American Society of Ophthalmic Plastic and Reconstructive Surgery®

Orlando 2025

56th Annual Fall Scientific Symposium

October 16-17, 2025 | Rosen Shingle Creek, Orlando, Florida

SYLLABUS

GENERAL INFORMATION

Continuing Medical Education

The American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide Continuing Medical Education (CME) for physicians. ASOPRS designates this live activity for a maximum of ***13.5 AMA PRA Category 1 Credits™***. Physicians should claim only the credit commensurate with the extent of their participation in the activity. Self-assessment CME credit may be claimed if the physician completes the self-assessment questionnaire at the end of the online meeting evaluation.

Continuing Medical Education Mission Statement

The purpose of the American Society of Ophthalmic Plastic and Reconstructive Surgery's Continuing Medical Education (CME) program is to present oculofacial plastic surgeons with the highest quality learning opportunities in the areas of aesthetics, eyelid, lacrimal, and orbital diseases that promote positive change in physician performance or competence, thus enabling such physicians to maintain or improve the knowledge, skills, and professional performance needed to provide the best possible care for their patients. Ongoing assessment of the impact of the CME program is important in determining modifications to existing activities and the development of new activities. Specific expected results include increased knowledge across the ASOPRS community, a desire among practicing ophthalmologists to pursue lifelong learning, the refinement of already employed techniques or skills, and the application of new techniques or skills for the improvement of practice and patient care.

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A link to an evaluation will be provided to attendees after the meeting via email. You will have an opportunity to download a CME certificate once you have completed the evaluation. Your feedback is carefully considered when planning future meetings. Thank you in advance for helping ASOPRS improve our Fall Scientific Symposium.

Abstract Disclaimer

Abstract information is published as submitted.

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In accordance with the **ASOPRS CME Education Policy and Procedure**, the ASOPRS Accreditation Committee must ensure that the planning and presentation of our Scientific Symposia are balanced and free of commercial influence/bias through a process of mitigation of relevant financial relationships.

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The ASOPRS Accreditation Committee has conducted a mitigation of relevant financial relationships process with anyone determined to have a relevant financial relationship. This process included:

- Reviewing presentations for indicators of integrity and absence of bias, and details from faculty regarding how they will be unbiased/balanced.
- Moderators with relevant disclosures have attested that they will not allow their disclosure to bias their role.
- Committee (Awards, Thesis, YASOPRS, etc.) members with relevant financial relationships were removed from making any decisions or having any influence over the programmatic content which relates to their financial disclosure.
- Scientific Symposia Directors with research relationships have had their programmatic decisions reviewed by a group of peer reviewers.

During the program, it is the responsibility of moderators to identify potential commercial bias by the presenters. Attendees may also address concerns during Q&A or the meeting evaluation.

Individuals with financial relationships found relevant to their role are published below under the heading 'Relevant Financial Relationships.' These relationships have been mitigated by the Accreditation Committee.

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Brian Biesman	Panelist, Moderator	1-Acclaro 2-Cytrellis 3-Galderma 4-Loreal 5-Solta 6-Revance 7-La Mer, LRM, Luvo, MTF, RBC, Xmedica 8-Alastin, Jetema, Levation, Merz, Raziel, Soliton, Symatese 9-Revision 10-Sofwave 11-Teoxane	1-Independent Contractor, Research, Stocks 2-Independent Contractor, Research, Stocks 3-Independent Contractor, Research 4-Independent Contractor, Consultant/Advisor, Research 5-Independent Contractor, Consultant/Advisor, Research 6-Independent Contractor, Consultant/Advisor, Reserach 7-Consultant/Advisor 8-Research 9-Consultant/Advisor, Research 10-Consultant/Advisor, Research 11-Consultant/Advisor, Reserach	1-No 2-No 3-No 4-No 5-No 6-No 7-No 8-No 9-No 10-No 11-No
César A. Briceño	Presenter	1-Amgen 2-Roche/Genentech, Inc.	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No

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Name	Role	Company	Relationship	Ended
Jackie Carrasco	Abstract Reviewer	Amgen	Speakers Bureau	No
Sarah M. Cheng	Co-Author	Amgen	Researcher	No
Steven Couch	Panelist, Moderator	1-Sling Therapeutics 2-Amgen 3-Viridian Therapeutics	1-Researcher 2-Researcher 3-Researcher	1-No 2-No 3-No
Hakan Demirci	Presenter	1-Aura Bioscience 2-Castle Bioscience	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Vikram Durairaj	Presenter	Stryker	Consultant/Advisor	No
Ebby Elahi	Presenter	VisageX	Ownership interests	No
Neda Esmaili	Abstract Reviewer	Immunovant	Researcher	No
Gabriella Espinoza	Abstract Reviewer	Argenx BV	Researcher	No
John Fezza	Panelist, Speaker	1-Allergan 2-Evolus 3-Nordic Pharma	1-Speakers Bureau 2-Speakers Bureau 3-Royalties or patent beneficiary	1-No 2-No 3-No
Suzanne Freitag	Panelist, Moderator, Co-Author	1-Amgen/Horizon, Argenx, Ethyreal, Immunovant, Janssen, Kriya, Lassen Therapeutics, Merida, Sling Therapeutics, Viridian 2-Medtronic, Poriferous, WL Gore & Associates 3-Springer, Thieme	1-Consultant/Advisor 2-Consultant/Advisor 3-Textbooks	1-No 2-No 3-No
Molly Fuller	Abstract Reviewer	Amgen	Speakers Bureau	No
Jean Pierre Hubschman	Presenter	Horizon Surgical Systems	Employee	No
Sasha Hubshcman	Moderator, Introducer	Horizon Surgical Systems	Stocks	No
Femida Kherani	Presenter, Abstract Reviewer	1-AbbVie Inc. 2-Amgen Inc. 3-Santen Pharmaceutical Co., Ltd. 4-Sun Pharmaceutical Industries Ltd. 5-Tarsus Pharmaceuticals, Inc.	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor 4-Consultant/Advisor 5-Consultant/Advisor	1-No 2-No 3-No 4-No 5-No

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Jwu Jin Khong	Co-Author	1-ACELYRIN, INC 2-Alkira Bio 3-Amgen 4-Centre for Eye Research Australia 5-Roche	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor 4-Researcher 5-Consultant/Advisor	1-No 2-No 3-No 4-No 5-No
Don O. Kikkawa	Co-Author, Abstract Reviewer	1-Amgen, Immunovant, Genentech, Acelyrin, Argenx, and Lassen Therapeutics 2-Elsevier	1-Consultant/Advisor 2-Royalties	1-No 2-No
Bobby S. Korn	Co-Author	1-Amgen; Advisory Board: Acelyrin, Argenx, Immunovant, Viridian 2-Elsevier	1-Consultant/Advisor 2-Royalties	1-No 2-No
Andrea Kossler	Co-Author	1-Amgen, Viridian, sling, Lassen, Kriya 2-Genentech, Acelyrin, Argenx, Amgen, Viridian, Kriya, Lassen, Immunovant	1-Researcher 2-Consultant/Advisor	1-No 2-No
David A. Kostick	Co-Author	Amgen	Speakers Bureau	No
Nahyoung Grace Lee	Co-Author, Abstract Reviewer	1-Amgen 2-Argenx	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Wendy Lee	Panelist	1-Galderma 2-Revance 3-Evolus 4-RoC 5-Tarsus 6-Viatris 7-Amgen 8-Viridian 9-Santen 10-Acelyrin 11-Ethyreal	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor 4-Consultant/Advisor 5-Consultant/Advisor 6-Consultant/Advisor 7-Consultant/Advisor 8-Consultant/Advisor 9-Consultant/Advisor 10-Consultant/Advisor 11-Consultant/Advisor	1-No 2-No 3-Yes 4-No 5-Yes 6-Yes 7-No 8-No 9-No 10-No 11-No
Catherine Y. Liu	Co-Author, Abstract Reviewer	1-Lassen Therapeutics, Genentech, Amgen 2-Wolters Kluwer	1-Researcher 2-Royalties	No
Amina Malik	Moderator	1-Amgen 2- Immunovant 3-Tourmaline	1-Consultant/Advisor 2-Researcher 3-Researcher	1-No 2-No 3-No

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Louise Mawn	Panelist, Co-Author, Abstract Reviewer	1-Amgen 2-Genentech	1-Consultant/Advisor 2-Consultant/Advisor, Researcher	1-No 2-No
Cameron Nabavi	Abstract Reviewer	Tourmaline Bio - Researcher (not ended)		
Santiago Ortiz-Perez	Co-Author	1-Amgen 2-Roche/Genentech 3-Thea Lab	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor	1-No 2-No 3-No
Chau Pham	Panelist, Abstract Reviewer	1-Edwards Life Sciences 2-Regeneron	1-Stocks 2-Stocks	1-No 2-No
Fatemeh Rajaii	Abstract Reviewer	1-Amgen 2-Immunovant 3-Acelyrin 4-Roche 5-Viridian 6-Khartis	1-Consultant/Advisor 2-Researcher 3-Consultant/Advisor 4-Researcher 5-Researcher 6-Consultant/Advisor	1-Yes 2-No 3-Yes 4-No 5-Yes 6-No
Deepak Ramesh	Moderator	1-Poriferous 2-Viridian 3-Amgen	1-Royalties 2-Researcher 3-Researcher	1-No 2-No 3-No
Kelsey Roelofs	Abstract Reviewer	Amgen	Consultant/Advisor	No
Daniel Rootman	Panelist, Co-Author, Abstract Reviewer	1-Amgen 2-Argenx	1-Speakers Bureau 2-Consultant/Advisor	1-No 2-No
Rob Schwarcz	Panelist	1-Galderma 2-Amgen	1-Consultant/Advisor 2-Speaker Bureau	1-No 2-No
Brittany Simmons	Co-Author	1-Genentech/Roche 2-Argenx 3-Amgen 4-Tourlamine Bio	1-Consultant/Advisor 2-Researcher 3-Researcher 4-Researcher	1-No 2-No 3-No 4-No
Ann Tran	YASOPRS Workgroup	1-Genentech 2-argenx	1-Consultant/Advisor, Researcher 2-Researcher	
Krishna Tumuluri	Co-Author	Amgen	Consultant/Advisor	No

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Shoaib Ugradar	Presenter	1-ACELYRIN, INC 2-Viridian Therapeutics	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Suzanne van Landingham	Abstract Reviewer	Immunovant	Researcher	No
Ana Carolina Victoria	Presenter	1-Candela Medical 2-Amgen 3-Allergan 4-Tarsus	1-Consultant/Advisor 2-Speakers Bureau 3-Consultant/Advisor 4-Consultant/Advisor	1-No 2-No 3-No 4-No
Julie Woodward	Panelist	1-Allergan 2-Galderma 3-Merz 4-SkinCeuticals 5-Canfield	1-Independent Contractor 2-Independent Contractor 3-Independent Contractor 4-Speakers Bureau 5-Independent Contractor	
Michael Yen	Abstract Reviewer	1-Viridian Therapeutics 2-Amgen 3-Lassen Therapeutics 4-Argenx 5-Tourlamine Bio	1-Researcher 2-Researcher 3-Researcher 4-Researcher 5-Researcher	1-No 2-No 3-No 4-No 5-No
David Yoo	Abstract Reviewer	1-Balance Ophthalmics 2-Ollin Biosciences	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Michael K. Yoon	Scientific Symposia Committee, Co-Author	1-Viridian 2-Amgen 3-Sling	1-Researcher 2-Researcher 3-Researcher	1-No 2-No 3-No

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Anne Barmettler	Moderator	Revance	Independent Contractor	No
Carisa Bohnak	Presenter	Manhattan Eye & Ear Ophthalmology Alumni Foundation	Other	Yes

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Name	Role	Company	Relationship	Ended
Cesar Briceno	Moderator	1-Roche 2-Amgen 3-Genentech	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor	1-No 2-No 3-No
Keith Carter	Co-Author	Genentech	Consultant/Advisor	No
Sarah M. Cheng	Co-Author	Amgen	Researcher	No
Ray Cho	Presenter, Moderator	Genentech	Researcher	Yes
Jeremy D. Clark	Co-Author	Amgen	Consultant/Advisor	No
Allison Coombs	Co-Author	Kriya Therapeutics	Consultant/Advisor	Yes
Steven Couch	Co-Author	Amgen, viridian and Sling therapeutics	Researcher	No
John R Craig	Co-Author	Aerin Medical, Inc.	Consultant/Advisor	No
Hakan Demirci	Presenter	1-Aura Bioscience 2-Castle Bioscience	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Christopher Dermarkarian	Presenter	1-Bryn Mawr Communications 2-ArgenX	1-Advisor 2-Clinical Investigator	1-Yes 2-No
Angela Maria Dolmetsch	Presenter	1-Curie.Bio 2-Stephen's Surgical Instruments	1-Consultant/Advisor 2-Patent beneficiary	1-Yes 2-No
Neda Esmaili	Moderator	Immunovant	Researcher	Yes
James Fleming	Co-Author	AO North America	Speakers Bureau	No
Andrew Harrison	Panelist, Moderator	1-Amgen 2-Viridian 3-Argenx	1-Consultant/Advisor, Speakers Bureau 2-Consultant/Advisor, Researcher 3-Consultant/Advisor	
John Holds	Introducer, Speaker	Horizon Therapeutics	Speakers Bureau	Yes
Sasha Hubschman	Presenter, Co-Author	Horizon Surgical Systems - Equity	Stocks	No
Femida Kherani	Moderator	1-Abbvie 2-Sunpharma 3-Amgen	1-Consultant/Advisor 2-Speakers Bureau 3-Consultant/Advisor	1-No 2-Yes 3-Yes
Don O. Kikkawa	Co-Author	1-Amgen, Immunovant, Genentech, Acelyrin, Argenx, and Lassen Therapeutics 2-Elsevier	1-Consultant/Advisor 2-Royalties	1-No 2-No

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Name	Role	Company	Relationship	Ended
Bobby S. Korn	Co-Author	1-Amgen; Advisory Board: Acelyrin, Argenx, Immunovant, Viridian 2-Elsevier	1-Consultant/Advisor 2-Royalties	1-No 2-No
Andrea Kossler	Co-Author	1-Amgen, Viridian, sling, Lassen, Kriya 2-Genentech, Acelyrin, Argenx, Amgen, Viridian, Kriya, Lassen, Immunovant	1-Researcher 2-Consultant/Advisor	1-No 2-No
Nicole Langelier	Moderator	Sciton	Consultant/Advisor	No
Wendy W. Lee	Co-Author	1-Galderma 2-Revance 3-Evolus 4-RoC 5-Tarsus 6-Viatris 7-Amgen 8-Viridian 9-Santen 10-Acelyrin 11-Ethyreal	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor 4-Consultant/Advisor 5-Consultant/Advisor 6-Consultant/Advisor 7-Consultant/Advisor 8-Consultant/Advisor 9-Consultant/Advisor 10-Consultant/Advisor 11-Consultant/Advisor	1-No 2-No 3-Yes 4-No 5-Yes 6-Yes 7-No 8-No 9-No 10-No 11-No
Gary Lelli	Co-Author	Amgen	Consultant/Advisor	No
Catherine Y. Liu	Co-Author	1-Lassen Therapeutics, Genentech, Amgen 2-Wolters Kluwer	1-Researcher 2-Royalties	1-No 2-No
Mark Lucarelli	Moderator	1-Amgen 2-Viridian	1-Consultant/Advisor 2-Consultant/Advisor	1-Yes 2-Yes
Amina Malik	Co-Author	Amgen	Consultant/Advisor	No
Ronald Mancini	Co-Author	Squid Healthcare	Executive role	No
Louise Mawn	Co-Author	1-Amgen 2-Genentech	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Cameron Nabavi	Presenter	Tourmaline Bio	Researcher (see above for details)	No
Tanuj Nakra	Co-Author	Avya Skincare	Ownership interests	No
Rupin Parikh	Presenter, Co-Author	1-Vertex Pharmaceuticals 2-Apellis Pharmaceuticals	1-Stocks 2-Stocks	1-No 2-No

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Name	Role	Company	Relationship	Ended
Chau Pham	Co-Author	1-Regeneron 2-Edward Life Sciences	1-Stocks 2-Stocks	1-No 2-No
Karim Punja	Co-Author	Clarion Medical Technologies	Consultant/Advisor	No
Deepak Ramesh	Co-Author	Poriferous	Royalties or patent beneficiary	No
Daniel Rootman	Co-Author	Amgen	Consultant/Advisor, Speakers Bureau	No
Robert Schwarcz	Presenter	1-Galderma 2-Amgen	1-Consultant/Advisor 2-Speakers Bureau	1-No 2-No
Theodore Schwartz	Co-Author	1-MIVI 2-Serenity Medical 3-Bendit Technology 4-Endostream Medical 5-Precision Neuroscience	1-Ownership interests 2-Ownership interests 3-Ownership interests 4-Ownership interests 5-Ownership interests	1-No 2-No 3-No 4-No 5-No
Pete Setabutr	Moderator, Co-Author	1-Lodestone Inc. 2-Oyster Point Pharma	1-Ownership interests 2-Consultant/Advisor	1-No
Roman Shinder	Co-Author	1-Amgen 2-Springer	1-Consultant/Advisor 2-Royalties	1-No 2-No
Erin Shriver	Moderator, Co-Author	1-Amgen 2-Genentech 3-Immunovant	1-Consultant/Advisor 2-Consultant/Advisor 3-Researcher	1-No 2-No 3-No
Ann Tran	Co-Author	Genentech	Consultant/Advisor	No
Shoaib Ugradar	Presenter	1-Amgen 2-Acelyrin 3-Viridian Therapeutics	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor	1-No 2-No
Bryan Winn	Co-Author	Roche/Genetech	Independent Contractor (including contracted research)	No
Michael Yen	Co-Author	1-Viridian Therapeutics 2-Amgen 3-Lassen Therapeutics 4-Argenx 5-Tourlamine Bio	1-Researcher 2-Researcher 3-Researcher 4-Researcher 5-Researcher	1-No 2-No 3-No 4-No 5-No

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7:32–7:35 am

A Rare and Fatal Case of Giant Cell Myocarditis Presenting First as Orbital Myositis

Lensa Moen[1], Kevin Michels[2,1]

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Introduction: To describe a rare and fatal case of giant cell myocarditis that first presented as orbital myositis and progressed to cardiogenic shock.

Methods: An 18-year-old female with a personal history of amblyopia, type 2 diabetes, obesity, and family history of thyroid eye disease presented to the oculoplastics clinic for evaluation. Her complaints included 3 weeks of double vision, headache, bilateral periocular swelling, and difficulty moving her eyes. Since the onset of symptoms, the patient has sought care at an emergency department, her primary care provider, and her optometrist who referred her to oculoplastics. At the time of presentation, the patient was already taking 40 mg of prednisone as prescribed by her primary care provider.

Results: On examination, the visual acuity was 20/25 in right eye and 20/20 in her left eye. Motility was -3.5 in all fields. Color vision was 11/11 in both eyes. External exam showed 1+ chemosis laterally of both eyes with mild injection. The rest of eye exam was normal with the exception of resistance to retropulsion which was 3+ in both eyes. Bilateral proptosis, erythema, and edema of the upper and lower eye lids were noted along with mild bilateral conjunctival injection and chemosis. The patient had already had a CT scan done which was normal with questionable enlargement of the lateral and medial rectus muscles. (Figure 1)

An MRI scan along with labs for thyroid disease and orbital pseudotumor were ordered. The patient's prednisone was increased to 60 mg and follow up was scheduled for 1 week later because of her somewhat unusual presentation and her young age. Her visual acuity and exam were stable. Three weeks after the patient's initial visit to our clinic, she stated that her symptoms were improved. Her vision remained steady. Motility was much improved to a -1 in all fields of gaze in both eyes. The working diagnosis at this point was orbital myositis.

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All diagnostic laboratory testing was negative for thyroid disease including TSH, T3, FT4, antithyroid peroxidase antibody, and thyroid stimulating immunoglobulin. Labs for orbital pseudotumor, myasthenia gravis, rheumatoid arthritis, CRP, and ESR were also negative. However, it was known that the patient was on steroids at the time of the laboratory testing. The leading diagnosis at this point was orbital myositis, with euthyroid eye disease and lymphoma still in the differential diagnosis.

Since the patient's symptoms and exam had improved over about 3 weeks with Prednisone, a steroid taper was initiated and the MRI results were obtained (Figure 2). The radiologist noted that the MRI showed improved inflammation of the lateral and medial rectus compared to the earlier CT scan. However, our interpretation of the images, it looked relatively normal. The steroid taper was continued because of patient's clinical and subjective improvement. When the patient had tapered down to 20 mg of steroids per day, her orbital symptoms started to recur along with the new symptom of chest pain for which she visited her local Emergency Department. She was then found to have myocarditis. We called the pediatric and adult cardiology services and stated that it is very rare for a patient to present with orbital myositis and myocarditis simultaneously. We shared with them our suspicion that this could be giant cell myocarditis and recommended that a myocardial biopsy be performed and that the patient be placed on high dose steroids and aggressive immunosuppression under the guidance of rheumatology. As the patient's chest pain resolved, our recommendations were not implemented, and she was discharged for outpatient follow-up.

One week later, the patient returned to the ED with chest pain which was complicated by prolonged ventricular fibrillation arrest lasting 90 minutes. Patient was treated with ACLS, ECMO, pressors, and inotropes.

Endomyocardial biopsy was performed and demonstrated giant cell myocarditis, so the patient was placed on 1 gram of methylprednisolone per day in addition to mycophenolate and cyclosporin. She was weaned off ECMO and had significant recovery to near normal left ventricular systolic function. She underwent a neurologic evaluation and was found to have suffered hypoxic brain injury. The patient succumbed to her disease and advanced life support was withdrawn.

Conclusions: The co-occurrence of orbital myositis with giant cell myocarditis is extremely rare. As of 2020, only 10 such cases had been reported. Since giant cell myocarditis has a 1-year mortality rate of 70%[i], it is imperative that physicians maintain a high level of suspicion when a patient presents with orbital myositis and chest pain or cardiac symptoms. Giant cell myocarditis must be considered, and an urgent myocardial biopsy and aggressive immunosuppression must be recommended and started as was done in this case. We surmise that when her prednisone was increased to 60 mg per day, which was effective 1 mg/kg per day, it likely controlled her systemic autoimmune disease as her orbital symptoms also improved. She was treated with this higher dose for a few weeks. When she started to taper off of the oral steroids, her orbital symptoms started to recur, and she developed myocarditis ultimately leading to her death.

(continued)

Figure 1

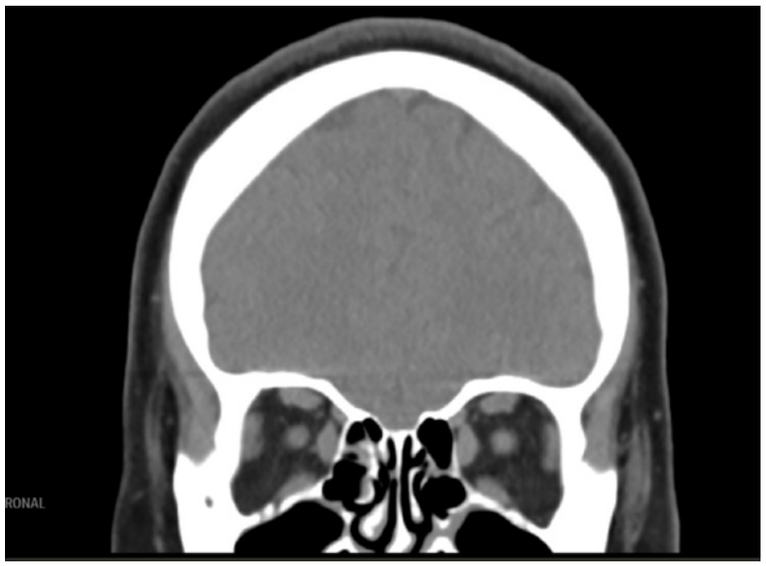
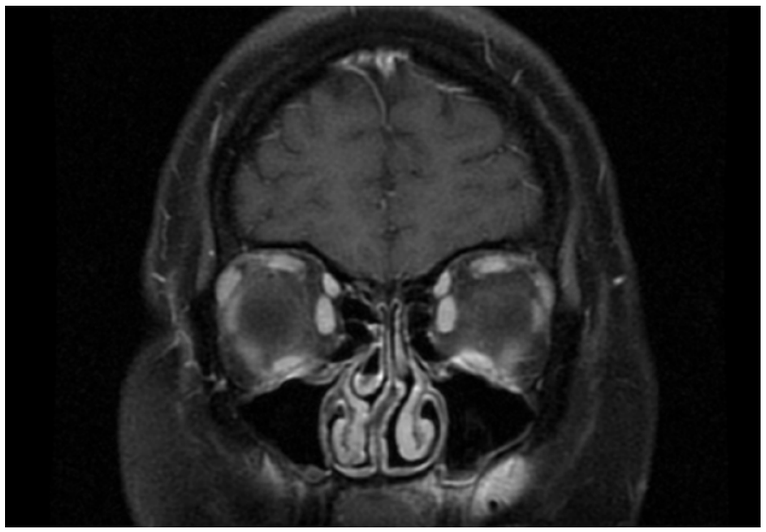


Figure 2



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7:35–7:38 am

Spontaneous Regression of Periocular Sebaceous Cell Carcinoma: A Case Report with Histopathologic, Genetic, and Imaging Correlation

Benjamin Meyer, Miguel Hernandez-Emanuelli, Maria Idarraga, Sander Dubovy, Karla Marina Gorra Casanova, Andrew Rong
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Introduction: Ocular adnexal sebaceous carcinoma (OaSC) is a rare, aggressive malignancy of the ocular adnexa, accounting for 1-5% of eyelid malignancies, with a high risk of recurrence and metastasis[1,2]. Spontaneous regression of OaSC is exceedingly rare, with only a few cases reported in the literature[3]. Typically requiring wide local excision or orbital exenteration due to its aggressive nature, the potential for regression without intervention challenges current management paradigms. We present a unique case of spontaneous regression of periocular OaSC following incisional biopsy, supported by histopathologic, genetic, and immunohistochemical (IHC) analysis. This case aims to document this rare phenomenon, explore potential immune-mediated mechanisms, and highlight the role of molecular profiling in understanding tumor behavior.

Case Description: A 44-year-old male presented with a firm, progressively enlarging right upper eyelid mass (Figures 1-2). Incisional biopsy with IHC confirmed high-grade OaSC (Figure 3)[4]. Next-generation sequencing revealed a *TP53* mutation, microsatellite stability, and low tumor mutational burden (TMB, 4 mutations/Mb). Despite medical recommendations, the patient declined further intervention and opted for lifestyle management with close clinical observation and serial imaging. Over a 15-month period, serial MRI demonstrated marked regression of the lesion, decreasing from 28 x 12 mm to minimal residual T2 signal and enhancement (Figures 4-5). At 18 months of follow-up, the patient remains asymptomatic with no clinical evidence of recurrence or metastasis.

Conclusions: This case underscores the rare phenomenon of spontaneous regression in OaSC, likely mediated by a biopsy-triggered immune response. Interestingly, despite the tumor exhibiting microsatellite stability and a low tumor mutational burden (4 mutation/Mb)—features typically associated with poor response to immunotherapy—the patient experienced significant and durable regression without systemic treatment. One possible explanation is that the identified *TP53* mutation may have generated immunogenic neoantigens, driving a targeted cytotoxic anti-tumor T-cell response[5,6]. Recent single-cell RNA sequencing of OaSC tumors has revealed a complex tumor microenvironment, including the presence of exhausted T-cell populations, which are generally associated with limited cytotoxicity[7]. The probable immune-mediated regression observed in our case challenges these predictive markers and suggests that conventional biomarkers like tumor mutational burden and T-cell exhaustion status may not fully capture immunogenic potential in OaSC. The absence of granulomatous inflammation further supports a mechanism of direct T-cell-mediated cytotoxicity

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rather than a delayed-type hypersensitivity response[3]. These findings underscore the immunologic heterogeneity of OaSC and raise the possibility that patients with similar molecular profiles may benefit from immune checkpoint inhibition, as demonstrated in microsatellite-stable metastatic OaSC cases responding to pembrolizumab[8]. Further investigation is warranted to better understand the immune dynamics of OaSC and refine predictive tools for immunotherapy response.

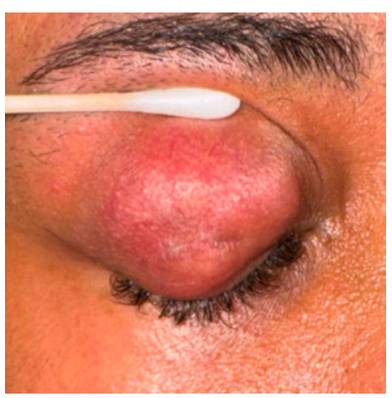

Figure 1: External photograph of the right upper eyelid at presentation, showing a firm, enlarging mass.

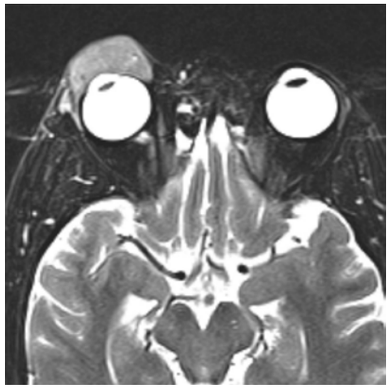

Figure 2: Axial T2-weighted-fat-suppressed MRI at diagnosis, showing a bulky, lobulated right periorbital/upper lid mass (28 x 12.6 mm) with heterogeneous signal intensity. The mass abuts the globe, the tendinous origins of the right medial and lateral rectus muscles, and the right lacrimal gland, with no postseptal extension.

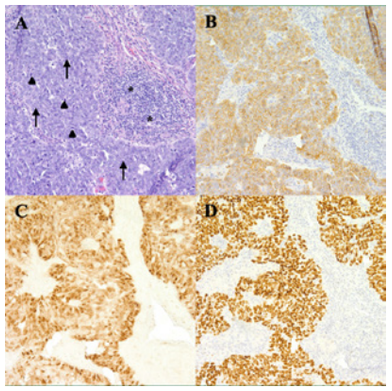

Figure 3: Composite histopathology including A) Hematoxylin and Eosin (H&E) stain showing atypical pleomorphic, basophilic cells with granular nucleoplasm (arrows), abundant mitotic figures (arrowheads), and a prominent chronic inflammatory cell infiltrate (asterisks) composed of lymphocytes and histiocytes surrounding the malignant cells; B) epithelial membrane antigen (EMA) immunohistochemistry, diffusely positive on tumor cell membranes; C) androgen receptor (AR) immunohistochemistry, diffusely positive within tumor cell nuclei D) p63 immunohistochemistry, diffusely positive within tumor cell nuclei.

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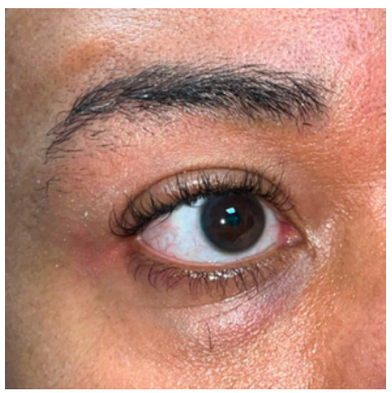

Figure 4: External photograph of the right upper eyelid at 15-month follow-up, demonstrating complete resolution of the mass.

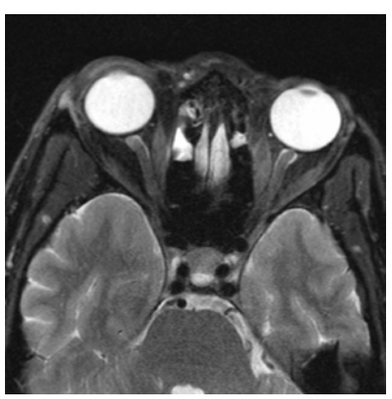

Figure 5: Axial T2-weighted MRI at 15-month follow-up, showing minimal asymmetric increased T2 signal in the right periorbital/upper lid soft tissues, likely representing post-biopsy changes or trace residual tumor, with no postseptal extension.

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7:38–7:41 am

Orbital NTRK-Fusion Negative Congenital Infantile Fibrosarcoma: A Case Report

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Introduction: Congenital infantile fibrosarcoma (CIFS) is a rare spindle cell tumor of early childhood, typically characterized by low metastatic risk and recurrence rate after initial treatment. However, these tumors can exhibit rapid growth, resulting in significant morbidity or even mortality. Most cases of CIFS harbor neurotrophic tyrosine receptor kinase (NTRK) fusion mutations, which respond well to NTRK inhibitors like larotrectinib.[1] We present a rare case of NTRK-fusion negative CIFS located in the orbit, treated with gross total resection.

Methods: Case report.

Results: A five-month-old male with an unremarkable perinatal history presented with progressive left eye proptosis. Three months earlier, he sustained a head injury with a small parietal skull fracture and epidural hematoma, managed conservatively. Over subsequent months, his parents noted increasing facial asymmetry. Ophthalmologic examination revealed left proptosis, hypotropia, (Figure 1A) and elevation deficit. Dilated fundus exam was normal.

Magnetic resonance image (MRI) of the brain/orbits revealed a peripherally enhancing 2 cm x 1.5 cm x 2.2 cm mass inseparable from the superior rectus muscle (Figure 2), not present on prior neuroimaging. There was no evidence of systemic disease on computed tomography (CT) chest and whole-body PET. Anterior orbitotomy with biopsy revealed an encapsulated lesion interdigitating with the superior rectus. Histopathology confirmed infantile fibrosarcoma.

Due to the tumor's location, gross total resection posed high morbidity risk and empiric neoadjuvant larotrectinib was recommended, pending molecular results. Despite treatment, the lesion progressed rapidly, with worsening motility and proptosis (Figure 1B). Repeat MRI demonstrated further tumor growth and thinning of the orbital roof. Molecular analysis identified an MN1::TAF3 fusion, with no NTRK-fusion. Larotrectinib was discontinued, and the decision was made to proceed with gross total resection.
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Intra-operatively, the tumor was found to originate from the superior rectus, and the superior oblique tendon and muscle insertions passed through its medial aspect (Figure 3A). The levator muscle was wispy. The mass was completely excised (Figure 3B), requiring disinsertion of both involved muscles. To mitigate postoperative strabismus, a 7.0mm inferior rectus recession was performed concurrently.

Given a successful gross total resection and overall low metastatic risk, adjuvant chemotherapy was deferred. At postoperative month 5, the patient had residual ptosis and strabismus (Figure 4A) and underwent frontalis suspension with silicone sling, levator muscle advancement, and inferior rectus advancement (Fig 4B). One-year post-tumor resection and five-months post-ptosis surgery, he continues to do well with a clear visual axis (Figure 4C) and amblyopia managed with twice-weekly atropine penalization. Interval MRIs showed post-surgical changes without tumor recurrence.

Conclusions: We report a rare case of orbital CIFS without NTRK -fusion in a five-month-old infant. Fewer than five cases of primary orbital CIFS have been documented, with this case being the first NTRK-fusion negative in the literature.[2–4] Early diagnosis is crucial due to the tumor's rapid growth potential. This patient underwent successful surgical resection after rapid progression on larotrectinib and negative genetic screening for targetable mutations. Consistent with prior reports, the tumor was encapsulated with mild bony remodeling and was amenable to total excision.[3,4] The patient remains recurrence-free and continues under close ophthalmologic and radiologic surveillance.

Figure 1A (at presentation)

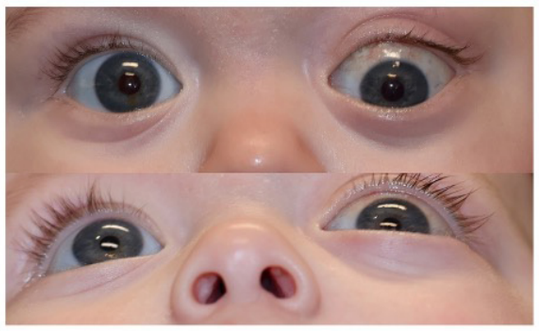

Figure 1B (at time of resection)

Figure 2 (MRI at time of presentation. T1FS coronal (left), T2FS coronal (center), T1 sagittal (right))

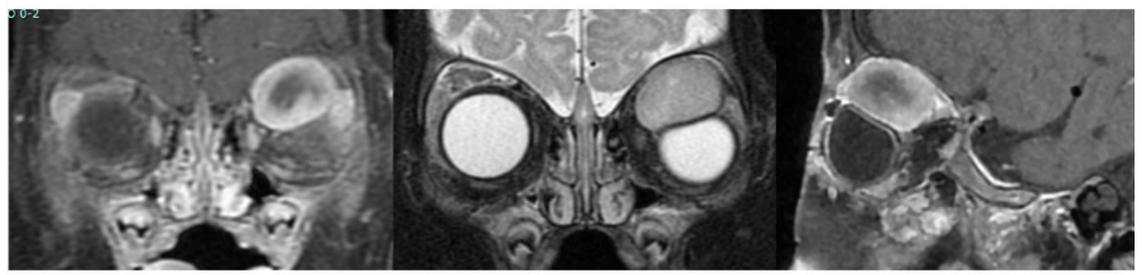

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Figure 3A (suture: SO tendon; freer: muscle to globe insertion)

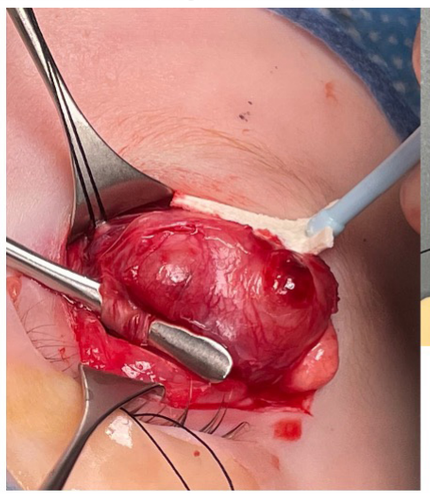


Figure 3B (resected mass)

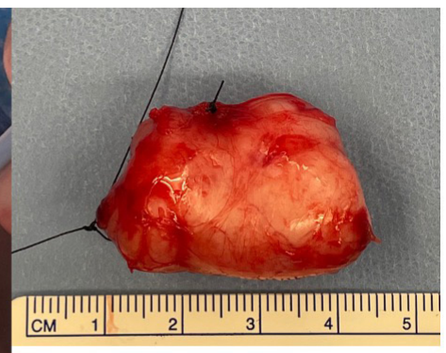
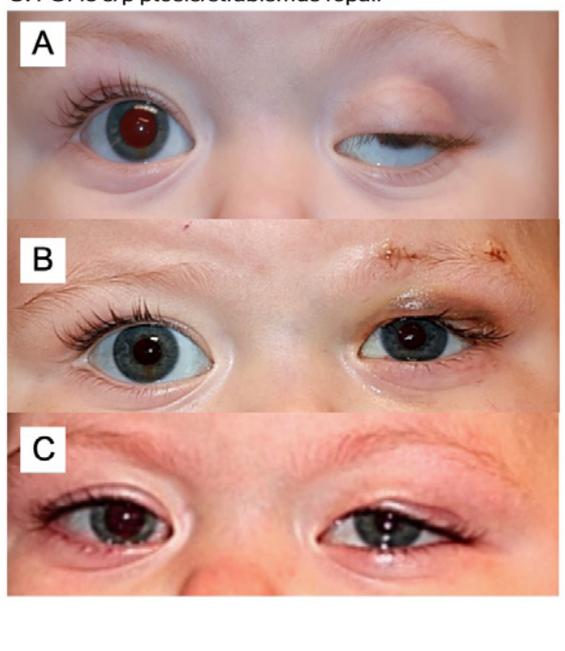


Figure 4
A- POM5 s/p resection
B: POW1 s/p ptosis/strabismus repair
C: POM5 s/p ptosis/strabismus repair



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7:41–7:44 am

High Grade B Cell Lymphoma in a Child with Ataxia Telangiectasia

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Introduction: Non-Hodgkin lymphoma (NHL) accounts for approximately 7% of pediatric malignancies with approximately 5-15% involving the ocular adnexa.[1,2] Orbital lymphoma is far less common in pediatric populations compared to adults: Keren et al. identified 18 cases of pediatric orbital lymphoma in the medical literature[3] of which, 3 were of B cell lineage. We seek to add to this literature by reporting an ocular adnexal high grade B cell lymphoma on a background of ataxia telangiectasia; an inherited neurodegenerative disorder that increases the risk of developing NHL up to 25%.[4]

Methods: Case report.

