at the Department of Ophthalmology of HaEmek Medical Center, between 2006 and 2023, were reviewed. We evaluated Gender predilection, Ethnic origin, type of primary defect, degree of ptosis and recurrence rate to the chosen surgical method.

Results: The median age of patients in the frontalis sling group was younger compared to those in the resection group (3 vs 6 years, respectively; P=0.073). The mean follow-up time (in months) for patients in the frontalis sling and levator resection groups was 24.44±28.32 and 17.98±23.79, respectively (P=0.164). There were no significant differences in the success or failure outcomes of the operations between the two groups. Among patients with MRD1 pre-operation is zero or plus, then the MRD1 post-operation is better in the levator resection group compared to the frontalis sling group ($MRD1_{\_Zero}$: 1.85 ±1.7 vs 0.89 ±1.04; $MRD1_{\_Plus}$: 2.79 ±1.18 vs 1.93 ±1.13). Conversely, among patients with MRD1 pre-operation is minus, then the frontalis sling group performs better than the levator resection group ($MRD1_{Minus}$: 1.93 ±1.17 vs 1.61 ±1.19).

Conclusions: Ptosis rated as MR1 below 0 it is recommended to use the frontalis sling approach. for ptosis rated as MRD0 1 or above is recommended to use the levator resection approach. The above classification could be a substitute for the levator muscle function test which is difficult to perform and its accuracy is questionable in the children's population.

Clinical and Radiological Predictive Factors for Surgical Intervention in Pediatric Subperiosteal Orbital Abscess Secondary to Acute Rhinosinusitis

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Purpose: This study aims to assess clinical and radiological parameters as predictive factors for surgical intervention in children diagnosed with subperiosteal orbital abscess (SPOA) secondary to acute rhinosinusitis.

Methods: Patients diagnosed with SPOA were divided into two groups: conservative treatment (n=20) and surgical intervention (n=25). Clinical parameters such as age, fever, leukocyte count, C-reactive protein (CRP) levels, and neutrophil-to-lymphocyte ratio (NLR) were evaluated. Radiological parameters, including abscess volume, abscess dimensions and proptosis, were measured using three-dimensional imaging techniques. ROC curve analysis was performed to assess the discriminatory ability of predictive factors.

Results: Age, fever, leukocyte count, and CRP levels did not significantly differ between the surgical and conservative groups. However, NLR was significantly higher in the surgical group (8.1 vs. 3.64, $p<0.001$). Radiological findings showed that both absolute radiological proptosis (19 mm vs. 16.1 mm, $p<0.001$) and the difference in proptosis between the affected and fellow eyes (4 mm vs. 2.1 mm, $p<0.001$) were significantly greater in the surgical group. A relative abscess volume ≥0.11 mL was found to predict the need for surgery with a sensitivity of 88% and specificity of 85%. Anteroposterior (AP) and craniocaudal (CC) dimensions of the abscess were significantly larger in the surgical group.

Conclusions: NLR and radiological parameters, particularly proptosis and abscess volume, are valuable predictors of surgical intervention in children with SPOA. These findings suggest that combining clinical and radiological assessments can improve decision-making for treating pediatric orbital infections, potentially guiding timely surgical management.

UVEITIS

Pediatric Pars Planitis: Clinical Characteristics and the Role of RNFL Thickness on OCT in Disease Monitoring

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Purpose: To study the role of RNFL thickness on OCT in the assessment and monitoring of children with pars planitis.

Methods: Demographic, OCT and Fluorescein Angiography (FA) data were obtained retrospectively between 2010/7 and 2023/12, from Hadassah Hospital medical records.

Results: Included were 29 children (50 eyes) with a mean age at diagnosis of 7.9±2.9 years (69% males, 72.4% bilateral). The most prevalent signs were snowballs (67.4%), iritis (40%) and papillitis (30.4%). Nine eyes (18%) had CME on OCT. Mean LogMAR BCVA was 0.47±0.6, and mean BIO score was 1.7±1.4. Out of 26 eyes with available FA, 20 eyes (80% of 25 eyes with available OD view) and 15 eyes (62.5% of 24 eyes with available view of the macula) had optic disc and macular leakage respectively. Mean RNFL thickness (28 eyes) was 209.6±179 µm. 22 eyes (78.6%) had RNFL thickness ≥130 µm, which was significantly associated with BIO score, iritis, papillitis, immunomodulatory therapy and biologic therapy. During the follow-up period of 12 months, BCVA improved and BIO score, and RNFL thickness decreased significantly. RNFL thickness was significantly associated with BIO score at 3 months, and with BCVA at 3 and 6 months.

Conclusions: RNFL thickness is increased and is associated with more severe presentation in pediatric pars planitis. OCT is a non-invasive imaging modality that could serve as a potential imaging biomarker in disease monitoring.

Adalimumab Biosimilars have Similar Efficacy to Originator Adalimumab When Treating Non-Infectious Uveitis

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Purpose: To compare the efficacy in achieving and maintaining control of inflammation between adalimumab biosimilars and originator adalimumab, as initial biologic treatment among patients with non-infectious uveitis (NIU).

Methods: This is a multi-center retrospective cohort study, including 260 eyes of 148 patients diagnosed with NIU who received initial biologic treatment of either originator adalimumab or a biosimilar. Events of uveitis relapse were noted per-eye following initiation of adalimumab treatment. Relapse was defined as the clinical diagnosis of intra-ocular inflammation, requiring an increase or change in local or systemic immunosuppression. Relapse rates and time to first relapse by 12 months, were compared between eyes treated with originator adalimumab or a biosimilar.

Results: Eyes were treated with either originator adalimumab (n=193, 74.23%) or a biosimilar (n=67, 25.77%). Median follow-up from baseline for patients who did not relapse was 24.0 months [IQR ,18.0 24.0]. Uveitis relapses occurred in 97 eyes (76 ,37.31% in the adalimumab group and 21 in the biosimilar group). By twelve months, the estimated relapse rate was 24.2% in the adalimumab group vs. 28.3% in the biosimilar group (Relative risk=1.17,95% CI 0.58 to 1.77). The average time to relapse by 12 months follow-up for the adalimumab group was 4.91 months compared with 5.04 months in the biosimilars group (mean difference 0.13 months, 95% CI -1.33 1.54 months). In multivariate analysis treatment with biosimilars was not a significant risk factor for uveitis relapse (HR=1.21, 95% CI 0.59 to 2.47, p=0.6).

Conclusions: Our study suggests that by twelve months use, biosimilar adalimumab agents were not inferior to originator adalimumab in preventing disease relapse among patients with refractory NIU. These results support the use of biosimilar adalimumab for treating NIU.

Adalimumab Biosimilars Compared to Originator: Impact on Uveitic Macular Edema

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Purpose: Managing uveitic macular edema is often challenging and may be refractory to anti-inflammatory treatments. In recent years, the use of adalimumab biosimilars has increased among patients with uveitis. We aim to observe the occurrences and resolution of macular edema in refractory uveitis treated with either originator adalimumab or biosimilars.

Methods: A multi-center retrospective cohort study of patients with non-infectious uveitis who initiated biologic therapy with either originator adalimumab or a biosimilar. Patients were included if they had non-infectious uveitis, received adalimumab treatment (either originator or biosimilar), and underwent repeated macular OCT scans to assess the presence of macular edema. Main outcome measures were the recurrence and resolution rates of macular edema at pre-determined time points up to 24 months follow-up.

Results: The study included 87 patients (146 eyes); 50 patients (84 eyes) treated with originator adalimumab and 37 patients (62 eyes) treated with biosimilars. Median follow-up time from baseline was 24.0 (IQR ,3.0 24.0) and 6.0 (IQR 6.0, 24.0) months for originator and biosimilar adalimumab, respectively. Macular edema at baseline was reported in 27 patients (32.1%) in the originator group and (35.5%) 22 in the biosimilar group. The majority of eyes without macular edema at baseline (n=97) did not develop macular edema over a two-year follow-up period (n=75, 77.32%). Most eyes with macular edema at baseline (n=49) achieved resolution (n=37, 75.51%), with 30% (n=15, 30.61%) of them experiencing relapses. A comparison between originator and biosimilar adalimumab in these eyes showed no statistically significant difference in the reduction of the percentage of eyes with macular edema up to the 24-month time point (p=0.47).

Conclusions: Treatment with either originator or biosimilar adalimumab is associated with improvement in macular edema among patients with refractory non-infectious uveitis. Biosimilar adalimumab was non-inferior to the originator in managing macular edema in these patients.

Epidemiological Characterization of Uveitis in Elderly Population: A Systematic Review and Meta Analysis

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Purpose: Uveitis is a major cause of vision loss, and with the global population aging, understanding its etiological patterns in individuals aged 60 years or older is increasingly important. This systematic review and meta-analysis aimed to characterize these patterns.

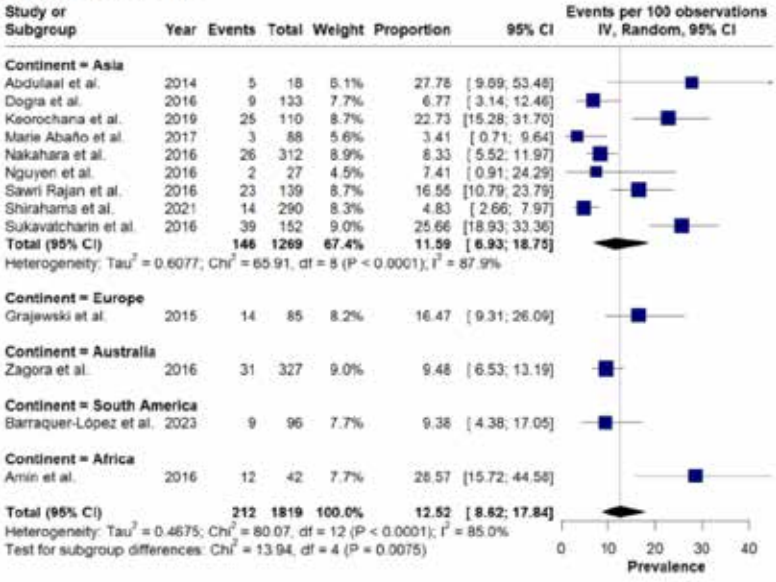
Methods: Following the PRISMA guidelines, we searched PubMed/MEDLINE, Scopus, CENTRAL, and Web of Science (1 January 2005 ,1–January 2025). Data extraction focused on study characteristics, sample size, uveitis location, and reported causes. Random-effects models were used to pool proportions across studies, heterogeneity assessed by the I^2 statistic. Methodological quality was evaluated via the Newcastle–Ottawa Scale for cohort studies and the JBI Critical Appraisal Checklist for cross-sectional studies.

Results: Out of 10,826 retrieved citations, 17 studies met the inclusion criteria. Idiopathic uveitis constituted the largest proportion, at 41.83% (95% CI: 32.60–51.71%). Infectious etiologies included herpetic uveitis (11.66%), cytomegalovirus (7.94%), tuberculosis (5.82%), and toxoplasmosis (7.79%). Non-infectious

Table 2. Meta-analysis of Differences in Uveitis Prevalence in elderly population

Condition	No. of studies	Sample size	Prevalence	Proportion (95% CI)	p-value	Heterogeneity (I^2%)
Infection						
Herpetic uveitis	[13]	1819	212 (11.66%)	0.1252 [0.0862; 0.1784]	< 0.0001	85.00%
TB	[13]	1664	97 (5.82%)	0.0566 [0.0314; 0.0977]	< 0.0001	84.90%
CMV	[11]	1739	138 (7.94%)	0.0407 [0.0161; 0.0989]	< 0.0001	92.20%
Toxoplasmosis	[10]	2054	160 (7.79%)	0.0348 [0.0183; 0.0653]	< 0.0001	88.70%
Endophthalmitis	[8]	1269	52 (4.1%)	0.0363 [0.0186; 0.0699]	0.0003	74.00%
Non-Infection						
Sarcoidosis	[15]	1976	170 (8.61%)	0.0519 [0.0288; 0.0919]	< 0.0001	85.70%
HLA-B27+	[10]	1914	140 (7.32%)	0.0766 [0.0447; 0.1281]	< 0.0001	89.60%
SO	[9]	1100	28 (2.55%)	0.0310 [0.0153; 0.0620]	0.0056	63.10%
BD	[7]	1074	20 (1.87%)	0.0250 [0.0110; 0.0559]	0.0055	67.20%
ARN	[5]	602	8 (1.33%)	0.0203 [0.0056; 0.0715]	0.0148	67.70%
Choroiditis	[5]	953	27 (2.84%)	0.0291 [0.0121; 0.0684]	0.0244	64.30%
Lymphoma	[4]	1039	74 (7.13%)	0.0525 [0.0198; 0.1318]	< 0.0001	93.30%
Idiopathic uveitis	[16]	2611	1092 (41.83%)	0.4185 [0.3260; 0.5171]	< 0.0001	90.80%

Fig 2. Herpetic uveitis



causes, such as sarcoidosis (8.61%) and HLA-B-27associated uveitis (7.32%), also contributed substantially. High heterogeneity (I^2>85%) was noted across most etiologies, likely reflecting variable study populations, diagnostic criteria, and geographic factors.