Results: A 12 year old male was referred to our hospital with a 1-week history of rapidly progressive left orbital swelling. His medical history was notable for ataxia telangiectasia, with secondary immunodeficiency and microcephaly. Best corrected visual acuity measured 20/100 OS and 20/30 OD with normal intraocular pressures OU. Ophthalmic exam revealed significant left proptosis, chemosis and minimal excursion of extraocular movements in all directions. The remainder of the exam was unremarkable. MRI showed a large, homogeneous mass involving the left orbit, ethmoidal and maxillary sinuses that was hypointense on both T1 and T2, demonstrated avid contrast enhancement, and restricted diffusion on ADC/DWI (Figure 1). Orbital biopsy was performed via a transcaruncular approach.

On histopathology, large pleomorphic cells with a classic starry sky appearance were noted. Immunohistochemical staining confirmed CD20 positivity, BLC2 negativity and moderate c-MYC positivity, leaving Burkitt's lymphoma and high grade B-cell Lymphoma as differential possibilities (Figure 2). Additional characterization via FISH revealed 40% MYC gene rearrangement, and a definitive diagnosis of high grade B-cell lymphoma was made. The patient underwent 4 courses of IV and intrathecal chemotherapy (Cyclophosphamide, Vincristine, Methotrexate, Cytarabine). 6 months post-presentation he is doing well, with no evidence of metabolically active lesions on PET scan.

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Conclusions: Non Hodgkin's Lymphoma (NHL) of the ocular adnexa is known to present at higher frequencies in immunocompromised patients, including ataxia telangiectasia. To the best of our knowledge, this is the first case of pediatric high-grade B cell NHL in the ocular adnexa presenting with a background of ataxia telangiectasia.This case also highlights the value of additional molecular genetic testing, which ultimately excluded the diagnosis of Burkitts lymphoma.

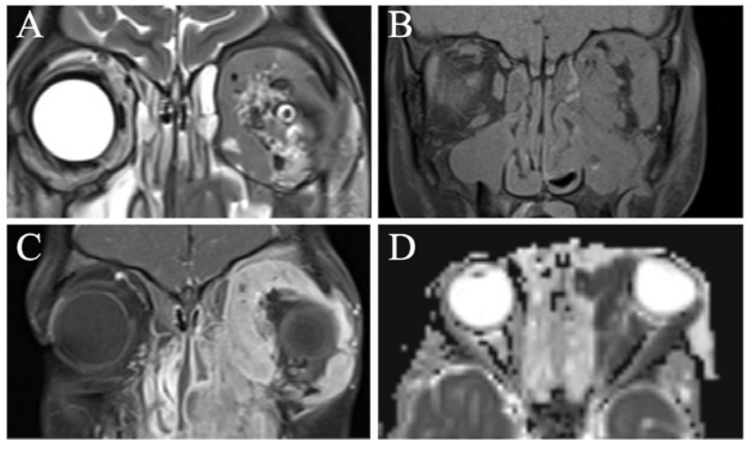

Figure 1. MRI demonstrates an extensive mass involving the left orbit, ethmoid and maxillary sinuses that is (A) hypointense on both T2 and (B) T1 weighted images with (C) avid post contrast enhancement (D) and marked diffusion restriction on ADC

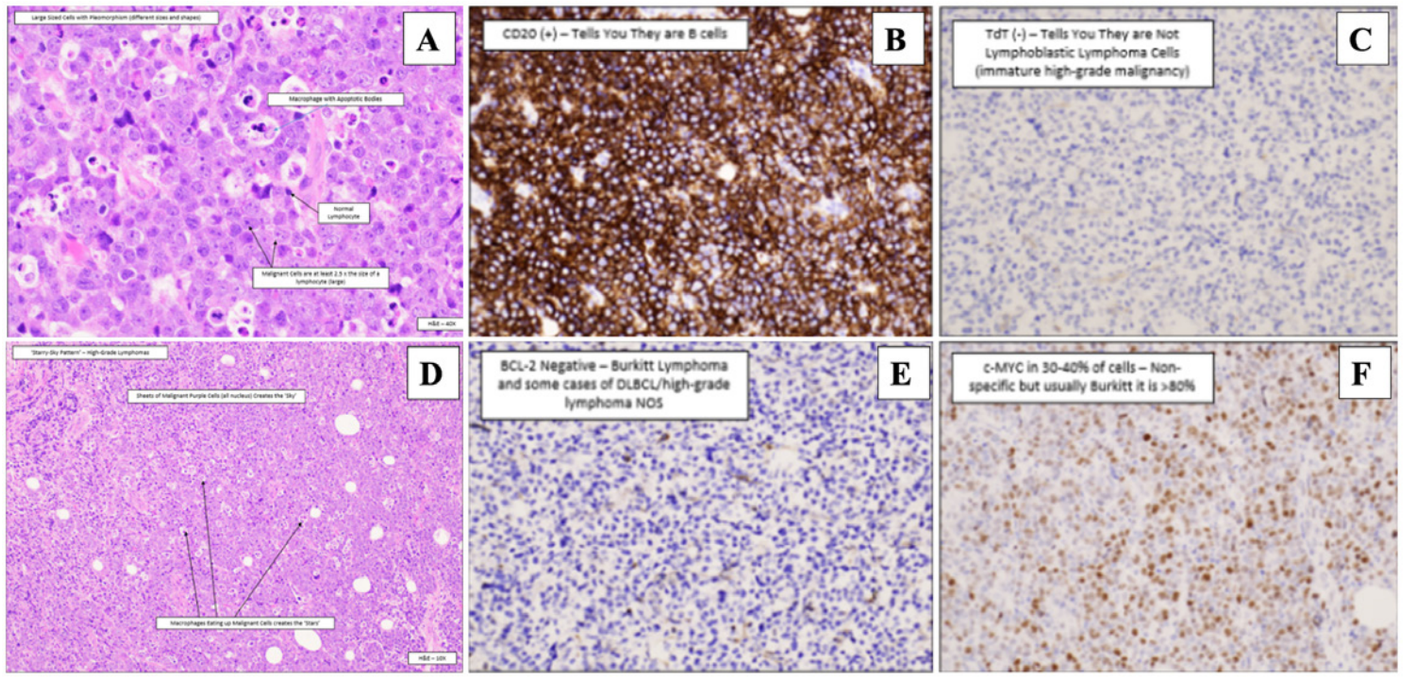

Fig. 2. Histopathology demonstrating (A) large pleomorphic malignant cells with (B) positive staining for CD20, confirming B cell lineage. (C) TdT staining is negative, excluding lymphoblastic lymphoma cells. (D) On low power, a classic "starry sky" appearance is seen, typical of high grade lymphomas. (E) BLC-2 is negative, in keeping with a differential diagnosis of Burkitts lymphoma, diffuse large B cell lymphoma and high-grade lymphoma not otherwise specificied, and (F) c-MYC is moderately positive, with 30-40% of cells demonstrating positive staining.

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7:44–7:47 am

Vision Loss and Ophthalmoplegia Following Calcium Hydroxyapatite Aesthetic Facial Injection: A Case Report

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Introduction: Calcium hydroxyapatite (CaHA) is a non-hyaluronic acid dermal filler, which do not have an antidote and are not classically thought to be amenable to hyaluronidase reversal. We describe a case of vision loss secondary to cosmetic temporal CaHA injection with significant visual recovery after implementation of an emergency filler reversal protocol including retrobulbar hyaluronidase.

Methods: Case report.

Results: A 37-year-old woman received 0.1 cc of CaHA dermal filler into the left temple. She experienced vision loss and diplopia within one minute of filler injection. Exam showed ptosis, hypotropia, and esotropia of the left eye as well as a left temporal rash. A vision-threatening vascular adverse event (VAE) was suspected. She immediately received 1,500 IU of hyaluronidase at the initial treatment site as well as 150 IU to the left temporal artery. The patient was then transferred to the emergency room where her visual acuity was 20/200 in the left eye.

Magnetic resonance (MR) imaging, MR angiography, and computed tomography of the orbits showed peripheral arterial embolism involving the supply of the left lateral rectus, superior rectus, and lacrimal gland. The patient received oral aspirin and antibiotics prior to consultation with general ophthalmology and oculoplastics. At this time, her visual acuity was 20/60 in the left eye with a sluggish left pupil, left upper eyelid ptosis, and left esotropia and hypotropia.

Fundus exam showed superior macular pallor surrounding an occluded vessel and absence of normal choroidal vasculature (Figure 1). Fluorescein angiography demonstrated superotemporal macular vessel occlusion, absence of choroidal filling temporally, and areas of late choroidal hyperfluorescence (Figure 2). Indocyanine green angiography showed slow filling in the macula, temporal choroidal defect with near absent flow except in the large choroidal vessels, and late hypercyanescence inferotemporally (Figure 3). Optical coherence tomography demonstrated fovea-involving inner retinal edema with inner retinal and choroidal hyperreflective foci
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likely signifying CaHA microemboli (Figure 4). Visual fields showed small superior and central scotomas and a larger nasal scotoma (Figure 5).

The patient was diagnosed with vascular occlusion of the left lacrimal artery, choroidal vasculature, and retinal vasculature by the CaHA filler which likely travelled anterograde in the anterior deep temporal artery to the lacrimal artery via anastomoses, then retrograde to branches of the ophthalmic artery that supply the temporal choroid.[1] She additionally received retrobulbar hyaluronidase injection as well as intravenous dexamethasone, oral acetazolamide, topical timolol eye drops, and hyperbaric oxygen therapy although it is not clear what role, if any, these adjunctive treatments contributed to her visual recovery. Her final visual acuity improved to 20/40 with a residual nasal scotoma of the left eye; the diplopia and ptosis resolved entirely.

Conclusions: CaHA filler does not have an antidote; however, reports have described the utilization of hyaluronidase in CaHA-associated VAEs. The hypothesized mechanisms of action of hyaluronidase on CaHA filler-related VAEs include dispersion, vasodilation, and reversal of vasospasm.[2–5] Hyaluronidase should remain in the toolbox of any cosmetic injector utilizing CaHA fillers for its potential to alleviate the consequences of intra-arterial vascular occlusion.

Figure 1

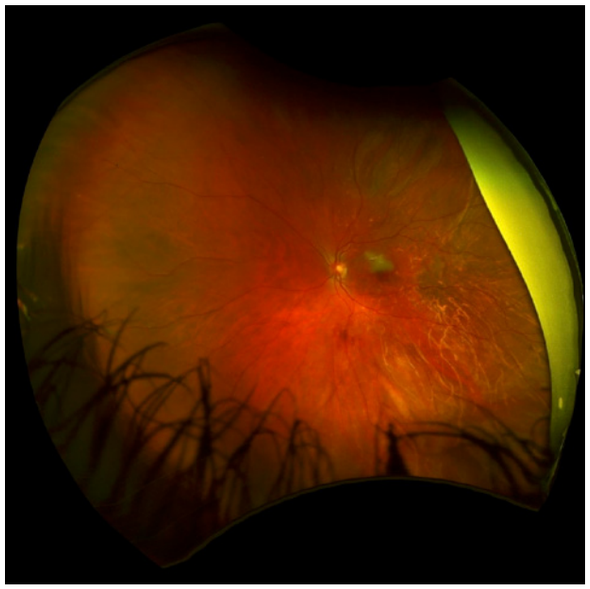

Figure 2

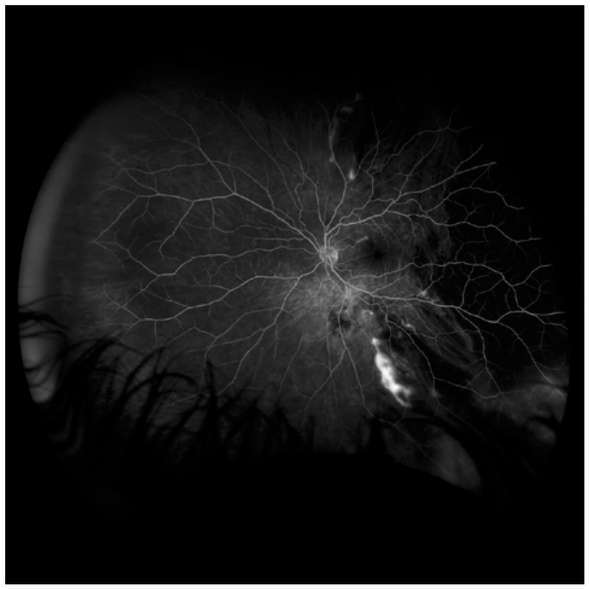

Figure 3

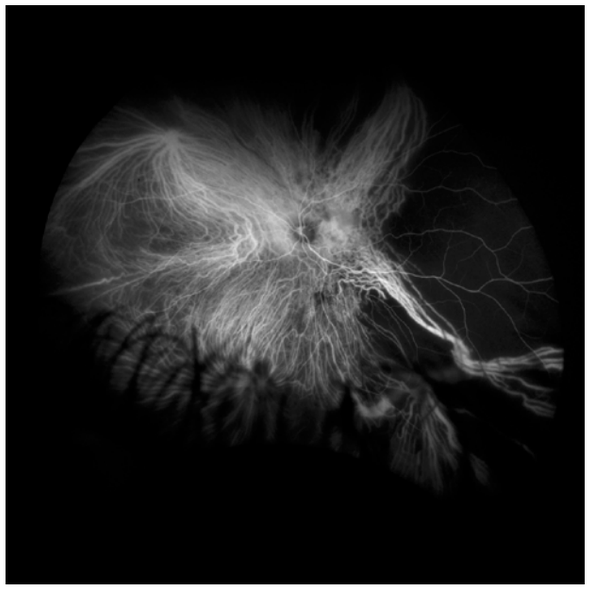

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Figure 4

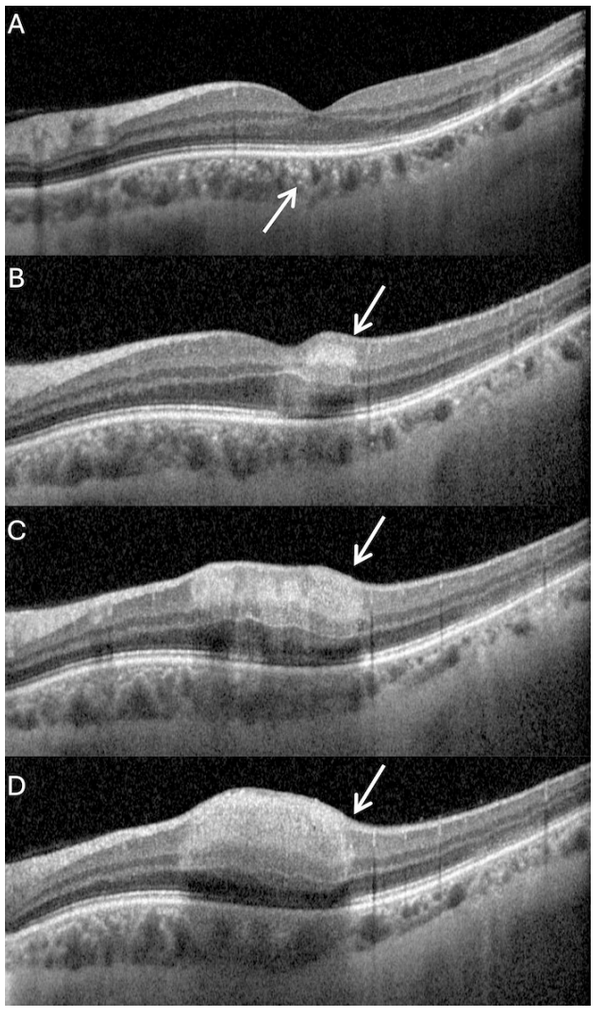
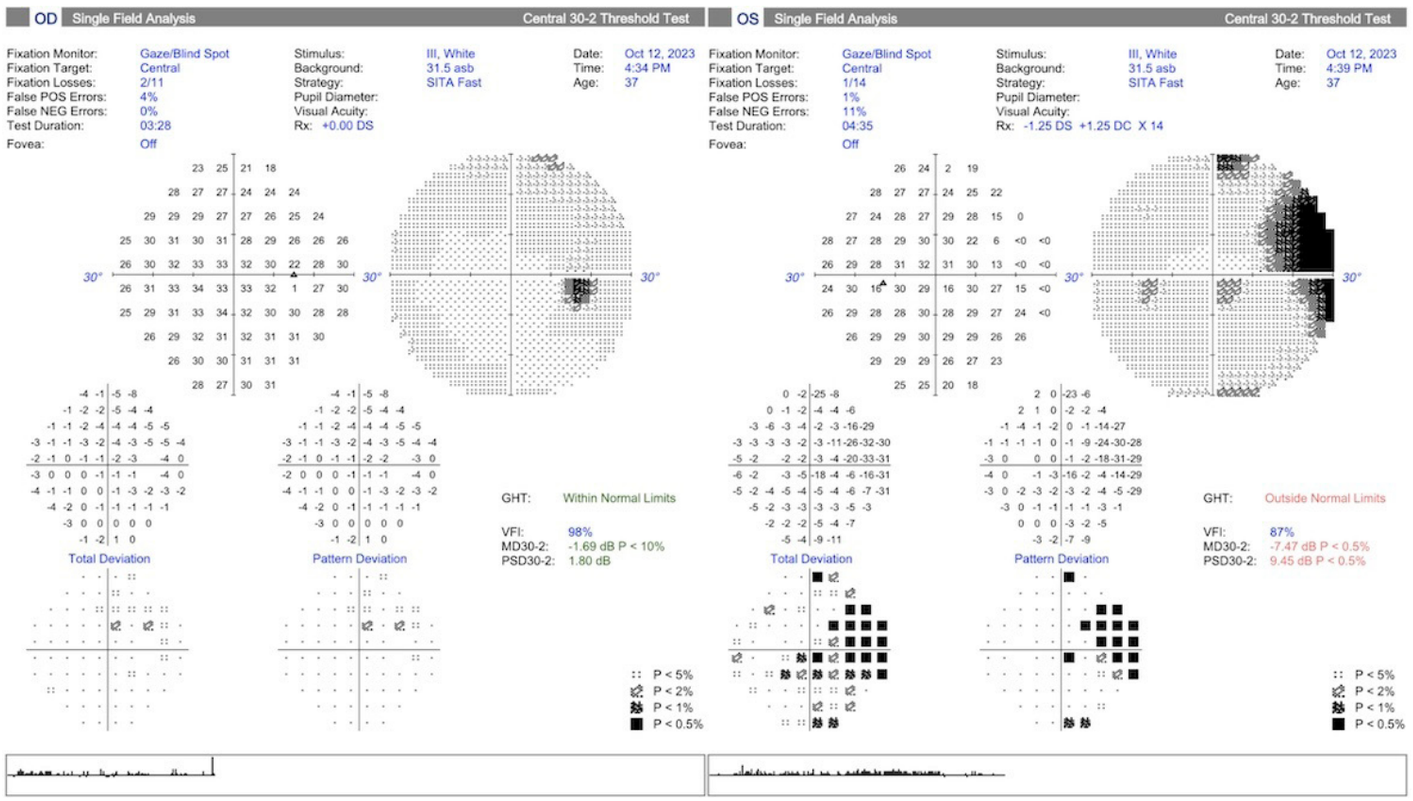


Figure 5



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7:47–7:50 am

Double – Shelved Scleral Contact Lens for Complex Inoperable Blepharoptosis

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Introduction: Advanced cases of complex blepharoptosis such as Chronic Progressive External Ophthalmoplegia (CPEO) is difficult to correct surgically, owing to poor Bell's phenomenon and limited ocular motility. Scleral lenses with either high vault or a pre-formed shelf, have been described for complex ptosis correction, bearing a risk of corneal hypoxia and decentration, respectively.[1,2] We report the management outcome of a modified, double-shelved, scleral contact lens (SCLs) in a case of severe CPEO.

Methods: A 41-year-old gentleman, driver by occupation, presented to the Oculoplasty clinic with bilateral painless, progressive blepharoptosis and reduced ocular motility for 10 - years duration. The best corrected visual acuity in both eyes was 20/20. Adnexal evaluation revealed bilateral marginal reflex distance 1 (MRD1) of - 1mm, levator action of 4mm, and a poor Bell's phenomenon in both eyes. Ocular movements were limited (-3) in all gazes. Ocular myasthenia work-up was negative. A diagnosis of CPEO with bilateral, symmetric, severe ptosis was established. With the patient's consent and the approval of Institutional review board, we designed a customized, gas - permeable, double-shelved (the upper shelf for providing the eyelid lift, and the lower shelf to counteract downward force generated by the weight of the upper eyelid) SCL (BostonSight (BSS), Massachusetts, USA). A baseline global pachymetry and specular count was performed to assess the effect of the lens on corneal health. Modified SCL of 17 mm diameter in right eye and 16 mm in left eye, with a base curve of 8mm, was dispensed with incorporation of his refractive error.

Results: The lenses allowed 9-10 hours of comfortable daily wear, improving the MRD 1 in each eye by 4mm with good cosmesis, and significant subjective improvement in ptosis. At 1 month follow-up with an average daily wear regime of 9 hours, the specular count or average pachymetry values did not show any signs of corneal hypoxia.

Conclusions: This case report highlights the safety and practical utility of a double-shelved modified SCL as a safe, non-surgical treatment for complex blepharoptosis. The modification with two shelves prevents lens decentration, a major limitation with single-shelved design.

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Figure 1

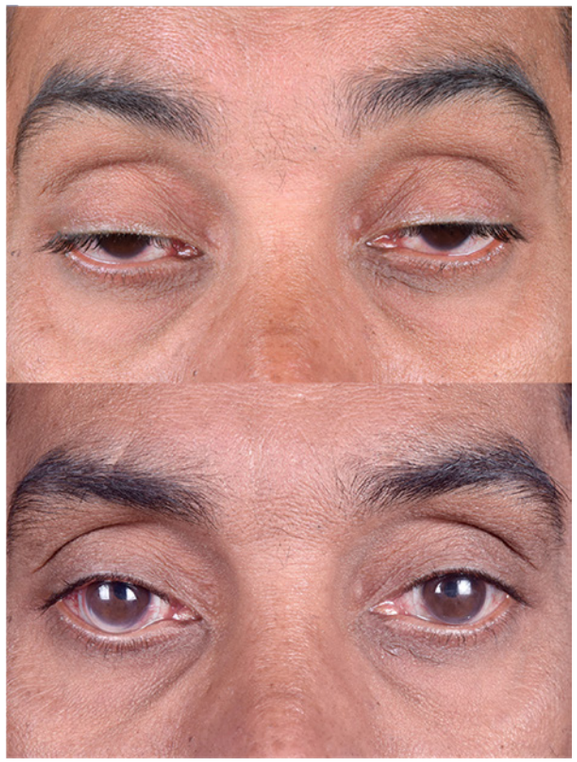
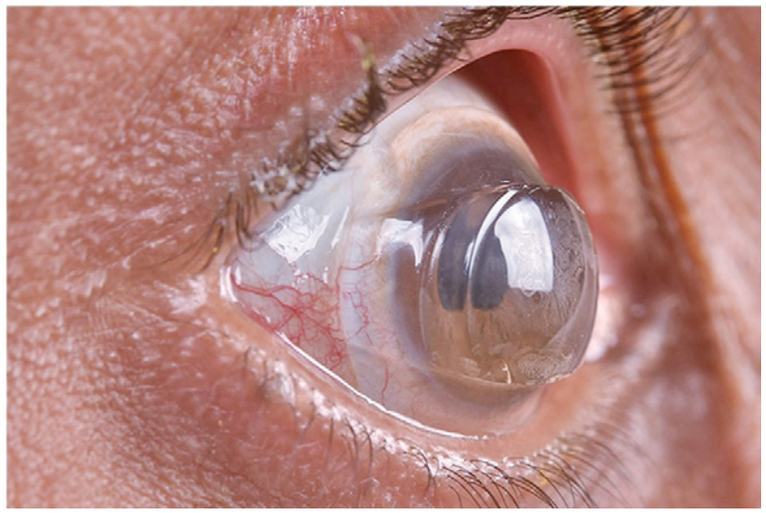


Figure 2



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7:50–7:53 am

Middle Cerebral Artery Aneurysm Clip Ligation via a Transorbital Approach

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Introduction: Transorbital surgery allows access to anterior and middle circulation cerebral aneurysms without performing traditional craniotomy. Although an eyelid crease approach may be technically challenging, experience with skull base and orbital surgery may optimally prepare the oculoplastic surgeon to access select MCA aneurysms.

Methods: Case report and surgical video

Results: A 49-year-old female with history of ruptured left middle cerebral artery (MCA) aneurysm status post coil embolization elected treatment for a right MCA aneurysm. Due to the small aneurysm size and wide neck, surgical clip ligation was preferred over endovascular techniques. Transorbital surgery by oculoplastics and neurosurgery teams was planned via a lateral eyelid crease incision based on the location of the sylvian fissure. A bony marginotomy was performed, followed by loupe guided burr removal of the greater sphenoid wing to expose the dura of the middle and anterior cranial fossae. The dura and sylvian fissure were opened under microscope guidance to expose the aneurysm. Clip ligation was performed with intraoperative indocyanine green angiography (ICG) and doppler ultrasound to confirm patency of proximal and distal parent vessels. Dural substitute grafts were placed for closure. The orbital rim was replaced and plated, followed by layered closure of the periosteum and soft tissue. There were no complications.

Conclusions: This video presentation demonstrates the transorbital route as an alternative to the lateral pterional approach to MCA aneurysm with direct access to the anterior middle fossa and medial sylvian fissure without requiring significant dissection or retraction. The transorbital approach has been suggested for aneurysms located within 15 mm of the MCA origin within the sylvian fissure. Careful identification of appropriate cases and multidisciplinary collaboration are imperative.

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8:03–8:09 am

Conjunctiva-Sparing Recession with Advancement of Fat Technique (CRAFT) for Upper Eyelid Retraction in Thyroid Eye Disease

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Introduction: Upper eyelid retraction repair in thyroid eye disease (TED) may improve upper eyelid height but this may come at the expense of a flattened upper eyelid contour and elevated upper eyelid crease[1-4]. To address these deficiencies, we describe a surgical approach, Conjunctiva-sparing Recession with Advancement of Fat Technique (CRAFT), to address the upper eyelid retraction in TED.

Methods: A retrospective consecutive case series of TED patients with upper lid retraction underwent CRAFT through a lid crease incision. Levator and Mueller's muscle was recessed as a single unit, keeping the conjunctiva intact until a MRD1 of 4.0mm was achieved. Then, the orbital septum was opened, and a preaponeurotic fat pedicle was developed and advanced to the inferior border of the orbicularis muscle.

Results: Total of 66 eyes of 43 patients with mean age 50.1+11.8 years (range 21 to 78 years), M:F ratio of 1:4 were included. CRAFT was performed at a mean of 18.3+14.2 months after decompression (74.2%) or after combined therapy of teprotumumab + decompression (10.6%). The mean pre-operative MRD1 was 6.8+0.7 mm that improved to a mean post-operative MRD1 of 4.0+0.3 mm. Revision rate for eyelid height or eyelid contour was 12.1% and residual skin removal was performed in 10.6%. The mean follow-up was 4.0+1.8 years.

Conclusions: Quiescent TED cases with upper eyelid retraction show excellent long-term outcomes with CRAFT involving a conjunctiva sparing single-unit retraction approach with central fat pad advancement with a normal eyelid height, natural eyelid contour and crease.

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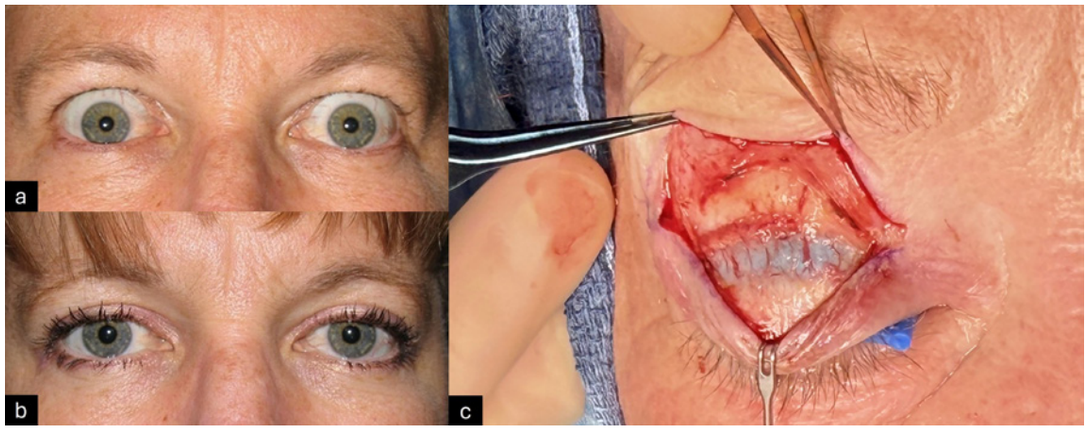
Figure 1



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8:09–8:15 am

Vascular Supply of the Biplanar Pivoted V-to-Y Flap for Medial Canthus Reconstruction: An Anatomic Study

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Introduction: The biplanar pivoted V-to-Y flap is useful for reconstructing soft tissue defects involving the medial canthus[1]. One feature of this versatile flap is the excellent vascular supply, as the biplanar dissection produces a hinge which acts as a pedicle. There may also be a component of collateral blood supply, as the midface and medial canthal regions receive blood from the internal carotid system via the supratrochlear, supraorbital, and infraorbital arteries while the external carotid system provides blood via the angular and dorsal nasal arteries[2,3]. The purpose of this study was to interrogate the origins of the blood supplying the flap as well as the graft bed by dissecting these flaps in human cadavers which were prepared by arterial filling with latex dye.

Methods: In this anatomical study, the arterial systems of four fresh, non-preserved, adult cadaver heads were filled with red neoprene latex in order to highlight the origin of bloody supplying both the flap and the bed using a previously described method[3]. The external carotid system was filled in 2 of the specimens while the internal carotid system was filled for the remaining 2 specimens. An ovoid 1.0x1.5 cm full thickness skin defect was made to simulate a post-Mohs surgery defect in the medial canthus region. A biplanar pivoted V-to-Y flap was dissected and mobilized into the defect, as employed for Mohs reconstruction. The latex dye filling pattern was recorded in a descriptive manner for each specimen as it pertained to the defect and the flap.

Results: All specimens (n=4) had successful filling of the intended arterial vascular system. For specimens which had the external carotid arterial systems filled, the angular and dorsal nasal arteries were noted to be supplying the flap as well as much of the tissue surrounding the simulated defect (Fig. 1A, B). None of the visualized arterial structures related to the flap lacked filling and 25-33% of the visualized arterial structures related to the simulated defect lacked filling. More extensive dissections of these specimens revealed non-filling of the supratrochlear, supraorbital, and infraorbital arteries, as would be expected. For specimens which had their internal carotid arterial systems filled, the supratrochlear and supraorbital arteries were noted to provide minor supply of the tissue surrounding the simulated defect and made no contribution to the arterial supply of the flap (Fig. 1C, D). 50% of the visualized arterial structures surrounding the simulated defect lacked filling.

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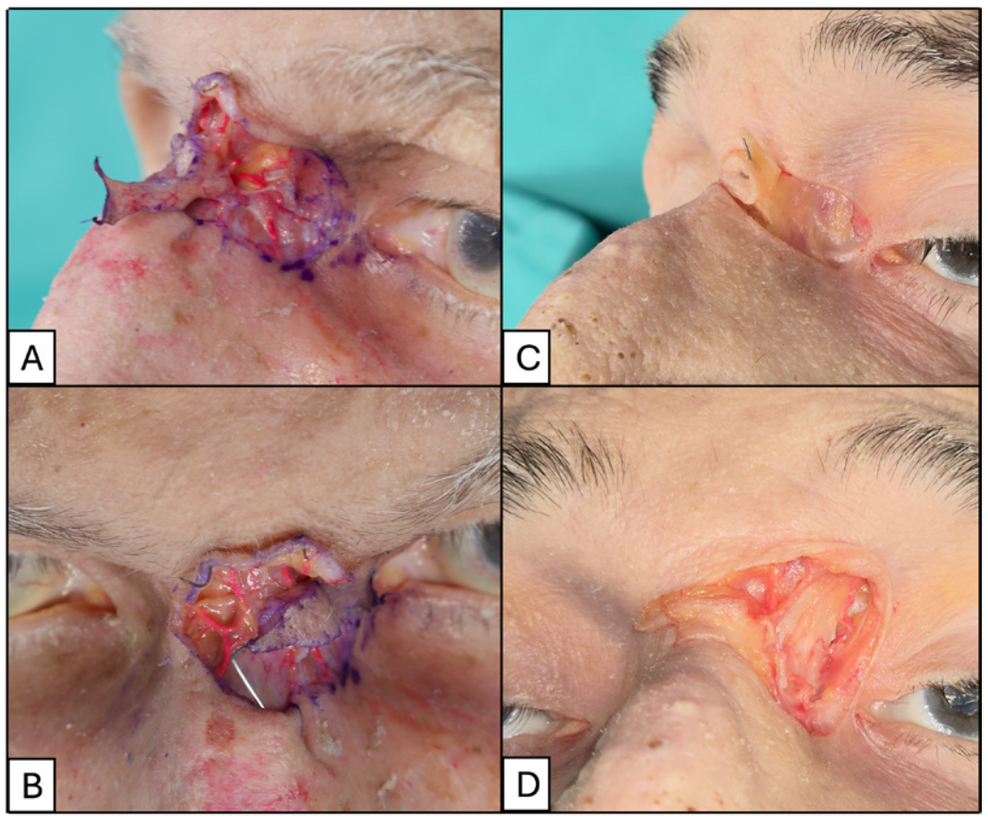
Conclusions: While the blood supply for the biplanar pivoted V-to-Y flap appears to require contributions from both external and internal carotid systems, the majority of vascular supply to the relevant tissues is derived from the external carotid system, with a minority of tissue surrounding the defect seemingly benefiting from collateral supply. Contributions from the internal carotid system may be more significant in patients with larger defects and those requiring full thickness skin grafts. These findings likely bear relevance in patients who have undergone procedures involving the external carotid system, such as head and neck reconstruction, or those with significant carotid occlusive disease.

Figure 1



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8:15–8:21 am

Characterizing Orbicularis Oculi Behavioral Kinematics in Two Dimensions

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Introduction: The orbicularis oclui (OO) is a complex muscle with precise sequences of contraction resulting in a range of different eyelid behaviors, each with a specific function including the lubrication and protection of the eye, outflow of tears, and maintennce of complex facial expressions.[1-7] The kinematics of the OO has previously been studied using search coils[8-10] and high-speed video.[11-14] However, these techniques typically focused on a single point on the eyelid margin and one dimension in vertical direction. The present investigation utilized a combination of 3-dimensional motion capture system and high-speed video to characterize the 2D kinematics of eyelid movement.

Methods: In this prospective study, eight adult patients without abnormal eyelid pathology or previous eyelid surgery were recruited. Thirteen reflective markers were placed across the upper and lower eyelid margins, the medial and lateral canthi and for reference, the glabella. With the patient in a seated position, six 3D motion capture cameras and 1 high-definition video camera were used to capture reflective marker trajectories. Each subject performed five different eyelid behaviors: spontaneous blink, voluntary blink, reflexive blink, soft closure, and forced closure. The order of eyelid behaviors was randomized for each participant and two minutes of rest was allowed between each behavior type. Data were smoothed, averaged and plotted for qualitative analysis. Significant differences in activation, trajectiory and velocity across blink types were evaluated via a one-way ANOVA with post-hoc Tukey HSD test.

Results: Eight particpants (5 female) with a mean age of 27.3 years (22-33 years) were included. The kinematic trajectory of each eyelid behavior was plotted to demonstrate differences in shape, speed, and amount of upper eyelid motion (Figure 1). Four kinematic determinants of eyelid behavior were identified: onset medial traction (early medial motion of the upper eyelid), reverberation (sweeping overshoot beyond complete closure), percent eyelid closure, and maximum velocity. Spontaneous blink was associated with significantly more onset medial traction ($p < 0.002$) than all other behaviors except voluntary blink. Reflexive blink showed significantly more reverberation ($p < 0.0001$) and the highest maximum velocity ($p < 0.0001$). Reflexive blink, soft closure, and forced closure resulted in full closure of the eyelid, whereas spontaneous blink produced significantly less than 100% closure ($p = 0.016$).

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Conclusions: Each eyelid behavior was characterized by unique two dimensional kinematic patterns of medial traction and reverberation and one dimensional parameters of max velocity and amount of closure. Spontaneous blink had significantly more medial traction and resulted in incomplete closure while reflexive blink, soft closure, and forced closure were characterized by complete closure. The highest velocity and greatest overshoot was noted in reflexive blink. Two dimensional parameters can enhance our understading of eyelid functions and aid in diagnostic characterization for patients with eyelid pathology.

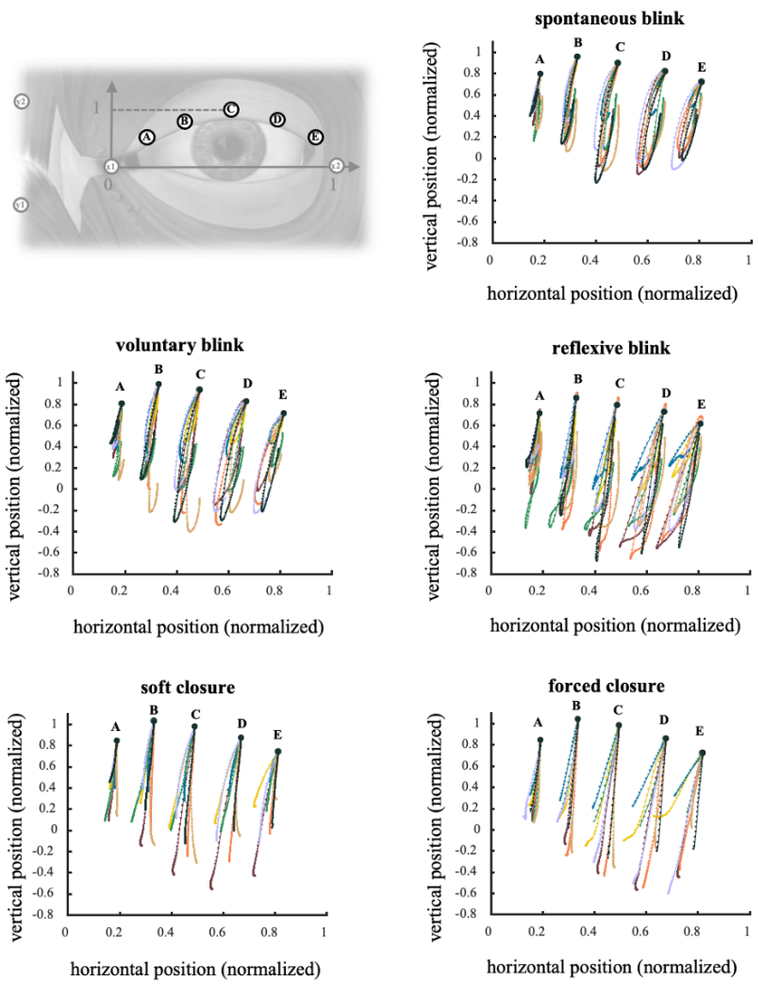

Figure 1. Subject level upper eyelid kinematics during eyelid behaviors. Individual lines represent intrasubject average kinematic trajectories with all motions starting at the black dot. All trajectories are uniformly translated to have starting points coincide with the inter-subject average starting point. Each colored dot represents a single motion capture frame with 2.5 ms between each dot.

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8:21–8:27 am

Free Graft-on-Graft Reconstruction of Large Eyelid Defects

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Introduction: Classic surgical teaching advocates against a graft-on-graft reconstruction as blood supply would be suboptimal and failure rate would be high secondary to necrosis. Traditionally, large full thickness eyelid reconstruction may utilize only one graft for either the anterior or posterior lamella, with the other lamella being repaired with a pedicle flap to provide blood supply to the adjacent graft. Such techniques have inherent drawbacks including obstructing the visual axis in a disfiguring way and requiring a second operation. Recent reports describe grafting techniques for full-thickness lid defects and demonstrated revascularization post-operatively via laser speckle contrast imaging.[1,2,3] Surgical success was attributed to the rich vascular supply in the periocular area. We herein describe our experience using a single stage graft-on-graft technique to reconstruct large full thickness eyelid defects after Mohs micrographic surgery.

Methods: This is a retrospective noncomparative review of consecutive patients who underwent graft-on-graft reconstruction for large (>50%) full thickness eyelid defects after Mohs micrographic surgery by the senior author (RS) within 24 hours of tumor excision between July 2021- July 2024. Excluded were patients with follow-up <6 months, or prior eyelid trauma/surgery. The posterior lamella was reconstructed with a free tarsoconjunctival graft from the ipsilateral upper lid for lower lid defects or contralateral upper lid for upper lid defects. The anterior lamella was reconstructed using a full thickness skin graft harvested from the upper lid when able or postauricular area as a second line harvest site. The grafts were harvested and secured in typical fashion. Cautery was used by the Mohs surgeon at their discretion but not used in the recipient bed during reconstruction. Tobramycin/dexamethasone ointment was applied and a pressure patch utilized for 5 days. Patients were seen at post-operative day 5, month 1, month 3, and month 6 with photographs taken and complications noted at each visit. Functional integrity, viability of grafts and cosmesis were evaluated at each visit.

Results: 15 patients (10 female, 5 male) with a mean age of 68 (22-87) years were included. Risk factors for poor wound healing included diabetes (5 patients), anticoagulants (5), smoking (4), obesity (4), COPD (2), and peripheral vascular disease (2). Three patients had upper lid reconstruction while 12 had lower lid reconstruction. No intraoperative complications occurred. The grafts survived in all patients with no cases of necrosis. All patients displayed functional integrity and all were subjectively satisfied (Fig 1, 2). Complications included lateral canthal rounding (2), mild hypertrophic skin graft (1), and mild ectropion (1) – none of which required revision. Mean follow-up was 18.4 (7-30) months.

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Conclusions: The free graft-on-graft technique appears to be a viable option for the repair of large full thickness eyelid defects even among patients who have risk factors for poor wound healing. Advantages over more conventional lid sharing procedures include a single operation and avoiding the functional and cosmetic downsides that come between the 1st and second stages of such surgeries. Surgeons may wish to consider this technique especially when the involved lid is ipsilateral to the better seeing eye. Future larger studies are warranted to corroborate the promising findings in our cohort.

Figure 1

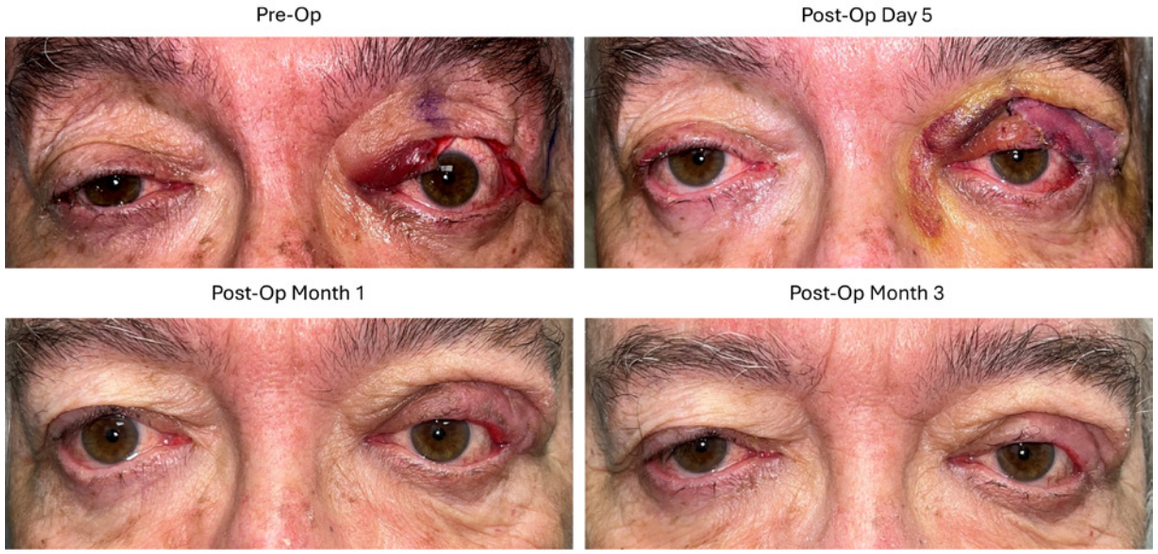
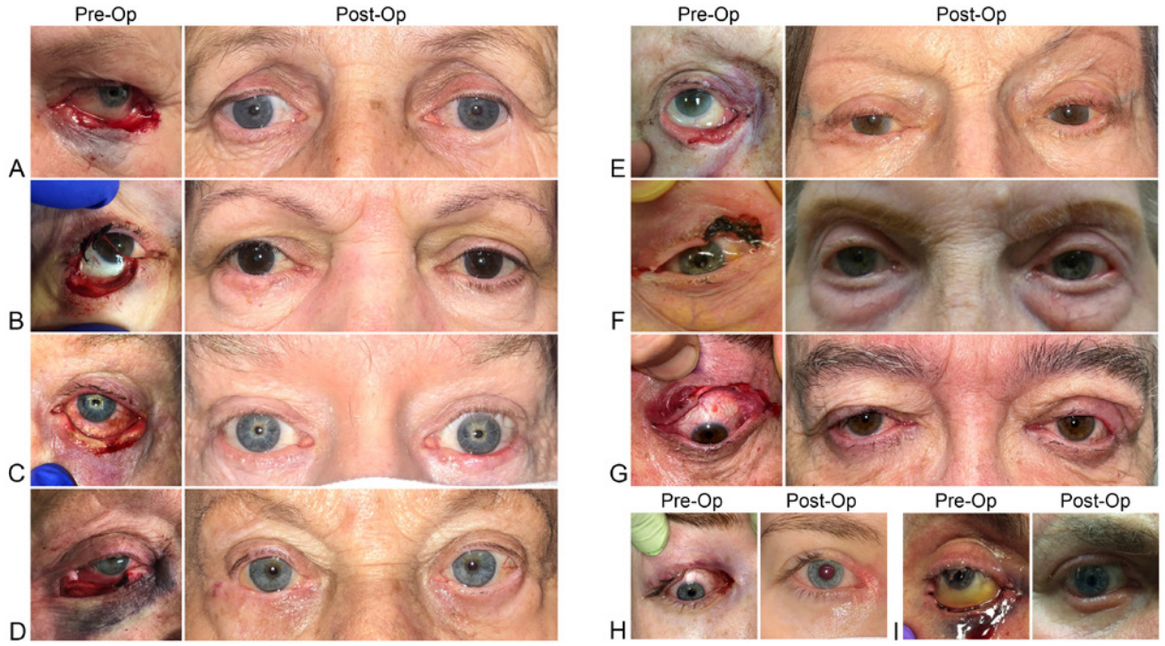


Figure 2



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8:27–8:33 am

Seeing Ptosis Differently: An Animated Media Character Trait Analysis

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Introduction: Media representation in animated films and television can significantly influence public perceptions of individuals with ptosis. This study explores the portrayal of characters with ptosis, analyzing positive and negative traits, to assess the potential impact on individuals affected by this condition. Ptosis has an incidence rate of approximately 4.7% - 13.5% in adults.[1] A 2024 study demonstrated that animated characters with strabismus are more frequently depicted negatively.[2] In response to these trends, we examine whether portrayals of ptosis in animated shows and films over the past 30 years follow a similar pattern. By analyzing traits linked to characters with ptosis, the study highlights the potential psychosocial impact this portrayal may have on individuals with eyelid ptosis.

Methods: This was a cross-sectional study analyzing animated films and television shows released between 1989 and 2020. Titles were selected from a filtered IMDb list and chosen based on popularity. Ptosis was defined by an eyelid-to-eye ratio greater than 0.3, measured using a pixel-based analysis of the eyelid-to-eye area. For each character with ptosis, ten traits were generated using ChatGPT to reduce bias, then categorized as positive or negative. The frequency of positive and negative traits in characters with ptosis was compared to main characters without ptosis using unpaired t-tests. Subgroup analyses, including gender-based comparisons, were conducted using unpaired t-tests. The top 30 animated television shows and top 30 animated films were initially included; titles without characters exhibiting significant ptosis were excluded from the final analysis.

Results: Characters with ptosis were assigned significantly fewer positive traits ($t = -6.18$, $p < 0.05$) and significantly more negative traits ($t = 4.62$, $p < 0.05$) compared to characters without ptosis. The average number of positive traits for characters with ptosis was 4.4 while for characters without ptosis it was 8.3 (figure 1). The average number of negative traits for characters with ptosis was 4.3, while for characters without ptosis it was 1.58. (Figure 1) No statistically significant differences were found between male and female characters with ptosis in terms of positive or negative traits. Within each gender group, characters with ptosis still had significantly fewer positive and more negative traits, consistent with the overall trend. The most common negative traits for characters with ptosis were “stubborn” ($n = 6$) and “sarcastic” ($n = 6$), while “loyal” ($n = 15$) was the most frequent positive trait. For characters without ptosis, the most common negative traits were “none” ($n = 11$) and “stubborn” ($n = 4$), with “loyal” ($n = 23$) being the most frequent positive trait.

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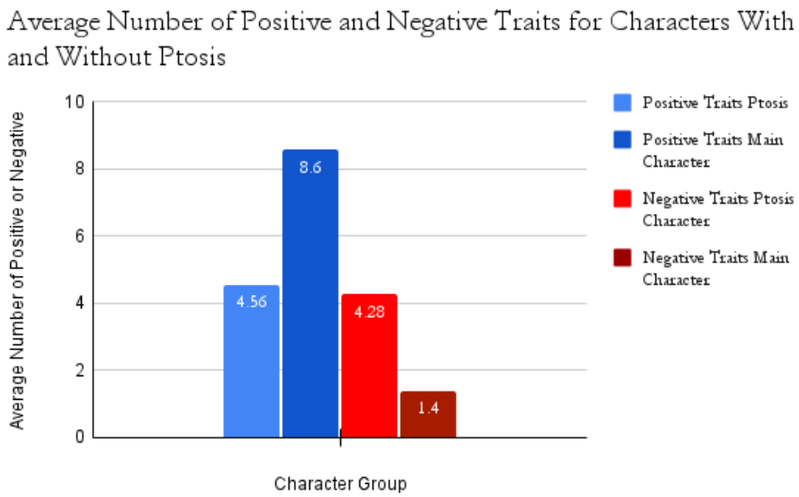
Conclusions: Significant differences in media portrayals of characters with and without ptosis suggest that individuals with ptosis are significantly more frequently associated with negative traits and fewer positive qualities in animated media. These portrayals may reinforce beauty standards and contribute to stigma, influencing how individuals with ptosis are viewed and view themselves. As media continues to shape societal attitudes, increased awareness and more diverse, positive representations of facial differences, including ptosis, are essential to reduce bias and support psychosocial well-being.

Figure 1



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8:44–8:49 am

Leveraging MRI-Derived Radiomics Signatures and Machine Learning for Non-Invasive Histopathological Characterization of Orbital Lymphomas

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Introduction: Orbital lymphomas (OLs) are rare entities constituting 6-8% of orbital tumors, and their histopathological characterization requires invasive biopsy or surgery. Extranodal marginal zone B-cell lymphoma of the mucosa-associated lymphoid tissue (MALT-lymphoma) is the most common subtype of OLs and is associated with better prognosis.[1–3] The purpose of this study is to develop a radiomics-based machine learning model to non-invasively differentiate orbital MALT-lymphomas from other OLs on preoperative pretreatment MRI, and integral component of OL staging.

Methods: All consecutive OL patients with preoperative pretreatment fat-saturated T1-weighted contrast-enhanced MRI of sufficient quality in our institutional PACS were included in this study. Clinical data such as age, gender, ethnicity, and histologic type of OL as confirmed on biopsy were recorded. OLs were manually segmented by a research associate on iTK-SNAP under the supervision of a board-certified neuroradiologist experienced with OLs. Around 15,000 radiomics features were subsequently extracted with the PyRadiomics library. Feature selection was performed with the least absolute shrinkage and selection operator (LASSO) method. Our model was developed with the TabPFN algorithm, an adapted Prior-Data Fitted Network design. Model performance was evaluated graphically and quantitatively over 5-repeat 5-fold cross-validation. SHapley Additive exPlanations (SHAP) were employed to determine the relative importance of selected radiomics features.

Results: Our cohort consisted of 122 consecutive patients (65 men, 57 females) with an age range of 21-90 years (median= 63 years). The MRI images analyzed dated between March 2002 and February 2020. There were 89 Whites, 15 Hispanics, 10 African Americans, 6 Asians, and 2 patients declined to answer regarding their ethnicity. There were 47 biopsy proven MALT-lymphomas and 75 cases of non-MALT OIs (26 diffuse large B cell lymphomas, 12 follicular lymphoma, 9 mantle cell lymphoma, , 9 T cell lymphomas, 17 other). A total of

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45 radiomic features were selected by the LASSO algorithm, and their relative contributions to the model output were apparent by SHAP. Our model resulted in a precision of 0.758 (95% CI: 0.720, 0.796), recall of 0.714 (95% CI: 0.671, 0.752), F1 score of 0.706 (95% CI: 0.678, 0.736), accuracy of 0.776 (95% CI: 0.753, 0.799), Matthews Correlation Coefficient of 0.555 (95% CI: 0.511, 0.600), area under the ROC curve of 0.772 (95% CI: 0.745, 0.797), area under the precision-recall curve of 0.772 (95% CI: 0.742, 0.797), and Brier score of 0.198 (95% CI: 0.183, 0.212).

Conclusions: Radiomics-based machine learning models are promising for distinguishing MALT-lymphomas from other less common and more aggressive orbital lymphomas. Once validated and further refined such models could assist in the non-invasive characterization of orbital lymphomas, and potentially offer a rapid, non-invasive alternative to surgical biopsy.

Figure 1

Figure 1: Axial contrast-enhanced fat-saturated T1-weighted MRIs of a right lacrimal gland orbital MALT-lymphoma (Figure 1A) and a left lacrimal gland non-MALT lymphoma (Figure 1C). Their respective segmentation masks (red masks Figures 1B and 1D) are also illustrated.

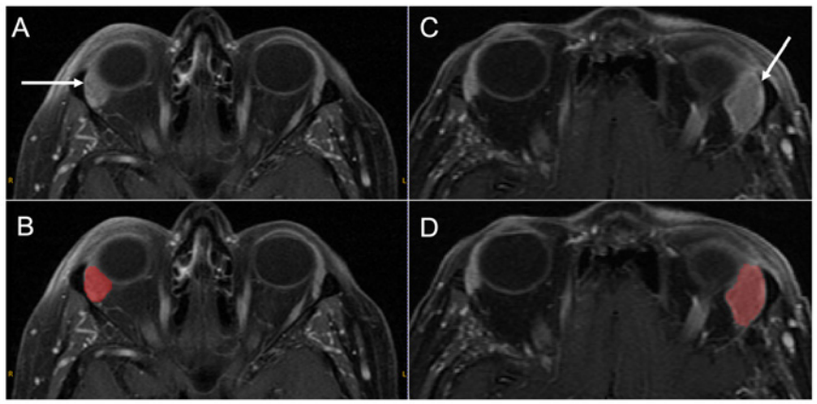
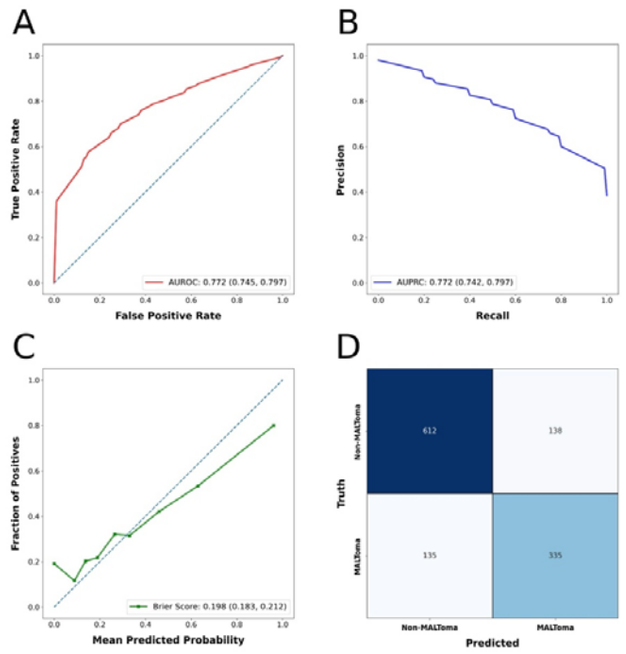


Figure 2

Figure 2: Model performance illustrated with the ROC curve (Figure 2A), precision-recall curve (Figure 2B), calibration curve (Figure 2C) and confusion matrix (Figure 2D) from which performance metrics are derived.



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8:49-8:54 am

Endoscopic Transorbital Resection of Spheno-Orbital Meningiomas

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Introduction: Endoscopic transorbital resection for spheno-orbital meningioma presents an alternative to craniotomy, with reduced risk of post operative cosmetic deformity, and equal or superior rates of gross total resection (GTR).[1,2] This investigation aims to characterize the proptosis and resection outcomes for transorbital meningioma resection.

Methods: In this cohort study, patients with spheno-orbital meningiomas who underwent transorbital surgery by neurosurgery and oculoplastic multidisciplinary teams at a single center were included. Patients 18 and older who underwent transorbital surgery and had meningioma confirmed on surgical pathology were included. Patients who underwent craniotomy surgery only were excluded. Demographic and clinical variables were extracted from patient records. Data are presented descriptively.

Results: Seventeen patients were identified, of which 15 were female. The mean (SD) age was 54.2 (15.7). Twelve cases were primary and 5 recurrent meningioma after prior craniotomy. Proptosis was the most common feature on presentation, noted in 15 patients. Two patients without proptosis both had recurrent meningioma. Four patients (three primary) presented with compressive optic neuropathy and vision loss. All seventeen patients underwent combined transorbital surgery by neurosurgery and oculoplastics teams.

Surgical procedure involved a lateral eyelid crease incision, bony marginotomy, and loupe guided burr removal of hyperostotic bone exposing the middle and anterior cranial fossae, unroofing the superior orbital fissure and exposing the temporalis completely. In appropriate cases, the foramen rotundum was also decompressed. The endoscope was utilized to complete deeper bony drilling and to resect tumor. Dura was reconstructed with a combination of dural substitute, abdominal fat grafting and dural sealant.

Post operative pathology was consistent with World Health Organization (WHO) grade I meningioma in thirteen patients, grade II disease in three patients, and grade III disease in one patient. Radiologic GTR was achieved in 11 cases. Patients with incomplete resection were noted to have extension into the ethmoid sinus (1 recurrent, 1 primary), the infratemporal fossa (1 primary), or multifocal tumors (1 recurrent). One patient had involvement of the superior oblique and supratrochlear nerve. Six patients underwent adjuvant therapy after subtotal resection, including radiotherapy and proton therapy. The adjuvant therapy group included 3 patients with recurrent grade I meningioma, 2 with primary grade II meningioma, and 1 with recurrent grade II meningioma. One patient with primary grade II disease underwent sequential craniotomy for progression after transorbital surgery and radiotherapy. Patients achieved significant orbital decompression with an average (SD) proptosis reduction of 4.3mm (3.3). Three of four patients with compressive optic

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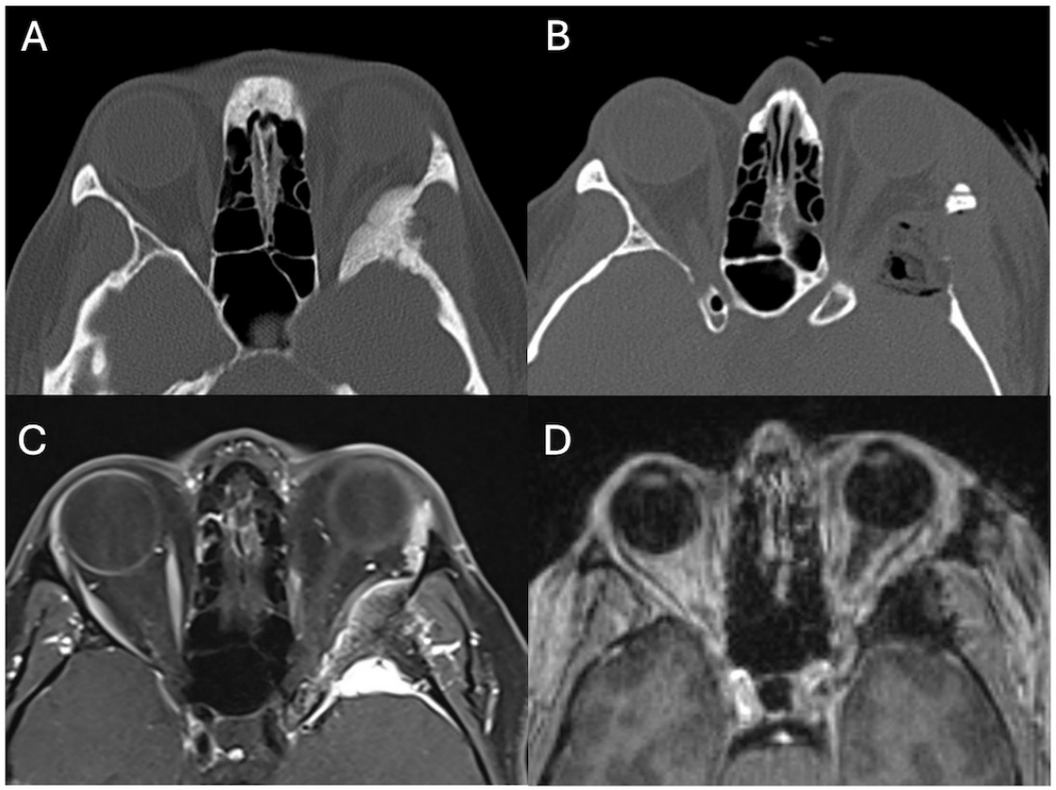
neuropathy achieved improvement in post operative visual acuity. One patient without improvement had light perception (LP) vision for four years prior to surgery. Three patients developed transient post operative diplopia that resolved by post operative month six.

Conclusions: For patients with spheno-orbital meningioma with hyperostosis, transorbital resection can be an option for both orbital decompression and to achieve meaningful tumor resection Recurrent and higher-grade meningiomas may also require adjuvant therapy. Bi-directional referral patterns and a collaborative approach between oculoplastics and neurosurgical services optimizes care for patients with these challenging skull base lesions.

Figure 1



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8:54–8:59 am

Blinded by the Flames: Evaluation of Novel Guidelines for Management of Burn Patients at Risk of Orbital Compartment Syndrome

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Introduction: Orbital compartment syndrome (OCS) is a devastating complication in burn patients due to an increase in orbital pressure that can lead to permanent vision loss and blindness. Intraocular pressure (IOP) remains the most reported surrogate for orbital pressure given accessibility to IOP measurement devices and closed anatomy of the orbit compartment, where elevated orbital pressure is theoretically translated to the globe. Currently, there is no consensus on the IOP threshold for surgical intervention or frequency of IOP checks in patients at risk of OCS. Little has been written about risk factors for OCS in burn patients and which patients require early and frequent eye examinations.

The Burn Orbital Compartment Syndrome guidelines (BOCS) were developed and initiated in 2020 to incorporate the previously reported significant OCS risk factors (>50% total body surface area (TBSA) involving the face) and likely risk factors identified at the study institution (vasopressor use, albumin use, and the presence of conjunctival chemosis) into a framework to direct initiation and frequency of IOP measurements and timing of surgical intervention.

The aim of this study is to evaluate the use of BOCS in detecting IOP elevation and preventing vision-threatening OCS in burn patients.

Methods: A 4-year retrospective review was performed to evaluate burn patients with facial involvement managed by ophthalmology using BOCS. Patients were divided into *High Risk* versus *Low Risk* and *Surgical* versus *Non-surgical* groups. *High Risk* patients had > 50% TBSA involving the face or at least 2 of 3 likely risk factors (vasopressor use, albumin use, or presence of conjunctival chemosis) with exams every 4 hours. Other patients (*Low Risk)* were checked every 8 hours. The *Surgical* group underwent interventions including canthotomy and cantholysis, septolysis, and/or eyelid split.

Results: Among the 24 included patients, surgical intervention was performed on 61.5% of *High Risk* patients, while 88.9% of *Surgical* patients were *High Risk*. Despite being a criteria for *High Risk* patients, the presence of conjunctival chemosis was not significantly different between *High Risk* and *Low Risk* patients, though %TBSA (59.2% vs 10.4%, $p<0.05$), vasopressor administration (92.3% vs 18.2%, $p<0.05$) and albumin use (84.6% vs 0%, $p<0.05$) were.
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Surgical patients had higher mean %TBSA (61.0% vs 22.3%, p<0.05) and albumin administration rates (88.9% vs 20%, p<0.05) compared to the *Non-surgical* group. Presence of chemosis (100% vs 60%) and vasopressor use (77.8% vs 46.7%) was not significantly different between *Surgical* and *Non-Surgical* groups. *Surgical* patients presented with mean intraocular pressure (IOP) of 28.4 mmHg (range 11-80) and reached peak IOP (mean 47.8 mmHg) at a mean of 11.8 hours (range 5-20) after injury.

Conclusions: Early and frequent IOP monitoring is essential in *High Risk* burn patients. Eye examinations should occur within 12 hours with adjustments in frequency based on risk factors like %TBSA and albumin use. Broader implementation and analysis of BOCS, combined with collaboration with burn centers nationally and internationally, will help refine OCS management strategies and enhance prevention efforts, ultimately reducing the risk of this devastating complication.

Table 1: The Burn Orbital Compartment Syndrome Guidelines (BOCS)

	Significant Risk Factor	Patient (yes/no)
%TBSA	>50% and involving face	
	Likely Risk Factor (2 or more)	
Albumin	Used	
Vasopressor	Used	
Chemosis	Present	
	Recommendations:	
	Patient's IOP	
	Start Brimonidine? (Y/N)	
	Recommended IOP check frequency	
	Next IOP check due (date, time)	
	Cantholysis done? (Y/N)	

Oculoplastic and Cornea fellows should be notified of these patients.

<u>If Total Body Surface Area (TBSA) >50% involving face, or 2 or more likely risk factors:</u>

•Intraocular Pressure (IOP) checks q4hrs until normalized x3, then extend to q12hrs x 2

•Start brimonidine drops three times a day (if patient is >6 years old)

•Continue until q12hr checks are complete

<u>For all others:</u> IOP checks q8hrs x3, then as needed

Consider canthotomy/cantholysis (c/c) for IOP >35; perform inferior, and consider superior if needed

IOP check immediately after c/c, then 1 hour later

Table 2. Patient demographics and clinical characteristics

	Total (n=24)	**Surgical** (n=9)	**Non-surgical** (n=15)	**p-value**	**High Risk** (n=13)	**Low Risk** (n=11)	**p-value**
Age ± SD (yr)	41.5 ± 23.1	39.6 ± 19.0	43.7 ± 23.1	0.693	42.4 ± 19.7	41.8 ± 24.0	0.8087
Male (%)	14 (58.3%)	8 (88.9%)	6 (40.0%)	**0.0333**	10 (76.9%)	4 (36.4%)	0.0953
Mortality (%)	4 (16.7%)	2 (22.2%)	2 (13.3%)	0.6146	4 (30.8%)	0 (0%)	0.0983
% TBSA burned ± SD	36.8% ± 30.7%	61.0% ± 23.8%	22.3% ± 25.0%	**0.0014**	59.2% ± 23.8%	10.4% ± 8.53%	**<0.0001**
Albumin administered (%)	11 (45.8%)	8 (88.9%)	3 (20.0%)	**0.0022**	11 (84.6%)	0 (0%)	**<0.0001**
Vasopressor administered (%)	14 (58.3%)	7 (77.8%)	7 (46.7%)	0.2099	12 (92.3%)	2 (18.2%)	**0.0005**
Conjunctival chemosis (%)	18 (75.0%)	9 (100%)	9 (60.0%)	0.0519	12 (92.3%)	6 (54.5%)	0.0608
High Risk patients (%)	13 (54.2%)	8 (88.9%)	5 (33.3%)	**0.0131**	---	---	---
Surgical patients (%)	9 (37.5%)	---	---	---	8 (61.5%)	1 (9.09%)	**0.0131**
Mean initial IOP (mmHg)	22.7	28.4	19.2	**0.0362**	26.8	17.9	**0.0011**
Mean peak IOP (mmHg)	31.9	47.8	22.3	**<0.0001**	41.5	21.9	**<0.0001**
Initial IOP <30 mmHg	19 (79.2%)	5 (55.6%)	14 (93.3%)	**0.0474**	9 (69.2%)	10 (90.9%)	0.3271
Peak IOP >35 mmHg	8 (33.3%)	8 (88.9%)	0 (0.0%)	**<0.0001**	8 (61.5%)	0 (0%)	**0.002**
Brimonidine started at onset (%)	10 (41.7%)	7 (77.8%)	3 (20.0%)	**0.0104**	9 (69.2%)	1 (9.09%)	**0.0045**
Mean final visual acuity (LogMAR)	0.0842	0.157	0.0374	**0.0239**	0.131	0.0374	0.0642

% TBSA, Percentage of total surface body area burned (all patients with facial involvement); SD, standard deviation; OCS, orbital compartment syndrome; IOP, intraocular pressure

High Risk patients include patients with at least >50% TBSA involving the face, or two of the three risk factors of albumin use, vasopressor use, or conjunctival chemosis

Surgical patients include patients that underwent interventions including canthotomy and cantholysis, septolysis, and/or eyelid split

Risk factors highlighted in gray

Bolded p-values indicate statistical significance (<0.05)

Table 3. Surgical interventions in burn patients at risk of OCS

	Inferior c/c	**Superior c/c**	**Inferior septolysis**	**Superior septolysis**	**Inferior eyelid split**	**Superior eyelid split**
Patient A	X	X	X	X	X	X
Patient B	X	X	X	X		
Patient C	X	X			X	X
Patient D	X	X				
Patient E	X	X				
Patient F	X	X				
Patient G	X					
Patient H	X					
Patient I	X					

Procedures listed in order performed from left to right

OCS, orbital compartment syndrome; c/c, canthotomy/cantholysis

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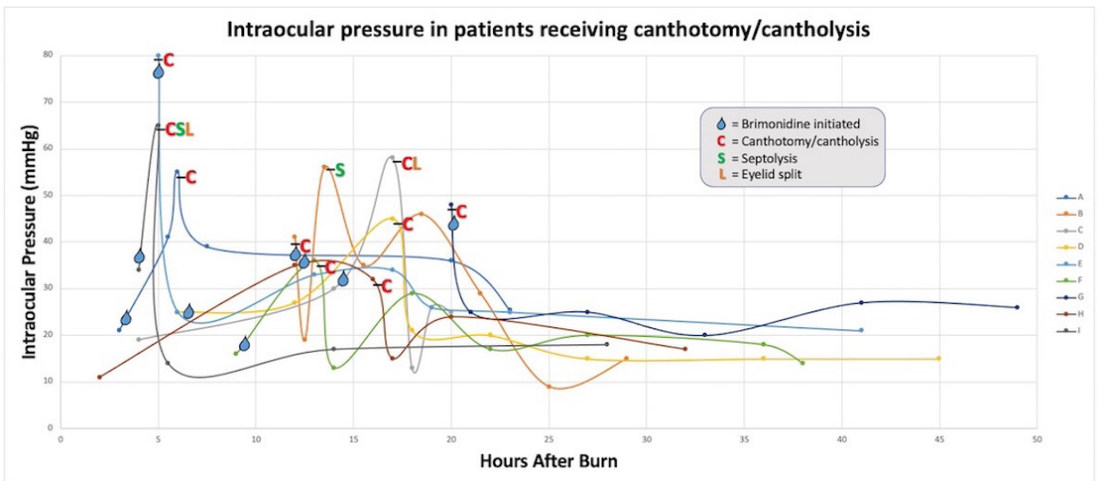

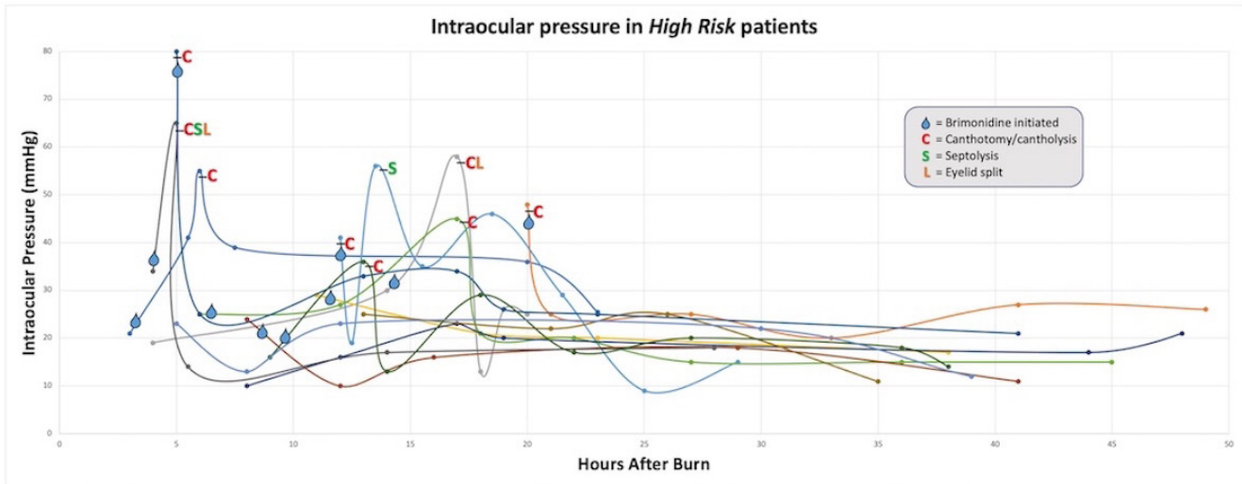

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8:59–9:04 am

Thyroid Eye Disease and the Temporal Risk for Glaucoma

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Introduction: Thyroid Eye Disease (TED) is an autoimmune orbitopathy most often associated with thyroid dysfunction. Glaucoma comprises progressive optic neuropathies characterized by optic nerve damage and visual field defects. Because elevated intra-ocular pressure (IOP) occurs in both disorders, TED may represent a population at heightened glaucoma risk.[1] Clinical evidence linking TED to glaucoma remains limited, with conflicting prevalence rates in published work. A recent voluntary database study using the NIH *All of Us* Research Program demonstrated a higher prevalence of glaucoma in TED, yet its opt-in design invites selection bias.[2,3] We therefore examined prevalence and temporal sequence of TED and glaucoma in a mandatory, single-center dataset.

Methods: A retrospective, cross-sectional analysis was conducted using aggregated de-identified data at a tertiary care academic medical center from September 2012 to September 2024. Adults (≥ 18 years old) with TED diagnoses were 1:4 propensity-matched to non-TED controls in a randomized manner controlling for demographics (age, gender, ethnicity), smoking history, and cardiovascular history. TED, glaucoma, or glaucoma suspect diagnoses were retrieved from ICD codes. With covariates equilibrated, bivariate logistic regression via Pearson Chi-Squared test of glaucoma on TED status yielded an unbiased association estimate without over-adjustment.

Results: 753 cases of TED (mean age 63.9 ± 15.4 years; 77.8 % female) were identified, with 3012 non-TED controls. Glaucoma or glaucoma suspect was documented in 73 TED cases (9.4%) versus 17 non-TED controls (0.6%). In the TED group, 55.9 % had diagnosed glaucoma and 44.1 % were suspects. TED was strongly associated with glaucoma on logistic regression (OR 18.9; 95 % CI 11.1–32.3; $p < 0.0001$). TED preceded the glaucoma diagnosis in 85.7 % of affected TED patients by an average of 7.8 years (0.1 - 48 years).

Conclusions: Nearly 10% of TED patients were diagnosed with glaucoma or as a glaucoma suspect in contrast to only 0.6% in a matched non-TED control population. This is in contrast to the 6% glaucoma or glaucoma suspect incidence reported in a recent NIH *All of Us* database study,[3] and highlights the risk of enrollment bias when analyzing trends in patient populations. The current work showed that TED conferred nearly 19-fold higher odds of glaucoma or glaucoma-suspect status, with TED typically arising first by many years. This temporal pattern suggests a link between TED and glaucoma, and also argues for routine glaucoma surveillance in TED care over years. Prospective, multicenter studies are needed to confirm causality, delineate underlying mechanisms, and establish evidence-based screening guidelines for patients with thyroid eye disease.

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9:04–9:09 am

Progression of Lentigo Maligna to Lentigo Maligna Melanoma: A SEER Database Study

Kimberly Papp[1], Samuel Baugh[2], Ezekiel Weis[1], Robert Goldberg[3], Kelsey Roelofs[4]
[1]Department of Ophthalmology, University of Alberta, Edmonton, Alberta, Canada, [2]Department of Statistics, University of Pennsylvania, Hershey, Pennsylvania, United States, [3]Department of Ophthalmology, University of California, Los Angeles, Los Angeles, California, United States, [4]Department of Ophthalmology, University of Alberta, Edmonton, Canada

Introduction: Lentigo maligna (LM) carries a risk of transformation into invasive lentigo maligna melanoma (LMM). As a result, consensus guidelines often recommend surgical resection of LM with 5 – 10 mm clinical margins as the standard of care; however, in the periocular area, large excisions requiring complex reconstruction can have significant functional and aesthetic implications. Factors impacting the likelihood of LM progression to LMM have been incompletely described in the literature, making it difficult to tailor interpretation of broad guidelines to an individual clinical scenario. This study aimed to investigate transformation of LM to LMM in order to better contextualize the magnitude of risks and benefits that oculoplastic surgeons aim to quantify in day-to-day clinical practice.

Methods: Data was pooled from 17 research registries within the de-identified SEER database from the United States spanning 2000-2020. Patients with a primary site of eyelid or face, plus a histopathologically confirmed diagnosis of LM and/or LMM were included and divided into groups: Group 1 had LM only, Group 2 had an initial LM diagnosis followed by a later LMM diagnosis, and Group 3 had LMM only. Statistical analysis was performed using R.

Results: A total of 42,980 tumors from 41,106 patients were included: Group 1 had 32,160 patients, Group 2 had 244 patients, and Group 3 had 8,702 patients. Overall, mean age at first diagnosis was 69.8 years and patients were followed for an average of 85.4 months. The majority of patients (92.5%) identified as White and there were nearly twice as many males (27,192; 66.2%) as females (13,914; 33.8%). Over the study period, all cause mortality was 29.7% and disease-specific mortality was 2.5%.

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Of the 32,404 patients diagnosed with LM, 0.75% (244 patients) went on to develop LMM. Patient factors significantly associated with a greater risk of developing LMM included longer follow up time (9.7 vs 7.1 years; p<0.001) and older age at diagnosis (71.8 vs 69.6 years, p<0.001). Of those diagnosed with LM, 90% (29,107/32,404) were treated with surgery. Patient factors associated with receiving surgery for LM included longer follow up (p<0.001) and younger age (p<0.001). Receiving surgery for LM did not significantly alter the chance of developing LMM (0.76% vs 0.70%; p = 0.778) nor did it impact 20-year disease specific mortality (p=0.099) (Figure 1); however, those receiving surgery for LM had a longer mean time to diagnosis of LMM compared to those not receiving surgery for LM (4.7 vs 2.7 years, p=0.009). On multivariate analysis, older age at diagnosis was the only significant predictor for developing LMM after LM (OR: 0.017; p=0.004) (Figure 2).