Conclusions: Our meta-analysis underscores the diverse etiological landscape of uveitis in the elderly, with nearly half of cases remaining idiopathic. High heterogeneity highlights regional variations and diagnostic challenges. Standardized evaluation protocols and improved access to advanced investigations may help reduce the burden of undiagnosed cases and guide tailored management strategies for this growing population.

Ocular Involvement in West Nile Virus Infection: Final Results of a Multimodal Imaging Study

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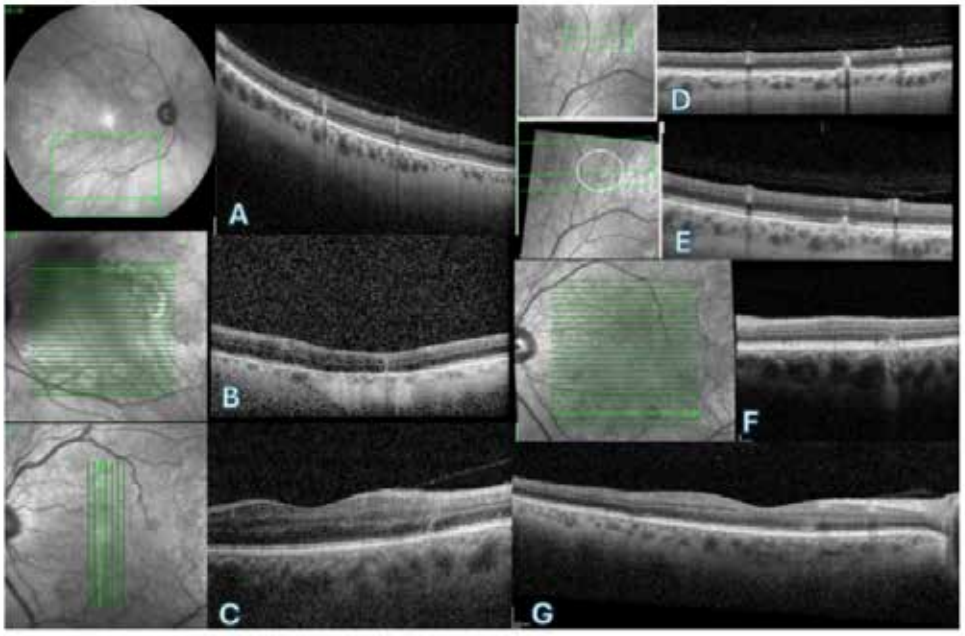
Purpose: Israel experienced a substantial West-Nile Virus (WNV) outbreak in June 2024. We aimed to characterize ocular manifestations of WNV infection using multimodal imaging (MMI) techniques, evaluate their relationship with systemic disease severity, and assess the necessity of various imaging modalities in diagnosis.

Methods: We retrospectively reviewed 37 hospitalized patients with confirmed WNV infection at Sheba Medical Center between July and September 2024. All patients underwent comprehensive ophthalmologic evaluations, including slit-lamp biomicroscopy, dilated fundus examination, and multimodal imaging comprising fundus photography, spectral-domain optical coherence tomography (OCT), fundus autofluorescence (FAF), fluorescein angiography, and indocyanine green angiography when clinically indicated. Clinical characteristics were compared between patients with and without ocular involvement.

Results: Ocular involvement was identified in 17 patients (46%), with chorioretinal lesions being the predominant finding (15 patients, 28 eyes). Patients with ocular involvement exhibited significantly higher rates of neuroinvasive disease (94% vs. 60%, p=0.017) and mechanical ventilation (35% vs. 5%, p=0.024). Lesions displayed various distribution patterns, including curvilinear arrangements along retinal nerve fibers (32%), scattered multifocal patterns (21%),



or mixed presentations (46%). MMI revealed a spectrum of chorioretinal lesions, ranging from clinically invisible lesions detected only on FAF to clinically apparent creamy-yellow lesions. OCT revealed varying degrees of retinal involvement (Figure). The extent of retinal pigment epithelium involvement correlated with clinical outcomes: lesions confined to the outer retina showed complete resolution within 1-2 months, while those with pigment epithelial disruption resulted in persistent scarring or atrophy. In 6 eyes, imaging demonstrated more extensive involvement reaching the inner retinal layers.

Conclusions: We found a strong association between WNV-related ocular involvement and both the presence and severity of neuroinvasive disease. MMI reveals a broader spectrum of retinal alterations than previously recognized, underscoring the importance of incorporating FAF and OCT in the ophthalmologic evaluation of patients with neuroinvasive WNV infection.

The Prevalence and Characteristics of Inflammatory Bowel Disease-Related Ocular Involvement

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Purpose: Ocular manifestations (OM) in patients with inflammatory bowel disease (IBD) are relatively uncommon. We aimed to explore the prevalence and characteristics of IBD-associated OM in a large cohort study.

Methods: A cross-sectional study was performed using the Maccabi Healthcare Services (MHS) database. The eligible population included all patients who were diagnosed with IBD as adults (>18 years) between January 2005 and July 2023. The study outcome was first OM diagnosis (event) that occurred post-IBD diagnosis date.

Results: Out of 14,686 patients with IBD (females 50.5%, Crohn's disease 51.5%), 349 (2.4%) were diagnosed with OM after diagnosis of IBD. Uveitis was diagnosed in n=225, Episcleritis in n=154, and n=30 were diagnosed with both. The median time between the two events was 44.94 months (IQR 15.88, 91.25). The presence of ocular involvement was more common in females (P=0.001), in patients with Crohn's disease (P<0.001) treatment with any medication (P=0.005), treatment with systemic steroids (P=0.027), etanercept treatment (P<0.001) and have a longer follow-up period (P=0.001). Also, OM's were more common in patients with arthritis (P=0.04). The prevalence of OM among patients with IBD did not change significantly over time during study period (p=0.296), with a prevalence of 2.3% at the end of the study period.

Conclusions: The prevalence of ocular involvement in adults with IBD is low and steady and is more common in females, inpatients with Crohn's' disease and in patients treated for their disease, mainly with steroids, potentially representing a more severe disease course but possibly not fully controlled.

The Association of Uveitis with Hepatitis B and Hepatitis C Viruses: A Large-Scale Population-Based Study

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Purpose: To examine the association of uveitis with hepatitis B (HBV) and hepatitis C (HCV) chronic infections.

Methods: This is a population-based cross-sectional study. The study encompassed 13,183 consecutive patients with uveitis and 65,331control subjects. The prevalence of chronic HBV and HCV infections was compared between patients diagnosed with uveitis and age-, sex-, and ethnicity-matched controls. Lifetime prevalence rates of HBV and HCV were calculated for patients with uveitis and control individuals. Odds ratio (OR) for HBV and HCV was evaluated across different strata.

Results: The lifetime prevalence rate of chronic HBV infection was greater in patients with uveitis than in controls (1.2% vs. 0.8%, respectively; $P < 0.001$). The association of HBV with uveitis was statistically significant among individuals older than 40 years of age, both sexes, and individuals of Jewish ethnicity. The lifetime prevalence of HCV was comparable between patients with uveitis and controls (0.8% vs. 0.7%, respectively; $P = 0.189$). Thus, no independently significant association was found between uveitis and HCV (fully-adjusted OR, 1.15; 95% CI, 0.93-1.42; $P = 0.211$).

Conclusions: Uveitis is associated with HBV. The association was more prominent among older and Jewish patients. Patients with uveitis may benefit from screening for HBV. An association between uveitis and HCV has not been found.

REFRACTIVE SURGERY

Vertical Gas Breakthrough Complicating Femto-Second Laser Assisted In-Situ Keratomileusis: Incidence, Management, and Visual Outcomes

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Purpose: To evaluate the outcomes and management of vertical gas breakthrough (VGB) during flap creation with the femtosecond laser in Laser assisted in situ keratomileusis (FSL-LASIK) procedure.

Methods: A retrospective chart review was conducted on patients who underwent FSL-LASIK at Care Vision Clinic between June 2020 and January 2023. The incidence of Vertical Gas Breakthrough (VGB) was assessed among all FSL-LASIK procedures and specifically among cases where an uncut area was identified during flap creation. Surgical videos of these cases were analyzed by a cornea specialist to confirm the diagnosis of VGB. Collected data included patient demographics, pre- and postoperative uncorrected and corrected distance visual acuity (UDVA and CDVA), corneal curvatures, surgical parameters, VGB management strategies, and associated complications.

Results: A total of 7,746 eyes underwent Femto-LASIK, with 79 eyes (1.01%) identified as having an uncut area during flap creation. Among these, 23 eyes (29%) were diagnosed with vertical gas breakthrough (VGB) based on surgical recordings. The mean age was 36±11.73 years (range 20-60 years), with 14 eyes (60.8%) in female patients. In 3 eyes (13%), the VGB extended into the visual axis. LASIK was completed as planned in 11 eyes (48%), while 5 eyes (21.7%) underwent manual dissection, 5 eyes (21.7%) were converted to photorefractive keratectomy (PRK), and 2 eyes (8.7%) had the procedure aborted. The mean post-surgical best-corrected visual acuity (BCVA) was 1.03±0.089 decimal (range 0.9-1.2), and uncorrected visual acuity (UCVA) was 0.97±0.2 decimal (range 0.7-1.2). One eye was aimed for monovision with uncorrected near vision (40 cm) at J3. Complications included flap buttonholes in 2 eyes (9.5%) and mild postoperative haze (Grade 1) in 1 eye (4.7%) following PRK.

Conclusions: VGB is a rare complication during flap creation in FSL-LASIK. However, it does not appear to significantly affect visual outcomes, with no cases of visually significant complications reported.

Impact of Age and Targeted Myopia on Long-Term Glasses Dependency and Satisfaction in Monovision Refractive Surgery

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4. Meir Medical Center, Kfar Saba

Purpose: To assess how age and targeted myopia at the time of monovision surgery affects long-term patient satisfaction and dependence on glasses.

Methods: A retrospective analysis was conducted on a cohort of patients who underwent monovision refractive surgery between 2000 and 2023. Demographic information, preoperative clinical measurements, intraoperative details, and postoperative outcomes were collected. In addition, patients completed a survey evaluating their dependence on glasses for near, intermediate, and distance work, overall satisfaction, and their likelihood to recommend the procedure. Responses were age-matched between younger and older patient groups to ensure comparability.

Results: A total of 5,249 patients were included, with a mean age of 45.2 years and a mean follow-up of 6.6 years. Younger patients at the time of surgery were significantly more likely to be targeted with lower myopic corrections (mean target refraction: -0.76 D) compared to older patients (mean target refraction: -1.28 D). Younger patients who were targeted with lower myopic corrections demonstrated significantly greater dependency on glasses for intermediate and near work compared to older age-matched patients targeted with more myopic corrections ($p<0.001$), with dependency increasing as follow-up time extended. Multivariate regression analysis revealed that patients initially targeted with lower myopia reported lower satisfaction from surgery as follow-up time increased ($p=0.032$).

Conclusions: Younger patients undergoing monovision refractive surgery targeted to lower myopia demonstrate increased dependency on glasses later in life and reduced long-term satisfaction. Clinicians should consider aligning myopic targets for younger patients more closely with those applied to older patients to optimize long-term visual outcomes and reduce future dependence on corrective lenses.

PRK Versus LASIK for Mixed Astigmatism

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Purpose: To compare the visual and refractive outcomes of photorefractive keratectomy (PRK) and laser-assisted in situ keratomileusis (LASIK) for the treatment of mixed astigmatism.

Methods: This retrospective matched comparative study included consecutive patients aged 17 to 60 years who underwent PRK or LASIK for mixed astigmatism (spherical error of ≥ +0.50 D and spherical equivalent < 0.00 D) between 2013 and 2022. Matching was performed for age, gender, spherical equivalent (SE), sphere, cylinder, and year of surgery. Inclusion required a postoperative follow-up of at least 30 days for LASIK and 90 days for PRK. Preoperative, intraoperative, and postoperative visual and refractive parameters were analyzed and compared between the groups.

Results: The study comprised 82 eyes in each group. Mean preoperative cylinder and spherical equivalent were comparable (P > 0.05). Preoperative best-corrected visual acuity (BCVA) was higher for LASIK group (0.04 ± 0.05 versus 0.06 ± 0.07, P = 0.023). Intraoperative parameters were comparable between the groups. Postoperative uncorrected visual acuity (UCVA) was 0.10 ± 0.17 LogMAR for PRK and 0.06 ± 0.11 LogMAR for LASIK (P = 0.043), while BCVA was 0.04 ± 0.07 and 0.02 ± 0.04 LogMAR, respectively (P = 0.034). Postoperative cylinder was lower in LASIK eyes (-0.47 ± 0.46 D) than PRK eyes (-0.66 ± 0.77 D, P = 0.002). Measures of refractive accuracy, including the index of success and cylinder correction, were slightly better in LASIK eyes, with a significant difference in deviation vector (P = 0.01). Both procedures demonstrated high safety and efficacy indices (P > 0.05).