Conclusions: There are several important limitations of this study to acknowledge, including the lack of granularity with respect to additional, potentially meaningful clinical and surgical data not recorded within SEER; however, the data above help to contextualize the magnitude of risk/benefit associated with various demographic and management variables, better arming the clinical to personalize the application of broad consensus guidelines to an individual patient scenario.

Figure 1. Disease specific survival of patients with LM

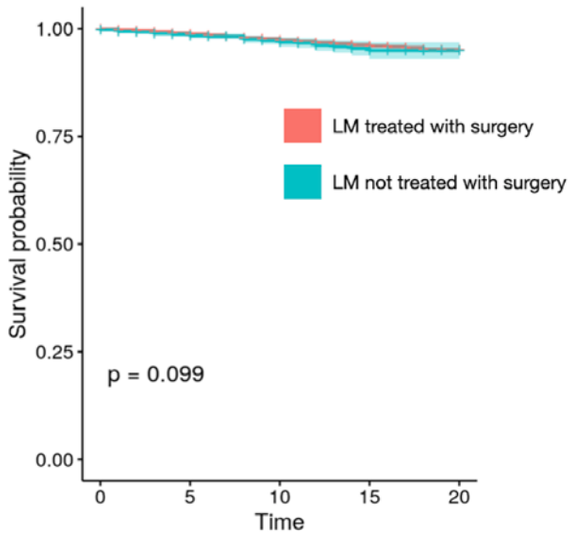
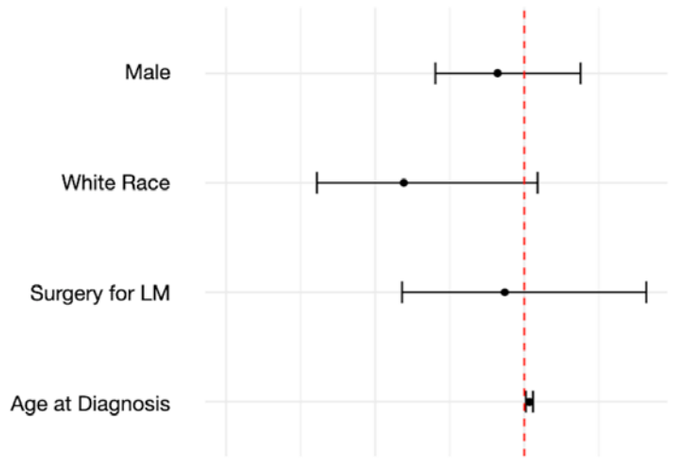


Figure 2. Multivariate analysis of predictors for progression of LM to LMM



9:09–9:14 am

Rituximab is an Effective Therapy in Treating Adult Orbital Xanthogranulomas

Jessica Waninger, Buse Guneri, Sarinee Juntipwong, Victor Elner, Hakan Demirci
Ophthalmology, University of Michigan, Ann Arbor, Michigan, United States

Introduction: Adult orbital xanthogranulomas are a group of rare orbital tumors characterized as non-Langerhans histiocytic disorders (type II)[1]. There are four subtypes: adult-onset xanthogranuloma (AOX), adult-onset asthma and periocular xanthogranuloma (AAPOX), necrobiotic xanthogranuloma (NBX), and Erdheim-Chester disease (ECD). They are characterized by their pathological and clinical features, as well as systemic associations. Treatment options vary considerably given disease rarity and lack of prospective data. These include debulking surgery; topical, intralesional, or systemic steroid; alkylating agents; and mitogen-activated protein kinase (MAPK) directed targeted therapies[2]. Here we describe the use of rituximab, a CD20 inhibitor, in a series of six patients with adult orbital xanthogranulomas.

Methods: This is a descriptive retrospective case series of patients with adult xanthogranuloma treated with rituximab. Patient demographics, clinical parameters, treatment data, and survival data were collected via review of the electronic medical record. Outcome measures included time to recurrence, periorbital/orbital symptoms, and lesion size before and after rituximab treatment. Time to recurrence was determined based on time from rituximab administration to time of clinical recurrence. For size metrics, comparisons were made of the lesion's largest dimension, determined clinically, before and at least three months after rituximab treatment. A p-value of 0.05 or less was considered significant.

Results: Six patients with adult xanthogranulomas were included. Three patients presented with orbital swelling, one with lacrimal gland swelling, and two with upper eyelid swelling and ptosis. Of the six patients, four were diagnosed with NBX, one was diagnosed with AAPOX, and one was diagnosed with AOX. Five patients were female, and one was male. The median age was 62.5 years old (range 31-74y) All patients received one or more treatments prior to rituximab therapy including surgery (67%), radiation therapy (17%), oral prednisone (50%), intralesional triamcinolone (83%), methotrexate (17%), and IVIG (17%). Given recurrent disease or minimal improvement on the aforementioned treatments, five patients received one or more doses of intralesional and/or retrobulbar rituximab and one patient received rituximab infusions. All patients had recorded improvement in symptoms including improvement in lesion size, periorbital swelling, and/or erythema. There was significant improvement in the lesion size (p=0.02) after treatment. All patients had recurrence except one that was lost to follow up. The median time to recurrence was 24.3 months.

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Conclusions: This study suggests that intralesional and/or retrobulbar rituximab may be an effective treatment for adult xanthogranuloma in the setting of otherwise refractory disease. A larger, prospective study is warranted to further evaluate the use of rituximab in this rare subset of patients.

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9:14–9:19 am

Incidence and Risk Factors for Sympathetic Ophthalmia Following Open Globe Injuries: A Population-Based Analysis

Niloufar Bineshfar[1,2], Natalia Davila[2], Chloe Shields[2], Samantha A. McLaughlin[2], Sugi Panneerselvam[2], Tejus Pradeep[2], Wendy W. Lee[2]
[1]Mass Eye and Ear, Boston, Massachusetts, United States, [2]Bascom Palmer Eye Institute, Miami, United States

Introduction: Sympathetic ophthalmia (SO) is a rare, bilateral granulomatous uveitis triggered by an autoimmune response to uveal antigens exposed after ocular trauma or surgery. Although SO is uncommon, it can cause significant visual loss in both the injured and uninjured eye, with onset ranging from days to decades post-injury. Open globe injuries (OGIs) are the most common traumatic cause, but the exact risk of SO and the protective effect of early enucleation remain uncertain.

While advances in immunomodulatory therapy have improved SO outcomes, the role of early enucleation in prevention remains debated. Recent studies suggest limited benefit from early eye removal, challenging traditional management paradigms. Using the large and diverse TriNetX network, this study aimed to evaluate SO incidence after OGIs, assess the effect of early enucleation or evisceration, and identify demographic risk factors associated with SO development.

Methods: This retrospective cohort study included patients diagnosed with OGIs between September 2004 and September 2024 using the TriNetX database. SO incidence was calculated at six months, one year, five years, and ten years post-injury. Risk factors, including demographics, use of corticosteroids, and the effect of enucleation/evisceration within 30 days, were analyzed using Cox proportional hazards models.

Results: Of 63,763 patients with OGIs (mean age 42.0±23.7 years; 70.9% male), the overall incidence of SO was 0.13% at six months, rising to 0.18% at ten years. SO was diagnosed in 105 patients, with 74.3% presenting within six months of injury. Enucleation was performed in 1.82% of patients with OGIs at six months, increasing to 2.15% by ten years. No significant difference in SO risk was observed between patients undergoing early eye removal surgeries and those receiving primary repair (hazard ratio (HR): 0.655, 95% confidence interval (CI): 0.236–1.817, P=0.416). Demographic factors associated with increased SO risk included Native Hawaiian or Other Pacific Islander ethnicity (HR: 6.775, 95% CI: 1.786–25.694, P=0.005) and Hispanic ethnicity (HR: 2.862, 95% CI: 1.077–7.608, P=0.035).

Conclusions: SO following OGIs is rare but persists as a long-term risk, with most cases developing within the first year. Early enucleation or evisceration does not appear to significantly alter SO risk. Demographic disparities highlight the need for targeted surveillance and follow-up in high-risk populations.

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References

1. Classification Criteria for Sympathetic Ophthalmia. *Am J Ophthalmol*. 2021;228:212-219. doi:10.1016/j.ajo.2021.03.048
2. Hall N, Douglas VP, Ivanov A, et al. The Epidemiology and Risk Factors for the Progression of Sympathetic Ophthalmia in the United States: An IRIS Registry Analysis. *Am J Ophthalmol*. 2024;258:208-216. doi:10.1016/j.ajo.2023.09.011

HENRY I. BAYLIS COSMETIC SURGERY AWARD LECTURE

Thursday, October 16

Moderator: Guy G. Massry

9:29–9:49 am

Shaping Tomorrow’s Faces: Aesthetics in Oculofacial Surgery

John B. Holds

REGENERATIVE MEDICINE FOR OCULOFACIAL REJUVENATION

Thursday, October 16

Moderator: Julie Woodward

10:25–10:38 am

Trends and Sourcing of Regenerative Medicine

Julie Woodward

10:38–10:51 am

PRP, PRF, Autologous and Biostimulatory Injectables

John J. Martin

10:51–11:04 am

Bioregenerative Solutions for Longevity and Age Reversal

Special Guest: Azza Halim

1:16–1:22 pm

Histopathologic Analysis of Festoons

Sava Novakovic[1], Liane Dallalzadeh[2], Pooja Parikh[2], Phillip Tenzel[2], Bret Evers[3], Ronald Mancini[2]
[1]School of Medicine, University of Texas Southwestern Medical Center, Dallas, Texas, United States, [2]Ophthalmology, University of Texas Southwestern Medical Center, Dallas, Texas, United States, [3]Pathology, University of Texas Southwestern Medical Center, Dallas, Texas, United States

Introduction: The pathophysiology of festoons, drapes of edematous excess skin overlying the malar eminence, remains poorly understood.[1-3] Previous studies have hypothesized that festoons arise in part due to lymphatic stasis resulting in fluid retention.[1,2] Interventions reported to address festoons include tetracycline injections, midface lifting, fat repositioning, direct surgical excision, or a combination of the above.[1-4] This study aims to evaluate the histopathology of festoons to elucidate their pathophysiology and guide potential intervention.

Methods: This is an IRB-approved retrospective histopathologic study comparing festoons with malar controls. Inclusion criteria included adult patients 18 years or older who underwent surgical excision of tissue above the malar eminence (festoon) from 2016-2024 at a single academic institution (Figure 1). This was compared to excess malar tissue in the identical upper cheek region where festoons are located that was excised during reconstruction following Mohs micrographic surgery (control). Patients with history of prior surgery involving the midface or lower eyelids were excluded.

Initial tissue staining was conducted with hematoxylin and eosin (Figure 2A). Subsequent staining included D2-40 (podoplanin; lymphatic specific; Figure 2B) and CD31/CD34 (vascular and lymphatic). Vessels lined by a single endothelial layer and lacking luminal erythrocytes were selected for analysis. Total vessel count, area, and dermal location were reported for 2 separate slices from each tissue sample (Table 1).

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Results: To date, 6 patients (4 festoon, 2 controls) with mean age 67.8 ± 2.2 years and 50% male met inclusion criteria. Mean total vessel count for festoon and control was 89.8 vs 52 (p = 0.043), mean total vessel area was 152,480 vs 32,333 square microns (p = 0.002); mean area per vessel was 1,667 vs 622 square microns per vessel (p = <0.001). A statistically significant difference was observed in average papillary dermis vessel count (festoon 27.5 vs control 11; p = 0.034), but not in the reticular or hypodermis. However, across all 3 layers of the dermis, there was a significantly greater vessel area and area per vessel in festoons relative to control.

Conclusions: Here, we provide histopathologic evidence of a significant increase in total lymphatic vessels and dilation in patients with festoons relative to malar tissue control.

Figure 1

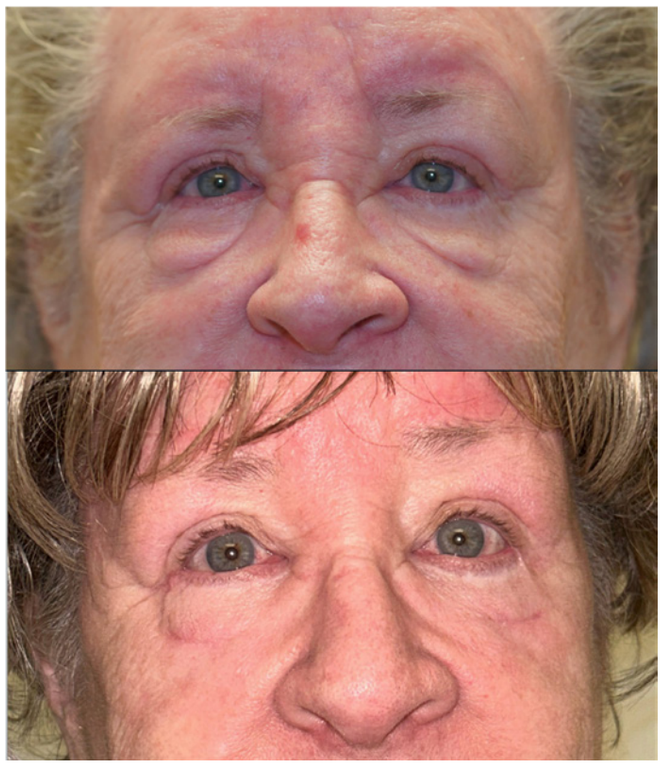

Figure 2

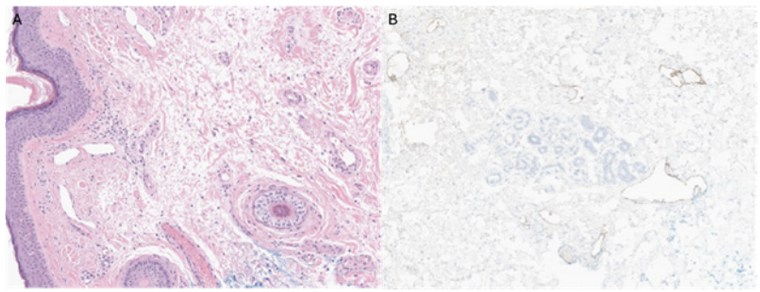

Figure 3

Figure 3

	Festoon	Control	p-value
Papillary dermis			
Vessel count	27.5	11.0	**0.034**
Vessel area (square microns)	41,396.2	8,794.0	**0.022**
Area per vessel (square microns per vessel)	1,592.4	799.5	**0.013**
Reticular dermis			
Vessel count	39.7	30.0	0.259
Vessel area (square microns)	75,235.9	13,340.0	**0.001**
Area per vessel (square microns per vessel)	1,971.6	444.7	**<0.001**
Hypodermis			
Vessel count	22.7	11.0	0.070
Vessel area (square microns)	35,848.2	10,199.0	**0.012**
Area per vessel (square microns per vessel)	1688.2	927.2	**0.005**
Total Specimen			
Vessel count	89.8	52.0	**0.043**
Vessel area (square microns)	152,480.2	32,333.0	**0.002**
Area per vessel (square microns per vessel)	1,666.9	621.8	**<0.001**

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1:22–1:28 pm

Safety Analysis of Oxymetazoline Eyedrops for Blepharoptosis Using the FDA Adverse Event Reporting System

Daniel Azzam[1], Teresa Chen[2], Yosur Alsulaiman[2], Seanna Grob[2], Lilangi Ediriwickrema[2], M. Reza Vagefi[1], Jeremiah Tao[2]
[1]Division of Oculofacial Plastic and Orbital Surgery, New England Eye Center, Tufts Medical Center, Boston, Massachusetts, United States, [2]Division of Oculofacial Plastic and Orbital Surgery, Gavin Herbert Eye Institute, University of California, Irvine, Irvine, California, United States

Introduction: Oxymetazoline hydrochloride ophthalmic solution 0.1% is a sympathomimetic selective α1- and partial α2 agonist approved by the Food and Drug Administration (FDA) for treatment of acquired blepharoptosis in adults.[1,2] Prior studies addressing its safety reported mostly mild local reactions, with no differences in adverse drug event (ADE) rates (12.3-31.2%) compared to placebo.[3-7] While much of these data come from clinical trials, these studies are limited by strict inclusion criteria, small samples, and short follow-up. Hence, a post-marketing surveillance investigation is necessary to evaluate potential ADEs further.

The FDA Adverse Event Reporting System (FAERS) is recognized as the largest publicly available pharmacovigilance database worldwide and has been utilized to assess safety of many ophthalmology-related drugs.[8-10] The primary aim of this study was to conduct a safety profile analysis of oxymetazoline eyedrops using real-world FAERS data.

Methods: This retrospective pharmacovigilance study queried the FAERS database utilizing OpenVigil 2.1 platform for oxymetazoline eyedrop ADEs from initial release in July 2020 to April 2025. Data were deduplicated and only reports of oxymetazoline eyedrop as the primary suspect of ADEs were included. Disproportionality analysis using the case–non-case approach was performed by calculating the proportional reporting ratio (PRR), relative reporting ratio (RRR), reporting odds ratios (ROR), and chi-square analysis to detect statistically significant positive signals.

Results: A total of 306 patients with 658 ADEs associated with oxymetazoline eyedrops were analyzed (Figure 1). Demographics included female majority (N=262, 85.6%), median age 61 (47-72) years, and United States as the top reporting country (Table 1). Table 2 demonstrates the 30 significant signals identified, mainly within eye disorders (N=321, 85.8%). All ADEs listed on the drug label were significant signals, including those pertaining to ocular surface disease (N=129, 34.5%, multiple RORs, all P<0.001), conjunctival hyperemia (N=43, 11.5%, ROR 76.9 [55.7-106.2], P<0.001), blurred vision (N=33, 8.8%, ROR 23.5 [16.4-33.7], P<0.001), instillation site pain (N=27, 7.2%, 42.8 [28.8-63.6], P<0.001), and headache (N=32, 8.6%, ROR 5.0 [3.5-7.2], P<0.001).

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Notably, novel associations were found with vitreoretinal complications (N=12, 3.2%) – including retinal detachment (N=3, 0.8%, ROR 27.5 [8.8-85.8], P<0.001), vitreous detachment (N=3, 0.8%, ROR 115.2 [36.8-360.6], P<0.001), vitreous floaters (N=3, 0.8%, 22.5 [7.2-70.2], P<0.001), and vitreous hemorrhage (N=3, 0.8%, 96.4 [30.8-301.4], P<0.001) – as well as systemic hypertension (N=6, 1.6%, ROR 3.2 [1.4-7.2], P=0.009), mydriasis (N=21, 5.6%, ROR 175.4 [112.4-273.7], P<0.001), and decreased therapeutic effect over time (N=5, 1.3%, ROR 5.1 [2.1-12.4], P<0.001), despite not being listed on the drug label (Table 2). Five patients experienced serious outcomes, including one requiring hospitalization for increased blood pressure with blurry vision (Table 3).

Conclusions: Although signal detection analysis based on FAERS does not establish a definitive causal relationship, this study highlights that oxymetazoline eyedrops can cause various ADEs. These findings corroborate prior reports of mild local reactions, as well as suggest new associations with vitreoretinal complications, systemic hypertension, mydriasis, and drug tolerance.

Figure 1

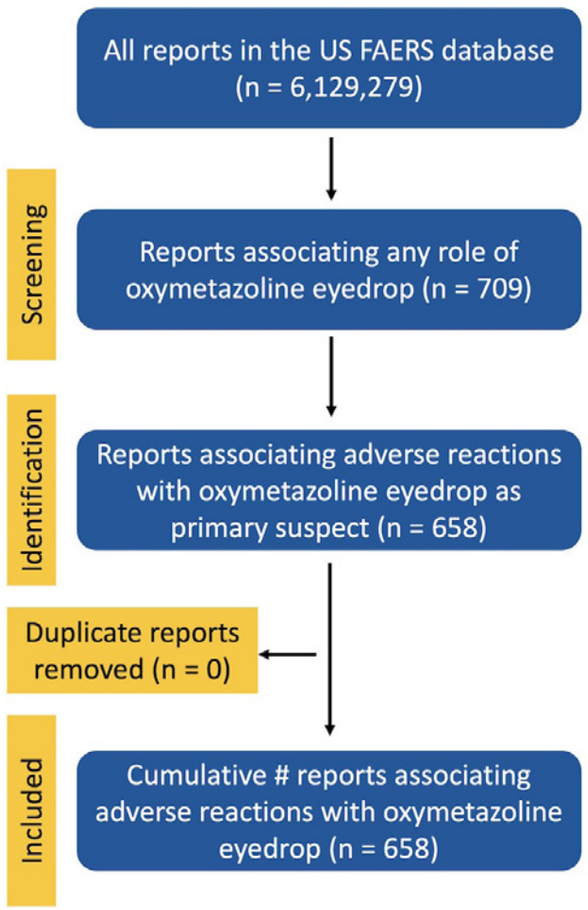

Table 1. Demographics of Adverse Event Reports for Oxymetazoline Eyedrop

Characteristics	N (%)
Age (years)	
<18	2 (0.7%)
18-44	38 (12.4%)
45-64	73 (23.9%)
65-74	42 (13.7%)
≥ 75	38 (12.4%)
Not specified	113 (36.9%)
Median (IQR)	61 (47-72)
Gender	
Female	262 (85.6%)
Male	27 (8.8%)
Not specified	17 (5.6%)
Outcomes	
Disability	3 (1.0%)
Required intervention to prevent impairment	2 (0.7%)
Hospitalization	1 (0.3%)
Life-threatening	0 (0.0%)
Death	0 (0.0%)
Other outcomes	15 (4.9%)
Not specified	285 (93.1%)
Reporting top countries	US, UM

US united states, UM united states minor outlying islands

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Table 2. Statistically Significant Adverse Event Signals Associated with Oxymetazoline Eyedrop

	Adverse event (N)	SOC (N)	New	PRR	χ2	RRR	ROR (95% CI)	P Value
1	Eye irritation (50)	Eye disorders (321)	On SmPC	64.0	3034.7	63.8	76.3 (56.3 - 103.4)	< 0.001
2	Ocular hyperaemia (43)		On SmPC	66.3	2694.4	66.0	76.9 (55.7 - 106.2)	< 0.001
3	Vision blurred (33)		On SmPC	21.0	612.6	21.0	23.5 (16.4 - 33.7)	< 0.001
4	Eye pain (27)		On SmPC	39.1	965.6	39.0	42.8 (28.8 - 63.6)	< 0.001
5	Dry eye (24)		On SmPC	29.6	635.2	29.5	32.0 (21.1 - 48.6)	< 0.001
6	Mydriasis (21)		New	163.4	3201.5	161.9	175.4 (112.4 - 273.7)	< 0.001
7	Eye pruritus (14)		On SmPC	25.4	304.2	25.4	26.6 (15.5 - 45.4)	< 0.001
8	Eye swelling (13)		On SmPC	31.4	352.9	31.4	32.8 (18.8 - 57.1)	< 0.001
9	Erythema of eyelid (12)		New	171.9	1853.8	170.2	178.9 (100.2 - 319.4)	< 0.001
10	Swelling of eyelid (11)		New	77.2	749.8	76.9	80.0 (43.8 - 146.3)	< 0.001
11	Lacrimation increased (10)		On SmPC	23.2	191.2	23.2	24.0 (12.8 - 45.1)	< 0.001
12	FBS in eyes (9)		On SmPC	139.7	1095.8	138.6	143.9 (73.9 - 279.9)	< 0.001
13	Eyelid disorder (8)		New	318.7	2186.9	313.1	327.3 (161.2 - 664.5)	< 0.001
14	Photophobia (7)		New	33.8	191.2	33.8	34.6 (16.3 - 73.3)	< 0.001
15	Eye discharge (6)		On SmPC	41.6	198.7	41.5	42.5 (18.9 - 95.3)	< 0.001
16	Abnormal sensation in eye (4)		On SmPC	123.7	369.3	122.9	125.3 (46.6 - 337.2)	< 0.001
17	Asthenopia (4)		New	67.7	199.7	67.5	68.6 (25.5 - 184.3)	< 0.001
18	Eyelid margin crusting (4)		New	81.6	241.9	81.2	82.7 (30.8 - 222.2)	< 0.001
19	Blepharitis (3)		New	48.3	95.4	48.2	48.8 (15.6 - 152.3)	< 0.001
20	Eyelid pain (3)		New	115.1	233.4	114.4	116.2 (37.1 - 363.8)	< 0.001
21	Periorbital swelling (3)		New	21.2	39.3	21.2	21.4 (6.9 - 66.8)	< 0.001
22	Retinal detachment (3)		New	27.2	51.8	27.2	27.5 (8.8 - 85.8)	< 0.001
23	Vitreous detachment (3)		New	114.1	231.3	113.4	115.2 (36.8 - 360.6)	< 0.001
24	Vitreous floaters (3)		New	22.3	41.5	22.3	22.5 (7.2 - 70.2)	< 0.001
25	Vitreous haemorrhage (3)		New	95.4	192.9	94.9	96.4 (30.8 - 301.4)	< 0.001
26	Hordeolum (6)	Infections (6)	New	77.9	380.1	77.5	79.4 (35.3 - 178.5)	< 0.001
27	Blood pressure increased (6)	Investigations (6)	New	3.2	6.9	3.2	3.2 (1.4 - 7.2)	0.009
28	Headache (32)	Nervous system disorders (36)	On SmPC	4.6	87.6	4.6	5.0 (3.5 - 7.2)	< 0.001
29	Migraine (4)		New	3.3	4.3	3.3	3.3 (1.2 - 8.9)	0.038
30	Therapeutic effect dec. (5)	General disorder (5)	New	5.1	12.6	5.1	5.1 (2.1 - 12.4)	< 0.001

Signals were deemed statistically significantly only if all the following criteria were met: ROR lower limit of the 95% CI >1, frequency of ADE ≥3, PRR ≥2, and χ2 ≥4 which corresponds to P value <0.05.

FBS foreign body sensation, SOC system organ classification, SmPC summary of product characteristic, PRR proportional reporting ratio, χ2 chi-squared, RRR relative reporting ratio, ROR reporting odds ratio, CI confidence interval, dec. decreased.

Table 3. Serious Outcome Reports of Adverse Events with Oxymetazoline Eyedrop

Case	Serious outcome[a]	Statistically significant adverse event(s)	Age	Gender
1	Hospitalization	Blood pressure increased; Vision blurred	not specified	Female
2	Disability	Retinal detachment; Vitreous detachment; Vitreous haemorrhage; Vitreous floaters; Vision blurred	56	Female
3	Disability	Vision blurred; Mydriasis	55	Male
4	Disability; Required intervention to prevent impairment	Dry eye	46	Female
5	Required intervention to prevent impairment	Photophobia; Dry eye	67	Female

[a]Serious adverse events were defined as outcomes resulting in death, hospitalization (initial or prolonged), disability or permanent damage, life-threatening situations, or requiring interventions to prevent permanent impairment/damage.

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1:28–1:34 pm

Artificial Intelligence-Driven Prediction of Post-Operative Outcomes in Oculoplastic Surgery: A Deep Learning Approach for Upper Eyelid Blepharoplasty

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Introduction: Preoperative expectation management is critical for successful upper eyelid blepharoplasty, yet current methods relying on verbal descriptions and in-office demonstrations often fall short. This study aims to develop and validate an artificial intelligence (AI)-powered platform capable of visually simulating postoperative outcomes based on preoperative photographs, enhancing patient counseling and satisfaction.

Methods: We retrospectively analyzed 165 patients who underwent upper eyelid blepharoplasty between 2019 and 2024 at the University of Michigan. Patients were selected based on the availability of standardized pre- and postoperative photographs. Images were processed and used to train a deep learning model utilizing a state-of-the-art generative adversarial network (GAN) framework, optimized for high-fidelity eyelid outcome simulation with a relatively small dataset. Model performance was assessed by expert evaluation, quantitative metrics and computer similarity test comparing predicted and actual postoperative appearances.

Results: The cohort included 93 females (56.4%) and 72 males (43.6%), with a median age of 68 years. Our AI model successfully simulated postoperative eyelid crease changes with high visual similarity demonstrating strong predictive fidelity even with a limited dataset. Technical innovations, including targeted feature mapping and specialized loss functions, allowed effective learning from a relatively small training set, distinguishing our model from prior works that required significantly larger datasets.

Conclusions: Our AI-powered simulation platform represents a significant advancement in preoperative planning for oculoplastic surgery. By bridging the communication gap between surgeons and patients, it has the potential to enhance patient satisfaction, optimize surgical planning, and drive innovation within the ASOPRS community.

1:34–1:40 pm

Surgical Anatomy for Platysma Rejuvenation Using 13 Hemifacial Human Anatomical Specimens

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Introduction: When considering facial rejuvenation, obtaining long-lasting neck lift results proves to be noticeably difficult; in Pelle-Ceravolo's case series a recurrence of 35.4% was observed.[1] Diffuse arborization, variability, and distal anastomosis of the marginal mandibular branch (MMb) and cervical branch (CVb) of the facial nerve contribute to this.[2,3] As such techniques to address the platysma have been described–these include effacement with simple plication, platysma myotomy, and platysma myectomy.[1,4,5] Plication alone may address the bands initially from effacement but there is no denervation of the platysma.[6] Alternatively, combining platysma tightening with myotomy and/or myectomy have been proposed as techniques.[1,4]

As surgeons consider these techniques during deep-plane neck-lifting, an understanding of facial nerve anatomy informs the approach and technique selected. This understanding protects the MMb of the facial nerve and provides the surgeon with confidence when considering the denervation of the platysma.

Methods: This was a hemifacial anatomical study on 13 randomly selected human anatomical specimens. A preauricular facelift incision was used. A subcutaneous dissection was carried 2cm anterior to the deep plane entry point in the lower face and neck. The deep-plane entry point in the face extends from a line that extends from the mandibular angle (MA) to the lateral canthus. In the neck the entry point is the lateral border of the platysma.

The deep plane for the face and neck were entered and this dissection was carried to approximately 75% of the way towards the midline. The inferior trunk of the facial nerve was identified to identify the MMb and CVb in a retrograde dissection.

Results: This anterior-posterior distance from the MA to the main descending CVb was 5.5mm +/- 1.4mm; in each specimen this branch was deep to the superficial lobe of the parotid gland. The distance the CVb travels outside of the parotid before entering the deep surface of platysma was 12mm +/- 1.6mm (Figure 1). The distance of the MMb to the MA was 1.5mm +/-1.5mm.

Conclusions: Based on the results, the MMb appears closer to the MA than described by the seminal paper by Dingman & Grabb.[7] With this in mind, the surgeon is safe from damaging the MMb if they remain 1cm below the MA. Similarly, if aiming to transect the main

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CVb laterally, this requires neurotomy in close proximity to the MA. This finding may advocate for higher placement of a platysma myotomy/myectomy than is recommended in current surgical techniques.[1,4] The senior author M.J.I. routinely uses a complete platysma myectomy which has yielded a recurrence rate less than that reported by Pelle-Ceravolo (Figure 2-5).[1]

This may, understandably, be met with hesitation giving variations in human anatomy. Additionally, definitive differentiation between the MMb and CVb may prove difficult in a live surgery as their depth is not clearly defined. One alternative is a medial approach to the platysma myotomies where the cervical branch becomes more superficial and easier to transect.[8]

Figure 1

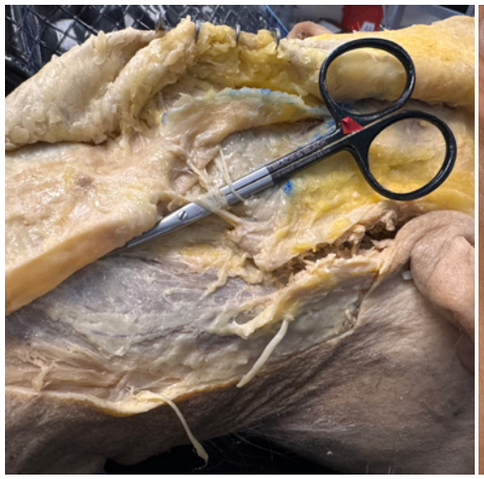


Figure 2

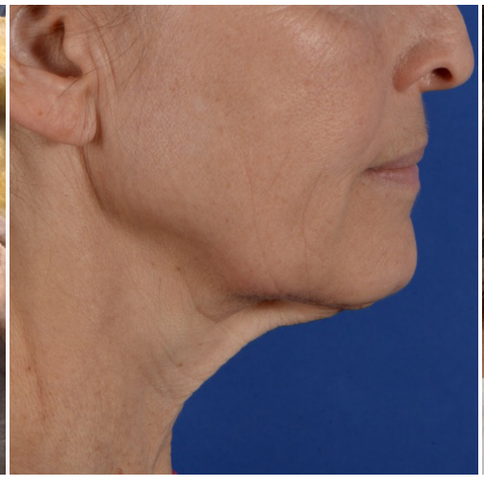


Figure 3

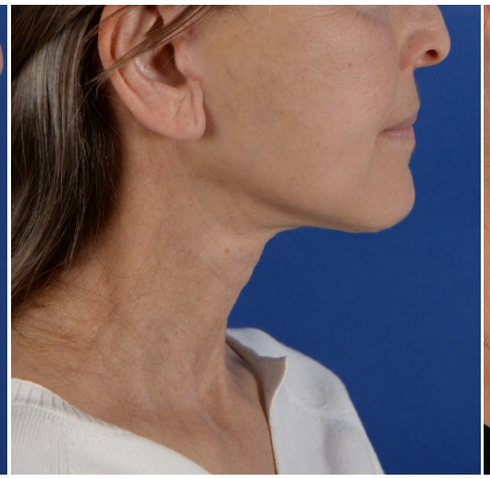


Figure 4

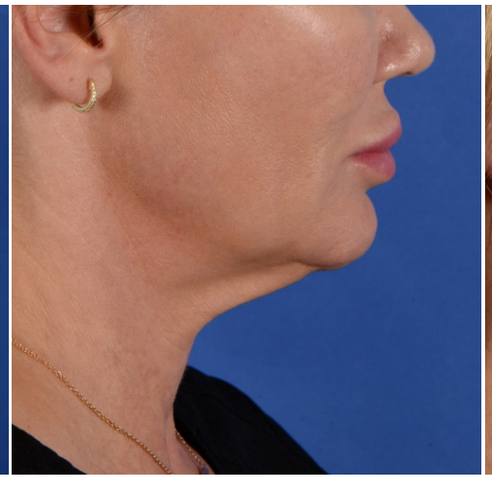
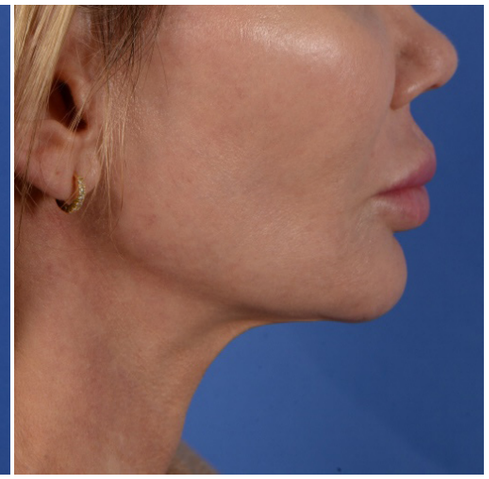


Figure 5



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1:40–1:46 pm

Preclinical Safety and Tolerability of a Novel Adjustable Nitinol-Based Oculofacial Implant in a Sheep Model

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Introduction: Oculofacial reconstructive and aesthetic procedures often require implants to restore volume and symmetry. Current implant solutions include solid alloplastic materials such as silicone and porous polyethylene, patient-specific implants made from polyether-ether-ketone or metals, and temporary as well as permanent injectable fillers. However, these solutions are either static and non-adjustable or temporary and unstable. In clinical scenarios where postoperative tissue changes are unpredictable, such as in post-traumatic deformities, congenital asymmetries, or secondary revisions, the inability to fine-tune implant volume without additional surgery remains a significant limitation[1]. Adjustable implants, such as tissue expanders, are available in other surgical fields, but no equivalent solution exists for oculofacial subcutaneous implants. We developed a novel device integrating a Nitinol-based framework with shape-memory properties, allowing for non-invasive contour modification after placement[2,3]. The aim of this study is to assess the implant's safety, tolerability, and tissue integration in a large-animal model.

Methods: Two adult sheep, designated as Sheep A and Sheep B, were included in the study. The sheep were implanted with the device in the occipital region. The implant includes a foldable nitinol core embedded in a biocompatible polymer matrix and features six actuators for localized expansion upon external thermal activation (Figure1). Sheep A was used to evaluate partial expansion of the implant after a two-month healing period. Changes in implant morphology were examined via endoscopic video imaging to visualize subcutaneous modifications. Radiographic imaging was then used to confirm the extent of expansion and structural integrity of the implant. Sheep B underwent full expansion testing and was subsequently sacrificed for macroscopic and histopathological evaluation, focusing on tissue response, biocompatibility, and implant integration. The evaluation included the intensity of inflammatory response, severity of edema, presence of necrosis or hemorrhage, extent of granulation tissue formation, and presence of soft tissue/bone thermal lesions. Bone pressure atrophy was also evaluated to determine potential mechanical effects of the implant on the underlying bone. Fibrosis was assessed separately and categorically graded.

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Results: In Sheep A, expansion was symmetrical and preserved implant integrity, with visible subcutaneous contour modulation. Imaging confirmed a measurable volume increase without displacement or tissue damage (Figure2). In Sheep B, gross inspection showed no infection, necrosis, or fluid accumulation. Soft tissues remained intact with fibrotic encapsulation. New tissue adhered to the subcutaneous-facing surface, while focal new bone formation was noted at the bone-contacting interface (Figure3). Histology revealed mild lymphocytic infiltration without foreign body reaction or multinucleated giant cells. Both subcutaneous and bone-contacting regions showed organized fibrosis and mild cortical remodeling without osteolysis or inflammatory resorption. No thermal injury was observed (Figure4).

Conclusions: The implant demonstrated favorable biocompatibility and mechanical behavior. Its ability to undergo non-invasive, targeted expansion without inducing adverse reactions supports its potential for facial reconstructive and aesthetic use. Postoperative adjustability may help reduce secondary procedures, especially in cases with dynamic soft tissue changes. Further studies are warranted to evaluate long-term performance, the impact of fibrotic encapsulation on adjustability, and the definition of safe thermal activation thresholds. These preclinical findings support the feasibility of adjustable shape-memory implants for facial applications.