Conclusions: Both PRK and LASIK provide effective and safe refractive outcomes for mixed astigmatism. LASIK demonstrated slight superiority in postoperative visual acuity and cylinder correction, while PRK remains a viable alternative.

Photorefractive Keratectomy (PRK) Versus Laser-Assisted in Situ Keratomileusis (LASIK) for Moderate Hyperopia Correction: A Propensity Score Matching Study

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2. Enaim Refractive Center, Tel Aviv and Jerusalem, Israel

Purpose: To evaluate and compare the visual outcomes, efficacy, and safety of Photorefractive Keratectomy (PRK) versus Laser in Situ Keratomileusis (LASIK) for moderate hyperopia correction (SE>2.5D).

Methods: We conducted a retrospective case review of patients who underwent surgery for moderate hyperopia (SE>2.5D). Using propensity score matching, we matched 32 PRK patients to 66 LASIK patients in a 1:2 ratio. Matching criteria included gender, age (between ages 18-25 ±3 years, above that±5), spherical equivalent (±0.5D), and preoperative corneal thickness (±10 microns).

Results: Both groups showed comparable efficacy indices (PRK: 0.88±0.23, LASIK: 0.94±0.21, p=0.2999) and safety indices (PRK: 1.02±0.18, LASIK: 1.04±0.19, p=0.4258). UCVA of 20/20 or better was achieved in 56% of PRK eyes and 44% of LASIK eyes (p=0.327). LASIK demonstrated superior outcomes in cylinder control (0.29±0.46D vs. 0.52±0.60D, p=0.0143) and predictability, with 82.8% of LASIK eyes versus 59.4% of PRK eyes achieving within ±0.50D of the target (p=0.015).

Conclusions: In moderate hyperopia correction, both procedures demonstrate comparable efficacy and safety indices, with higher success rates than previously reported. While LASIK shows advantages in cylinder control and predictability, our findings suggest that either procedure can provide satisfactory outcomes when adequately selected. PRK remains a viable and practical option, particularly for patients with specific contraindications to LASIK.

The Influence of Breastfeeding on LASIK Outcomes: A Comparison of Visual and Refractive Results

Adir Sommer, *Rambam Medical Center, Haifa*

Purpose: To compare the visual and refractive outcomes of breastfeeding versus non-breastfeeding women who underwent laser assisted in situ keratomileusis (LASIK) surgery.

Methods: This retrospective study reviewed medical files of women undergoing LASIK (2013-2023). Patients were grouped into those breastfeeding during screening and those not. Pre-, intra-, and post-operative parameters were compared between groups.

Results: The study included 3,034 eyes from 1,595 women (161 breastfeeding). Preoperative UCVA was worse in breastfeeding women (LogMAR 1.3 vs. 1.15, P=0.02). Postoperative outcomes, including UCVA, BCVA, SEQ, safety, efficacy, and retreatment rates, were similar. Multivariate analysis showed no differences.

Conclusions: Breastfeeding women undergoing myopic LASIK achieved similar visual and refractive outcomes to non-breastfeeding women over a follow-up averaging two months (up to one year). LASIK provided excellent visual outcomes for both groups.

Disagreement Between Corneal and Refractive Astigmatism and Retreatment Rates after Laser Refractive Surgery

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Purpose: To compare laser refractive retreatment rates between patients with and without disagreement between corneal and refractive astigmatism.

Methods: This retrospective study included consecutive patients who underwent laser in situ keratomileusis (LASIK) or photorefractive keratectomy (PRK) between January 2005 and December 2019 at the Care-Vision Laser Centers, Tel-Aviv, Israel. Myopic patients were divided into two groups according to whether or not they demonstrated preoperative disagreement between corneal and refractive astigmatism. Disagreement was defined as either ≥0.75D difference in magnitude or ≥-15degree difference in axis (in patients with a refractive astigmatism ≥0.75D).

Results: Overall, 14,333 eyes were included in the final analysis. The age of the participants was 27.4 ± 7.8 years and 53.4% were male. Of these, 3,079 eyes (21.5%) had a disagreement between corneal and refractive astigmatism. Overall, 0.58% (n=83) of eyes underwent retreatment. The disagreement group had a significantly greater retreatment rate (1.14% versus 0.43%, p<0.001) and these eyes were 2.68 times more likely (95% CI 1.73 to 4.16) to undergo retreatment. Disagreement in both magnitude and axis was associated with even higher retreatment rates (3.57% versus 0.54%, p<0.001) and these eyes were 6.78 times more likely (95% CI 2.91-15.78) to undergo retreatment.

Conclusions: A disagreement between corneal and refractive astigmatism in myopic patients undergoing laser refractive surgery is associated with an increased risk for subsequent retreatment.

Machine Learning-Based Algorithms for Ectasia Risk Assessment in Candidates for Refractive Surgery

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Purpose: Corneal ectasia is a progressive, degenerative disorder characterized by corneal thinning and protrusion, ultimately leading to irregular astigmatism and diminished visual acuity. Refractive procedures such as LASIK can exacerbate preexisting biomechanical vulnerabilities, predisposing eyes to iatrogenic ectasia. Conventional diagnostics - including keratometry, pachymetry, and corneal tomography - often fail to detect early biomechanical alterations, risking misclassification of subclinical cases. Our study aims to develop a machine learning–based preoperative risk stratification model to accurately distinguish at-risk eyes from non-risk cases, thereby enhancing screening precision, optimizing patient selection, and improving surgical outcomes.

Methods: Pencatam (Oculus) Tomography scans of 238 eyes (122 male, 116 female) were manually stratified for ectatic risk following refractive surgery using a traffic light system: green (non-risk), yellow (at risk), and red (ectatic). Machine learning algorithms were employed on 132 different parameters in each scan to generate decision trees. The dataset was partitioned into 80% for training, 15% for testing, and 5% for validation.

Results: Among the machine learning models evaluated, the QUEST decision tree achieved 95% accuracy, the C5.0 decision tree reached 97.5% accuracy, and the Classification and Regression Tree attained 98.3% accuracy in classifying eyes according to a traffic light risk system: green (non-risk), yellow (at risk), and red (ectatic).

Conclusions: We present a fully machine learning-driven approach for tomography-based classification of candidate eyes for refractive surgery. These models enable detailed risk assessment, enhance clinical decision-making, and have the potential to improve surgical outcomes.

Baseline Photoreceptor-to-Retinal Pigment Epithelium Atrophy Ratio and Its Association with Long-Term Atrophy Progression in Age-Related Macular Degeneration

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Purpose: To evaluate how the baseline ratio of the photoreceptor (PR) layer atrophy, to the retinal pigment epithelium (RPE) layer atrophy relates to the progression of atrophy in these layers over time in eyes with geographic atrophy (GA) secondary to age-related macular degeneration (AMD).

Methods: Macular Optical Coherence Tomography (OCT; Spectralis, Heidelberg Engineering) scans from 146 patients with AMD (287 eyes) were analyzed using automated segmentation performed by the RetinAI OCT Segmentation Discovery tool (Ikerian AG). Atrophy measurements were obtained for each eye at baseline and for all available follow-up visits. All eyes had measurable atrophy areas at baseline. The relationship between the baseline PR/RPE atrophy area ratio and the longitudinal progression rates of PR and RPE atrophy was assessed using Spearman's correlation test. Atrophy expansion rates were calculated as the change in atrophy area (mm^2/year), averaged across all visits.

Results: The mean age±SD of participants was 79.39 years±9.06, with 64 males and 82 females. The mean number of visits was 50 ± 71, with an average interval of 59±90 days between visits. The mean atrophy area at baseline of the combined Ellipsoid Zone, Outer PR Segment, and Interdigitation Zone was 4.09mm^2±6.51, while the mean atrophy area at baseline of the RPE layer was 2.60mm^2±5.04. The baseline PR/RPE atrophy ratio had a mean of 3.73±10.91. A positive correlation was observed between the baseline PR/RPE ratio and the longitudinal atrophy progression in both the PR layer (Spearman's rho=0.168, P=0.004) and the RPE layer (Spearman's rho=0.229, P=8.7×10^{-5}).

Conclusions: This study highlights an association between the PR/RPE atrophy ratio at baseline and the longitudinal progression of atrophy in these layers respectively. These findings suggest that structural OCT biomarkers at baseline can potentially provide valuable insights into GA progression, aiding in improved risk stratification and disease management strategies.

Incorporation of Home-OCT in the management of Neovascular AMD patients

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Purpose:

To evaluate and describe the incorporation of home optical coherence tomography (OCT) guided neovascular age-related macular degeneration (nAMD) patients' management on treatment burden and visual outcomes.

Methods: A prospective observational study was conducted to incorporate home based OCT monitoring in the follow-up of nAMD patients over a period of 3-8 months. Treatment decisions were based on fluid recurrence episodes observed on home OCT review system as well as by an in-office OCT, OCT-Angiography (OCT-A) scans and color fundus photos. Patient adherence to home scanning was measured by the number and duration of scans performed per week. Imaging patterns of fluid recurrence episodes and fluid volume trajectories were evaluated.

Results: Eighteen eyes of 10 patients were monitored for 3-8 months. Scans were performed daily and were eligible for artificial intelligence–based fluid volume quantification. Forty percent of patients had bilateral nAMD. The mean age of 75.5 years, fifty percent were females. All participants were either switched or on a treat and extend protocol of Faricimab treatment upon enrolment. Visual acuity changes, fluid volume trajectories and OCT-A pattens will be announced at the convention.

Conclusions: Incorporation of home-based OCT monitoring allowed personalized management of nAMD patients with reduction in treatment burden with preservation of stable visual acuity. Fluid volume trajectories may be associated to macular neovascularization pattern on OCT-A.

The Risk of Retinal Vein Occlusion Among Patients with Neovascular Age Related Macular Degeneration: a Large-Scale Cohort Study

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#. Contributed equally

Purpose: To examine the risk for retinal-vein-occlusion (RVO) in patients with neovascular age-related-macular-degeneration (AMD) as compared to age- and sex-matched controls.

Methods: This is a population-based, cohort study. The study encompassed 24,578 consecutive patients with neovascular AMD and 66,129 control subjects. Multivariate cox regression analysis was utilized to detect the risk of RVO among patients with neovascular AMD. Predictors of RVO in patients with neovascular AMD were identified using multivariate logistic regression analysis. Mortality of patients was assessed using Kaplan-Meier method.

Results: The incidence rate of RVO was estimated at 1.25 (95% CI, 1.06-1.45) per 1,000 person-years among patients with neovascular AMD and 0.25 (95% CI, 0.20-0.31) per 1,000 person-years among controls. Patients with neovascular AMD were associated with an increased risk of RVO (adjusted HR, 4.35; 95% CI, 3.34-5.66; $P < 0.001$). Among patients with neovascular AMD, older age (≥79.0 years) was associated with a decreased risk of RVO (adjusted OR, 0.50; 95% CI, 0.37-0.70; $P < 0.001$), whilst a history of glaucoma increased the likelihood of RVO (adjusted OR, 2.66; 95% CI, 1.94-3.65; $P < 0.001$). Patients with neovascular AMD and comorbid RVO had a comparable risk of all-cause mortality relative to other patients with neovascular AMD (HR, 0.90; 95% CI, 0.67-1.22; $P = 0.500$).

Conclusions: An increased risk of RVO was found among patients with neovascular AMD. Younger age and glaucoma predicted the development of RVO in patients with neovascular AMD. Awareness of this comorbidity is of benefit for clinicians as patients with neovascular AMD might be carefully examined for RVO signs and complications.

AMDNet: A Deep Learning Generalization Model for Age-Related Macular Degeneration Screening Based on Fundus Images

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Purpose: Age-related macular degeneration (AMD) is one of the leading causes of irreversible vision loss in the aging population globally. Recent advances in deep learning have facilitated the automation of AMD detection using digital fundus images (DFIs). however, these models frequently exhibit limited generalizability across populations, various OCT devices, and clinical settings. In order to overcome these barriers, we developed the AMDNet; a robust deep learning model based on 7 independent datasets from diverse geographic and demographic backgrounds encompassing about 83,000 DFIs with expert-labeled annotations.

Methods: Seven AMD DFIs datasets were included for training and validation. Five public datasets and new datasets that were accrued for this study: HYAMD dataset, from the Hillel Yaffe Medical Center and BRAMD dataset, from the São Paulo Federal University. We trained vision machine learning models, pre-trained on natural images and retinal fundus images, to diagnose AMD DFIs based on the AREDS dataset and evaluated by analysis on the other datasets. Dinov-2large, proved to be the best performing model. It was then upgraded by training it on all 7 datasets (multi-source domain training) resulting in a novel model named AMDnet. We then compared the AMDnet to pre-existing open-source AMD recognition models to assess out-of-domain AMD diagnosis.

Results: AMDNet demonstrated the highest performance, achieving AUCs ranging from 0.86 to 0.97 in target domains, significantly outperforming that by the other models by up to 33.4%.

Conclusions: AMDNet was shown to be superior to existing models for DFI-based AMD diagnosis.

Central Bouquet Hemorrhage with Henle Fiber Layer Involvement in Myopic Eyes

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10. Doheny Eye Institute
11. UCLA

Purpose: To characterize the clinical and multimodal imaging features of central bouquet hemorrhage (CBH) with Henle fiber layer (HFL) involvement in highly myopic patients, and to investigate the relationships between hemorrhage characteristics, reabsorption time, and visual outcomes.

Methods: Multicenter, retrospective analysis of high myopic eyes with CBH involving HFL, confirmed by Optical Coherence Tomography (OCT).

Results: 18 eyes from 18 subjects were included for analysis. The mean age was 39 ± 13.7 years (range 17-69) and 61% of subjects were female. Mean refractive error was -14.8 ± 3.14 diopters (range -9D to -22D). All eyes demonstrated a combined CBH with HFL component, while subretinal component was present in 83.3% of cases. Myopic choroidal neovascularization (CNV) was excluded in all eyes using optical coherence tomography angiography (OCTA) or dye-based angiography (fluorescein or indocyanine green). No correlation was observed between hemorrhage size and visual outcomes or reabsorption time. Hemorrhage cleared after a mean of 2.63 months and the radial HFL hemorrhage component resolved first. All patients showed improvement in visual acuity from baseline. Persistent OCT alternations after resolution of hemorrhage included ellipsoid zone disruption (88.9%) and hyperreflective changes in HFL (77.8%). Anti-VEGF injections were administered to 6 eyes (33.3%) and did not correlate with a significant visual or anatomical benefit.

Conclusions: CBH with HFL involvement in high myopia was associated with significant improved visual outcomes from baseline but structural alterations can persist after clinical resolution. The size of the hemorrhage did not correlate with resorption time and anti-VEGF treatment did not affect outcome. These findings provide new insights into the natural history and management of non-neovascular CBH in highly myopic eyes.

Distinct Patchy Perifoveal Chorioretinal Atrophy Caused by a Newly Identified Causative Gene: C19ORF44

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Purpose: Since 1990, when the first two inherited retinal dystrophy (IRD)-causative genes were identified, an average of 8 new causative genes have been identified every year and to date over 280 IRD-causative genes are known. The current work is aimed to clinically characterize the unique common retinal phenotype in a subset of Israeli patients, and to describe a newly identified causative gene to their IRD.

Methods: Study participants underwent a comprehensive ophthalmological evaluation, including best-corrected visual (BCVA) acuity, visual field testing, fundus autofluorescence (FAF), optical coherence tomography (OCT) and electroretinography (ERG). Genetic analysis included exome sequencing and Sanger sequencing.

Results: Most patients started noticing visual difficulties in their 50's. At the average age of 75 YO (range: 52-87 years) the BVCA was relatively well preserved; average 6/24 (range 6/6 to CF). Fundus appearance and FAF were characterized by a unique pattern, comparable for all participants, showing large atrophic patches in the posterior pole with some peripheral pigment. OCT showed perifoveal outer retinal layers loss in most patients (in advanced disease it included the fovea as well). All patients had rod- cone dystrophy identified by ERG. Genetic testing revealed a new causative IRD gene in all patients, The disease is inherited in an autosomal recessive (AR) fashion. One homozygous variant in the C19ORF44 gene was identified in 9 patients from 7 unrelated families; five of which were of Yemenite Jewish descent and two of Ashkenazi Jewish origin. C19ORF44 is expressed in a variety of human tissues, including the retina.

Conclusions: Rare AR mutations in C19ORF44 gene cause a unique and easily identifiable clinical phenotype of patchy, perifoveal chorioretinal atrophy. C19ORF44 is a novel IRD-causative gene.

Human Amniotic Membrane Graft Covering for Large Persistent Macular Holes

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Purpose: To introduce a modified surgical technique utilizing a hAM patch for the treatment of persistent macular holes (MHs) in patients who previously undergone pars plana vitrectomy (PPV) for MH closure.

Methods: Five eyes of five Patients with persistent MH were enrolled. All underwent at least one previous PPV with internal limiting membrane (ILM) peeling and gas endo tamponade. A 23-gauge PPV was performed with the implantation of a hAM patch to cover the MH without packing it inside, supported by perfluorocarbon (PFC) that was left in the eye at the end of the surgery. Following the initial surgery, patients were instructed to maintain a face-up position. After two to three weeks, a second surgery was conducted to replace the PFC with sulfur hexafluoride (SF6) gas 20%. Postoperative evaluations included optical coherence tomography (OCT) and changes in best-corrected visual acuity (BCVA).

Results: All patients in the study were females, with a mean age of 67 ± 4.5 years. The mean minimum MH diameter before the hAM patch was 709±160µm. The median time since their previous surgery was 3.4 months. The mean follow-up time was 5±3months. OCT scans 2-1 months postoperatively showed

Table 1: patients characteristics

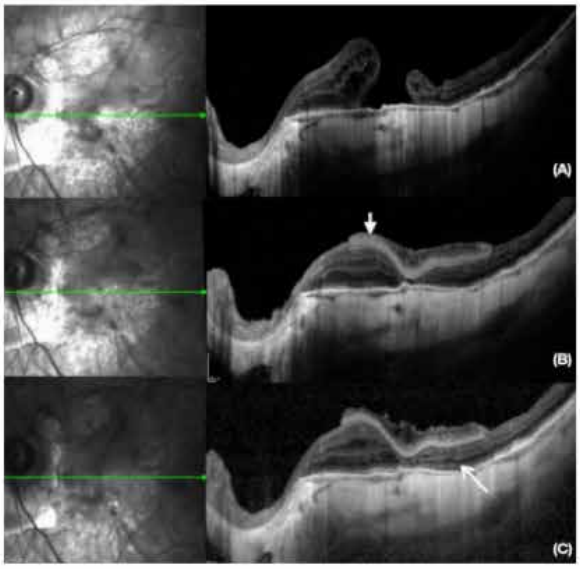
Patient	Age (years)	Previous Intervention	Time since last PPV (months)	MH Minimum Diameter (mm)	MH closure	Pre operative BCVA, (LogMAR)	Postoperative BCVA, (LogMAR)	Post Operative Follow-up time (months)
# 1	69	* PPV+ILM peeling * PPV+hAM plug	4.8	751	+	0.8	0.7	11
# 2	69	* PPV +ILM peeling for MH * PPV +ILM peeling for persistent MH	3.2	759	+	1.7	1	6.7
# 3	72	PPV+ILM peeling	3.5	664	+	2.4	0.4	4
# 4	60	* PPV+ SF6 for RD * PPV+SOI for recurrent RD * PPV+SOR +ILM peeling for MH	2.8	905	+	1.9	1.3	3
# 5	67	PPV+ILM peeling for retinoschisis +MH	31.5	467	+	2.4	2.4	3

*PPV - pars plana vitrectomy, ILM- internal limiting membrane, RD – retinal detachment, SOI -silicone oil injection, SOR – silicone oil removal, MH – macular hole, BCVA - best-corrected visual acuity.

successful closure of all MHs, stable hAM grafts, with full edge approximation (Figure 1). Three eyes also exhibit outer segment continuity. At the last follow-up, the mean BCVA significantly improved from 1.8±0.7 to 1.16±0.7logMAR (P=0.19). No postoperative adverse events occurred during the follow-up period.

Conclusions: Our modified surgical technique for persistent MHs with hAM covering shows promising clinical and anatomical results.

Figure 1



Patient #3

(A) Preoperative scan showing a large full-thickness macular hole (FTMH) in the left eye, with cystic hydration at the margins.
(B) One month postoperatively: amniotic membrane (arrow) covering the surface of the FTMH, with subsequent approximations of its margins.
(C) Four months postoperatively: FTMH closure, with outer segment continuity (arrow)

Pars Plana Vitrectomy for Complex Retinal Cases Following Osteo-Odonto keratoprostesis

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Purpose: To present the experience and challenges with complex retinal cases following osteo-odonto keratoprostesis.

Methods: Surgical experience with pars plana vitrectomy on 3 complex retinal cases following OOKP surgery.

Results: The patients that will be presented as one patient with macular pucker, one with total retinal detachment and one with massive subretinal hemorrhage, retinal detachment and proliferative vitreoretinopthy.

Conclusions: Retinal cases following OOKP are very challenging in many aspects of surgery yet in some cases can be operated with excellent surgical outcomes.

Real Time Monitoring of Head Posture in Patients After Pars Plana Vitrectomy for Retinal Detachment Repair and Correlation to Retinal Displacement

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Purpose: Maintaining head position after pars plana vitrectomy (PPV) for rhegmatogenous retinal detachment (RRD) repair may enhance the success rate. It is a common practice to maintain face down posture on the first day after RRD repair. Several studies have shown that post RRD repair face down posture lowers retinal displacement rate. The aim of this study is to assess compliance rate of face down position following PPV for RRD repair. Additionally, correlation between head posture and retinal displacement was analyzed.

Methods: A small sensor which recorded 3-axis acceleration and timestamp (MetaMotionR, from MBIENTLAB) was mounted and activated at the end of PPVs for RRD repair until the next morning. The posture of the patients was extrapolated from the raw accelerometer data recorded by the sensor. Several observations of the patients' head position were recorded by the medical staff to validate the sensor data. All patients underwent postoperative ultra-widefield fundus autofluorescence to assess retinal displacement.

Results: 24 patients signed a consent to participate in this prospective cohort study. Overall posture adherence rate was 62% ,66% ,68% and 53% in the 1,2,4 and 8 postoperative hours, respectively. Overall, the compliance rate significantly declined with time in the first 8 hours (p=0.001). On univariable analysis younger age, local anesthesia and male gender were associated with better compliance. Upon multivariable analysis only time after surgery sustained statistical significance. There was no statistically significant correlation between compliance rate and postoperative retinal displacement.

Conclusions: Compliance to post RRD repair face down regimen is suboptimal and significantly declines with time. Post RRD repair retinal displacements does not depend solely on head position.

Contralateral Detachment after GRT: Prevalence, Risk Factors, and the Efficacy of Prophylactic Laser Treatment. A Long-Term Retrospective Study

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Purpose: Giant retinal tears (GRTs) threaten vision, and contralateral retinal detachment remains a concern for retina specialists. This study examines the fellow eye's natural history, assesses the effectiveness of prophylactic °360 laser treatment in preventing contralateral retinal detachment, and identifies risk factors for contralateral GRT development.

Methods: This retrospective cohort study was conducted at Sheba Medical Center, from 2010 to 2024. It included 85 patients with non-traumatic, non-syndromic GRTs who underwent surgical intervention and were followed for contralateral retinal events. Prophylactic laser treatment was offered for contralateral eyes based on physician recommendation and patient consent. Clinical data, including demographics, ocular history, surgical outcomes, and contralateral retinal events, were analyzed. Statistical analyses used paired t-tests, Pearson's chi-square tests, and logistic regression.

Results: Retinal tears occurred in 40% (34/85) of contralateral eyes, with 30.56% (26/85) progressing to detachment or GRTs. Despite prophylactic °360 laser treatment in a subset of patients (16.5% ,14/85), we found no statistically significant reduction in contralateral detachment rates (28.6% vs. 31.0%, P = 0.858). Importantly, no significant associations were found between contralateral detachment and clinical variables such as age, axial length, or refraction.

Conclusions: As previously reported, GRT patients have a high risk of contralateral detachment. In our study, prophylactic °360 laser treatment had no protective effect. This suggests that, as applied at our institute, it may be ineffective in preventing detachment, and a more aggressive approach may be needed. Given no other risk factors, our data suggest that treating 4-3 patients prophylactically may prevent one detachment. However, potential adverse effects, such as fixed dilated pupils and visual field defects, complicate the risk-benefit analysis. Clinicians must balance preventing one detachment against the risk of side effects in multiple treated patients. Close monitoring is crucial, and future research should focus on safer, targeted prophylactic interventions for this high-risk population.

Safety and Efficacy of Various Topical Anesthesia for Intravitreal Injection: A Randomized Controlled Trial

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Purpose: This study aimed to determine the efficacy of various types of topical anesthesia prior intravitreal injection in an effort to lessen bleeding and pain.

Methods: This randomized controlled open-label study included 239 patients. All patients were randomly assigned to either receive: (1) Lidocaine gel 3% (Esracain 3%), (2) Lidocaine gel 10% (Esracain 10%) ,(3) Localine (Oxybuprocaine hydrochloride), (4) Tetracaine (Tetracaine HCl 1%), (5) A combined Localine eye drops and an ice patch. Patients' discomfort, itching, burning and pain (using visual analog scale), and bleeding size (using images) were measured 1 and 10 minutes following the injection. Tolerability was calculated by averaging patients' pain, discomfort, itching, and burning scores.

Results: In the one- and ten-minute post-injection analyses, the groups receiving Tetracaine (p=0.60±0.63, p=0.50±0.61) and a combined Localine and ice patch anesthesia (p=0.55±0.66, p=0.38±0.58) had the lowest mean tolerability scores. In most parameters (discomfort burning, and pain scores) the Tetracaine and the combined Localine and ice patch anesthesia demonstrated the lowest mean scores. All subjective criteria assessed by the surgeon immediately following the injection were not found to be significantly different at any group, such as movements during injection (p=0.19), complaints during injection (p=0.56), complaints following the injection (p=0.21). Bleeding size (area or circumference) was not statistical different between groups.