Figure 1

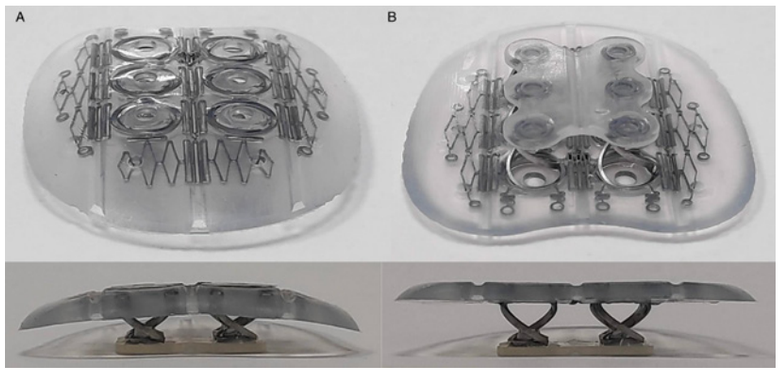


Figure 2

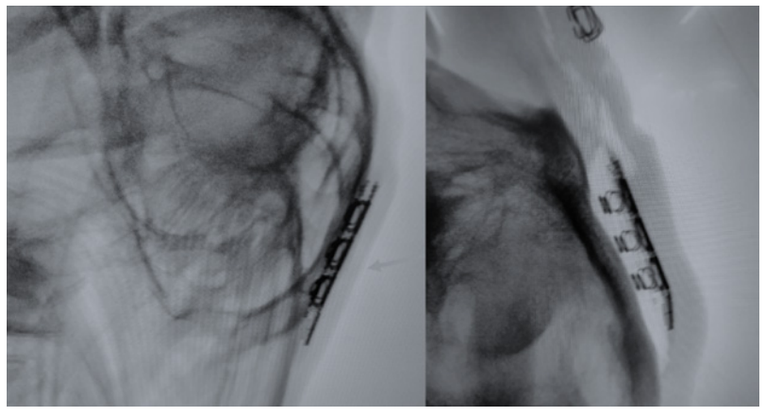


Figure 3

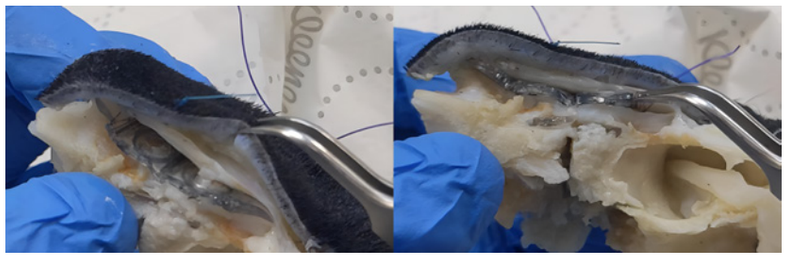
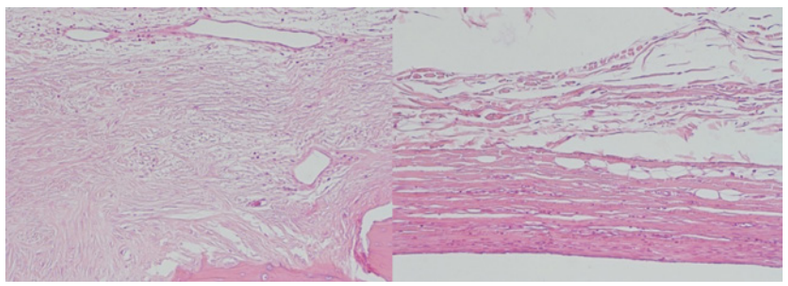


Figure 4



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1:46–1:52 pm

Differences and Transitions from SMASectomy to Deep Plane Facelift

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Introduction: Over the years there have been variations in facelift techniques including superficial musculoaponeurotic system (SMAS) flaps, composite flaps, deep plane, skin flaps, and subperiosteal facelifts, among others. The term deep plane rhytidectomy was originally described by Hamra. This term has since been linked with facelift surgery with recent advances including incision placement, treatments of SMAS-platysma complex and release of the four retaining ligaments of the face.

Methods: An in depth look at the steps and maneuvers to accomplish a deep plane face lift how it can be easily transitioned by a capable surgeon currently utilizing SMAS flap techniques. Incision into th eSMAS to enter the deep plane is accomplished more posteriorly than standard SMAS procedures and thus a significant amount of skin undermining is spared. In addition careful blunt dissection is accomplished with a trepsat and finger dissection in. the deep plane to a allow a continuous flap extending over the mandible inclusive of the platysma. Retaining ligaments are released simultaneously and the deep plane flap is elevated and secured in an anatomic glide plane. With less skin delamination and a more robust blood supply post operative healing and skin condition can be imporved.

Results: Consistent and improved results noted in the jawline, midface and neck face junction with the deep plane facelift as compared to SMAS flap techniques. This technique is highly reproducible and can effectively be transitioned from those

Conclusions: The deep plane face-lift is a safe and reliable technique for treatment of the aging face. It affords improvement in the lower face and midface. The deep plane is a more logical and natural approach to lifting of the face and neck, lifting along the natural anatomic glide planes. The deep plane technique allows for the face and neck to be treated and lifted as a single composite unit, providing a more natural and long-lasting result and less distortion of underlying structures. There is less delaminating of the skin and more movement in a nature vector with more intact blood supply. While there have been many papers describing the deep plane facelift experience with the limited delamination extended deep plane rhytidectomy is based on anatomical evidence. This paper at its core focusses on transitioning from SMAS flaps to Deep plane flap in a safe and efficient manner.

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2:01–2:07 pm

Risk of Ocular and Adnexal Immune Related Adverse Events in Thyroid Patients on Immune Checkpoint Inhibitors

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Introduction: Immune checkpoints inhibitors (ICI) therapy is a rapidly growing cancer treatment strategy that increases the ability of the immune system in combating cancer. However, in some cases, the use of ICI may lead to immune hyperactivity and, subsequently, autoimmune diseases. Graves' disease (GD) and ocular, orbital and adnexal inflammation such as thyroid eye disease (TED), orbital myopathy and others have been reported. However, little is known of it's prevalence. We aim to assess the risk between thyroid disease (TD) and the risk of ocular, orbital and adnexal immune-related adverse events (irAE) in patients on checkpoint inhibitors (CI)

Methods: Pts with pre-existing TD on CI from 1/2015 - 12/2024 were identified from Epic Cosmos, an electronic health record database of 295 million pts. Odds ratios (OR) were calculated on identified ophthalmic irAEs.

Results: Amongst 22923108 pts with TD, 191673 pts received CI treatment. Pts with TD exhibited signficantly higher rates of developing uveitis (OR 16.69, [14.55 - 19.14]), optic neuritis (16.48 [14.26 – 19.05]), myasthenia gravis (16.35 [13.85 – 19.31]), keratoconjunctivitis (15.48 [8.64 – 27.7]), ptosis (15.24 [13.63 – 17.04]), diplopia (14.84 [13.20 – 16.66]), temporal arteritis (14.74 [11.78 – 18.46]), orbital Inflammation (14.59 [8.64 – 24.64]), scleritis (13.31 [9.59 – 18.49]), Bell's palsy (13.23 [11.34 – 15.45]), cranial nerve palsy (12.52 [9.55 – 16.42]), dacryoadenitis (11.51 [6.24 – 21.23]), orbital myositis (11.22 [2.90 – 43.45]) and keratitis (10.37 [6.42 – 16.75]) ($p<0.01$).

Conclusions: These findings highlight the need for close monitoring of patients undergoing CI therapy for early detection and treatment of ocular, orbital and adnexal immune-related adverse events.

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2:07–2:13 pm

Primary Results of the Phase 3 SatraGO-1 and Satra-GO-2 Trials: Efficacy and Safety of Satralizumab in Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) is a complex orbital inflammatory disease that can lead to significant morbidity, including facial disfigurement, reduced quality of life, and sight-threatening complications. There remains an unmet need for disease-modifying treatment options, as existing therapies for active TED are associated with significant disease relapses and substantial side effects, whereas inactive TED is largely managed with surgery. Interleukin-6 (IL-6) and its receptor (IL-6R) play a key role in the pathogenesis of TED.[1] Satralizumab, a humanized monoclonal antibody that targets IL-6R, was designed using innovative antibody recycling technology, which allows for longer duration of circulation and subcutaneous dosing every 4 weeks (Q4W). Satralizumab has been approved for the treatment of neuromyelitis optica spectrum disorder in > 85 countries worldwide.[2] The phase 3 SatraGO-1 and SatraGO-2 trials are investigating the efficacy and safety of satralizumab in participants with moderate-to-severe active and chronic inactive TED.

Methods: SatraGO-1 (NCT05987423) and SatraGO-2 (NCT06106828) are ongoing, identical, global, phase 3, double-masked, 2-stage, randomized, placebo-controlled, 72-week multicenter studies. In SatraGO-1, 131 participants were recruited across 53 sites and 11 countries. In SatraGO-2, 127 participants were recruited across 48 sites and 10 countries. Participants aged ≥ 18 years with moderate-to-severe active TED (onset of symptoms ≤ 12 months prior to baseline) or stable chronic inactive TED (initial diagnosis > 12 months but < 10 years prior to screening) were eligible, provided the systemic disease was under control (euthyroid or mild hyper-/hypothyroidism). Participants were randomized 1:1 to receive subcutaneous satralizumab or placebo at weeks 0, 2, and 4 (loading doses) and then Q4W through week 20 (maintenance doses) (Figure 1). The week 24 primary efficacy endpoint was the proportion of participants with active TED who achieved a proptosis response (≥ 2-mm improvement in proptosis from baseline in the study eye). Secondary endpoints included proptosis response in participants with active and chronic inactive TED, overall response (≥ 2-point reduction in clinical activity score from baseline and a proptosis response in the study eye) in participants with active TED, and proportion of participants achieving ≥ 1-grade improvement in diplopia. Safety outcomes included the incidence, seriousness, and severity of adverse events.

Results: At the time of abstract submission, the trials are ongoing. However, by the time of the proposed ASOPRS presentation, primary endpoint data at week 24, along with key safety and secondary efficacy endpoints, will be available and presented for the first time.
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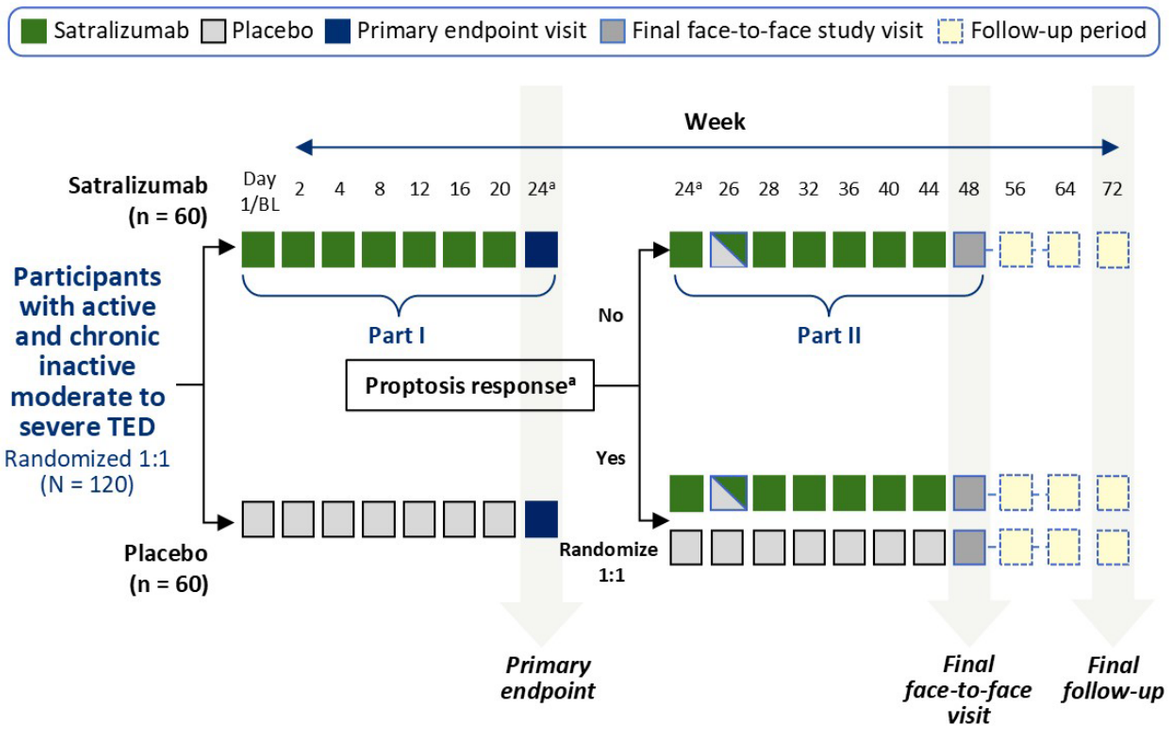
Conclusions: SatraGO-1 and SatraGO-2 are designed to investigate IL-6R inhibition via satralizumab in participants with TED. Primary efficacy and safety data will be presented and are expected to provide insights into the potential role of satralizumab as a disease-modifying therapy for TED.

Figure 1. SatraGO-1 and SatraGO-2 Study Design



ª Week 24 will be the final visit for Part I and the day 1 visit for Part II.
BL, baseline; TED, thyroid eye disease.

Acknowledgements: Oluwatobi Idowu, Laura Brockwell, Giulio Barteselli, Christopher Brittain, Alexander Burdeska, Thomas Kuenzel

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2:13–2:19 pm

Metabolic Analysis of Orbital Adipose Tissue in Patients with Thyroid Eye Disease and the Effects of Teprotumumab

Diane Wang[1], Ivy Kaznoski[2], Mark Eminheizer[3], Jeff Hao[4], Jinyu Lu[4], Jianhai Du[5], Chadi Makary[6], John Nguyen[7,6]
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Introduction: Expansion of orbital fat can be seen in Thyroid Eye Disease (TED), and teprotumumab is effective in improving proptosis, inflammation and vision as well as reducing 29-35% of fat volume on imaging.[1] However, there is limited knowledge of its molecular effects beyond the targeting the insulin-like growth factor 1 receptor pathway (IGF1-R). We aim to explore the metabolic changes in the orbital adipose tissue of controls and patients with TED, including those who have undergone prior treatment with teprotumumab.

Methods: IRB approved prospective study of patients with thyroid eye disease undergoing orbital decompression and non-thyroid eye disease controls undergoing blepharoplasty between August 2021 and November 2024 at West Virginia University. Specimens were snap-frozen in liquid nitrogen and transferred -80° for later analysis. All tissues were weighed and extracted for metabolites. Targeted metabolomics was performed using LC-MS/MS and metabolomics data was analyzed with partial least squares discriminant analysis (PLSDA), heat maps, volcano plots, receiver operating characteristic curve (ROC) curve and pathway enrichment using Metaboanalyst 6.0.

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Results: Orbital adipose tissue samples were obtained from 9 TED patients without prior teprotumumab treatment (TED-NT), 13 TED patients who had prior teprotumumab treatment (TED-T), and 13 controls (Table 1). 135 metabolites covering major metabolic pathways in glycolysis, the citric acid cycle, amino acids, nucleotides, lipids and vitamins were analyzed. PLSDA analysis showed moderate separation between controls and TED-NT, as well as between controls and TED-T (Figure 1AB). Among the metabolites, 37 metabolites significantly changed in TED-NT compared to controls, and 27 were significantly changed in TED-T compared to TED-NT. Pathway enrichment comparing TED-NT to controls showed substantial changed pathways in the Warburg effect, fatty acids, citric acid cycle and amino acids (Figure 2). ROC curve analysis showed L-carnosine, L-acetylcarnitine and GABA had the highest scores as biomarkers for TED (Figure 3). Importantly, TED-T demonstrates restoration of many of the changes particularly in GABA, lysine and nucleotide metabolism.

Conclusions: There are distinctive metabolic alterations in the orbital adipose tissue of patients with TED-NT, and controls. Prior treatment with teprotumumab partially restores the metabolic reprograming. The distinct metabolites of orbital fat in TED patients may serve as potential molecular biomarkers for the disease and aid in monitoring treatment response.

Table 1

Table 1: Group Characteristics

Characteristics	TED-NT (N=9)	TED-T (N=13)	Control (N=13)
Age (years)	58.5 ± 11.5	50.2 ± 13.1	64.6 ± 7.9
Gender			
Female	8 (88.9%)	8 (61.5%)	10 (76.9%)
Male	1 (11.1%)	5 (38.4%)	3 (23.1%)
Race			
White	10	13	12
Black	1	0	1
Smoker			
Current	1 (11.1%)	3 (23.1%)	1 (7.8%)
Former	3 (33.3%)	5 (38.4%)	7 (53.8%)

Figure 1

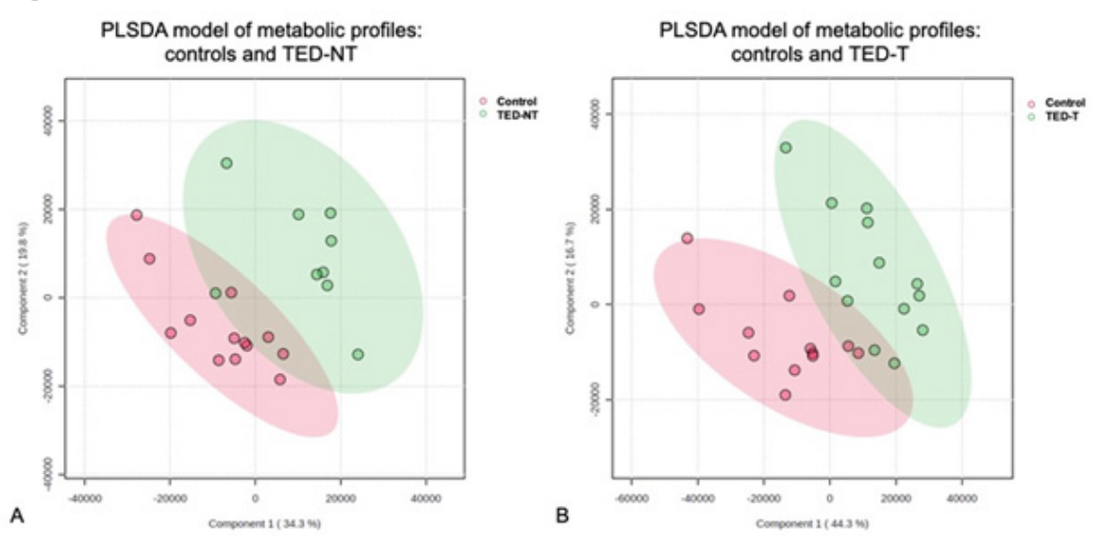

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Figure 2

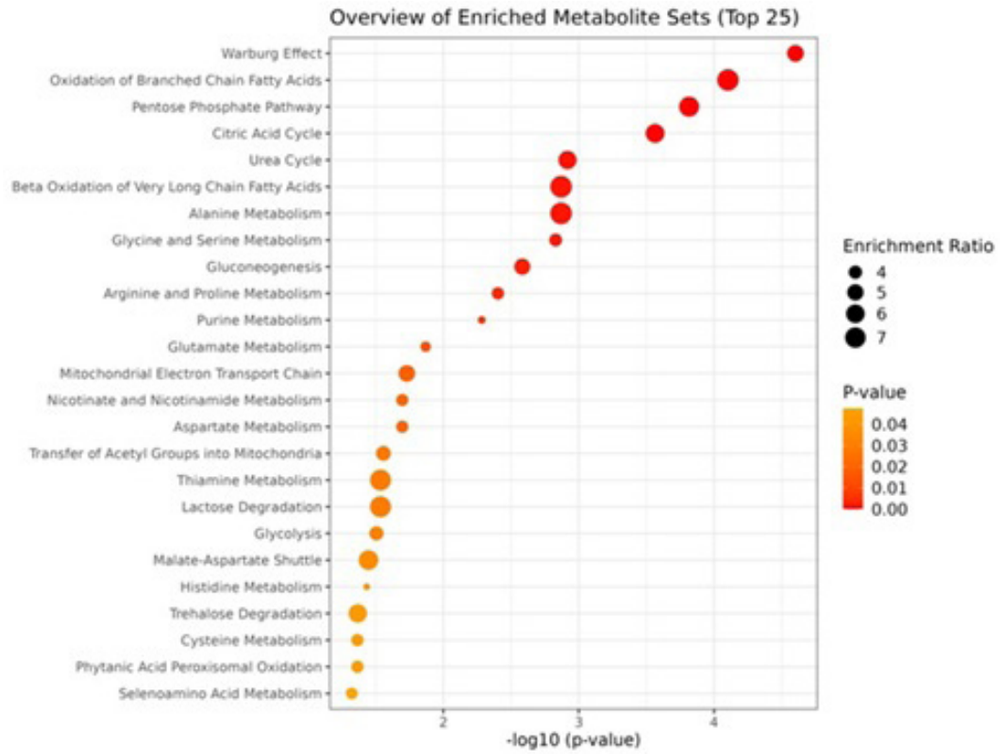
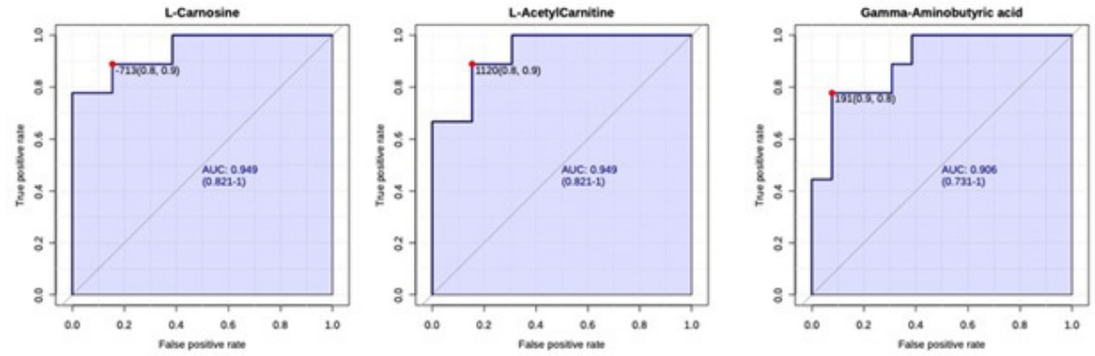


Figure 3



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2:19–2:25 pm

Safety, Efficacy, and Quality of Life Outcomes of Subcutaneous Lonigutamab (Anti–IGF-1R): Week 12 Results from a Phase 1/2 Proof of Concept Study in Patients with Thyroid Eye Disease (TED)

Shoaib Ugradar[1], David A. Kostick[2], Jane Spadaro[3,4], Dinesh Selva[5], Jean-Louis deSousa[6], Krishna Tumuluri[7,8,9], Jwu Jin Khong[10,11]
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Introduction: TED is a chronic, vision-threatening condition largely driven by aberrant stimulation of the insulin-like growth factor 1 receptor (IGF-1R) pathway. Despite treatment advances, opportunity exists for durable multifaceted responses and reduced treatment-limiting side effects compared with intravenous anti–IGF-1Rs. Lonigutamab is a novel, high-affinity, subcutaneously administered, monoclonal antibody that binds to IGF-1R noncompetitively with IGF-1. We present week 12 data from 3 fully enrolled cohorts of a phase 1/2 dose-ranging study evaluating lonigutamab in patients with TED (NCT05683496).

Methods: Eligible patients had proptosis of ≥3 mm above the normal range in the study eye and a Clinical Activity Score (CAS) of ≥4 (7-item scale). The first cohort was double masked and randomized 3:1 to lonigutamab (40 mg every 3 weeks [Q3W]) or matching placebo for 2 doses (6-week treatment period); 12-week (off-treatment follow-up) data are reported. In the other 2 cohorts, patients received open-label lonigutamab at either 50 mg every 4 weeks (Q4W) for 3 doses or a 50 mg loading dose followed by 25 mg every week (QW) for 11 weeks; 12-week (on-treatment) data are reported. Missing data were handled using nonresponder imputation.

Results: Eight patients were enrolled in the 40 mg-Q3W cohort (lonigutamab, n=6; placebo, n=2 [1 with evaluable post-baseline data]), 8 in the 50 mg-Q4W cohort, and 8 in the 50 mg-load/25 mg-QW cohort. In the 40 mg-Q3W cohort, 3/6 (50%) patients had a proptosis response (vs 0% for placebo), 1/4 (25%) with baseline diplopia had a diplopia response (vs 0% for placebo), and 6/6 (100%) had a ≥2-point improvement in CAS from baseline (vs 0% for placebo) at week 12; mean change from baseline (CFB) in Graves' Ophthalmopathy Quality of Life (GO-QoL) score was +12.3 (vs –15.6 for 1 placebo patient; higher scores indicate better health). In the 50 mg-Q4W cohort, 2/8 (25%) patients had a proptosis response, 3/5 (60%) had a diplopia response, and 5/8 (63%) had a ≥2-point improvement in CAS at week 12; mean CFB in GO-QoL was +14.4. In the 50 mg-load/25 mg-QW cohort, 5/8 (63%) patients had a proptosis response, 3/6 (50%) had a diplopia response, and 8/8 (100%) had a ≥2-point improvement in CAS at week 12; mean CFB in GO-QoL was +27.7.
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Treatment-emergent adverse events (TEAEs) occurred in 4/6 (67%) patients receiving lonigutamab 40 mg-Q3W (2/2 [100%] receiving placebo), 6/8 (75%) receiving 50 mg-Q4W, and 8/8 (100%) receiving 50 mg-load/25 mg-QW. Most events were mild in severity, with no serious TEAEs. Four patients receiving lonigutamab had adverse events of special interest; all were mild cases of tinnitus (no changes on audiogram). There were no hyperglycemia events. One patient receiving placebo discontinued due to dysthyroid optic neuropathy.

Conclusions: These findings with lonigutamab demonstrate proof-of-concept for the subcutaneous administration of an anti–IGF-1R in patients with TED and suggest that optimal clinical efficacy across multiple TED manifestations was achieved when exposure was maintained above receptor saturation. Evaluation of multiple dosing regimens showed that lonigutamab was well tolerated with no serious adverse events or discontinuations.

2:25–2:31 pm

The Bowls of the Skull: Anatomical Tips for Successful Orbital Decompression Surgery – Visual Presentation

Robert A. Goldberg, Jordan N. Cornwell, Abdulrahman Almalouhi
Division of Orbital and Ophthalmic Plastic Surgery, Doheny and Stein Eye Institutes, University of California, Los Angeles, Los Angeles, California, United States

Introduction: Superolateral orbital decompression takes advantage of the marrow space and thick areas of the sphenoid bone. The three-dimensional anatomy is complicated and abuts the intracranial cavity and superior orbital fissure.

Methods: Surgical video

Results: We present a video highlighting key anatomical landmarks for orbital decompression surgery, with a focus on the intracranial location and thickness of the bowls of the skull critical to ensuring a safe and successful procedure (Figure 1). An anatomical skull, three-dimensional bony modeling software, and cadaveric dissection will be used to illustrate these concepts.

Conclusions: For maximal and safe decompression to be achieved, the shape and dimension of orbital bony landmarks as they extend into the cranium must be understood in three dimensions.

Figure 1

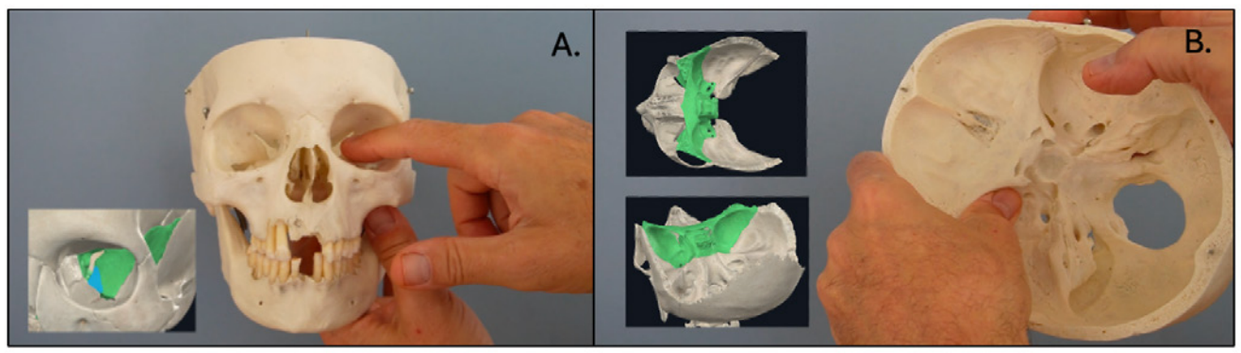

Figure 1. A. The deep lateral wall of the sphenoid bone (highlighted in blue). B. Thumb print shape of the middle cranial fossa for conceptualization of deep lateral wall decompression of the sphenoid bone (highlighted in green).

ASOPRS FOUNDATION MICHAEL J. HAWES LECTURE

Moderators: Pete Setabutr and Sasha Hubschman

Thursday, October 16

2:45–3:10 pm

Bridging Surgery, Academia, and Entrepreneurship: A Personal Journey

Jean-Pierre Hubschman, MD

BREAKOUT SESSIONS ‘HOW I DO IT’

Thursday, October 16

3:45–5 pm

Aesthetics – Sebastian L-1&2

Moderator: David B. Samimi
Panelists: John P. Fezza, Brian S. Biesman, Robert M. Schwarcz, and Wendy W. Lee

Eyelid/Oncology – Sebastian I-1&2

Moderator: Elizabeth A. Bradley
Panelists: Brian Willoughby, Jill A. Foster, Chau Pham, and Philip L. Custer

Orbit/Thyroid Eye Disease – Sebastian K (General Session room)

Moderator: Steven Couch
Panelists: Suzanne K. Freitag, Daniel B. Rootman, Jurij R. Bilyk, and Louise A. Mawn

7:32–7:35 am

Primary Epithelioid Hemangioma of the Eyelid with GATA6::FOXO1 Fusion: A Case Report and Literature Review

Sonia Anchouche[1], Kenneth Chang[1], Bo Ngan[2], Dan DeAngelis[1]
[1]Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, Ontario, Canada, [2]Department of Pathology and Laboratory Medicine, University of Toronto, Toronto, Ontario, Canada

Introduction: Primary epithelioid hemangioma (EH) of the eyelid is exceedingly rare, with no previously published cases identified. By contrast, epithelioid hemangioendothelioma (EHE), a more aggressive vascular tumor, has been described in the eyelid [1-4]. Recent molecular studies have identified novel gene fusions in EH involving GATA6::FOXO1. We report the first documented case of a primary epithelioid hemangioma of the eyelid with confirmed GATA6::FOXO1 fusion.

Methods: Case report and review of the literature.

Results: A 12-year-old male presented with a 10-month history of a progressively enlarging erythematous-violaceous nodule on the right lower eyelid (Figure 1). He was initially treated by the referring physician with 100 mg of oral doxycycline daily, topical olopatadine once daily in the right eye, and loteprednol gel four times daily for 10 days. His topical drops were subsequently discontinued, and he was maintained on 40 mg of doxycycline daily. Despite treatment, the lesion continued to progress over the following months. On examination, visual acuity was 20/20 in the right eye, and the intraocular examination was within normal limits. A 0.6x0.8 cm friable, bleeding vascular lesion was observed on the right lower eyelid, which disrupted lid architecture and was associated with madarosis (Figure 1). An excisional biopsy was performed without complication. Microscopic examination of the eyelid lesion revealed a proliferation of numerous capillary-sized vessels lined by atypical endothelial cells. The lesion demonstrated a biphasic architectural pattern, characterized by well-formed vascular channels interspersed with solid sheets of epithelioid cells. Immunohistochemically, the endothelial cells were positive for CD31, CD34, and ERG, but negative for D2-40. There was strong nuclear expression of p53 in approximately 75% of tumor cells, and the Ki-67 proliferation index reached up to 35%. Smooth muscle actin (SMA) highlighted pericytes but was absent in the more cellular regions. The tumor was negative for BRAF, cytokeratin, epithelial membrane antigen (EMA), Wilms

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tumor 1 (WT1), and human herpesvirus 8 (HHV-8). Molecular testing revealed a GATA6::FOXO1 fusion transcript, while no oncogenic single nucleotide variants were detected. Based on these findings, the tumour was classified as an epithelioid hemangioma. Two weeks following the excisional biopsy, the patient's visual acuity remained 20/20, with a normal intraocular examination. The incision on the right lower eyelid healed well, and the lid contour was restored.

Conclusions: This case highlights the first reported instance of primary epithelioid hemangioma of the eyelid featuring a GATA6::FOXO1 fusion. The diagnosis was confirmed through histopathological examination and molecular analysis, underscoring the importance of molecular testing in characterizing vascular neoplasms. While four cases of primary epithelioid hemangioendothelioma of the eyelid were identified in the literature, these lesions were all histologically consistent with hemangioendothelioma, a more aggressive vascular tumor; none of these cases showed distant metastasis and all responded well to local excision[1-4]. Molecular findings, such as the GATA6::FOXO1 fusion, differentiate the lesion presented herein from the more aggressive hemangioendothelioma variants that are typically characterized by different gene fusion abnormalities. This case, with its unique molecular fusion, contributes novel insights into the molecular pathology of this rare vascular tumor.

Figure 1: A 0.6x0.8 cm friable, bleeding vascular lesion on the right lower eyelid disrupting lid architecture and associated with madarosis.

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7:35–7:38 am

Primary Intraocular Rhabdomyosarcoma with Metastases

Sasha Hubschman[1], Mye Makornwattana[2], Ye Huang[1], Michael Chen[1], Amy Lin[3], Pooja Bhat[1], Ann Tran[1], Pete Setabutr[1]
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Introduction: Intraocular cases of rhabdomyosarcoma are exceedingly rare, with only six prior cases documented in the literature.[2] We describe a case of primary intraocular rhabdomyosarcoma initially treated with enucleation with negative surgical margins, but eventually recurred with metastatic progression. This case contributes to the limited literature regarding the presentation of intraocular rhabdomyosarcoma and highlights the complexities of diagnosis and treatment.

Methods: Retrospective case review.

Results: The patient is a 14-year-old female who had previously undergone vitrectomy and lensectomy in the left eye to treat a cataract of unknown etiology. She developed findings of sympathetic ophthalmia in the fellow eye and began treatment with adalimumab. However, two weeks afterward, she developed acute lid swelling, pain, and buphthalmos in the surgical left eye (Figure 1). At this time, vision in the left eye was no light perception (NLP) compared to light perception (LP) from prior. Computed tomography (CT) scan and magnetic resonance imaging (MRI) of the orbits showed left globe enlargement as well as pre- and post-septal enhancement, suggesting an inflammatory or infectious process (Figure 2). The patient's symptoms did not respond to broad-spectrum antibiotics but did improve with systemic steroids. A diagnosis of neoplastic process masquerading as panuveitis was considered, and she underwent enucleation using a no-touch technique. Pathologic analysis showed a large mass protruding from the choroid and occupying most of the vitreous cavity (Figure 3). Immunohistochemistry staining was positive for vimentin, desmin, and myogenin. Mutations in the *DICER1* and *TP53* genes were also found in the tumor specimen. A diagnosis of malignant teratoid medulloepithelioma with rhabdomyosarcomatous differentiation versus primary or metastatic rhabdomyosarcoma was considered. After consultation with multiple ophthalmic pathologists from different institutions, pathology was finalized to be medulloepithelioma. Two months after enucleation, the patient developed lid edema and firmness of the left eye socket. Imaging showed a mass within the left orbit consistent with tumor recurrence, as well as a mass in the cavernous sinus and nodules throughout the lung lobes, suggesting metastases. Pathologic analysis obtained via orbitotomy confirmed tumor recurrence. These findings were consistent with a final diagnosis of Stage 4 Group 4 embryonal rhabdomyosarcoma. Radiation and chemotherapy with high-dose cyclophosphamide, vincristine, and dactinomycin were initiated. At follow-up nine months after the orbitotomy, the patient was stable and continued to be closely monitored while receiving chemotherapy.

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Conclusions: Intraocular rhabdomyosarcoma is an exceedingly rare entity that poses a diagnostic challenge and may present clinically as sterile orbital cellulitis in a pediatric patient with a history of leukocoria. In addition to enucleation, careful pathologic analysis is necessary to arrive at a diagnosis and determine the appropriate systemic therapeutic regimen, including radiotherapy and chemotherapy.

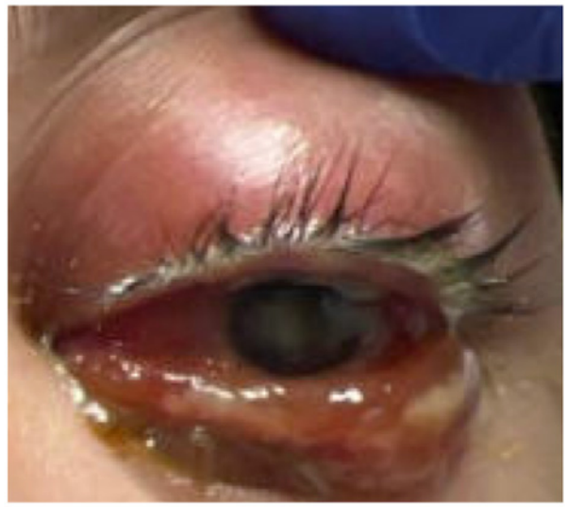

Figure 1: Image of left eye with chemosis, surrounding periorbital edema, and erythema.

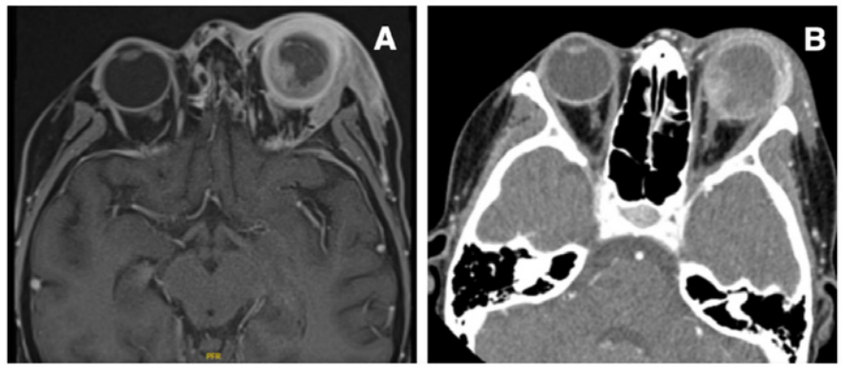

Figure 2: A) Magnetic resonance imaging and B) CT scan showing hyperintensity /hyper-density in the posterior left globe and thickening of periorbital soft tissue in the left orbit

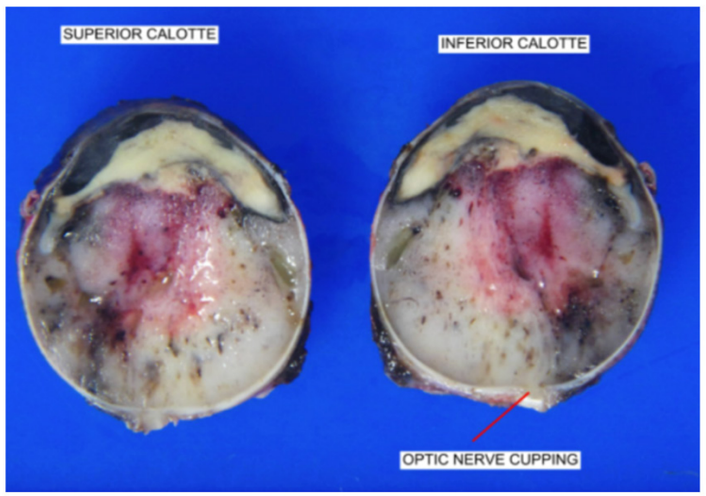

Figure 3: Gross pathology of the enucleated eye containing the tumor specimen cut along the horizontal meridian. The anterior chamber is flat and filled with blood. Soft tan-yellow material occupies most of the vitreous cavity and is completely contained within the eye.

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7:38–7:41 am

Squamous Cell Carcinoma of the Lung Presenting as Paraneoplastic Antibody Positive Orbital Myositis and Review of Literature

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[1]Hamilton Eye Institute, Memphis, Tennessee, United States, [2]Nashville, Tennessee, United States, [3]Hamilton Eye Institute, Memphis, Tennessee, United States, [4]Radiology, University of Tennessee Health Science Center, Memphis, Tennessee, United States

Introduction: Paraneoplastic syndromes are rare, occurring in approximately 0.01% of cancers[1] of which only 0.1% of paraneoplastic syndromes have ophthalmologic manifestations[2]. Several cases have described the association of orbital myositis with various cancers. To date, there are only two other reported cases of orbital myositis presenting as a paraneoplastic syndrome preceding the diagnosis of the primary cancer[2-4]. Our case is the first to have associated retinopathy and positive antibodies associated with paraneoplastic syndromes.

Methods: Case report and review of the literature.