Conclusions: This study demonstrated a considerable reduction in pain and overall tolerability with Tetracaine or a combination of ice patch and Localine anesthesia. These findings may lessen patients' discomfort and improve their tolerance.

Cystoid Macular Edema (CME) and Corneal Endothelial Insufficiency. Partners In Crime

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Purpose: Cystoid macular edema (CME) develops when excess fluid accumulates within the macular retina, disturbing cell function. CME represents a common pathological sequel of the retina and occurs in a variety of conditions. A healthy corneal endothelium is essential in keeping the cornea transparent. The human corneal endothelial cell density (ECD) is continuously decreasing throughout life. There are cases where there is an accelerated corneal endothelial attrition. We present a series of cases of patients with CME which all have in common the presence of underlying corneal decompensation. This association could represent another insight into the etiologies of CME. Although its pathophysiology has yet to be elucidated. To our knowledge, little literature has delved into the interaction of those two pathologies, trying to understand if there is any association between them.

Methods: Retrospective case series study. Medical records of patients seen at the Ophthalmology Department in one center (Shamir Medical Center, Israel) between the years 2018-2025. We collected data on patients with chronic CME.

Results: We present a series of 9 cases of patients with CME, all have in common the presence of an underlying corneal decompensation or failure. All of them are pseudophakic. One patient was after a trabeculectomy, and another one had pars plana vitrectomy surgery (both patients presented several years after the primary surgery). 4 patients underwent a corneal transplantation procedure. following this procedure there was an improvement in their macular edema and central macular thickness. The remaining 5 patients had persistent CME that was resistant to conventional treatment and presented with clear corneas and low endothelial count.

Conclusions: Chronic cystoid macular edema that does not improve under standard treatment may be related to corneal decompensation (even in the absence of corneal edema). In unexplained cases of persistent CME, corneal failure should be considered and addressed accordingly.

CORNEA

Possible Correlation Between Chemotherapy Treatment of Corneal Donors to Lower Endothelial Cell Density of Their Grafts

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Purpose: Corneal grafts endothelial cell count is a key factor indicating graft's quality and suitability for transplantation. Several factors are known to influence the donor's cell count: donor's age, donor's ocular surgeries, trauma, genetic diseases, etc. Oncological treatments such as chemotherapy may lead to systemic effects that could also potentially affect the status of corneal tissues. At present, there are no studies demonstrating lower endothelial cell density in donors corneas received prior-to-death chemotherapy.

Methods: Corneal transplants data was collected from the records of the Rabin medical center eye bank, for the years 2014-2024. Data of donors receiving prior-to-death chemotherapy was compared to an age-matched control group of donors that did not receive chemotherapy. Data included graft's endothelial cell density (ECD), donor's ocular and systemic medical history, donors chemotherapy regimen received, and radiation therapy to the head-neck area. All cell counting was performed by the same examiner in a manual fashion (and not automatic).

Results: 471 corneal grafts of donors receiving chemotherapy prior-to-death were identified. A control group of 471 age matched consecutive donors that did not receive chemotherapy was collected. Average death age was 65 in both groups. The average time from death to graft's processing was 1.1 days. There was no difference between the groups regarding sex, death-to-processing time, and cell density of donors received head/neck radiation. The comparison of ECD between the groups yielded the following results: Up to 40 y/o: 2694.2 vs. 2993.1 (p=0.024, n=13). 40-50 y/o: 2652 vs. 2596.4 (p =0.44, n=31). 50-60 y/o: 2377.9 vs. 2656.4 (p=0.006, n=90). 60-70 y/o: 2242.6 vs. 2522.0 (p=0.00001, n=149). 70 y/o and above: 2119.3 vs. 2264.1 (p=0.75, n=188).

Conclusions: Our findings suggest that chemotherapy may lead to endothelial cell loss in donor corneal grafts, in different age groups. To the best of our knowledge, this observation was not previously described. Lower ECD seen in the chemotherapy group could lead to suboptimal outcomes of corneal transplant procedures and could be an important history detail in selecting grafts for transplantation. An effort is currently made to identify the exact compounds and chemotherapy regimens that may be responsible for the lower ECD seen in different age groups of corneal donors.

Clinical And Epidemiological Factors Affecting Donor Corneal Endothelial Cell Count

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Purpose: The limited availability of corneal donors poses a significant challenge to meeting transplantation demands. Factors like advanced donor age and prior cataract surgery decrease donor corneal quality, yet a predictive system for resource optimization is lacking. This study identifies factors affecting donor corneal endothelial cell count (ECC) in an Israeli eye bank, focusing on short death-to-retrieval time (DRT).

Methods: A retrospective analysis of 611 donor corneas retrieved at Hadassah Medical Center from 2018 to 2022 was conducted. Univariate and multivariate analyses identified factors associated with adequate ECC for transplantation (defined here as ECC≥2400 cells/mm^2), including age, sex, medical history, cause of death and DRT.

Results: The study included 611 corneas from 310 donors, with a mean ECC of 2,624 cells/mm^2 (SD ±519), and 76.3% (n=466) meeting ECC adequacy criteria. The mean donor age was 64.4 (SD ±15.3) years. Median DRT was 2 hours, 29 minutes. Advanced donor age and conditions like diabetes mellitus (DM), hypertension (HTN), ischemic heart disease (IHD), and prior cataract surgery were risk factors for lower ECC (P <0.001). Multivariate analysis confirmed age (adjusted OR 0.955 per year) and cataract surgery (adjusted OR 14.253) as significant. A trend suggested higher adequate ECC in corneas retrieved within 4 hours of death (82.5% vs. 75%; p=0.11), though not statistically significant.

Conclusions: Advanced donor age, cataract surgery, death due to sepsis, and conditions like DM, HTN, and IHD significantly reduce corneal ECC, thereby negatively affecting transplantation suitability. A potential benefit of shorter DRT on corneal suitability warrants further investigation.

Transepithelial Phototherapeutic Keratectomy (transPTK) for the Treatment of Post-Infectious Corneal Scars

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Purpose: Postinfectious corneal scars are a common cause of visual impairment. The aim of this study is to describe the clinical outcomes of patients with corneal scars following infectious keratitis treated in Rabin Medical Center and Assuta Optic refractive surgery center, with Transepithelial phototherapeutic keratectomy (transPTK).

Methods: A retrospective case series. The clinical details of patients with post-infectious corneal scars in Rabin Medical Center and Assuta Optic treated with transPTK between 2023-2025 were documented.

Results: Six patients aged 18-80 were treated with wet or dry transPTK. Maximal treatment depth ranged between 40 and 230 microns. Depth was determined following anterior segment Optical Coherence Tomography (AS-OCT). All patients had only a single treatment. No intraoperative or postoperative complications were noted. Corrected distance visual acuity and corneal topography improved significantly in all cases. Three cases also had cataract and were scheduled for subsequent surgery.

Conclusions: Transepithelial phototherapeutic keratectomy (transPTK) is safe and effective for the treatment of post-infectious corneal scars.

Keratoconus Prevalence in Astigmatic Adolescents: Findings from a Nationwide Screening Setting

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Purpose: To investigate the association between varying levels of astigmatism and the likelihood of keratoconus diagnosis in a large, population-based cohort of adolescents.

Methods: This cross-sectional study included 896,377 adolescents aged 16-20 years who underwent a standardized medical assessment between 2011 and 2022, including refraction and topography/tomography in cases where astigmatism above 2.00 diopters (D) was observed. Astigmatism was categorized into five groups.

Results: 1,886 adolescents were diagnosed with keratoconus. Each -1diopter increase in cylinder >2 D yielded a 1.76-fold increase in OR of keratoconus (OR = 1.76, 95% CI: 1.70–1.82, $p < 0.001$). In ROC analysis optimal cut-off value was 2.88 D, yielding a sensitivity of 0.744 and a specificity of 0.644.

Conclusions: Astigmatism, particularly above 2 D, is significantly associated with keratoconus in adolescents. These findings suggest that higher astigmatism could be a valuable screening tool for identifying individuals at risk for keratoconus, allowing for earlier diagnosis and intervention.

Therapeutic Contact Lenses versus Tight Bandage Patching for Pain Management After Pterygium Excision with Fibrin Glue: A Prospective Randomized Controlled Study

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Purpose: To compare the effectiveness of therapeutic contact lenses (TCL) versus tight bandage patching (TBP) in managing post-operative pain and autograft stability following pterygium excision with conjunctival autografting using fibrin glue.

Methods: This prospective, randomized, controlled study enrolled 63 eyes undergoing primary pterygium excision with conjunctival autografting using fibrin glue. Patients were randomly assigned to receive either a TCL (n=33) or TBP (n=30) postoperatively. Pain levels were assessed using a 1–10 numeric VAS pain scale at 24 hours and 1 week post-surgery. Analgesic painkiller consumption was recorded during the first post-operative week. The stability of the conjunctival autograft was evaluated at 1-week follow-up, with graft displacement or dehiscence recorded as indicators of failure.

Results: All grafts remained stable at 1 week with no displacement. Graft movement at Week 1 was observed in 2.9% of TCL eyes compared to 3.4% of TBP eyes. Dellen formation was lower in the TCL group (8.8%) compared to TBP (24.1%), and foreign body sensation was reported by 32.4% of TCL versus 48.3% of TBP patients. The Day 1 VAS score was lower in the TCL group (2.29 ± 1.34) compared to the TBP group (3.06 ± 1.67), although this difference was not statistically significant. The Week 1 VAS score was 0.75 ± 2.20 in the TCL group and 0.86 ± 1.88 in the TBP group. Analgesic consumption was significantly lower in the TCL group, with patients requiring pain medications 1.00 ± 0 times per day compared to 1.27 ± 0.46 times per day in the TBP group ($p = 0.041$).

Conclusions: While both therapeutic contact lenses and tight bandage patching maintained autograft stability following pterygium excision, TCL was associated with significantly lower analgesic consumption and a trend toward reduced pain scores compared to TBP, suggesting improved post-operative pain management.

Endoart Artificial Endothelial Replacement Membrane Implant for Treating Corneal Edema After Failed Penetrating Keratoplasty

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Purpose: To report the outcomes of a novel artificial endothelial replacement membrane implant for treating corneal edema in patients with multiple prior graft rejections, making them less suitable for repeat live donor keratoplasty.

Methods: Nine patients with chronic corneal edema and a history of multiple graft rejections underwent implantation of an artificial endothelial replacement membrane (EndoArt, EyeYon Medical, Israel) in eyes after penetrating keratoplasty. The implant was secured to the posterior corneal surface using an air–gas bubble and CU5- nylon sutures. Outcome measures included corrected distance visual acuity (logMAR), central corneal thickness, and device-related complications.

Results: Nine eyes of nine patients underwent EndoArt implantation. At 3–6 months postoperatively, the membrane was well-centered and adherent, with improved corneal transparency in all patients. Corrected distance visual acuity (logMAR) improved from 2.3 to 1.0, and central corneal thickness decreased from 740 µm to 580 µm. One patient developed infectious keratitis, and another required reimplantation. Most patients needed multiple air–gas bubble injections and sutures for adhesion. No severe complications occurred, and all patients reported reduced ocular pain.

Conclusions: Synthetic endothelial replacement membrane implantation improves central corneal transparency and visual acuity in patients with failed PK and a history of multiple graft rejections, making them less suitable for repeat live donor keratoplasty. No significant implant-related adverse events occurred after surgery. This study, conducted at the Hadassah Ophthalmology Department, demonstrates the potential of this novel technique as a viable alternative for managing corneal edema in complex, high-risk cases.

Epidemiological and Clinical Characteristics, Risk Factors and Predicting Factors for Final Visual Acuity Outcome Following Infective Corneal Ulcer

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Purpose: This study aimed to identify epidemiological and clinical characteristics, risk factors, and predictors of final visual acuity (VA) in patients with corneal ulcers.

Methods: A retrospective study was conducted at Tzafon Medical Center (2013–2023) involving 287 patients. Data included demographics, medical history, ulcer characteristics, treatment details, and VA at presentation, 1, 3 months, and final follow-up. Patients were categorized into better (logMAR ≤ 0.3) and worse (logMAR > 0.3) VA outcomes. Risk factors were analyzed using multivariate analysis.

Results: The mean age was 48.8 years, with 59.2% male, 32.1% contact lens wearers, and 49.8% non-Jewish ethnicity. Worse outcomes were associated with older age (64.5 vs. 41.3 years, $p < 0.001$), non-Jewish ethnicity (58.1% vs. 45.9%, $p = 0.053$), and topical steroid use ($p < 0.05$). Worse baseline VA (0.85 vs. 0.31 logMAR, $p < 0.001$), central ulcers (31.1% vs. 10.8%, $p < 0.001$), larger ulcers (1.88 vs. 1.01 mm, $p < 0.001$), and hypopyon (12.9% vs. 3.1%, $p = 0.001$) were more common in the worse outcome group. Treatment-related factors included longer hospital stays (5.27 vs. 2.30 days, $p < 0.001$), higher recurrence rates (18.5% vs. 8.3%, $p = 0.011$), and more surgical interventions (14.0% vs. 0.5%, $p < 0.001$). Multivariate analysis confirmed older age, non-Jewish ethnicity, topical steroid use, and worse baseline VA as significant predictors of poor outcomes.