Results: An 82-year-old African American male presented with worsening vision after cataract surgery. He was found to have bilateral orbital compartment syndrome with tight orbits, a visual acuity of 20/250 OU and a MRI scan showing bilateral enlargement of the extraocular muscles with a tight apex (Figure 1). He was admitted for laboratory workup, intravenous steroids, and underwent bilateral simultaneous orbital floor and medial wall decompression. Due to his age and euthyroid status, orbital biopsies were sent for histopathology which showed fibroadipose tissue, no muscle fibers present. The patient was nonresponsive to steroids. Rheumatology was consulted for a mildly elevated pANCA. He was lost to follow up and returned to clinic with progressive vision loss and worsening orbital compartment syndrome. Examination revealed bilateral light perception vision, minimally reactive pupils, tight orbits with marked decrease motility and right sided peripheral pigmentation of the choroid with optic atrophy. He was admitted again for intravenous steroids and extended lateral wall decompressions. A left lateral wall decompression was performed and the biopsy of the left lateral rectus showed nonspecific orbital inflammation. A CT of the chest, abdomen and pelvis revealed a 4x3x3.5cm left hilar mass. The lung biopsy showed squamous cell carcinoma. The antineoplastic antibody panel was positive for Calcium Channel Binding Antibody (P/Q-type). Thus, pembrolizumab was started and the vision improved to count fingers, and the orbital tightness has since resolved.

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Systematic review of the literature revealed nine cases of orbital myositis as a paraneoplastic syndrome with differing diagnostic and treatment approaches (Table 1). To our knowledge, this is the first case of paraneoplastic orbital myositis presenting with a positive antibody test. Initially described in 1983, the Calcium Channel Binding Antibody is typically seen with NSCLC, as demonstrated in our case, and should be considered in the setting of a paraneoplastic syndrome.

Conclusions: Bilateral enlargement of the rectus muscles in the elderly should prompt consideration for diagnoses beyond the common thyroid eye disease and nonspecific orbital inflammation entities and in the setting of a nondiagnostic biopsy, additional imaging such as a CT of the chest, abdomen and pelvis should be considered. Both metastatic disease and paraneoplastic syndromes should be considered. The Calcium Channel Binding Antibody may be an important diagnostic tool in the diagnosis of paraneoplastic orbital myositis.

Figure 1

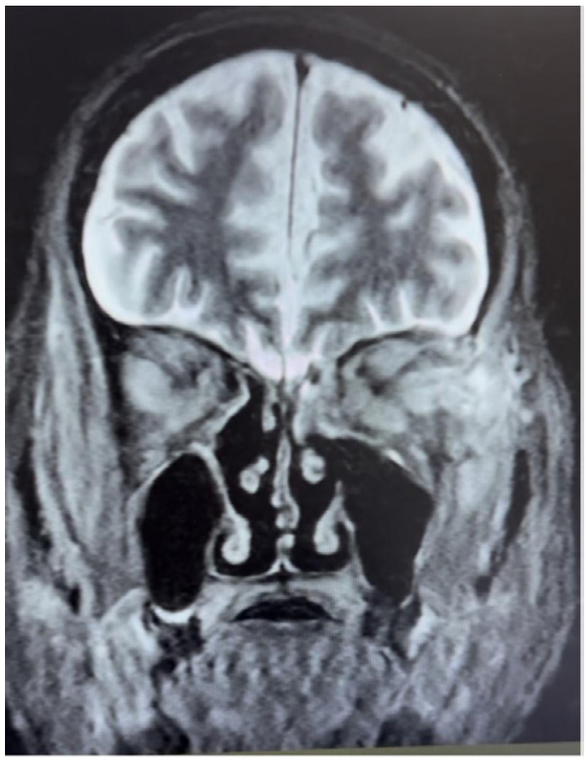

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Figure 2

Case	Primary Cancer	Initial Diagnosis	Orbital Signs	Antibody	Treatment	Other systemic or neuro signs
Jeong, A et al.	Natural killer/T-cell lymphoma	Primary Cancer	14D Hypertropia and limited elevation of the left eye.	None tested	IV Steroids	None
Herranz-Cabarcos, A et al.	Renal Cell Carcinoma	Orbital Myositis	Bilateral orbital pain and chemosis.	None tested	IV Steroids	None
Hunt, SV et al	Multiple Myeloma	Multiple Myeloma	Right upper and lower eyelid swelling with proptosis, binocular diplopia in all directions of gaze and chemosis	None Tested	Antibiotic therapy, then Dabrafenib and trametinib	None
Ahmad, W et al	Colorectal Neoplasm	Simultaneously	Right upper lid retraction and grade 1 proptosis	Autoimmune panel negative	Resection of primary tumor	Rectal Bleeding and diarrhea
Eckel, F et al.	Cardiac Carcinoma	Cardiac Carcinoma	Bilateral chemosis, protrusion and decreased vision	None tested	High Dose Steroids	None
Yoshida, M et al	Lung Cancer	Lung Cancer	Bilateral decreasing vision and visual field defects	None tested	Resection of primary tumor	None
Harris, G J et al	B Cell Lymphoma	Orbital Myositis	Right proptosis, exotropia, and complete ophthalmoplegia except for intorsion	None tested	Chemotherapy	Left 7th nerve paralysis
Jakubowska, W et al	Testicular Seminoma	Simultaneously	Bilateral pressure, swelling, and binocular diplopia	None tested	IV steroid, resection of primary tumor, and plasma exchange	None
Rivera Pérez de Rada P, et al	Colon Adenocarcinoma	Colon Adenocarcinoma	Left proptosis and pain and increased IOP	None tested	IV steroids and intraorbital Rituximab	None
This Case	Squamous Cell Carcinoma of the lung	Orbital Myositis	Bilateral proptosis, decreased vision, restricted motility	Calcium Channel Binding Antibody	IV steroids, then orbital decompression	None

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7:41–7:44 am

Testosterone Dysregulation and Erectile Dysfunction Associated with Teprotumumab Infusions: A Case Report

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Introduction: Teprotumumab is an insulin-like growth factor-1 (IGF-1) receptor antagonist approved for treatment of moderate to severe thyroid eye disease (TED). [1] It has been associated with a range of side effects, including changes in hormonal levels such as elevated growth hormone, and menstrual irregularities.[2,3,4] We present a case of a male patient who developed testosterone dysregulation, erectile dysfunction (ED), and decreased libido during teprotumumab treatment.

Methods: A retrospective case report.

Results: A 52-year-old male with no significant past medical history presented with proptosis, eyelid edema and erythema, tearing, and conjunctival injection. He denied vision changes, diplopia, or hyperthyroidism symptoms. He received oral prednisone for 3 weeks by an outside physician prior to presentation. Examination revealed normal visual acuity, left eye proptosis and upper eyelid retraction, bilateral eyelid edema, retropulsion resistance, and retro-orbicularis oculi fat hypertrophy. Clinical activity score (CAS) was 4. Humphrey 30-2 perimetry was normal. Orbital computed tomography showed left levator enlargement. Thyroid function tests performed one month prior to presentation were normal. Thyroid-stimulating immunoglobulin (TSI) was elevated to 396 (normal < 140). Teprotumumab infusions were started. TED improved, with CAS reducing to 0 after five doses. He continued to be euthyroid, biochemically and clinically. However, after the fifth infusion, he developed ED, decreased libido, muscle cramps, and fatigue. Given the hypogonadal symptoms, his endocrinologist began to monitor testosterone levels. Testosterone levels (normal 300 – 890) were low during treatment [199 ng/dL at 5 months, 193 ng/dL at completion], but gradually recovered post-completion, reaching 318 ng/dL at 4 months and 371.2 ng/dL at 9 months (Graph 1). Hypogonadal symptoms resolved and TED remained inactive. Nine months post-treatment, TED recurred (CAS 3/10 and TSI 429). He developed significant diplopia, requiring a temporary leave from work. Despite six IV 500 mg methylprednisolone doses over two months, symptoms worsened (CAS 7/10), prompting a second teprotumumab course. Following the third infusion, he experienced fatigue, low energy, ED, and reduced libido—symptoms identical to those reported during the first cycle of teprotumumab. Testosterone level dropped from 420.2 ng/dL pre-treatment to 257 ng/dL at two months post-initiation (Graph 1). Testosterone cypionate injections (100 mg every 10 days) were started, leading to improvement in ED and libido and testosterone normalization (498 ng/dL).

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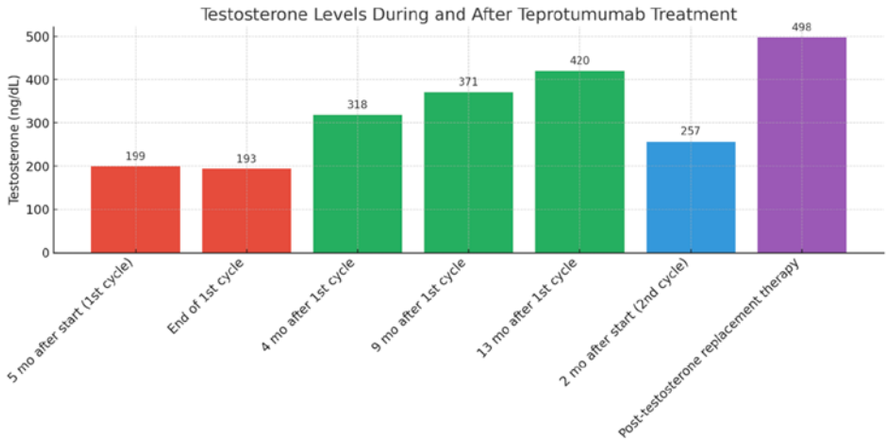
After completing teprotumumab, testosterone cypionate was tapered. Prostate-specific antigen level one-month post-completion was normal.

Conclusions: This case suggests that teprotumumab may disrupt testosterone regulation, as evidenced by the temporal relationship between infusions and testosterone decline. While pre-treatment testosterone levels were unavailable, the recovery of testosterone after the first course and its subsequent decline during the second cycle support a causal link. Age-related testosterone decline is unlikely since studies show mean testosterone levels plateau after age 40.[5] The mechanism remains unclear but may involve IGF-1, which enhances Leydig cell function and testosterone synthesis.[6] By blocking IGF-1, teprotumumab may theoretically impair this process and reduce testosterone levels. This case highlights potential hormonal side effects of teprotumumab in men warranting further investigation. Clinicians should monitor for hypogonadal symptoms and consider hormonal monitoring during treatment.

Graph 1



Legend:

1. **Red (1st cycle):** Testosterone levels during the first course of teprotumumab treatment.
2. **Green (Recovery):** Testosterone levels after completion of the first course, prior to the second cycle.
3. **Blue (2nd cycle):** Testosterone levels during the second course of teprotumumab.
4. **Purple (post-testosterone replacement therapy):** Testosterone level after initiation of testosterone replacement therapy during the second cycle.

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7:44–7:47 am

A Case of Recurrent Sequential Bilateral Orbital Inflammation Associated with Bispecific T-cell Engager (BiTE) Immunotherapy

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Introduction: We present the first case report of orbital inflammation associated with bispecific T-cell engager (BiTE) therapy.

Bispecific T-cell engagers (BiTEs) simultaneously bind T-cells via CD3 receptors and tumor-specific antigens, facilitating targeted immune-mediated killing. Xaluritamig, an investigational BiTE for metastatic castrate-resistant prostate cancer (mCRPC) targets STEAP1, a surface protein expressed on prostate cancer cells.[1] Since 2014, nine BiTEs have received FDA approval, with nearly 100 others under development.[2,3] This case highlights a potential orbital inflammatory complication associated with this class of immunotherapies.

Methods: This case report describes a 70-year-old male with no significant ophthalmic history who presented with acute right-sided periorbital swelling, hemorrhagic chemosis, proptosis, and ophthalmoplegia (-3 abduction, adduction, supraduction and infraduction deficits) eight days after initiating xaluritamig therapy for mCRPC. Examination further revealed visual acuity of 20/200 in the right eye, a relative afferent pupillary defect and intraocular pressure of 25 mmHg. The left eye had 20/25 vision with a normal exam. Orbital imaging demonstrated diffuse right-sided intraconal inflammation and optic nerve sheath enhancement (Figure 1). Symptoms resolved with empiric antibiotics, high-dose corticosteroids and a 6-week taper (Figure 2). The patient subsequently developed two additional inflammatory episodes involving the face and scrotum during cycles 2 and 5 of xaluritamig, respectively. Both were successfully treated with high-dose corticosteroids. Despite xaluritamig dose reduction, a similar inflammatory episode involving the contralateral orbit occurred during cycle 6 (Figure 3), again responsive to pulse-dose corticosteroids and a prolonged taper (Figure 4).

Results: The patient experienced four steroid-responsive episodes of inflammation, including two orbital episodes temporally associated with xaluritamig, sequentially involving both orbits. All inflammatory episodes occurred during periods of corticosteroid tapering or waning systemic exposure and resolved with increased dosage (Figure 5). Xaluritamig was discontinued after the second orbital episode, with no recurrence of inflammatory symptoms to date.

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Conclusions: The history, exam, and radiographic findings strongly favor xaluritamig-induced orbital inflammation as the leading diagnosis, making this the first reported case of orbital inflammation linked to BiTE therapy. Similar orbital inflammatory syndromes have been described with immune checkpoint inhibitors, a class of drugs that also activate T cells for cancer destruction.[2,4,5] As BiTE therapy becomes increasingly prevalent, early recognition and reporting of orbital toxicities are essential to prevent potentially vision-threatening complications.

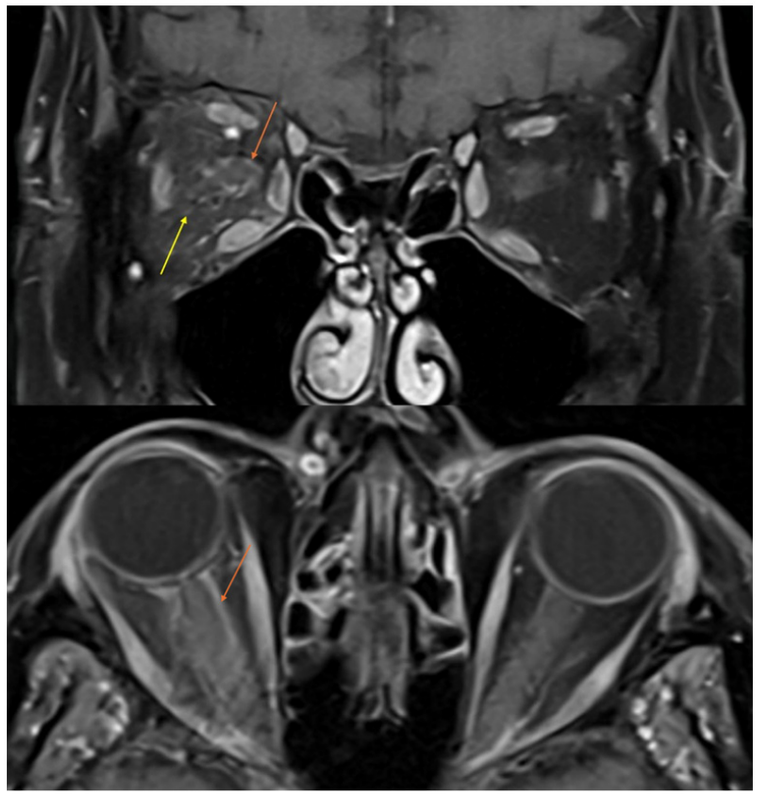

Figure 1. T1-weighted fat-suppressed MRI demonstrating coronal (top) and axial (bottom) views, showing enhancement of the right optic nerve sheath (orange arrow) and retrobulbar fat (yellow arrow

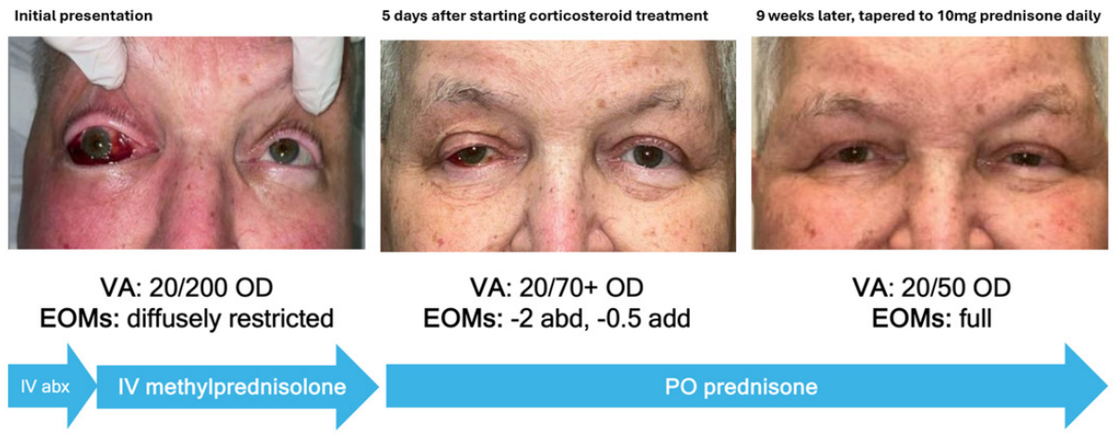

Figure 2. Photographs demonstrating clinical improvement of right orbital inflammation following corticosteroid treatment

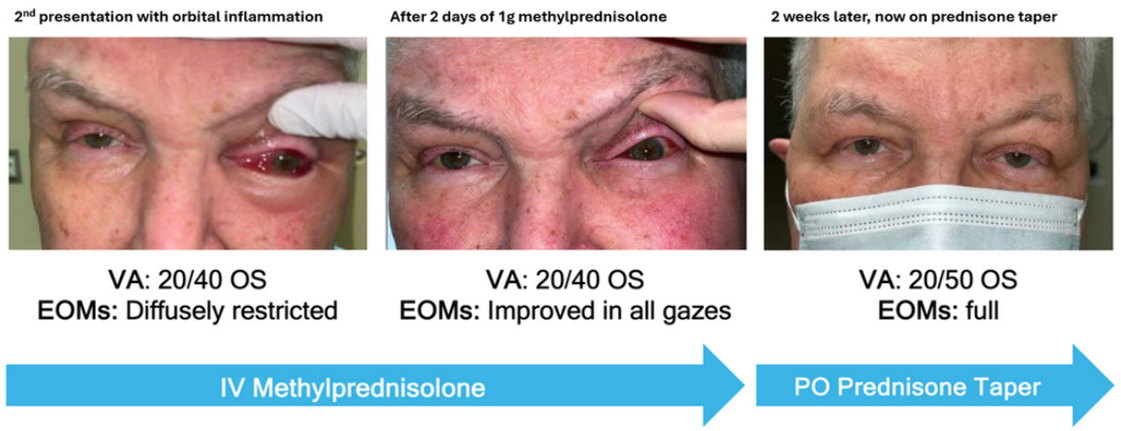

Figure 3. Photographs demonstrating clinical improvement of left orbital inflammation following corticosteroid treatment

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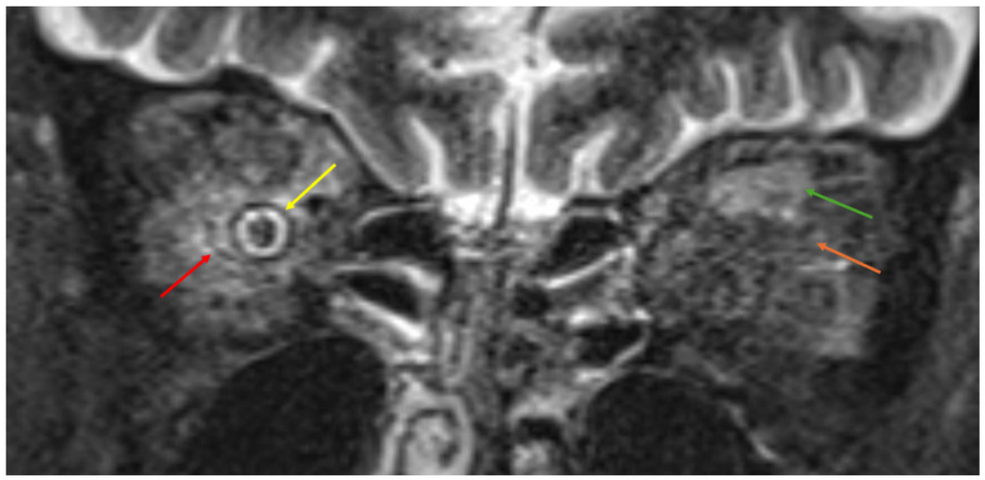

Figure 4. T2-weighted MRI demonstrating enlargement and enhancement of the left superior rectus muscle (green arrow) with surrounding orbital fat stranding (orange arrow). Residual enhancement of the right optic nerve sheath (yellow arrow) and right orbital fat stranding (red arrow) are also noted, despite clinical resolution of right-sided symptoms several months earlier.

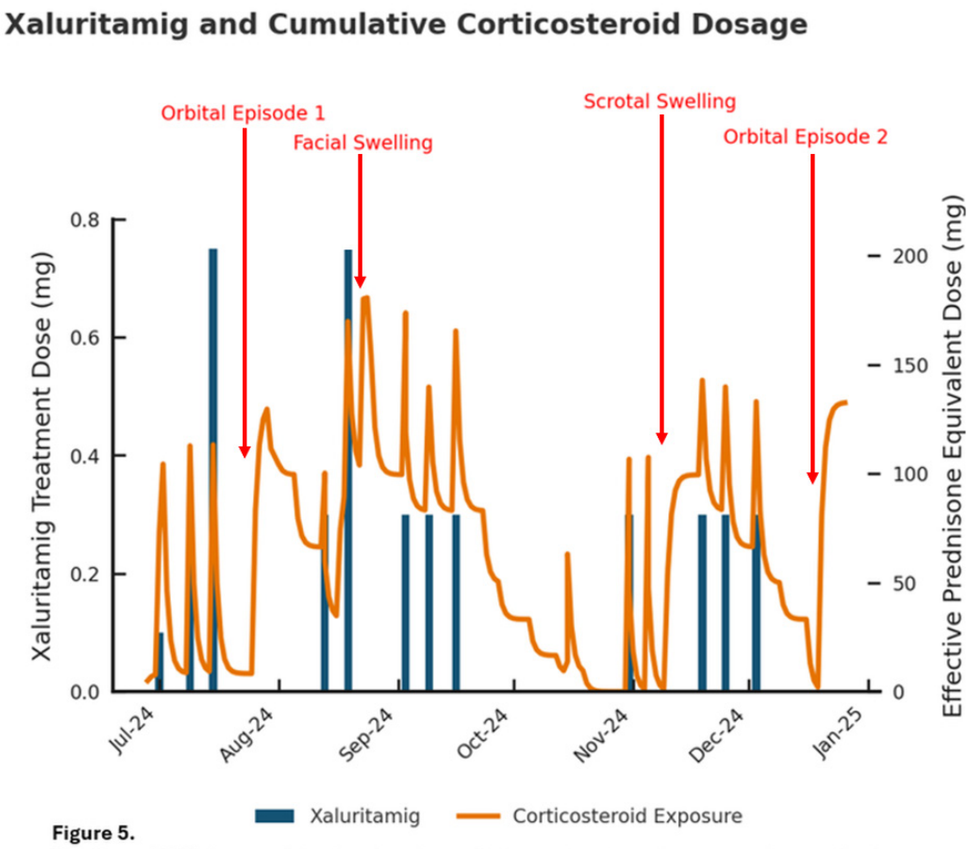

Figure 5.
Timeline of BiTE therapy (blue bars) and cumulative corticosteroid exposure (orange line). Cumulative corticosteroid levels were calculated accounting for biological half-lives of dexamethasone and prednisone. Red arrows depict the timing of inflammatory events. Methylprednisolone administered during initial treatment of orbital episodes is not shown due to its disproportionately high dosage.

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7:47–7:50 am

Case Report: Transformation of TED Phenotype Following Teprotumumab Treatment

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Introduction: We present a case of phenotypic shift in Thyroid Eye Disease (TED) following teprotumumab treatment in a 35-year-old female non-smoker with Graves' disease.

Methods: This is a case report. The relevant history, examination, treatment, and outcomes are reported. Collection and evaluation of protected patient health information were HIPAA compliant.

Results: A 35-year-old female non-smoker with Graves' disease and papillary thyroid cancer status post total thyroidectomy developed mild bilateral lid swelling and mild right upper lid retraction (Figure 1A). She received eight cycles of teprotumumab, with improvement of lid swelling and development of mild hair loss. Family history was notable for mother and maternal grandmother with hypothyroidism.

Six months post-treatment, she presented with marked bilateral periorbital edema, proptosis, worsening lid retraction and diplopia (Figure 1B). Visual acuity was 20/20 (right) and 20/25 (left). She had a left afferent pupillary defect, dyschromatopsia and inferior scotoma. Slit lamp exam was notable for bilateral corneal erosions, chemosis, and caruncle edema. Hertel measurements were 32mm bilaterally. Supraduction, abduction and infraduction were limited in both eyes. Computed tomography (CT) scan revealed significant bilateral enlargement of the superior, medial, and inferior rectus muscles and apical crowding (Figure 3A-B).

Initial oral prednisone (1mg/kg daily) improved signs and symptoms, but relapse occurred with taper. Despite initiating EUGOGO intravenous steroid protocol, vision deteriorated to 20/30 and 20/50, extraocular motility remained severely limited, left afferent pupillary defect and dyschromatopsia persisted, and left inferior scotoma progressed (Figure 2). Left endoscopic medial and floor decompression improved all measures of optic nerve function with expected worsening of left globe motility. Three months post-op and 19 months after relapse, she entered a stable clinical state and underwent right orbital decompression and strabismus surgery.

Conclusions: This case represents a rare and dramatic shift in TED phenotype following teprotumumab. While TED relapse occurs in ~40% of cases with disease-modulating agents, including teprotumumab and corticosteroids,[1, 2] relapse in this case represents a wholescale change in clinical phenotype. Although pre-treatment imaging was not obtained, the initial phenotype was characteristic of younger patients, featuring lid swelling and upper lid retraction, corresponding to Type I disease. Post-treatment, she developed a phenotype more typical of older patients, featuring massive muscle enlargement (Type II disease) with the attendant clinical

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manifestations,[3, 4] including marked proptosis, dysmotility, and steroid non-responsive compressive optic neuropathy, with a prolonged active phase of 19 months. This transformation is particularly notable given her low-risk profile—young age, female, non-smoker, and post-thyroidectomy with no comorbidities such as diabetes, dermopathy, or sleep apnea.

We propose that the severity and phenotypic changes associated with reactivation following teprotumumab treatment is an area worthy of future investigation.

Figure 1

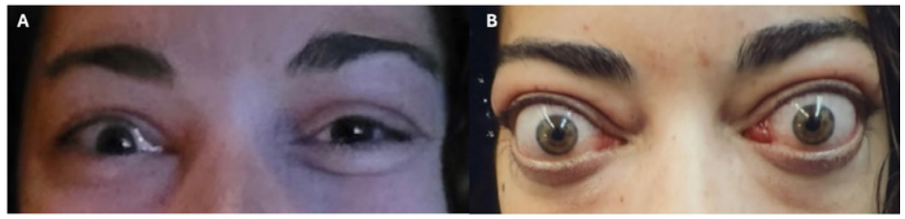


Figure 2

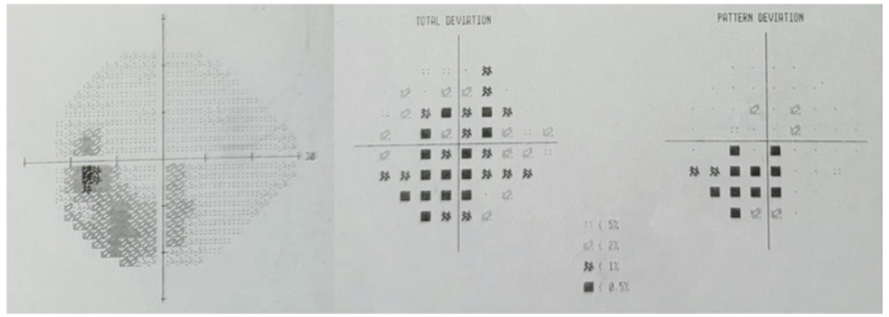
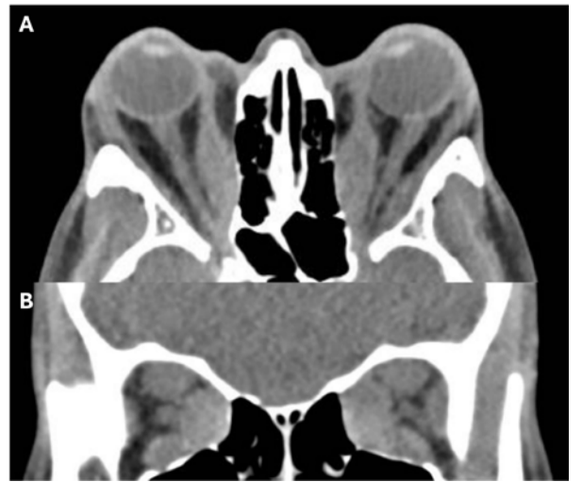


Figure 3



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7:50–7:53 am

Novel Intraoperative Application of Hydroxyapatite Cement in Lateral Orbital Wall Reconstruction Following Intraosseous Lesion Excision

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Introduction: Orbital bony defects, including following excision of intraosseous lesions, may lead to contour deformities affecting globe position and aesthetics. Although calcium phosphate cements have been used in cranioplasty and orbital floor repairs, reconstruction of the lateral orbital wall with hydroxyapatite bone cement has not been reported. We describe intraoperative application for lateral orbital wall reconstruction following removal of an intraosseous vascular malformation.

Methods: Case report.

Results: A 35-year-old woman presented with a firm, non-tender mass along the inferolateral right orbit present for one year. Imaging showed a 13 x 11 x 19 mm trabeculated osseous lesion arising from the right zygoma/lateral orbital wall (Figure 1). After initial observation, follow-up at 5 months revealed lesion enlargement (14 x 14 x 23 mm) and progressive symptoms. MRI showed minimal perfusion; angiogram/embolization was therefore deferred by neurosurgery.

The patient underwent lateral orbitotomy with lesion excision (surgical video available, Figure 2). An irregular spiculated lesion was noted inferotemporally and carefully biopsied. The remaining bony lesion was removed with an ultrasonic bone aspirator with microcutter tip with care to preserve a small isthmus of anterior normal bone along the orbital rim. Hydroxyapatite bone cement was mixed, placed beneath the isthmus, and molded in situ. The cement set within minutes, restoring contour without fixation. Pathology confirmed intraosseous vascular malformation (Figure 3). At follow-up, the patient had improved symptoms and excellent globe position and orbital/zygomatic bony contour.

Conclusions: Hydroxyapatite bone cement is approved for craniofacial reconstruction. This case highlights its use as a safe and effective material for lateral orbital wall reconstruction. Compared to traditional bone grafts or allogenic implants, it offers direct moldability, rapid intraoperative setting, biocompatibility, and osseointegration without donor site morbidity, thermal injury, or need for fixation. While prior studies have described prefabricated hydroxyapatite implants for orbital defects, this case demonstrates its novel use for intraoperative orbital lateral rim reconstruction and supports potential for broader applications in orbital reconstruction.

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Figure 1

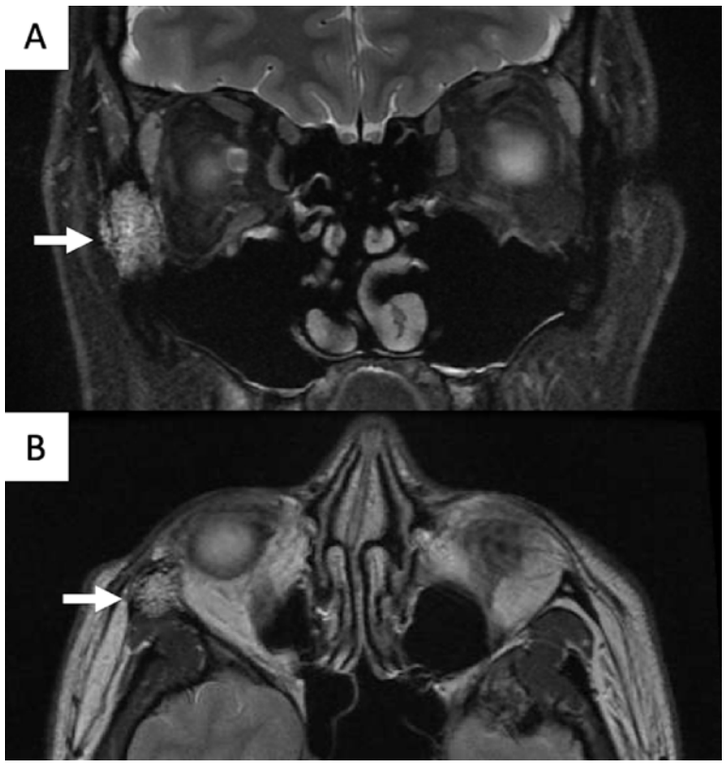


Figure 2

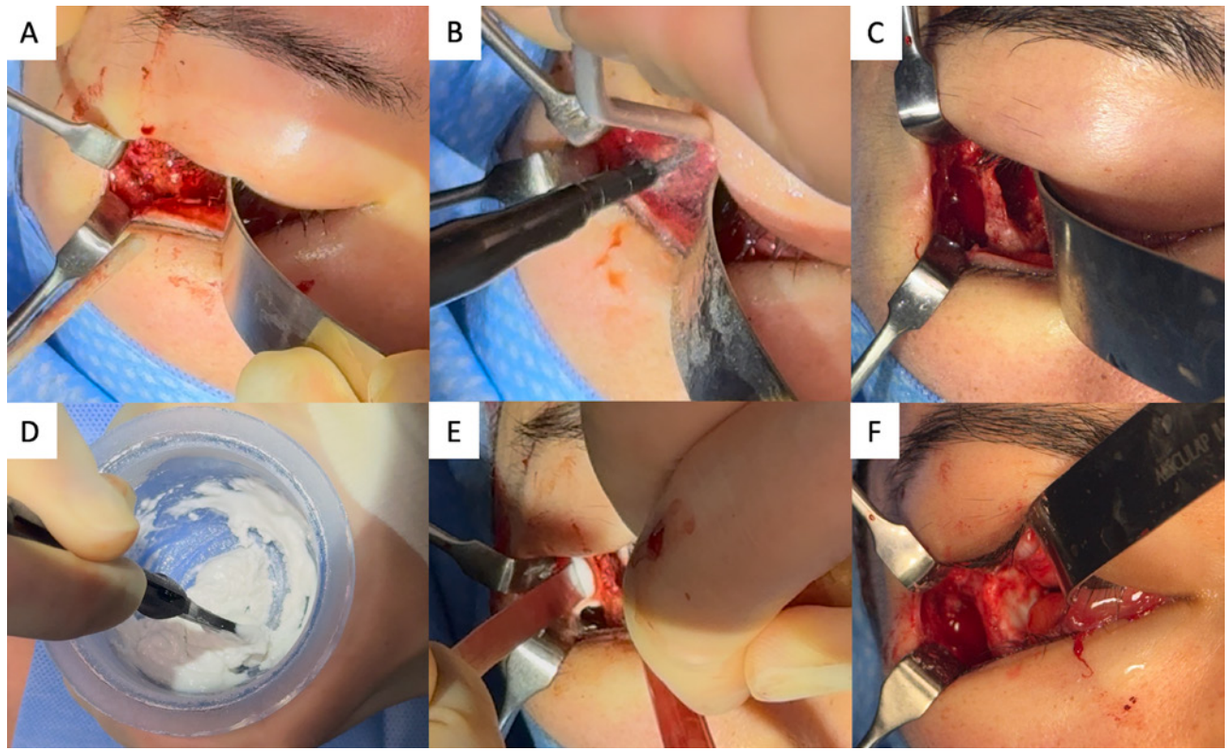
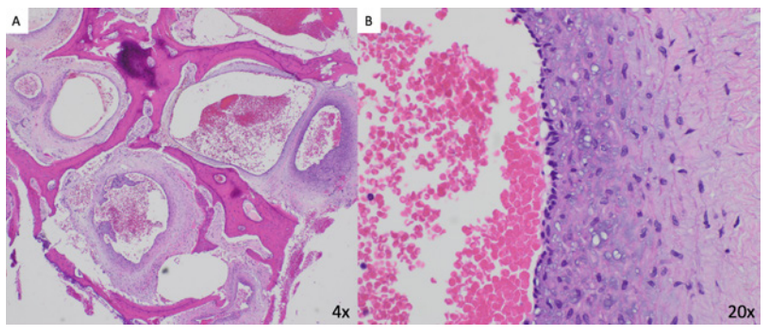


Figure 3



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8:03–8:08 am

Targeted Treatments for Midface and Periorbital Over-Volumization: Bony Contouring, Soft Tissue Debulking, and Microliposuction

Kendall Goodyear[1,2], Makayla McCoskey[1,2], Tanuj Nakra[1,2]

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Introduction: To describe a novel schema for managing lower eyelid and midface over-volumization, most commonly encountered in revision cosmetic surgery patients following filler or fat grafting complications. Nodular deposits of previously grafted fat are often found within the orbicularis oculi muscle or in the deep suborbicularis oculi fat, but existing literature offers limited guidance on effective surgical management of such cases.[1] While transconjunctival excision has been described as a method for removing previously grafted fat nodules in the tear trough,[2] this approach does not adequately address deformities involving the lateral eyelid-cheek junction, the midface, and overvolumization deformity compounded with dynamic midface movement, especially. Our technique involves either bony reduction, soft tissue debulking, or microliposuction through transconjunctival or transcutaneous access, selectively applied based on individualized anatomy.

Methods: This is a retrospective case series of eight patients presenting with lower eyelid and midface over-volumization, either from prior cosmetic procedures (filler, fat grafting) or innate skeletal anatomy. All patients underwent anatomically targeted debulking procedures based on clinical evaluation of the predominant contributor to over-projection. Two patients underwent anterior maxillary bone reduction via a transconjunctival approach, involving direct osseous contouring of the anterior maxilla (Figure 1A-B). Two patients underwent transconjunctival excision of scarred and displaced fat grafts (Figure 1C-D). Four patients underwent microliposuction of the midface using a low-suction cannula through a small transcutaneous stab incision (Figure 1E). All procedures were performed by a single surgeon. Outcomes were assessed through pre- and postoperative photographs, patient satisfaction, and complication monitoring.

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Results: All patients demonstrated improved midface contour and a more natural lid-cheek transition (Figure 2). The procedures were well tolerated with no complications – specifically no facial nerve injury. Patient-reported satisfaction was high, especially among those undergoing revision after unsuccessful filler reversal or fat grafting. Improvements were noted in contour harmony, reduction of pseudofestoons, and resolution of midface heaviness.

Conclusions: Anterior maxillary decompression and selective soft tissue debulking via transconjunctival and/or transcutaneous approaches represent effective strategies for managing lower eyelid and midface over-volumization. By tailoring surgical intervention to the underlying anatomical contributor—bony projection or soft tissue bulk—this approach provides a nuanced and anatomically precise solution for complex revision cases.

Figure 1

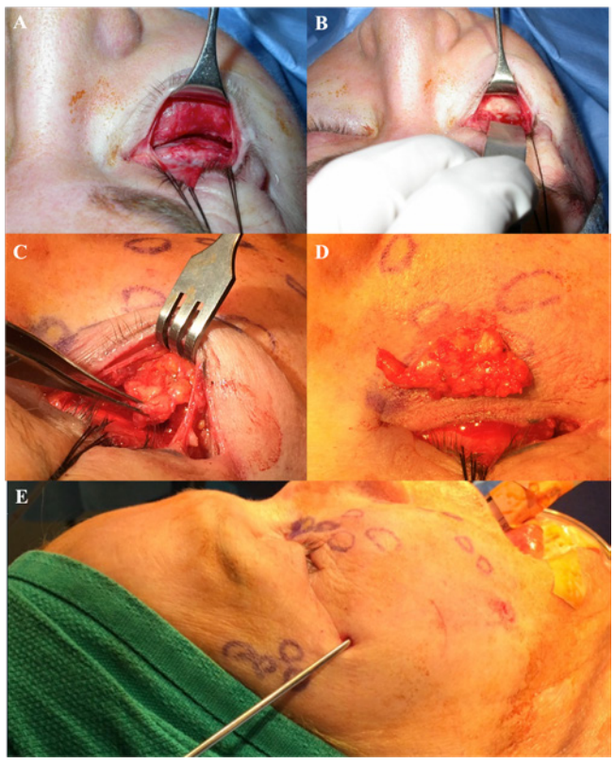

Figure 2

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8:08–8:13 am

The Oculoplastic Experience in Eyebrow Transplantation: A Case Series and Narrative Review of Aesthetic and Functional Perspectives

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Introduction: Eyebrows are essential to facial harmony, expression, and nonverbal communication. Their loss — whether from trauma, alopecia, or overplucking — can significantly impair emotional well-being, confidence, and social functioning. Despite this, there is limited research in the oculoplastic surgery literature evaluating patient-centered outcomes after eyebrow transplantation. Eyebrow restoration techniques have evolved considerably, with modern approaches primarily utilizing follicular unit transplantation (FUT) or follicular unit excision (FUE) methods to achieve natural-appearing results.[2,3] In this study, we discuss our experiences with FUE eyebrow transplantation and present a case series evaluating the quality-of-life outcomes of eyebrow transplant recipients, alongside a narrative review of the clinical, aesthetic, and psychosocial significance of the brows.

Methods: A retrospective case series was performed on patients who underwent follicular unit excision (FUE) eyebrow transplantation between 2020 and 2024. In this technique, the recipient site is first demarcated (Figure 1A). After topical anesthesia of the donor site (Figure 1B), individual follicular units are harvested from the scalp (Figure 1C) and meticulously placed into the eyebrow region (Figure 1D) to recreate natural angulation, density, and shape (Figure 1E). All subjects were additionally asked to complete a survey that assessed subjective postoperative brow symmetry, brow density, brow naturalness, self-esteem, and social comfort. Likert-scale responses were analyzed using descriptive statistics. For the literature review, relevant publications were identified through a computerized search through PubMed and Google Scholar. Search terms included “eyebrow AND aesthetics,” “eyebrow loss AND quality of life,” “eyebrow transplantation AND satisfaction,” “eyebrow AND facial expression,” and related keywords. Articles published between 2000 and 2025 in English were reviewed. The included studies encompassed clinical trials, case series, reviews, and psychological surveys addressing the cosmetic, functional, and emotional role of eyebrows. Correspondence, editorials, letters to the editor, and duplicates were excluded.

Results: Thirty-three patients were included in the case series. All patients achieved satisfactory outcomes and none experienced donor site or recipient site complications such as scarring, infection, or graft failure. Survey data collection is ongoing, with final results pending additional patient responses.

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Literature review identified 21 relevant articles for detailed review published between 2003 and 2024. The literature spanned multiple disciplines, including plastic and reconstructive surgery, dermatology, oculoplastic surgery, and psychology. Eyebrows were consistently shown to be vital for facial identity, expression, and interpersonal communication. Their loss is associated with significant psychological burden, including diminished self-confidence, anxiety, and reduced quality of life, often exceeding that of scalp hair loss. Eyebrow transplantation, especially using single-hair follicular unit techniques, demonstrated high rates of patient satisfaction and psychological benefit, with graft survival frequently exceeding 85%. Studies further support the restoration of expressiveness, facial harmony, and identity following transplantation.

Conclusions: Eyebrow loss represents more than a cosmetic concern. It significantly impacts psychological health and quality of life. Transplantation is a powerful solution that restores both form and function. As the demand for facial rejuvenation grows, oculofacial plastic surgeons are uniquely equipped to address brow loss with a nuanced understanding of periorbital anatomy, aesthetic balance, and patient-centered care. Further study on long-term outcomes and technique refinement is warranted.

Figure 1

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8:13–8:18 am

Identification of Upper Eyelid Asymmetry and the Role of Tarsal Platform Contour in Conveying Emotion

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Introduction: Aesthetic goals of upper blepharoplasty often include manipulation and control of tarsal platform show (TPS), brow height and/or contour (brow fat span, BFS) and upper eyelid position (MRD1). In addition, as adjunctive techniques including fat grafting have become more common, modulation of tarsal platform contour (TPC) has become another potential goal in cosmetic upper eyelid surgery. To the best of our knowledge, the impact of TPC in conveying emotion has not previously been investigated. Moreover, while achieving symmetry in all four of these metrics may be the goal, in some situations, prioritization of symmetry in one over the other may practically become necessary. In this study, we utilized crowdsourcing to better characterize laypeople's perception of (a) symmetry and (b) conveyed emotion in images depicting various alterations of these key aesthetic components of the upper eyelid.

Methods: We employed a prospective psychometric evaluation via crowdsourced online survey. Layperson participants (n = 247) who provided consent were recruited using data quality controls from CloudResearch's Amazon Mechanical Turk (MTurk) toolkit.1 Low quality responses were excluded in accordance with best practices.2 Participants completed an online survey classifying digitally drawn face images that differed in either upper eyelid symmetry (MRD1, BFS, TPS, TPC) or tarsal platform contour (highest TPS medially, centrally, laterally). Primary outcomes were recognition of upper eyelid asymmetry and Ekman's six basic emotions.3 Secondary outcome was time participant's spent selecting an image. Statistical differences were assessed with Pearson's chi-squared test. Statistical significance was defined as $p < 0.05$.

Results: 247 complete responses were collected. Significant asymmetry (84.2%, 69.6%; $p<0.05$) was correctly identified when the TPC was high medially and centrally, while a unilaterally high lateral TPC was less noticeable, and reported as symmetric by 67.6% of participants ($p < 0.05$) (Figure 1). With respect to the other three metrics, participants were best at identifying asymmetry in MRD1 (91.9%) followed by TPS (66.8%). There was no significant difference in participant response when symmetry in BFS was altered ($p >0.05$) (Figure 2).

With respect to emotion, the majority of participants identified a high central TPC as conveying surprise, whereas a high medial TPC produced equal amounts of fear and sadness. No pattern of emotion was identified for a high lateral TPC. Question response time was inversely correlated to % agreement within the MRD1, TPS, and BFS groups.Overall, participants were in greater agreement and quickest to report asymmetry in TPC, highlighting its importance as a relevant aesthetic outcome in cosmetic upper eyelid surgery.

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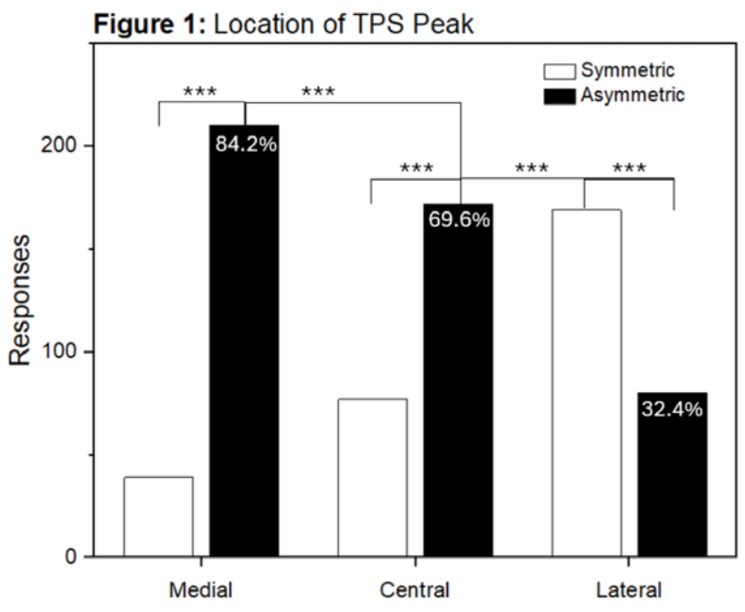
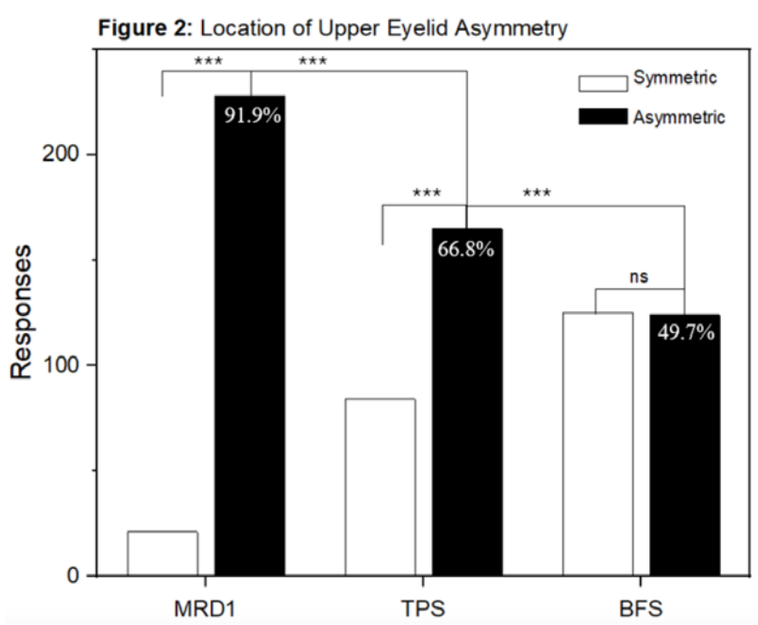
Conclusions: We aimed to more precisely characterize the role of MRD1, TPS, BFS and TPC in perceptions of upper eyelid symmetry and conveyance of emotion. In our study, laypersons were able to readily identify asymmetry in MRD1 and TPS; however, asymmetry in BFS was generally not recognized. We found high medial TPC conveys surprise, while high central TPC conveys fear and sadness. High lateral TPC was not associated with any particular emotion. Lastly, the digital manipulation of upper eyelid metrics is likely not entirely representative of the real world, and further study evaluating standardized pre and post-operative patient photographs is required (Figure 3).





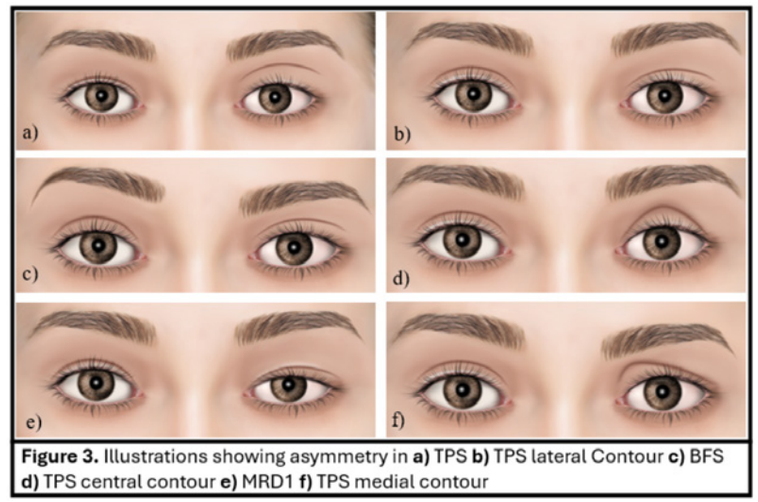


Figure 3. Illustrations showing asymmetry in **a)** TPS **b)** TPS lateral Contour **c)** BFS **d)** TPS central contour **e)** MRD1 **f)** TPS medial contour

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8:18–8:23 am

Eyelid Xanthelasma as a Marker of Cardiovascular Risk: A Real-World Data Analysis

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Introduction: Xanthelasma palpebrarum, the most common type of cutaneous xanthoma, presents as yellowish plaques on the eyelids and is frequently associated with lipid metabolism disorders. Although commonly regarded as a superficial and benign dermatologic finding, several studies suggest that xanthelasma may be an external marker of systemic atherosclerosis and increased cardiovascular risk.[1-2] This study aimed to evaluate whether the presence of eyelid xanthelasma is associated with elevated cardiovascular risk using a large, real-world dataset from the TriNetX Research Network, which aggregates de-identified electronic medical records from over 120 global healthcare organizations.

Methods: A retrospective cohort study compared adults diagnosed with eyelid xanthelasma to a propensity score-matched control group of adults undergoing eye examinations without a diagnosis of xanthelasma, matched on demographics and baseline clinical features. Primary outcomes included major adverse cardiovascular events (MACE), coronary artery bypass grafting (CABG), percutaneous coronary intervention (PCI), and all-cause mortality.

Results: After matching (N=17,424 per group), patients with eyelid xanthelasma had higher rates of MACE (14.0% vs 11.8%; p<0.001), CABG (0.3% vs 0.1%; p<0.001), and PCI (0.9% vs 0.4%; p<0.001). Diagnoses of hyperlipidemia (35.2% vs 26.9%; p<0.001) and disorders of lipoprotein metabolism (53.5% vs 33.2%; p<0.001) were also more common in the xanthelasma group. Kaplan-Meier analysis showed lower MACE-free survival in the xanthelasma group (HR 0.73; 95% CI: 0.68–0.79; p<0.001). Survival analysis revealed a significantly reduced long-term survival probability (72.4% vs 78.9%; HR 1.18; 95% CI: 1.06–1.31; p=0.002).

Conclusions: Eyelid xanthelasma is associated with a higher incidence of hyperlipidemia, cardiovascular events, and decreased long-term survival. These findings support the importance of systemic evaluation and cardiovascular risk assessment in patients presenting with xanthelasma. These findings highlight the need for clinician awareness of xanthelasma as a potential marker of systemic vascular risk.

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8:23–8:28 am

Does Simultaneous Internal Brow Fixation Reduce Reoperation Rates After Upper Blepharoplasty? A Comparative Study of 1720 Eyelids

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Introduction: Upper blepharoplasty is frequently performed to address dermatochalasis and improve eyelid contour and visual function. However, persistent lateral hooding including from post-surgical brow descent may necessitate revision surgery. Internal brow fixation offers lateral brow stabilization and may reduce persistence or recurrence of temporal excess skin; however, comparative outcome data regarding its effect on revision rates remains limited. This study evaluates whether combining internal brow fixation with blepharoplasty reduces the incidence of reoperation.

Methods: This retrospective study identified patients who underwent blepharoplasty alone or combined with internal brow fixation at UC San Diego from January 2019 to December 2022. All cases were performed by oculoplastic surgeons using a standardized eyelid-crease technique. Exclusion criteria included prior eyelid surgery, concurrent upper eyelid procedures (e.g., ptosis repair), or brow-lift approaches other than internal brow fixation. Revisions were defined as involving subsequent upper eyelid skin excision and/or brow revision. Data included demographics, surgical details, follow-up duration, and incidence of revision surgery. χ^2-testing, Mann-Whitney U-tests, and Kaplan Meier analysis were performed.

Results: 1720 eyelids of 867 patients (73.2% female; mean age 64.5±10.9 years) were included. 904 eyelids underwent blepharoplasty alone and 816 underwent blepharoplasty with brow fixation. Overall, 155 eyelids (9.0%) underwent revision at a mean of 16.6±16.2 months after initial surgery. Revisions were bilateral in 55 patients (110 eyelids) and unilateral in 45 eyelids. Revisions mostly involved skin excision alone (n=118) and were frequently performed in the office (n=120).

Revisions were significantly less frequent in the blepharoplasty with brow fixation group (6.4% vs. 11.4%, $p<0.001$). Age and gender were not significantly associated with incidence of reoperation ($p=0.38$, $p=0.67$, respectively). There was no significant difference in rates of unilateral vs. bilateral revision or location of revision among groups, although there was a trend towards more in-office revisions in the blepharoplasty alone group vs. the blepharoplasty with brow fixation group (79.6% vs. 67.3%, $p=0.11$). Revision rates were consistently lower in the blepharoplasty with brow fixation group compared to the blepharoplasty alone group at both <12 months (6.6% vs. 12.5%) and ≥12 months of follow-up (6.0% vs. 10.0%). Kaplan-Meier analysis demonstrated a significantly lower cumulative revision rate over

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time in the brow fixation group compared to blepharoplasty alone (Figure 1, log-rank p<0.001). The brow fixation group consistently maintained a higher proportion of revision-free outcomes throughout the follow-up period.

Conclusions: In this large comparative study, internal brow fixation at the time of blepharoplasty was associated with a significantly lower rate of revision surgery compared to blepharoplasty alone. While this effect has been hypothesized, to our knowledge it has not been previously demonstrated at this scale. These findings highlight the role of lateral brow stabilization in improving both short and long-term surgical outcomes. This study supports performing simultaneous internal brow fixation in patients undergoing upper blepharoplasty to achieve durable outcomes.

Figure 1

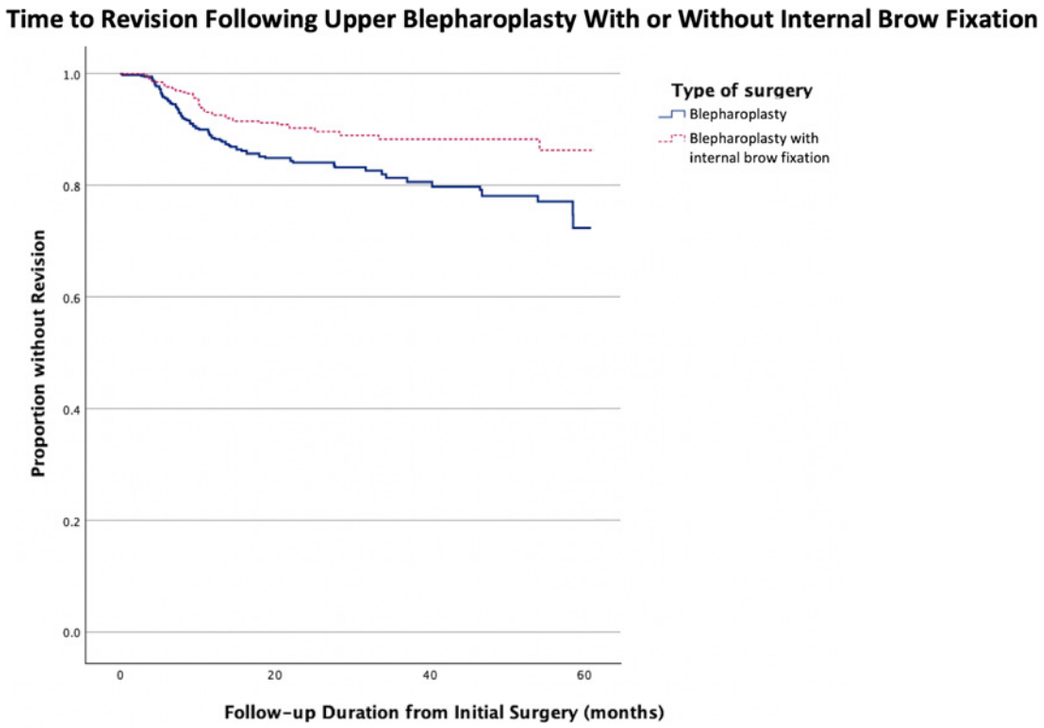

Table 1

Table 1. Comparison Among Blepharoplasty Alone and With Browpexy

	Blepharoplasty Alone (n=904)	Blepharoplasty + Browpexy (n=816)	p-value
Age (years)	64.2 ± 11.2	67.4 ± 9.3	**<0.001**
Gender (Female)	72.1% (n=652)	74.4% (n=252)	0.31
Revision rate (%)	11.4% (n=103)	6.4% (n=52)	**<0.001**
Mean time to revision (months)	16.0 ± 15.2	17.8 ± 17.9	0.49
% Revisions unilateral	28.2% (n=29)	30.8% (n=16)	0.74
% Revisions in office	79.6% (n=82)	67.3% (n=38)	0.11
Mean duration follow-up (months)	19.8 ± 20.7	20.4 ± 21.3	0.59

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8:28–8:33 am

Large Language Models as Medical Translators: A Study of ChatGPT for Oculoplastic Surgery Postoperative Instructions

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Introduction: Language barriers are a well-established driver of healthcare disparities, contributing to miscommunication, adverse events, and decreased treatment adherence. While large language models (LLMs) such as ChatGPT offer a novel, scalable means of medical translation,[1] their utility in translating patient discharge instructions for oculoplastic procedures has not been evaluated. This study assesses the accuracy, understandability, actionability, and readability of ChatGPT-generated Spanish and Mandarin translations of standardized English-language oculoplastic discharge instructions.

Methods: Standardized English-language postoperative discharge instructions following common oculoplastic procedures were translated into Spanish and Mandarin using GPT-4 (ChatGPT). Translations were prompted with: "Translate the following postoperative discharge instructions into [Spanish/Mandarin]. Maintain clinical accuracy and patient readability." Each version was evaluated independently by three native or fluent raters using the Patient Education Materials Assessment Tool for Print (PEMAT-P), which assesses understandability (13 items) and actionability (5 items).[2] Evaluators of each language were blinded to the other language versions. Readability was assessed using aggregates of validated language-specific indices and mapped to an estimated grade level. Descriptive statistics were calculated, and comparisons of PEMAT-P scores across languages were performed using Kruskal-Wallis tests with eta-squared (η^2) were calculated to estimate effect size.

Results: PEMAT-P total scores (maximum score = 18) ranged from 67% to 83% across all languages. Mean total scores were 83% (range 83–83%) for English, 78% (range 72–83%) for Spanish, and 72% (range 67–78%) for Mandarin. Overall understandability scores across languages ranged from 69% to 85%, with no statistically significant difference observed ($p = 0.24$), though a small-to-moderate effect size was noted ($\eta^2 = 0.15$). Actionability scores ranged from 60% to 80%, and similarly did not differ significantly between language groups ($p = 0.26$), with a small effect size ($\eta^2 = 0.11$). Readability analysis showed the English instructions approximated a 10th-grade reading level, the Spanish version an 8th-grade level, and the Mandarin version a 4.5-grade level, consistent with junior secondary education. All translations were within or near the recommended 6th–8th grade range for patient health literacy materials.

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Conclusions: ChatGPT-generated translations of oculoplastic postoperative instructions into Spanish and Mandarin demonstrated high levels of understandability and actionability, with performance metrics comparable to the original English version. While no statistically significant differences were observed between language groups, small-to-moderate effect sizes suggest potential variability in perceived clarity across translations. All language versions met or closely approached recommended health literacy readability levels. These findings support the feasibility of using large language models like ChatGPT to generate linguistically accessible, medically accurate discharge instructions for patients with limited English proficiency, though further validation in larger and more diverse patient populations is warranted.

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8:43–8:49 am

Immune Checkpoint Expression in Orbitally Invasive Sinonasal Undifferentiated Carcinoma: Implications for Therapeutic Manipulation

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Introduction: Sinonasal undifferentiated carcinoma (SNUC) is a rare, highly aggressive tumor. Tumors are typically advanced at the time of diagnosis and despite aggressive interventions involving a combination of surgery, chemotherapy and/or radiotherapy, 5-year survival rates range from less 10% to 50%.

The advent of immunotherapy has drastically altered the treatment paradigm for numerous malignancies. The goal of this study was to investigate whether checkpoint inhibitor proteins, including programed death protein-1 (PD1), programmed death-1-pathway ligand (PD-L1), cytotoxic T-lymphocyte associated protein-4 (CTLA-4), Lymphocyte Activation Gene-3 (LAG3), and CD73 are implicated in orbitally invasive SNUCs. Demonstration of increased levels of one or more of these proteins may demonstrate a proof of principle to suggest the utility of immunotherapy to address a malignancy with an exceptionally poor prognosis.

Methods: Patients with orbitally invasive SNUC presenting to a single institution between 2020 and 2024 were identified. Age and gender match controls were identified. Immunohistochemical staining was performed for each of the check-point inhibitors. Using light microscopy, the number of positively staining cells per 40× field was recorded across 5 consecutive fields and averaged. The differences in expression between the two were compared via a Mann-Whitney analysis.

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Results: Six patients with orbitally invasive SNUC and 11 sinus mucosal controls were identified. Immunohistochemical analysis of these tumors demonstrated positivity in both SNUC specimen and normal sinus mucosa for all biomarkers tested (CD73, LAG3, CTLA-4, PD-L1, PD1). Expression of CD73 and PD-L1 was statistically significantly higher in SNUC specimens compared to normal sinus controls. (p=0.0003 and p=0.0111, respectively).

Conclusions: Specimens from patients with sinonasal undifferentiated carcinoma express increased levels of PD-L1 and CD73 compared to sinus controls. The results discovered in this investigation represent a significant proof of principle that immunotherapy may be a promising approach to address a potentially devastating disease.

Figure 1

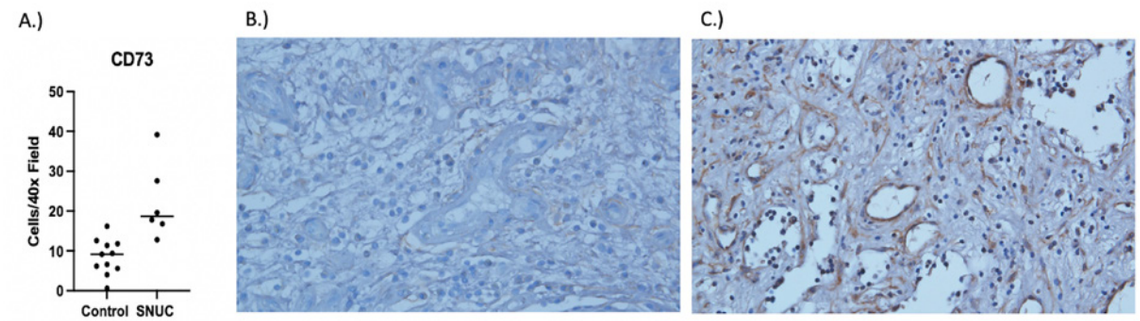
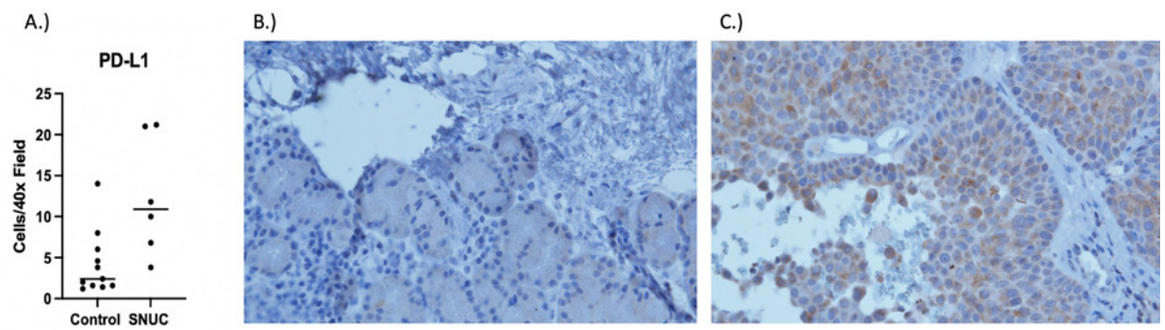


Figure 2



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8:49–8:55 am

Aprepitant for Oculoplastic Surgeries

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Introduction: Postoperative nausea is a common complication of oculofacial plastic surgery due to a combination of anesthesia, surgical duration, postoperative pain, and opioid use. Nausea is a frequent source of patient dissatisfaction and, more critically, vomiting in the immediate postoperative period can compromise surgical outcomes through suture tension, wound dehiscence, increased Valsalva pressures, ecchymosis, and hemorrhage. Reducing nausea and vomiting may therefore improve both patient experience and surgical results.

Despite routine prophylaxis, postoperative nausea and vomiting (PONV) remains prevalent, affecting up to 70% of patients, with rates as high as 45% even in those receiving 5HT3 antagonists like ondansetron.[1] Aprepitant, a neurokinin-1 (NK1) receptor antagonist with a longer half-life (9–12 hours vs. ondansetron's 6), has demonstrated efficacy in other surgical fields but has never been studied in oculoplastic surgery.[2,3] This study aimed to evaluate the efficacy of aprepitant in reducing PONV in this population and to assess its impact on nausea severity, antiemetic use, and opioid consumption.

Methods: We conducted a prospective, double-blind, randomized controlled trial at the New Millennium Surgery Center in Southfield, MI. Adult patients undergoing oculofacial procedures under systemic anesthesia—especially those undergoing longer or high-risk surgeries—were eligible. Patients were randomized to receive either 40 mg of oral aprepitant or placebo, in addition to a standardized prophylactic regimen (famotidine, IV fluids, IV glycopyrrolate, scopolamine patch, IV ondansetron, and postoperative oral rehydration solution, in addition to opioids and ondansetron at discharge). The primary outcome was incidence of vomiting on postoperative day 1 (POD1) and week 1 (POW1). Secondary outcomes included subjective nausea (Figure 1), measured via verbal and visual analog scales, number of ondansetron and opioid doses taken.

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Results: On POD1, vomiting incidence was significantly lower in the aprepitant group (0%, 0/34) than in the placebo group (16.3%, 7/43; p = 0.013). Nausea scores were also significantly lower in the aprepitant group at POD1 (mean 0.56 ± 0.38 vs. 1.40 ± 0.65; p < 0.01) and POW1 (0.50 ± 0.18 vs. 1.47 ± 0.41; p < 0.01) (Table 1). Aprepitant patients used fewer rescue antiemetics (1.00 ± 0.77 vs. 1.64 ± 0.99; p < 0.01) and oral opioids (2.09 ± 0.77 vs. 2.86 ± 1.14; p < 0.01) in the first postoperative week (Table 2).

Conclusions: Adding aprepitant to standard antiemetic prophylaxis significantly reduces both nausea severity and vomiting incidence following oculofacial plastic surgery. This simple adjunct may enhance patient comfort, reduce complications, and improve perioperative outcomes in oculoplastic practice.

Figure 1

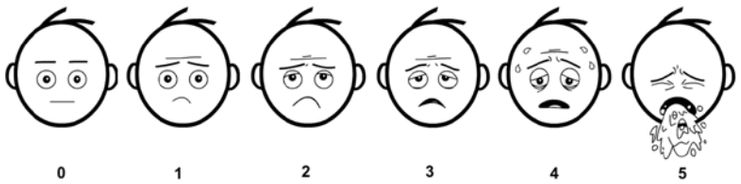

Figure 2

Figure 2. Postoperative Nausea and Vomiting

	Aprepitant Group (n=34)	Placebo Group (n=43)	p-value
Post-operative Day 1			
Nausea Verbal Analog Scale (95% CI)	0.56 (0.18-0.94)	1.40 (0.75 – 2.04)	< 0.01
Emesis (%)	0% (0/34)	16.3% (7/43)	0.01
Post-operative Week 1			
Nausea Visual Analog Scale (0-5)	0.50 (0.32 – 0.68)	1.47 (1.05 – 1.88)	< 0.01
Emesis	0% (0/34)	16.3% (7/43)	0.01

Figure 3

Figure 3. Postoperative Medication Usage

	Mean Number of Ondansetron Tablets (95% CI)	Mean Number of Opioid Tablets (95% CI)	p-value
Aprepitant	1.00 (0.23 - 1.77)	2.09 (1.32 – 2.86)	< 0.01
Placebo	1.64 (0.65 – 2.63)	2.86 (1.72 – 4.01	< 0.01

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9:00–9:06 am

Comparison of Biomarkers to Distinguish Between Orbital Infectious Diseases

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Introduction: Orbital infectious processes (including necrotizing fasciitis (NF) and orbital cellulitis (OC)) often present in similar fashions, although the management varies by etiology, making rapid diagnosis is critical to the initiation of appropriate therapy. Several previous studies have explored cell-based biomarkers, in the hopes of distinguishing between NF and OC. The Laboratory Risk Indicator for Necrotizing Fasciitis score (LRINEC) is a well-validated metric to diagnose NF in systemic disease, although this system has not been employed in orbital disease. This study was undertaken to compare the efficacy of previously established biomarkers and the LRINEC in differentiating NF and OC in the largest known cohort of patients with these diagnoses.

Methods: LRINEC scores, neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), monocyte-to-lymphocyte ratio (MLR), and neutrophil-to-platelet ratio (NPR) were calculated retrospectively on first blood draws of patients who presented to a tertiary care Emergency Department (ED) with radiographically and histologically confirmed diagnoses of OC and NF. Statistical analyses were conducted using a dedicated statistical software package, comparing differences between groups via Mann-Whitney tests, and receiver operating characteristic (ROC) curves. P-values of < 0.05 were considered statistically significant.

Results: Our cohorts included 21 patients with NF, and 21 patients with OC. The LRINEC scores (P Value = 0.3400, AUC = 0.5862), MLRs (P Value = 0.2204, AUC = 0.6164), and PLRs (P value = 0.5489 , AUC = 0.5582) were not statistically significantly different in OC and NF. NLRs (P value = 0.0051, AUC = 0.7593) and NPRs (P Value = 0.0002, AUC = 0.8254) were statistically significantly higher in NF, as compared to OC.

Conclusions: This study employed the largest data set to date of patients with NF and directly compared the biomarkers of these patients to those with orbital cellulitis. While the LRINEC may be useful in systemic NF, it failed to distinguish orbital NF from OC. Nonetheless, the NLR and NPR rapidly and accurately differentiated between these conditions. Given that these biomarkers are readily available and easily calculated, they could be used as a paradigm shifting first step to accurately screen patients to ensure swift and appropriate surgical interventions for these life- and vision-threatening conditions.

9:06–9:12 am

Management of Erdheim-Chester Disease with BRAF and MEK Inhibitors in 8 Cases with Ophthalmic Manifestations

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Introduction: Erdheim-Chester Disease (ECD) is a rare, slow-growing histiocytic tumor with potentially life-threatening multi-organ involvement, including the pituitary, kidneys, intraabdominal region, cardiovascular system, bones, orbit, eyes, skin, testes, and other visceral organs. Ophthalmic involvement has been reported in 25 to 30% of cases. Patients are usually referred to ophthalmology clinics either due to ocular symptoms or for systemic screening. Recent advancements in understanding the disease's pathophysiology, particularly involving the BRAF, MAPK, and RAS pathways, along with the development of targeted therapies, have resulted in new treatments. However, the efficacy of these treatments in managing ocular manifestations remains limited, with sparse data in the literature.

Methods: A retrospective chart review was conducted in Kellogg Eye Center and University of Michigan Health System between Jan 2010 to April 2025.

Results: 8 ECD patients with ophthalmic manifestations were included. 7 patients experienced ophthalmic symptoms from ECD (bilateral orbital involvement in 6, uveitis in 2 patients). 1 patient had a visual field defect due to an occipital lobe stroke secondary to the epicardial/pericardium involvement. BRAF mutation was positive in 5 patients (63%), negative in 2 (25%), and equivocal staining was observed in 1 patient (13%). 5 patients were treated with only BRAF inhibitors (Vemurafenib in 4 patients, and first Vemurafenib and later Dabrafenib in 1 patient), 2 patients with only MEK inhibitors (Cobimetinib in 1 patient, first Cobimetinib, later Binimetinib and last Trametinibin 1 patient), and 1 patient with both BRAF and MEK inhibitors (Vemarafenib and first Cobimetinib and later Trametininb). 3 patients (Vemurafenib in 1 patient, Cobimetinib in 2 patients) discontinued medication due to side effects. During the mean duration treatment of 43 months (range; 7 - 123 months), all patients except one who used Vemurafenib showed a response to treatment. This patient switched Vemufenib therapy to Dabrafenib, and showed a complete response. The response was observed as less enhancement of orbital lesions in MRI and decrease/ disappearance of FDG activity of body lesions in PET scan. During the mean follow-up of 11 years (range; 1.4 - 26 years), 6 patients continued the medication to control the disease. 1 patient used dabrafenib

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therapy for 2 years and topped. 2 years later, he developed a recurrence. 1 patient who could not tolerate the targeted therapy had the progression of the disease and finally died. The side effects included acneiform rash, diarrhea, fatigue, fever, nausea, vomiting, photosensitivity, joint pain/edema.

Conclusions: Bilateral orbital involvement is a common eye manifestation in ECD. Targeted therapy including BRAF and MEK inhibitors are effective treatments for ECD and long-term treatment might be needed.

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9:12–9:18 am

Orbital and Ophthalmic Outcomes after Transorbital Neuroendoscopic Surgery

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Introduction: Transorbital approaches to the skull base provide minimally invasive access to a variety of anatomic locations within the anterior and middle cranial fossa with decreased surgical morbidity in appropriately selected cases. Each location poses a differing degree of unique surgical challenges. The purpose of this study is to provide a location-based analysis of ophthalmic data and surgical outcomes of patients who underwent transorbital neuroendoscopic surgery (TONES).

Methods: A retrospective consecutive case review was performed. Included subjects underwent transorbital surgical approaches with oculoplastic and neurological surgery at a single center between 2016 and 2024. Subjects were stratified into four groups based on pathology location: intradural, extradural (excluding cavernous sinus), cavernous sinus, and hyperostotic sphenoid wing meningiomas (HSWM). Demographic information and comprehensive visual data were collected.

Results: Thirty-five subjects were included (Table 1). Subjects were stratified into four groups: dura opened (n=9), dura intact (n=12), cavernous sinus (n=7), and hyperostotic sphenoid wing meningioma (n=7). Overall, best-corrected LogMAR visual acuity improved by a mean of 0.26 Snellen lines (Table 2). Visual gains were seen in the intradural (0.43 Snellen lines), extradural (0.60), and cavernous sinus cohorts (1.57) (Table 3). The HSWM group experienced a mean decrease of 1.71 Snellen lines. Fourteen patients completed pre- and postoperative HVF testing. Overall, mean deviation scores improved from −3.59±4.28dB to −1.82±2.82dB. Improvements were observed in all groups except the extradural group, which demonstrated a decline from −0.13±2.39dB to −1.24±1.90dB. Additional data are summarized in Table 3. A small subset of subjects developed new, perioperative neuropathies (Table 4). All new diplopia, ptosis, and extraocular motility deficits resolved, however 66% of subjects with postoperative V1 or V2 hypoesthesia had persistent numbness at most recent follow-up.

Conclusions: Despite the varying degrees of surgical difficulty based on anatomic location, the majority of visual outcomes after TONES trended toward improved, and there was no statistically significant difference between the anatomically stratified groups.

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Two subjects that experienced a postoperative decline in vision underwent TONES for resection of a HSWM with involvement of the optic canal. One developed a post-operative macular hemorrhage, and vision at most recent follow-up was 20/30. The second had decreased visual acuity and signs of optic neuropathy pre-operatively. It is unclear if another surgical approach would have yielded different results given the inherent challenges of the case.

Two subjects in the extradural group demonstrated slightly decreased mean deviations on HVF post-operatively. Both subjects had normal post-operative visual acuities and ophthalmic examinations. Both demonstrated non-specific, scattered deficits on HVF inconsistent with optic neuropathy or any other pathology pattern.

The overall cohort showed a statistically significant improvement in EOM deficits, diplopia, exophthalmos, likely due to resolution of tumor compression. When stratified into groups, there were no statistically significant differences for EOM deficits, diplopia, trigeminal hypoesthesia, ptosis, or globe symmetry.

These results provide evidence that transorbital approaches to carefully selected cases with intradural, extradural, and cavernous sinus pathology as well as HSWM may all have a favorable morbidity profile from an ophthalmic perspective when performed by expert, multidisciplinary teams in carefully selected cases.