Conclusions: Advanced age, non-Jewish ethnicity, topical steroid use, worse baseline VA, central ulcers, and longer hospital stays were key factors associated with reduced final VA. Early intervention and tailored management are crucial for high-risk patients to improve outcomes.

Preoperative OCT Thinnest Stromal Thickness as a Predictive Tool for Corneal Thickness Progression During Cross-Linking in Keratoconus Patients

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Purpose: Keratoconus causes irregular thinning, visual distortion, and potential corneal transplantation. Corneal collagen cross-linking (CXL) strengthens the stroma to halt progression and requires a minimum of 400 µm thickness before UV irradiation. This study evaluates preoperative OCT with virtual epithelial removal via the Anterion as a more reliable predictor than pachymetry.

Methods: We retrospectively analyzed data from 24 keratoconus patients undergoing standard CXL. Corneal thickness measurements were obtained at four procedural stages:

1. Preoperative OCT (virtually de-epithelialized thinnest stromal thickness) + Manual CCT
2. Post-epithelial removal
3. Post-riboflavin loading (RiboCare solution)
4. Post-UV irradiation (using the CI cross-linking device)

We compared thinnest stromal thickness and CCT, tracked corneal thickness changes during the procedure, and used linear regression to assess pre-op OCT's ability to predict final post-UV thickness.

Results: Reliability of Preoperative OCT Thinnest Stroma Measurement: - A strong correlation was found between pre-op virtual thinnest stromal thickness and actual post-epithelial removal thickness (Pearson $r = 0.98$, $p < 0.0001$), confirming the accuracy of the Anterion OCT's virtual de-epithelialization algorithm.

CCT Progression Analysis:
- After epithelial removal: Mean decrease of 32.17 µm (Std Dev: 7.66 µm)
- After riboflavin loading: Mean increase of 60.50 µm (Std Dev: 11.60 µm)
- After UV irradiation: Minimal average change of 2.00 µm (Std Dev: 8.06 µm)
- Total change (pre-op to post-UV): Net increase of 30.33 µm (Std Dev: 16.19 µm)

Conclusions: Preoperative OCT-based thinnest stromal thickness measurements with virtual epithelial removal provide accurate and reliable predictions of intraoperative corneal thickness changes during CXL. Compared to CCT, the thinnest stromal thickness is a safer and more precise indicator, especially critical in keratoconus patients where CCT may not reflect localized thinning. This study introduces a predictive model enabling clinicians to estimate final corneal thickness from pre-op OCT data, supporting safer treatment protocols and reducing reliance on operator-dependent pachymetry.

Topical Azithromycin Versus Oral Doxycycline for Meibomian Gland Dysfunction - a Systematic Review and Meta-analysis

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Purpose: MGD is a common ophthalmologic condition causing progressive damage to the ocular surface. Treatments often include antibiotics, with a recent analysis showing oral azithromycin's superiority over doxycycline. This study compares oral doxycycline and topical azithromycin for MGD treatment.

Methods: A systematic search of for all peer-reviewed randomized controlled trails (RCTs) comparing oral versus topical antibiotic MGD treatment was done. 3,696 studies were found of which 6 RCTs were included in the analysis. Individual study data were extracted and evaluated in a weighted pooled analysis.

Results: Both treatments improved signs and symptoms. Azithromycin was superior in total symptom scores and meniscus floaters, with no other significant differences in efficacy or safety. Subgroup analysis showed doxycycline excelled in CFS scores, while 1% azithromycin was superior in TBUT and safety.

Conclusions: Topical azithromycin exhibited better symptom alleviation and overall non-inferiority compared to oral doxycycline and thus presents a safe and effective alternative for MGD treatment, particularly in patients at risk of systemic side effects. Treatment should be tailored to patient characteristics.

Factors Associated with Fuchs Endothelial Dystrophy: A Large-Scale, Population-Based Study in Israel

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Purpose: To identify potential factors associated with Fuchs endothelial corneal dystrophy (FECD) in Israel.

Methods: We conducted a cross-sectional study using data from Israel's largest healthcare provider covering the years 2005 to 2023. We identified FECD patients and compared them with age and gender matched controls (1:10 ratio). Demographic factors and comorbidities were analyzed. A multivariable conditional logistic regression model was used to identify independent risk factors associated with FECD.

Results: We identified 591 FECD patients with a mean age of 64.35±11 years; 198 (33.5%) were male. A ten-fold group (n=5910) of age-gender-matched subjects served as controls. Multivariable analysis revealed several factors significantly associated with FECD: Medium and high SES (OR=1.454, p=0.017) and (OR=1.3307, p=0.014), cataract (OR=4.834, p<0.001), skin cancer (OR=1.361, p=0.01), keratoconus (OR=4.346, p<0.002), hyperopia (OR=1.838, p<0.01), glaucoma (OR=1.726, p<0.003) and uveitis (OR=3.082, p<0.001).

Conclusions: This population-based study identifies several factors significantly associated with FECD, including medium and high SES, cataract, skin cancer, keratoconus, hyperopia, glaucoma and uveitis. These findings may guide targeted screening strategies and early intervention strategies for FECD patients.

Monitoring Postoperative Graft Thinning in Ut-Dsaek Using As-Oct: Clinical Relevance and Outcomes

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Purpose: Ultra-thin Descemet stripping automated endothelial keratoplasty (UT-DSAEK) is a widely used technique for treating endothelial dysfunction, offering faster visual recovery and improved outcomes compared to traditional endothelial keratoplasty methods. However, postoperative changes in graft thickness can influence visual acuity and overall graft survival. Anterior segment optical coherence tomography (AS-OCT) provides a precise, non-invasive method to monitor these temporal changes. This study aims to analyze the progression of central graft thinning following UT-DSAEK and evaluate its clinical significance.

Methods: This retrospective cohort study included consecutive patients who underwent UT-DSAEK with Eusol-C-preserved corneas between 2023 and 2024 and had postoperative AS-OCT records. Data were collected on ultrasound central corneal pachymetry when the cornea was mounted on an artificial chamber with the epithelium removed (CCT1-) and after the microkeratome cut (CCT2-). The microkeratome was set to remove a predetermined thickness of 300–400 µm. Postoperatively, central graft thickness was measured using AS-OCT at 1 day, 1 month, and 3 months after surgery.

Results: Seven patients (4 males, 3 females; mean age 70.7 ± 10.3 years) met the inclusion criteria. Preoperative best corrected visual acuity (BCVA) was LogMAR 1.63 ± 0.69. The mean CCT-1 was 552 ± 40.5 µm, and CCT-2 was 194.9 ± 38.3 µm. Postoperative graft thickness decreased from 374 ± 206.7 µm on day 1 to 308 ± 204.9 µm at month 1 and 276.5 ± 201.3 µm at month 3. The mean thinning rate was 22.7 ± 66.0 µm by month 1 and 83.3 ± 34.5 µm by month 3.

Conclusions: Progressive postoperative thinning was observed in UT-DSAEK grafts preserved in Eusol-C. Moreover, by 3 months, the targeted graft thickness was achieved, showing a trend comparable to organ-culture methods. These findings support Eusol-C as a viable preservation medium for ultra-thin grafts. Further comparative studies are needed to assess long-term clinical outcomes and endothelial survival across different preservation techniques.

Corneal Pathologies in Patients with Thyroid Eye Disease: Prevalence, Clinical Characteristics and Treatment

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Purpose: The purpose of this study is to investigate the prevalence, clinical characteristics, and prognosis of corneal conditions in patients with thyroid eye disease (TED), as these conditions can significantly impact the ocular surface.

Methods: This retrospective cohort study included patients diagnosed with TED and treated at the multidisciplinary TED clinic of Sheba Medical Center, Tel HaShomer. For each eye, data on the presence of corneal pathology and clinical characteristics were recorded at both the initial and final evaluations. Information on surgical interventions, corneal clinic visits, and additional treatments was also analyzed.

Results: A total of 121 TED patients were included. Corneal pathologies were observed in 64 patients (52%), most of which were bilateral (54, 84.4%). At presentation, 53 patients (82.81%) had punctate epithelial erosions (PEE), 18 (28.12%) had a TBUT <10 seconds, 5 (7.81%) were diagnosed with severe dryness or exposure keratopathy, and 2 (3.12%) presented with corneal opacity. Six patients (4.95%) required corneal clinic visits, while 12 (18.5%) underwent dry eye surgeries: 4 unilateral and 7 bilateral tarsorrhaphies, and 1 ectropion repair. Additionally, 6 patients received other treatments, including 5 plug insertions and 1 IPL therapy. No perforations due to dry eye were reported.

Conclusions: In conclusion, this study highlights the significant prevalence of corneal pathologies in patients with TED with over half of the participants affected. The findings indicate that bilateral involvement is common. While the majority of patients did not require extensive intervention, a subset underwent surgical treatments, underscoring the need for careful monitoring and management of ocular surface conditions in this population. Overall, these results emphasize the importance of a comprehensive approach to the evaluation and treatment of corneal conditions associated with TED to improve patient outcomes. Further research is essential to better understand the underlying mechanisms and optimize clinical guidelines for corneal assessment in TED patients.

OCULOPLASTICS III

The Effect of Botulinum Neurotoxin A Injections on Meibomian Glands and Dry Eye

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Purpose: To assess the influence of Botulinum neurotoxin A (BoNT-A) injection on meibomian gland function and dry eye in patients diagnosed with Blepharospasm (BPS) and Hemifacial spam (HFS).

Methods: Adult patients aged 18 years or older who suffer from periocular dystonia, and were treated with BoNT-A injections, were recruited in this interventional prospective study between 2023 and 2024. Each patient was followed up for a period of three months. The following parameters were compared at baseline, 14 and 90 days post BoNT-A injections: Visual acuity, meibography, tear break up time (TBUT), Schirmer test, meibum expression, tear meniscus height, fluorescein corneal staining, meibomian gland dysfunction (MGD) grading, and ocular surface disease index (OSDI). In addition, patients underwent subjective quality of life questionnaires for BPS and HFS.

Results: Thirty-six eyes of twenty-six patients were included in this study. The mean age ± SD was 59 ± 17.33 years. There was a significant statistical difference in vascular changes on the lid margin, TBUT, corneal and conjunctival fluorescein staining and meibum expression ($P<0.001$ in all). The differences were statistically significant when compared to baseline vs visit 2 and visit 2 vs visit 3 (p-value<0.05). Jankovic rating scale and HFS score improved significantly between the time periods ($P<0.001$ in both). There was no significant difference in meibomian gland loss, tear meniscus height, Schirmer test, and OSDI.

Conclusions: BoNT-A injection is an effective treatment for periocular dystonia, but it worsens ocular surface and dry eye disease. Moreover, it affects the meibomian glands by disturbing their secretion.

The UK National Artificial Eye Questionnaire Study: Exploring Factors Influencing Quality of Life in Cosmetic Shell Wearers

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Purpose: To report associations with visual function and quality of life (QOL) in cosmetic shell wearers.

Methods: This multicentre, observational, cross-sectional study was conducted nationwide within the National Health Service England. Items from the National Eye Institute Visual Function Questionnaire (VFQ) were integrated into the National Artificial Eye Questionnaire (NAEQ) and completed by 238 cosmetic shell wearers. Multivariate regression analyses evaluated associations between patients' experiences, routine management, demographic factors, baseline parameters, and QOL scores.

Results: Predictors of the QOL composite score included comfort ($\beta = 0.25$, $p < 0.001$; positive), age (between 50 and 65 years, $\beta = 0.20$-, $p < 0.05$; negative), appearance ($\beta = 0.20$, $p < 0.05$; positive), a subjective beneficial effect of polishing ($\beta = 0.15$-, $p < 0.05$; negative), and background aetiology (congenital, $\beta = 0.15$, $p<0.05$; positive). Regarding the specific subscales, better comfort was positively associated with all visual function and QOL subscales ($p < 0.05$ for all). Lesser discharge was only associated with near activities ($\beta = 0.19$, $p<0.05$), and discharge visibility (i.e., not visible) was associated with better social functioning ($\beta = 0.14$, $p<0.05$). The cosmetic shell appearance was positively associated with the mental health ($\beta = 0.19$, $p < 0.05$), role difficulties ($\beta = 0.17$, $p < 0.05$), and dependency ($\beta = 0.27$, $p < 0.001$) subscales. In contrast, the shell motility did not independently predict any QOL scale score. Patients between 30 and 50 scored worse on the dependency subscale ($\beta = 0.18$-, $p < 0.05$). A congenital aetiology predicted a better mental health score ($\beta = 0.19$, $p < 0.05$), while cancer predicted a worse role difficulties score ($\beta = 0.16$-, $p < 0.05$). Finally, respondents who perceived a more substantial benefit from polishing reported more role difficulties ($\beta = 0.16$-, $p < 0.05$) and worse dependency scores ($\beta = 0.12$-, $p < 0.05$).

Conclusions: This study demonstrates for the first time that multiple factors in the cosmetic shell experience predict visual function and QOL aspects. While there are similarities, notable differences were observed compared to previous findings in artificial eye wearers, highlighting unique considerations for this population.

Congenital Anophthalmic Syndrome, a Novel Surgical Complementary Approach

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Purpose: Congenital anophthalmic syndrome patients are difficult to manage and the end cosmetic result is frustrating in most patients. In past IOS meetings we have already described the use of 3D printed expanders in improving the results of the non-surgical ocularist treatment. This time we would like to share our experience and evolution of the supplementary new surgical strategy.

Methods: We would like to describe 8 consecutive patients that were treated since early childhood in our prosthetic clinic using acryl expander and later operated. Operation indications were prosthesis retention problem post surgeries elsewhere in 5 patients, and failure to achieve a cosmetic satisfactory result in 3. Patients did a presurgical CT scan to enable surgical planning. Interventions included surgical actions that were customarily chosen from the following list according to patient's needs: • Lateral wall trim thinning • Dermal fat graft implant +- alloplastic 16 mm' implant • Lateral socket amniotic membrane or buccal mucosal implant • Lateral elongation of the eyelids using "trouser shape" ear cartilage that enables further easy extension of the eyelid opening.

Results: All patients experienced socket enlargement post-surgery with an improvement in the anophthalmic eyelid opening and symmetry. The surgical procedure corrected the retention problem in all patients. Two patients developed a late symblepharon in the lateral canthus after avoiding prosthesis wear due to conjunctivitis. One of them was corrected by amniotic membrane implantation.

Conclusions: To the best of our knowledge, there are no common recommendations for the surgical treatment of Congenital Anophthalmic Syndrome patients. Custom surgical planning and the "trouser shape" lateral canthus implantation seems to offer a good complementary treatment in Congenital Anophthalmic Syndrome patients to improve cosmesis and resolve prosthesis retention problems.

Rabin Medical Centre's Recent Experience with Invasive Fungal Orbital Infection: Case Presentations and Literature Review

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Purpose: Invasive fungal orbital infections (IFOIs) are life-threatening conditions affecting immunocompromised individuals, commonly caused by mucormycosis and aspergillosis. These infections originate in the sinuses and may rapidly progress to the orbit and CNS. Treatment includes systemic antifungals, surgical debridement, and, in advanced cases, orbital exenteration. The role of local amphotericin B (AMB) injections as a globe-sparing alternative has been increasingly explored, particularly during the COVID19- pandemic. We present three IFOI cases managed at Rabin Medical Centre during the last winter and review the literature regarding AMB orbital injections versus orbital exenteration.

Methods: Cases report and review of the literature.

Results: A 66-year-old female with AML and diabetes developed sino-orbital mucormycosis and went into septic shock. After two retrobulbar AMB injections, she underwent eyelid-sparing orbital exenteration and survived. A 65-year-old male with AML and sino-orbital aspergillosis received five peribulbar AMB injections, showed local improvement, but discontinued invasive treatment after AML progression. A 4-month-old female with congenital AML and sino-orbital aspergillosis received six peribulbar AMB injections but succumbed within two weeks.

Conclusions: Our limited experience highlights the complexity of IFOI management. In our series, only the patient who underwent exenteration survived. However, recent studies, especially during the COVID19-pandemic, suggest AMB injections can prevent exenteration in select cases. A systematic review reported a 95% globe salvage rate with retrobulbar AMB injections for COVID-19-associated mucormycosis. While our cases did not demonstrate comparable infection control with AMB injections alone, recent findings support their potential role. Further research is needed to establish standardized treatment protocols.

BEST OF THE BEST

Metagenomic Next-Generation Sequencing: A New Horizon for Intraocular Infection Diagnostic

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Purpose: To report our experience with the use of metagenomic next-generation sequencing (mNGS) in diagnosing presumed intraocular infections.

Methods: A retrospective case series of patients presenting with presumed intraocular infections at Tel Aviv Sourasky Medical Center. Clinical and demographic data, as well as mNGS results were extracted from patient records. For mNGS, nucleic acid (NA) extraction was followed by human NA depletion using Devin Microbial DNA Enrichment Kit. Library preparation employed the Unison Ultralow DNA NGS Library Preparation Kit, followed by sequencing on the Illumina NextSeq500 platform. Taxonomic assignment utilized KrakenUniq. The following parameters were examined: Reads Per Million, Reads Per Million-ratio to negative control (RPM-r) and E-index (K-mers*coverage/reads).

Results: The study included 15 eyes of 15 patients (5 women, mean age: 66±17 years). All cases were presumed intraocular infections, 9 endophthalmitis and 6 uveitis cases. The mNGS test successfully identified the causative pathogens providing precise diagnoses even when clinical presentations were atypical or initial diagnostic workups were non-revealing. The identified pathogens spanned a range of bacteria (Bartonella henselae, Listeria monocytogenes, Staphylococcus epidermidis, Nocardia cyriacigeorgica, Rothia mucilaginosa, Pantoea agglomerans, Klebsiella pneumoniae, viruses (CMV, VZV), and parasites (Toxoplasma gondii). In addition, the mNGS test was useful to rule out the presence of infection and enabled the diagnosis of sterile endophthalmitis and non-infectious uveitis in 6 cases.

Conclusions: The metagenomic next-generation sequencing test allowed the identification of intraocular infections also in challenging cases, while ruling infections in suspected cases. This innovative approach enabled comprehensive pathogen identification and significantly improved the precision of treatment strategies.

Strabismus Surgery Outcomes Prediction Using Machine Learning and Multiple Preoperative Variables

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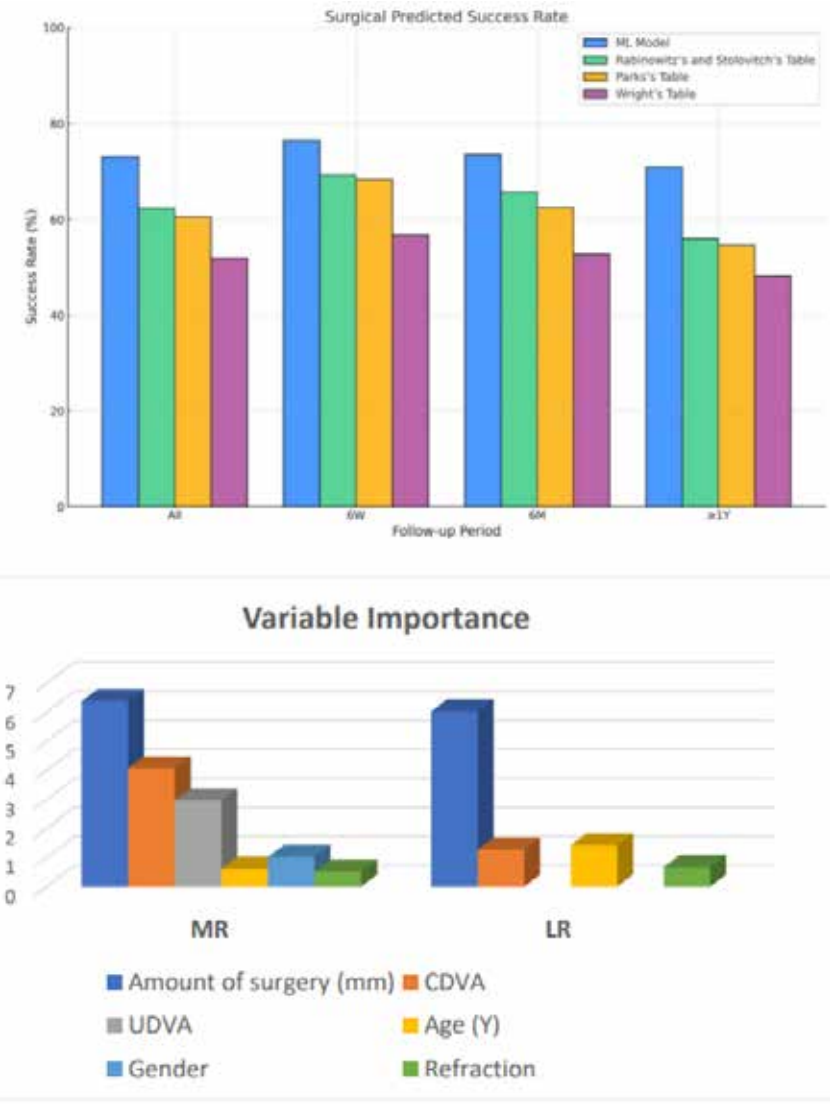
Purpose: To evaluate whether incorporating multiple preoperative variables in strabismus surgery planning can improve the accuracy of surgical outcomes compared to traditional methods.

Methods: A Machine Learning (ML) Linear Regression model was developed using a database of 3297 eye deviation measurements and 641 horizontal strabismus surgeries of 597 patients, performed by a single surgeon from 1990 to 2024. The model aimed to predict strabismus surgery outcomes based on multiple preoperative variables, including age, gender, refraction, and visual acuity. Success was defined as ≤10 prism diopters (PD) prediction error six weeks, six months, and ≥1 year after the surgery.

Results: The ML model significantly increased the prediction success rate by 10.88-%21.29% compared to traditional tables (73.15%, 95% CI 63.26-78.35% vs. 51.86-60.53% respectively; P<0.001), with mean absolute error (MAE) of 8.28 (95% CI 7.10-10.03) vs. 12.52-10.79 respectively (P<0.001). The variables that significantly influenced the prediction were the amount of surgery, (6.03 for lateral rectus (LR) surgeries, 95% CI 4.48-7.58; P<0.001, and 6.38 for medial rectus (MR) surgeries, 95% CI 5.37-7.40; P<0.001), age (1.43, 95% CI

Figure 1.



0.81-2.04; P<0.001 for LR surgeries and 0.61, 95% CI 0.13-1.09; P=0.001 for MR surgeries), gender (1.02, 95% CI 0.56-1.47; P<0.001 for MR surgeries), uncorrected distance visual acuity (2.96, 95% CI 2.21-3.72; P<0.001 for MR surgeries), corrected distance visual acuity (1.27, 95% CI 0.39-2.16; P=0.005 for LR surgeries and %95 ,4.07 CI 4.70-3.44; P<0.001 for MR surgeries) and cycloplegic refraction (0.67, 95% CI 0.26- 1.07; P=0.001 for LR surgeries).

Conclusions: Utilizing ML technology and incorporating additional preoperative variables can facilitate better prediction of strabismus surgery outcomes. This study represents an initial step towards improving strabismus surgery outcomes and developing an ML-based strabismus calculator that can provide surgeons with operative recommendations based on multiple variables.

Figure 2.

Comparison of Surgical Success Prediction Rates: Traditional Methods vs. Machine Learning Model

	Traditional Tables Prediction Success rate (%)	ML model predicted success rate (%)	P value	Traditional Tables Mean Absolute Error	ML model Mean Absolute Error	P value
All (surgeries n=641, deviation measurements n=3297)						
Rabinowitz's and Stolovitch's Table	62.27	73.15	<0.001	10.23	8.28	<0.001
Parks's Table	60.53		<0.001	10.79		<0.001
Wright's Table	51.86		<0.001	12.52		<0.001
6 weeks postop (surgeries n=340, deviation measurements n=624)						
Rabinowitz's and Stolovitch's Table	69.23	76.44	0.0025	8.83	7.38	<0.001
Parks's Table	68.27		<0.001	9.34		<0.001
Wright's Table	56.73		<0.001	11.38		<0.001
6 months postop (surgeries n=248, deviation measurements n=524)						
Rabinowitz's and Stolovitch's Table	65.65	73.47	0.0036	9.58	8.03	<0.001
Parks's Table	62.40		<0.001	10.06		<0.001
Wright's Table	52.67		<0.001	11.85		<0.001
≥1 year postop (surgeries n=242, deviation measurements n=975)						
Rabinowitz's and Stolovitch's Table	56.00	70.87	<0.001	11.48	8.98	<0.001
Parks's Table	54.56		<0.001	12.12		<0.001
Wright's Table	48.31		<0.001	13.62		<0.001

ML- machine learning, n-number, postop- post-operatively, %- percentage

Figure legend:

Figure 1: Surgical Predicted Success Rate
The surgical predicted success rate of the machine learning model and traditional tables (Rabinowitz's and Stolovitch's Table, Parks's table and Wright's table). ML- machine learning.
6W- 6 weeks, 6M- 6 months, 1Y- 1 year.

Figure 2: Variables Importance
Preoperative variables that significantly influenced the surgical outcomes.
The different preoperative variables importance in predicting surgical outcomes is shown in the graph.
CDVA- corrected distance visual acuity, UDVA- uncorrected distance visual acuity, Y-years, MR- medial rectus, LR- lateral rectus.

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Cognitive Indications and Dementia Prediction Based on Fundoscopy Imaging Using Advanced Deep Learning Methods

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Purpose: Dementia is a progressive neurodegenerative syndrome affecting over 55 million people worldwide, with numbers projected to rise significantly. Early detection is crucial for timely interventions, yet current diagnostic methods rely heavily on cognitive testing, which may not detect preclinical changes. Recent studies suggest that retinal microvascular changes, detectable via fundus imaging, may serve as biomarkers for dementia risk. This study aims to evaluate the predictive capability of fundoscopic imaging for cognitive function and dementia risk using advanced deep learning (DL) models. We assess the relationship between retinal features and cognitive performance on Mini-Mental State Examination (MMSE)-like metrics, and their association with subsequent dementia incidence.

Methods: A dataset of 176,114 fundus images from 86,518 patients was extracted from the UK Biobank, with 2,565 images corresponding to patients later diagnosed with dementia. Cognitive function was assessed using two validated tests: Fluid Intelligence (FI) and Prospective Memory (PM). Two convolutional neural networks were trained to classify fundus images based on high vs. low cognitive performance. Models were evaluated using accuracy, sensitivity, specificity, and area under the receiver operating characteristic curve (AUC), with additional confidence-based analysis to enhance clinical applicability.

Results: Analysis revealed a significant correlation between lower FI/PM scores and increased dementia incidence. The models demonstrated robust predictive performance, achieving AUCs of 0.901 (FI) and 0.829 (PM) at the patient level. Confidence-based analysis enabled high-confidence predictions, reducing misclassification risks.

Conclusions: This study highlights the feasibility of using fundus imaging as a scalable, cost-effective, and non-invasive screening tool for cognitive impairment and dementia risk. Retinal biomarkers, in combination with DL-based analysis, offer a promising avenue for early detection and intervention. Future work should focus on expanding datasets, integrating explainability techniques, and conducting prospective clinical studies to validate clinical utility.

Long-Term Outcomes of EndoArt® Implantation for Chronic Corneal Edema, Including High-Risk Patients for Human Tissue Rejection

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Purpose: The EndoArt® (EyeYon Medical, Ness Ziona, Israel) is an artificial endothelial replacement membrane designed to reduce corneal edema by acting as a water-impermeable barrier on the posterior cornea. To date, EndoArt® has been implanted in over 400 patients worldwide, with follow-ups extending beyond 5.5 years. This novel approach offers a promising alternative for patients with chronic corneal edema, particularly those at high risk for human graft rejection. This study reports on the long-term safety and efficacy of EndoArt® in both standard and high-risk patients.

Methods: A retrospective analysis of 115 patients implanted across multiple centers in Israel, Europe, India and China. Analysis includes 21 patients with long-term results and 45 patients at high-risk for human graft rejection EndoArt® was implanted in patients with chronic corneal edema, including those who had failed multiple keratoplasties or were at high risk of graft failure. Long-term safety and efficacy were assessed over 12 to 24 months, focusing on central corneal thickness (CCT), best corrected visual acuity (BCVA), and pain scores (for high-risk patients). Safety outcomes, including implant transparency, complications, and adverse events, were also evaluated.

Results: A significant reduction in CCT was observed across all cohorts. In the 21 cases with long-term follow-up, mean preoperative CCT of 793±108µm (681µm - 1087µm) improved to 565±110µm and 577±89µm after 12 and 24 months, respectively (p.value<<0.05). Among 45 high-risk patients, CCT decreased from 779±184µm (n=45) to 152±584µm and 593±152µm at 6 and 12-month follow-up, respectively (p value<<0.05). In terms of visual outcomes, 14 of 18 patients with visual potential in the long-term cohort experienced improved vision, with 10 regaining at least 7 ETDRS lines at 24 months. best BCVA after 2 years 6.5 in 2 patients. Safety outcomes were favorable, with no infections or implant-related inflammation reported. All implants remained transparent throughout follow-up. A comparison between high-risk and normal-risk patients (n=70) showed similar CCT improvements and pain relief, though BCVA outcomes and re-bubbling rates were better in the normal-risk group.

Conclusions: EndoArt® has demonstrated long-term safety, efficacy, and stability in reducing corneal edema and improving visual outcomes in both standard and high-risk patients. In high-risk cases, where human graft rejection is a concern, EndoArt® offers a viable, non-rejectable alternative, reducing pain and maintaining corneal clarity. With over 400 implantations and long-term follow-ups exceeding 5.5 years, EndoArt® presents a durable and promising solution for patients suffering from chronic corneal edema

Analysis of the ESCRS Calculator's Prediction Accuracy

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Purpose: To evaluate prediction accuracy of formulas included in the ESCRS-Online-IOL-Calculator using standard keratometry (K) or total keratometry (TK).

Methods: A retrospective case-series at a hospital-based academic practice, including 523 cataract patients (523 eyes). Outcome Measures: trimmed-means of the spherical equivalent prediction error (SEQ-PE, trueness), precision and absolute SEQ-PE (accuracy) of all seven formulas available on the ESCRS-Online-IOL-Calculator as well as the mean (Mean-All) and median (Median-All) of the predicted SEQ refraction of all formulas. Sub-group analyses evaluated the effect of axial length on formula accuracy.

Results: Trimmed-mean SEQ-PE of all formulas varied from –0.075 to +0.071D for K-based and from -0.003 to +0.147D for TK-based calculations, with TK-based being more hyperopic in all formulas. Precision ranged from 0.210 to 0.244D for both K-based and TK-based calculations. Absolute SEQ-PE ranged from 0.211 to 0.239D for K-based and from 0.218 to 0.255D for TK-based calculations. All formulas, including Mean-All and Median-All, showed high accuracy with 84–90% of eyes having SEQ-PEs within 0.50D. Myopic trimmed-mean SEQ-PEs significantly different from zero were observed in long eyes for Pearl DGS, Hill RBF and Hoffer QST, and in short eyes for EVO 2.0, Kane, Hoffer QST, Mean-All and Median-All.

Conclusions: Prediction accuracy of all ESCRS IOL Calculator formulas was high and globally comparable. TK-based calculations did not increase prediction accuracy and tended towards hyperopia. Observations indicating formula superiority in long and short eyes merit further evaluation.

Predictors of Visual Acuity Improvement in Amblyopic Patients Following Laser Vision Correction Surgery

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Purpose: To identify factors predicting a two-line (0.2 logMAR) improvement in best-corrected visual acuity (BCVA) following laser vision correction surgery in amblyopic patients.

Methods: This retrospective study analyzed consecutive amblyopic patients who underwent primary LASIK or PRK at Care-Vision Laser Centers, Tel-Aviv, Israel, between January 2013 and July 2024. Inclusion criteria included age >18 years, stable refraction for ≥12 months, myopia up to −12 D, hyperopia up to +6 D, and cylinder up to 6 D. Amblyopia was classified as mild (BCVA >20/40) or moderate (BCVA ≤20/40 and >20/80). Patients were categorized into an improvement group (≥2-line BCVA improvement postoperatively) or control group (<2-line improvement). Binary logistic regression was used to identify predictors of BCVA improvement, with variables included if they met a univariate significance level of $p<0.15$.

Results: Out of 1,894 amblyopic eyes reviewed, 1,007 eyes met inclusion criteria with complete follow-up data. Two-line BCVA improvement was observed in 22.8% (n=230). Predictors of improvement included younger age (OR = 0.96 per year, $p<0.001$), male gender (OR = 1.38, $p=0.04$), and worse preoperative BCVA (OR = 1.67 per 0.1 logMAR unit, $p<0.001$). Higher preoperative cylinder values were inversely associated with improvement (OR = 0.88 per diopter, $p=0.03$). Mean keratometry approached statistical significance (OR = 1.10 per diopter, $p=0.053$), while spherical equivalent refraction (SEQ) was not predictive of improvement. Patients in the improvement group were younger (27.3 ± 8.4 vs. 30.9 ± 10.5 years, $p<0.001$) and more likely to have moderate amblyopia (28.7% vs. 21.5%, $p=0.03$).

Conclusions: Younger age, male gender, worse preoperative BCVA, and lower cylinder values are significant predictors of a two-line improvement in BCVA in amblyopic patients undergoing LASIK or PRK. These findings can guide preoperative counseling and help set realistic expectations for this subset of patients.

Association Between Xanthelasma Palpebrarum with Cardiovascular Risk and Dyslipidemia: A Case Control Study

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Purpose: A case-control study conducted at a single tertiary care center aimed to determine whether xanthelasma palpebrarum (XP) is associated with dyslipidemia, cardiovascular disease (CVD), and other systemic conditions in a large population.

Methods: Participants were individuals who were examined at a medical screening institute from 2001 through 2020. Medical records were reviewed to extract data on ophthalmic evaluations, blood test results, and systemic diagnoses. Patients identified with XP in at least 1 eye constituted the study group. A control group without XP was established matched by age and sex at a 10:1 ratio to allow robust statistical analysis. The main outcome measures were associations between XP and dyslipidemia and CVD. Lipid profiles and diagnoses of dyslipidemia and CVD were compared between the case and control groups.

Results: The database included 35,452 individuals (69% male; mean age 52.2 ± 12.2 years). The study population comprised 203 patients with XP (0.6%) and 2030 matched controls. There were no significant differences between the groups in the prevalence of dyslipidemia (42% XP vs. 46% controls; $P = 0.29$), use of cholesterol-lowering medications (48% XP vs. 47% controls; $P = 0.88$), or lipid profiles, including total cholesterol, HDL, LDL, and triglycerides (all $P > 0.05$). The rate of CVD was also similar (8.9% XP vs. 10% controls; $P = 0.56$), as were the prevalences of hypertension (23% vs. 24%), diabetes (10% vs. 14%), and history of cerebrovascular accident (1% vs. 1.3%) (all $P > 0.05$).

Conclusions: XP was not associated with increased rates of dyslipidemia or CVD. This questions the extent to which XP serves as an indicative marker for heightened systemic risk. This abstract was presented at the 2024 AAO Conference and the research has been accepted for publication in the journal Ophthalmology in 2024.

Ocular Inflammation in West Nile Virus: A Multicenter Retrospective Study

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Purpose: West Nile virus (WNV) is a mosquito-borne zoonotic virus that usually causes asymptomatic infection. Ocular involvement is uncommon, with chorioretinitis as the most frequent manifestation. The virus reaches the eye via hematogenous spread or the optic nerve, with immune privilege and blood-retinal barriers limiting involvement in non-neuroinvasive cases. Chorioretinal lesions are typically multifocal, bilateral, and evolve into well-demarcated atrophic scars. Usually self-limited, however severe cases may lead to vision loss, especially with macular involvement or vascular occlusions. As no antiviral treatment exists, management is supportive. This study reports ocular inflammatory involvement in a large WNV cohort.

Methods: This nationwide multicenter retrospective study includes patients with serologically confirmed WNV infection and documented ocular inflammation findings. Data collected included demographics, medical history, clinical presentation, imaging, treatment and ocular and systemic outcomes.

Results: Among 30 patients with West Nile-related uveitis, 2 (6.7%) presented with anterior uveitis, 8 (26.7%) with intermediate uveitis, and 29 (96.7%) exhibited chorioretinal lesions. The mean age was 71±16 years, and 60% were male. Initial visual acuity ranged from 6/8.5 to 6/60. Chorioretinitis was the most common ocular inflammatory finding. Visual outcomes varied, with 28 patients (94%) achieving full recovery in visual acuity and ocular health, while 2 (6%) experienced only partial improvement.

Conclusions: Patients with WNV-related ocular inflammatory disease generally experience a favorable ocular outcome despite the severity of their systemic condition. However, early recognition and diagnosis of ocular manifestations can facilitate prompt management, leading to better outcomes in more severe cases.

Preserflo, is it a Choice for Refractory Childhood Glaucoma?

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Purpose: Childhood glaucoma is defined as IOP-related damage to the eye. Classification covers glaucoma occurring at any point in childhood. Various surgical techniques are available nowadays aimed to treat childhood glaucoma. Among these, Presserflo MicroShunt introduced in recent years offers a novel approach. Although not much information is presented regarding the efficiency of this procedure in the pediatric population. Classification evolves with ongoing systemic evaluation as secondary causes are uncovered, a child with bilateral glaucoma can carry a different diagnosis for each eye. Treating these cases is complex, leading to our motivation in determining the efficiency of Preserflo among pediatric patients with refractory glaucoma at our facility.

Methods: In this retrospective study, we examined data regarding 21 pediatric patients who underwent Presserflo MicroShunt procedure at SUMC from October 10th, 2023, through September 30th, 2024. Information on pre-surgical IOP, post-surgical IOP, and surgical failure, defined as the requirement for additional IOP-lowering procedures, was obtained from the hospital's database. The primary outcome was set as a reduction in IOP levels of 25% or more than the pre-operational IOP.

Results: Over a period of approximately one year, data from 21 patients, comprising 26 eyes, was collected. Four patients underwent bilateral surgery, while the remaining patients underwent unilateral procedures. The ages of the patients ranged from 6 months to 12.11 years, with a mean age of 5.12 years. Females comprised eight patients and males 13 accordingly. All patients were diagnosed with childhood glaucoma. Average pre-surgical IOP levels were 23.9 mmHg, compared to post-surgical IOP levels of 14.2 mmHg.

Conclusions: Presserflo demonstrated efficiency in reducing IOP associated with refractory childhood glaucoma, where other surgical procedures have failed. Regular and prolonged follow-up intervals are crucial for early prevention of surgical failure. Larger-scale studies are required to evaluate its efficacy in the pediatric population.

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