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Figure 1

Patient Demographics	Results
n	35
Mean age (years)	Median 52.45, IQR 33.9
Female (%)	60.0
Caucasian (%)	88.5
Post-operative follow up (weeks)	Median 34.4; IQR 112.4
Procedure type (number of subjects)	Subtotal resection: 16 Gross total resection: 11 Lesion biopsy: 6 Encephalocele repair: 2
Pathologic diagnosis (number of subjects)	Meningioma: 11 Schwannoma: 4 Fibrous tumor: 4 Metastasis: 2 Encephalocele: 2 Astrocytoma: 2 Orbital Inflammation: 2 Low Grade Glioma: 2 Prolactinoma: 1 Dermoid Tumor: 1 Craniopharyngioma: 1 High Grade Glioma: 1 Lymphoma: 1 Adenoma: 1
Tumor location (number of subjects)	Sphenoid Wing: 12 Cavernous Sinus: 7 Meckel's Cave: 4 Temporal Lobe: 4 Middle Fossa: 3 Anterior Fossa: 2 Petrous Apex: 1 Sella: 1 Temporalis Fossa: 1

Figure 2

Overall Outcome	Time	P value
LogMAR Visual Acuity (Snellen Chart)	Preoperative: 0.43 ± 0.26 (20/53.8) Postoperative: 0.37 ± 0.18 (20/46.8) Delta per patient: -0.26 lines	p=0.39
Intraocular Pressure (mmHg)	Preoperative: 14.68 ± 3.11 Postoperative: 15.16 ± 4.18	p=0.66
Dyschromatopsia (%)	Preoperative: 23.0 Postoperative: 10.0 Complete Resolution: 3 patients	p=0.06
Diplopia (%)	Preoperative: 31.4 Postoperative: 11.8 Complete Resolution: 7 patients	p=0.01
Extraocular Movement Deficits (%)	Preoperative: 36.7 Postoperative: 24.2 Complete Resolution: 3 patients	p=0.04
Exophthalmos (mm) measured by MRI	Preoperative: 19.41±2.9 Postoperative: 17.85±2.5	p=0.04
Mean Deviation 24-2 (dB)	Preoperative: -3.59 ± 4.2 Postoperative: -1.82 ± 2.8	p=0.35
Post-operative Symmetry (%)	Exophthalmos: 7 Enophthalmos: 7 Symmetric: 84	
Length of Hospitalization (days)	Median 2.00; IQR 3.00	
Length of Surgery (hours)	Median 5.65; IQR 1.92	

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Figure 3

Stratified Opthalmic Outcomes	Intradural (dura opened)	Extradural (dura intact)	Cavernous Sinus	HSWM
LogMAR Visual Acuity (Snellen)	Preoperative: 0.11± 0.15 (20/25.7) Postoperative: 0.03± 0.13 (20/21.4)	Preoperative: 0.12± 0.15 (20/26.3) Postoperative: 0.10± 0.11 (20/25.2)	Preoperative: 1.45±1.64 (20/563.7) Postoperative: 1.28±1.75 (20/381.1)	Preoperative: 0.14±0.18 (20/27.6) Postoperative: 0.64±1.48 (20/87.3)
Mean Deviation 24-2 (dB)	Preoperative: -0.77 ± 1.12 Postoperative: -0.21 ± 1.20 Delta: 0.55	Preoperative: -0.13± 2.39 Postoperative: -1.24 ± 1.90 Delta: -0.24	Preoperative: --10.52 Postoperative: -2.27 Delta: 8.25	Preoperative: -7.25± 7.96 Postoperative: -3.02 ± 3.61 Delta:1.64
Intraocular Pressure (mmHg)	Preoperative: 14.75± 1.9 Postoperative: 13.40± 5.4	Preoperative: 13.33± 1.37 Postoperative: 17.25± 2.82	Preoperative: 14.83± 2.31 Postoperative: 15.40± 5.68	Preoperative: 15.83± 5.23 Postoperative: 13.86± 3.02
Dyschromatopsia (%)	Preoperative: 0.00 Postoperative: 0.00 Resolution: N/A	Preoperative: 12.5 Postoperative: 0.00 Resolution: 1 patient	Preoperative: 40.0 Postoperative: 25.0 Resolution: 1 patient	Preoperative: 40.0 Postoperative: 20.0 Resolution: 1 patient
Diplopia (%)	Preoperative: 0.00 Postoperative: 0.00 Resolution: N/A	Preoperative: 50.0 Postoperative: 27.3 Resolution: 3 patients	Preoperative: 43.3 Postoperative: 14.3 Resolution: 1 patient	Preoperative: 28.6 Postoperative: 0.00 Resolution: 2 patients
Extraocular Movement Deficits (%)	Preoperative: 0.00 Postoperative: 0.00 Resolution: N/A	Preoperative: 50.0 Postoperative: 40.0 Resolution: 1 patient	Preoperative: 42.9 Postoperative: 28.6 Resolution: 1 patient	Preoperative: 42.9 Postoperative: 14.3 Resolution: 2 patients
Exophthalmos (mm)	Preoperative: 18.15± 1.77 Postoperative: 17.25± 3.10	Preoperative: 19.77± 2.38 Postoperative: 18.52± 2.45	Preoperative: 19.00± 3.94 Postoperative: 17.61± 1.64	Preoperative: 22.51± 2.54 Postoperative: 20.98± 3.41

Figure 4

Perioperative neuropathies	Intradural (dura opened)	Extradural (dura intact)	Cavernous Sinus	HSWM
EOM deficits (%)	33.3	0	0	0
Resolved (%)	100	N/A	N/A	N/A
Days to resolution	182	N/A	N/A	N/A
Diplopia (%)	22.2	0	0	0
Resolved (%)	100	N/A	N/A	N/A
Days to resolution	45	N/A	N/A	N/A
Hypoesthesia (%)	33.3	25.0	25.0	57.1
Resolved (%)	0	33	0	0
Days to resolution	N/A	90	N/A	N/A
Ptosis (%)	22.2	9.1	14.2	28.1
Resolved (%)	100	100	0	50
Days to resolution	60	60	N/A	30

9:18–9:24 am

Surgical Details for Use of the Titanium Strut Bar in Inferomedial Blow-out Fractures

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Introduction: The 3-point titanium strut bar reconstruction provides control of internal orbital architecture by recreating the inferomedial orbital strut.

Methods: Methods: The medial and inferior orbit are exposed through a combined Baylis transcaruncular and fornix incision, with the inferior oblique tagged and cut. The centerpiece of the inferomedial orbital architecture is the maxillary-ethmoid strut. We recreate this architecture by using a titanium bar with a slight bend to recreate the post-equatorial convexity. The titanium bar is placed onto the palatine bone ledge using direct visualization or, in difficult cases, by palpation. The bar is then fixated to the inferomedial orbital rim using a single titanium screw. A 60mm wraparound implant can then be placed spanning the orbital roof (aiming for 10mm overlap on the frontal bone), the titanium strut bar, and the zygomatic shelf. This 3-point fixation replicates and controls the internal orbital architecture.

Results: Accurately restoring the internal orbital architecture in large inferomedial blow-out fractures can be difficult because of limited view of the deep fracture edges. Preformed implants sometimes end up out of position posteriorly and medially. The strut bar reconstruction takes advantage of 3 anatomic surfaces that can be identified with confidence: the orbital roof, the palatine bone, and the zygomatic shelf.

Conclusions: With the titanium strut bar resting on solid bone and restoring the inferomedial orbital architecture, a wraparound implant can be placed from the orbital roof to the zygomatic shelf with confidence that the deep orbital volume will be controlled.

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Figure 1

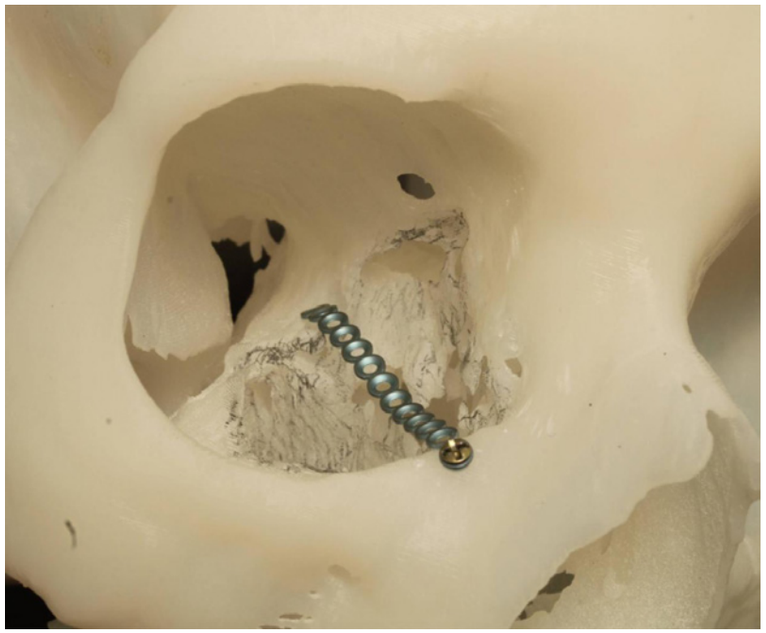


Figure 2

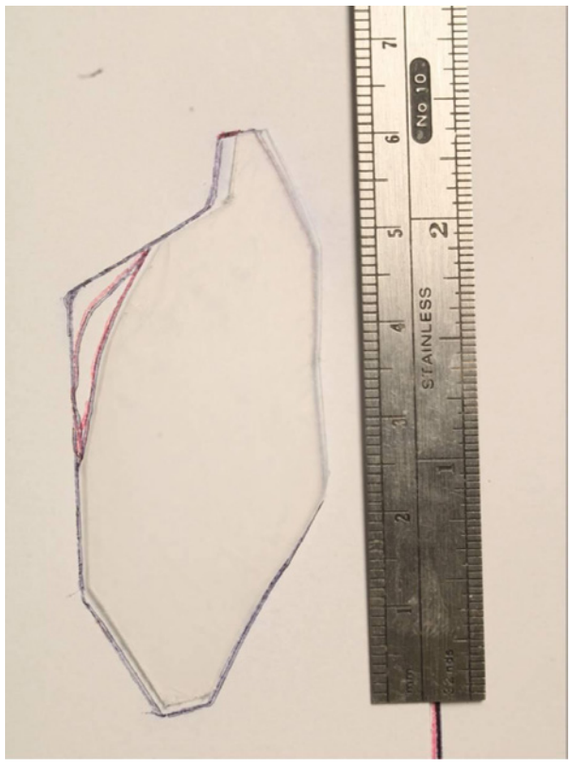
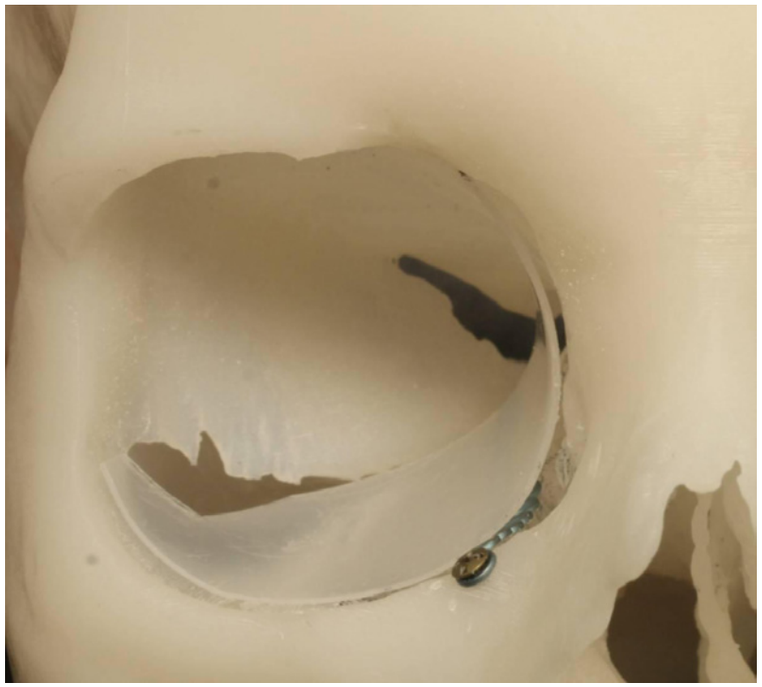


Figure 3



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9:24–9:30 am

Retrobulbar and Intravitreal Anesthesia in the Acute Management of Traumatic Optic Neuropathy in a Mouse Model

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Introduction: Traumatic optic neuropathy (TON) is an uncommon cause of permanent vision loss following orbital blunt force trauma.[1,2] The neuroprotective effects of anesthetics have been demonstrated in various settings. Intravenous lidocaine administered before and during transient focal cerebral ischemia in rats decreased infarct size and improved neurologic outcomes.[3] In a glaucomatous mouse model, retrobulbar injection of lidocaine to precondition retinal ganglion cells (RGCs) improved RGC survival and preserved pattern electroretinogram (PERG) function.[4] We investigate the effects of retrobulbar anesthetic injections and intravitreal ketamine on modulating the glutamate excitotoxicity pathway to provide neuroprotection in a TON animal model.

Methods: Twenty-three C57BL/6J mice were subjected to sonication-induced traumatic optic neuropathy (SI-TON) injury protocol.[5] Left optic nerves were injured in all animals; right optic nerves remained uninjured. Four were placed in the naïve group without undergoing SI-TON. The control group (n=10) received intravitreal injections (2 mL) and retrobulbar injections (3 mL) of PBS on Day 0. The treatment group (n=13) received intravitreal injection of ketamine (0.0475 g) and retrobulbar injection of ropivacaine (3 mg) mixed with lidocaine gel (52.5 mg). Treatment group animals had the injured eye sutured closed for one week to reduce retinal phototransduction. No eyelid suture fusion was performed in controls. Longitudinal PERG assessments were performed at weeks 0, 1, 2, 4, 6, 8, 10, and 12. Optical coherence tomography (OCT) measured ganglion cell complex (GCC) thickness at weeks 0 and 12. At week 12, mice were sacrificed; eyes were enucleated, and retinas were whole-mounted for RGC counts.

Results: RGC Density: At 12 weeks, RGC density over the entire retina was significantly higher in the treatment group (614.1±46.92 cells/0.2mm²) compared to the control group (463.3±64.91 cells/0.2mm²) ($p<0.001$) (Figure 1). The treatment group had higher numbers of RGCs in the peripheral ($p<0.05$), middle ($p<0.05$), and central ($p<0.01$) retina (Figure 1).

PERG: Baseline a-wave amplitudes were 21.75±2.15 µV for the treatment group and 22.28±2.87 µV for the control group ($p>0.05$). At 12 weeks, the treatment group had significantly larger a-wave amplitudes (18.72±2.70 µV) than the control group (13.00±2.20 µV) ($p<0.01$) (Figure 2). Treatment group a-wave amplitudes were not significantly different from baseline measurements at each time point. Latency was not different between treatment and control groups at any time point.

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OCT: The baseline average GCC thickness was 69.06±3.76 µm and 72.50±4.92 µm in the treatment and control groups, respectively ($p>0.05$). After 12 weeks, the average GCC thickness was 64.42±4.60 µm in the treatment group compared to 57.07±2.75 µm in the control group ($p<0.01$) (Figure 3). In contrast to the control group, the treatment group's GCC thickness at 12 weeks was not significantly different from baseline.

Conclusions: Retrobulbar ropivacaine and intravitreal ketamine injections following SI-TON injury confer structural and functional neuroprotection to RGCs. This is evidenced by higher RGC density, preserved a-wave amplitudes on PERG, and thicker GCC on OCT compared to controls at 12 weeks. These findings underscore the potential influence of glutamate excitotoxicity in neuropathic progression and offer a promising new direction for TON treatment, opening up intriguing possibilities for future research and clinical practice.

Figure 1

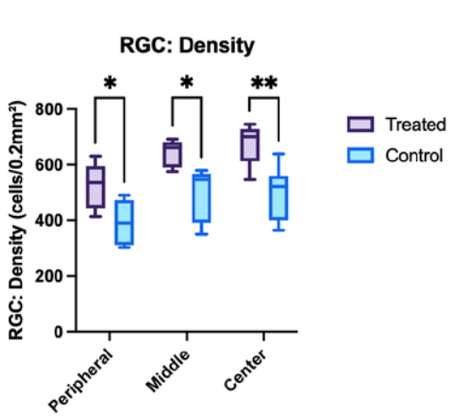
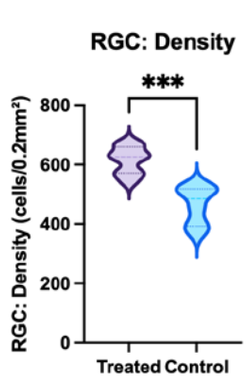


Figure 2



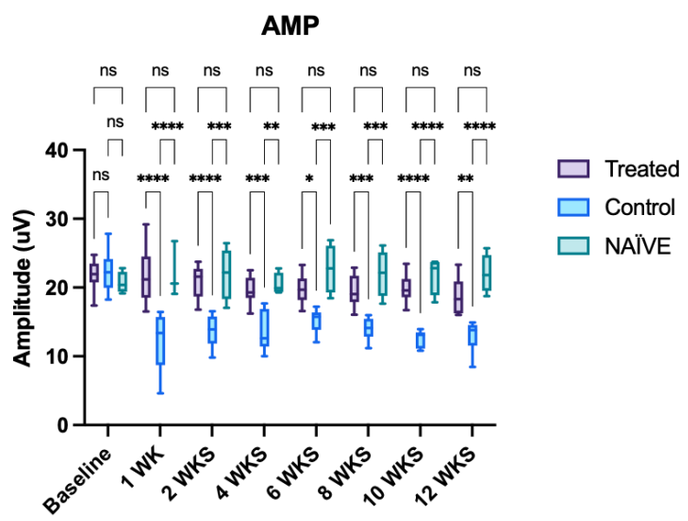
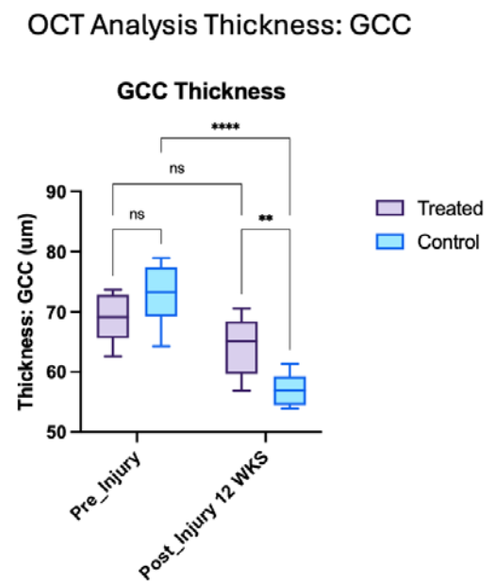


Figure 3



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9:30–9:36 am

Transcaruncular Medial Orbitotomy for Anterior and Posterior Ethmoid Neurectomy for Refractory Nonallergic Rhinitis

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Introduction: We describe the first documented case report of a scarless, transcaruncular approach to transect the anterior ethmoidal nerve (AEN) and posterior ethmoidal nerve (PEN) for treatment of persistent clear thin rhinorrhea (CTR) from chronic nonallergic rhinitis (NAR), a prevalent condition caused in part by sinonasal mucosal trigeminal and/or autonomic dysfunction that affects up to 40 percent of the general population [1].

Methods: A 55 year-old male presented with bilateral NAR-related CTR that was responsive to ipratropium bromide nasal spray and partially responsive to posterior nasal nerve cryoablation. This case report describes the surgical approach for a more permanent treatment of CTR via transection of the ipsilateral AEN and PEN to remove further sensory and autonomic innervation to the sinonasal mucosa.

Results: A right-sided transcaruncular incision was made between the plica semilunaris and caruncle (Figure 1A). Blunt dissection was continued posteriorly to the posterior lacrimal crest. A vertical periosteal incision was then made onto the lamina papyracea, and subperiosteal dissection was carried posteriorly to identify and ligate the anterior and posterior ethmoidal neurovascular bundles (Figures 1B-1C). Hemostasis was ensured (Figure 1D). An acellular dermal matrix was placed subperiosteally over both ethmoidal foramina to prevent nerve regeneration (Figure 1E). Postoperatively, the patient had no orbital complications, maintaining his baseline visual acuity, full extraocular movements, and symmetric Hertel exophthalmometry measurements. Most notably, his right-sided CTR resolved, and at 24 months postoperatively, he still reported improved right-sided CTR not requiring additional medical therapy.

Conclusions: In rare scenarios when medical and surgical therapies aimed at the vidian or posterior nasal nerves provide inadequate relief for NAR-related rhinorrhea, patients have very limited options. AEN and PEN are not well-studied as contributors to chronic rhinitis, though recent studies have demonstrated both sensory and autonomic fibers in the AEN, and therefore the ethmoidal nerves are potential targets for select patients[2,3]. There have been isolated reports of AEN glycerol rhizotomy[4] and AEN endonasal neurotomy[5] for rhinitis, but no large studies with long-term follow-up have been performed related to ethmoidal nerve treatments. Transecting the AEN and PEN endonasally can be challenging due to their relationships with the skull base, which carries a significant risk of intraoperative cerebrospinal fluid leak. Additionally, it requires complete sinus surgery to expose the skull base, carrying further morbidity of

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postoperative epistaxis and sinusitis related to wound healing as well as frontal sinus ostial stenosis. A transcutaneous Lynch incision could be considered, but causes visible scarring plus potential injury to the trochlea and nasolacrimal apparatus[6]. The transcaruncular medial orbitotomy is a scarless approach that provides optimal access for both AEN and PEN transection. This technique should be considered in rhinitis patients after careful multidisciplinary evaluation due to possible orbital complications.

Figure 1

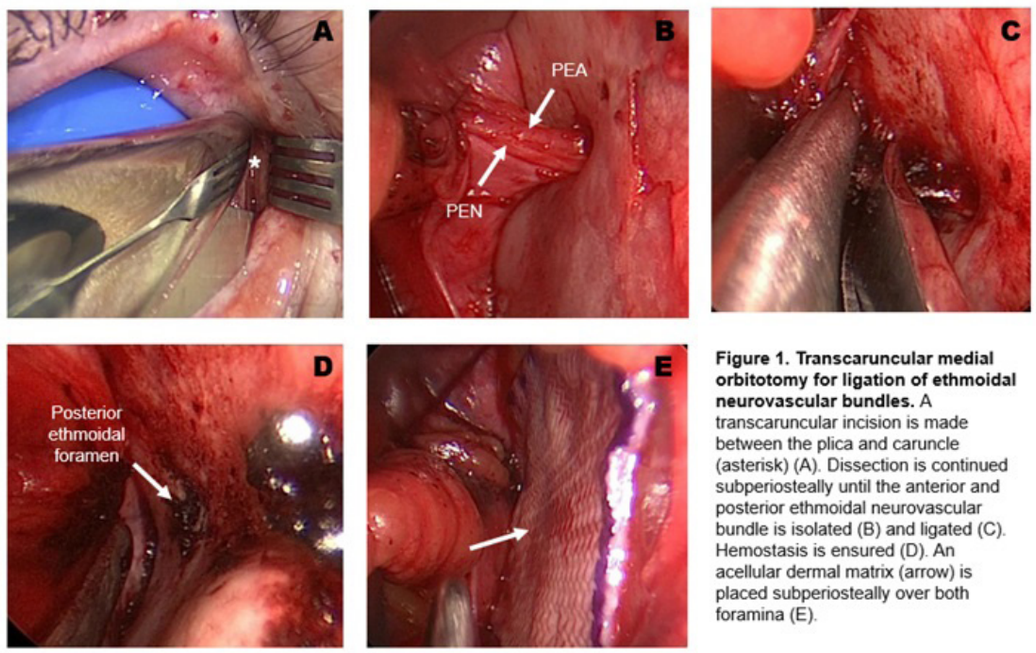

Figure 1. Transcaruncular medial orbitotomy for ligation of ethmoidal neurovascular bundles. A transcaruncular incision is made between the plica and caruncle (asterisk) (A). Dissection is continued subperiosteally until the anterior and posterior ethmoidal neurovascular bundle is isolated (B) and ligated (C). Hemostasis is ensured (D). An acellular dermal matrix (arrow) is placed subperiosteally over both foramina (E).

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10:19–10:25 am

Does Adjuvant Radiotherapy Prevent Local Tumor Recurrence in orbital Solitary Fibrous Tumor with Clinical/Histopathological Risk-Factors?

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Introduction: Solitary fibrous tumors (SFT) are uncommon spindle cell tumors of mesenchymal origin, most often arising from the pleura[1]. Infrequently they arise from various other sites including lungs, peritoneum, pericardium, kidneys, liver and rarely from orbit.[2-5] Surgical excision remains the treatment of choice, however with 9-11% local tumor recurrence. We have evaluated the role of adjuvant radiotherapy (RT) in preventing recurrence post-excision in cases with SFT.

Methods: Retrospective, interventional, consecutive, comparative case series of 35 patients with SFT (with clinical and histopathological risk factors), with and without adjuvant RT following surgical excision, were assessed with local tumor control as the primary outcome measure. Clinical and histopathological risk factors included: Age >45 years, size >3 cm, tumor necrosis, mitoses >4/2 mm², moderate-to-high cellularity and moderate-to-severe pleomorphism.

Results: SFT constituted 1% of all surgically managed orbital tumors. Median age was 34 years (range 14 - 63 years) with male predominance M:F 3.3:1. The mean duration of symptoms was 2.1 + 2.0 years (range 4 days to 10 years) with proptosis 33 (94.3%), restricted motility 20 (57.1%), diminished vision 11 (31.4%), ptosis 9 (25.7%), strabismus 6 (17.1%) and a palpable mass 21 (60%) located anteriorly 12 (34.3%) or supero-medially 8 (22.9%). Fundus evaluation showed choroidal folds 5 (14.3%), disc edema 3 (8.5%), disc hyperemia 3 (8.5%) and optic atrophy 3 (8.5%). Magnetic resonance imaging showed well-defined, intraconal, iso-dense, contrast enhancing mass with fossa formation. Excision biopsy was performed via anterior orbitotomy 16 (45.7%), lateral orbitotomy 11 (31.4%) or transconjunctival approach 6 (17.1%). Diffuse cases were managed with debulking 2 (5.7%). Histolopathologically, the tumors were epithelioid or mixed with CD34, Bcl2 and CD99 positivity. Adjuvant RT was given in 14 (40.0%). Local tumor recurrence was seen in

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10 (28.6%) with only 1 (2.9%) from the RT cohort and 9 (25.7%) from the non-RT cohort ($p<0.05$). Of the 35 patients with clinical and histopathological risk factors, 14 (40.0%) were provided RT and 21 (60.0%) were not. Local tumor recurrence in this subgroup was 1 (2.8%) with RT and 9 (25.7%) without RT ($p=0.02$). At the mean follow up of 14.9 + 4.8 years all had local and systemic tumor control.

Conclusions: A thorough clinical evaluation, meticulous surgical excision, and a detailed histopathology, followed by adjuvant RT specifically in patients with clinical and histopathological risk factors are recommended to reduce the risk of local tumor recurrence in orbital SFT.

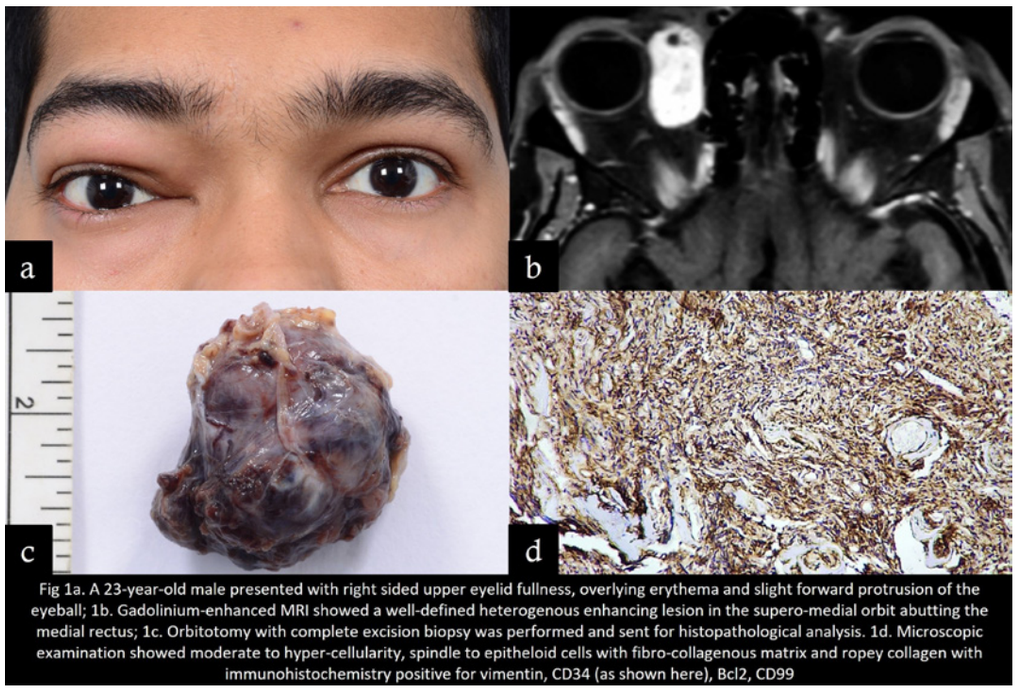

Fig 1a. A 23-year-old male presented with right sided upper eyelid fullness, overlying erythema and slight forward protrusion of the eyeball; 1b. Gadolinium-enhanced MRI showed a well-defined heterogenous enhancing lesion in the supero-medial orbit abutting the medial rectus; 1c. Orbitotomy with complete excision biopsy was performed and sent for histopathological analysis. 1d. Microscopic examination showed moderate to hyper-cellularity, spindle to epitheloid cells with fibro-collagenous matrix and ropey collagen with immunohistochemistry positive for vimentin, CD34 (as shown here), Bcl2, CD99

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10:25–10:31 am

Second Primary Malignancies: Hidden Threats of Survival in Ocular Adnexal Extranodal Marginal Zone Lymphoma

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Introduction: Ocular adnexal extranodal marginal zone lymphoma (OA-EMZL) possessed excellent survival prognosis and complete remission rate; nevertheless, previous studies have proved that the incidence of second primary malignancies (SPMs) significantly increased in systemic lymphoma patients. No exclusive literature had provided information regarding SPM in OA-EMZL so far. We therefore aimed to reveal the outcomes of OA-EMZL and the concurrence of SPMs.

Methods: We performed a 30-year retrospective cohort study in a tertiary center from January 1995 to November 2024. Patients with primary OA-EMZL were included. Patient demographics, AJCC 8th staging, overall survival (OS) and recurrence free survival (RFS) were collected and analyzed. We also collected the characteristics of SPMs and analyzed the effects of SPMs on survival rates in OA-EMZL patients.

Results: There were 380 OA-EMZL patients enrolled in this study with a median follow-up period of 56 months (range: 1 - 294). The mean age was 49.8314.24 years, and male sex comprised of 47.6%. Among these patients, complete remission was achieved in 95%. The 5- and 10-year overall survival (OS) rates were 94.5% and 87.5%; 5-and 10-year recurrence free survival (RFS) rates were 93.6% and 85.1%, respectively. Older age ($p < 0.001$), advanced N ($p = 0.0212$) and M ($p = 0.0383$) staging contributed to worse RFS. A total of 43 patients (11.3%) had SPMs during the follow-up period, and the most prevalent location was in the gastrointestinal tract (n = 12, 27.9%). Patients with SPM were significantly older (57.98, SD 13.83 versus non-SPM: 48.79, SD 13.98 years, $p < 0.001$), and associated with less favorable OS (hazard ratio: 3.00, 95% CI 1.01 – 9.91, $p = 0.047$).

Conclusions: Excellent survival prognosis and favorable complete remission rate are the hallmark of OA-EMZL; nevertheless, older age was related to less optimal survival outcomes. Secondary primary malignancies (SPM) might develop as patients aging and led to unfavorable survival rates. Clinicians should be aware of the possible comorbidity of SPM and undertake multidisciplinary scrutinization for OA-EMZL patients periodically.

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Figure 1

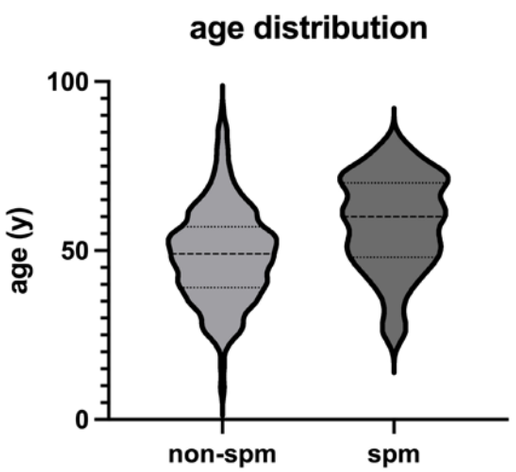
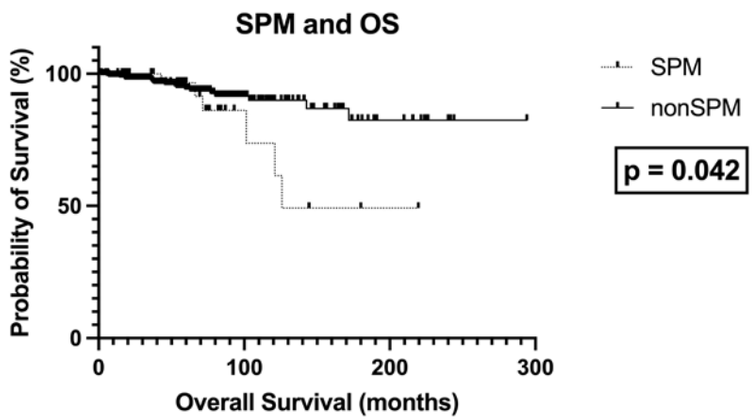


Figure 2



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10:31–10:37 am

Intraoperative Fluorescence of Ocular Adnexal Sebaceous Cell Carcinoma Using 5-Aminolevulinic Acid (5-ALA): Proof of Concept Case Report

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Introduction: Sebaceous cell carcinoma (SebCCa) is a rare and aggressive malignancy of the periocular region with high rates of local recurrence and orbital invasion due to its tendency for pagetoid spread and multicentricity. Achieving clear surgical margins remains a challenge, especially when tumor infiltration is subtle. 5-Aminolevulinic acid (5-ALA), a prodrug that induces tumor-selective fluorescence through accumulation of protoporphyrin IX, has been widely used in neurosurgical oncology but has not been reported in orbital malignancies.[1,2] Recent studies have also applied 5-ALA gliadin to non-glioma/glioblastoma tumors, demonstrating fluorescein uptake for a variety of proliferative malignancies including non-glial CNS neoplasms,[3,4] and head and neck squamous cell carcinomas.[5] These studies suggest that 5-ALA may serve as a marker for proliferative activity, distinguishing between cancerous and noncancerous tissue. This case report explores the utility of 5-ALA in the intraoperative visualization of periocular SebCCa.

Methods: An 80-year-old male presented with a large right upper eyelid and conjunctival biopsy proven invasive SebCCa. He was scheduled for orbital exenteration with sentinel lymph node biopsy and anterolateral thigh flap reconstruction. Preoperative MRI revealed asymmetric preseptal enhancing soft tissue thickening in the right eyelid and conjunctiva, without clear evidence of globe or retrobulbar invasion. Two hours before the induction of general anesthesia, the patient received an oral dose of 5-ALA (20 mg/kg). Intraoperative fluorescence was evaluated three hours post-ingestion using a blue light excitation source (405 nm wavelength) (Zeiss Pentero 800S Neurosurgery microscope and handheld bluelight flashlight) to identify areas of abnormal tissue. Postoperative histopathologic analysis was used to correlate fluorescent regions visualized intraoperatively with tumor involvement.

Results: Intraoperative examination under blue light 3-4 hours after the administration of 5-ALA revealed distinct fluorescence over the inferior and superior medial bulbar and tarsal conjunctiva and caruncle, as well as the superior bulbar and forniceal conjunctiva laterally, extending to the lateral canthus (Figures 1 and 2). These fluorescent regions were not grossly distinguishable under white light (Figure 1). Histopathologic evaluation performed by an ophthalmic pathologist masked to the intraoperative findings confirmed SebCCa in the fluorescing areas. Tumor margins, which were non-fluorescent, were also free of histopathologic evidence of tumor. Two sentinel
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lymph nodes were identified and excised. Although one of the sentinel lymph nodes had a high level of radioactivity intraoperatively, neither of them fluoresced and both were negative on histopathology. The patient had neither elevation in liver function tests postoperatively nor adverse reactions to 5-ALA.

Conclusions: This case demonstrates the successful intraoperative visualization of adnexal SebCCa using 5-ALA-induced fluorescence. The correlation between fluorescent areas and histopathologically confirmed tumor supports the feasibility of this approach in assisting with targeted “mapping” biopsies and with guiding tumor resection. 5-ALA may offer a valuable adjunct in the surgical management of SebCCa, especially in cases requiring margin control or involving occult tumor spread. Further investigation is warranted to evaluate the sensitivity and specificity of 5-ALA in periocular and orbital tumors and to explore its broader applications in oculoplastic oncology.

Figure 1

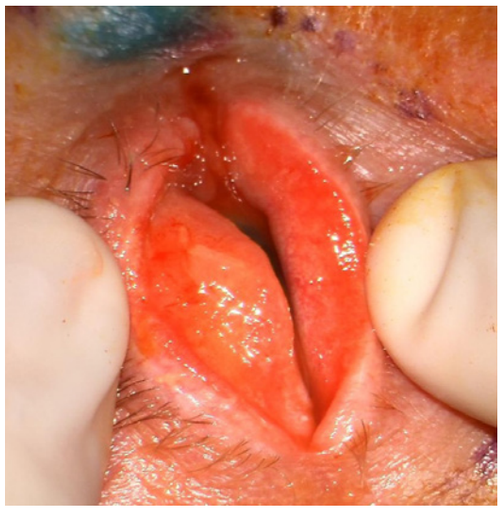
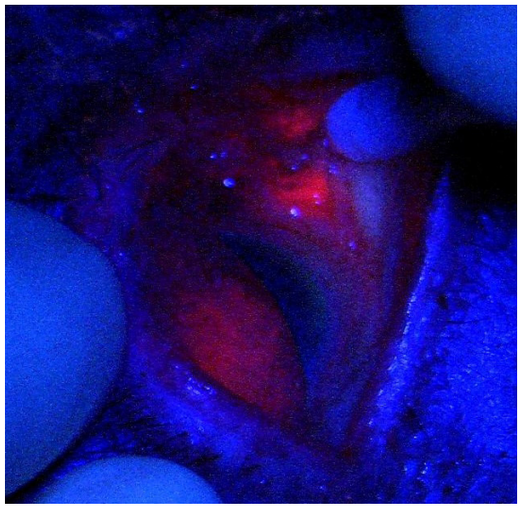


Figure 2



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10:37–10:43 am

Retrospective Analysis of Optic Nerve Biopsies at One Center Over a 20 Year Span

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Introduction: Evaluation of disease isolated to the optic nerve can be challenging, particularly in cases where 'safe' biopsies are equivocal (such as analysis of serum and cerebrospinal fluid) and no other tissue is involved on systemic imaging. Some of these conditions can be life-threatening and include central nervous system (CNS) lymphoma[1], neurosarcoidosis[2], and glioblastoma[3,4], among others. Biopsy of the optic nerve is often considered a last resort in patients with progressive vision loss of uncertain etiology because of surgical morbidity, but may be the only way to secure a diagnosis. We present a case series from one academic center spanning 20 years.

Methods: Retrospective, single-center, descriptive analysis of patients at Wills Eye Hospital from 2005 to 2025 who underwent optic nerve biopsy by the senior authors (JRB and JJE). Patients were included if they underwent optic nerve biopsy via orbitotomy alone or in conjunction with Otolaryngology and/or Neurosurgery transnasally. Data collected included patient age, gender, past medical history (specifically looking for a history of cancer or autoimmune disease), clinical presentation, laterality, features on magnetic resonance imaging, initial work-up and presumed diagnosis, initial treatment, pre-operative vision, final pathology, most recent recorded vision, and condition at last clinical follow-up.

Results: Eleven patients underwent biopsy of the optic nerve during this time period, 7 (64%) of whom were women. All biopsies were unilateral, with six on (55%) right. Age ranged from 15-80 years, with a median of 66 years. No patients had a prior cancer history. Three (27%) patients had a history of autoimmune disease. Prior to pursuing optic nerve biopsy, all patients (100%) underwent extensive evaluation of the cerebrospinal fluid (CSF) and serum with equivocal results, and all patients underwent an empiric corticosteroid trial without improvement. Four (36%) patients additionally underwent computed tomography(CT) of the chest, abdomen, and pelvis, two (18%) had positron emission tomography (PET)/CT from skull base to mid-thigh, one (9%) underwent vitreous biopsy, one(9%) underwent genetic testing, and one(9%) underwent bone marrow biopsy; all testing had equivocal results. Prior to optic nerve biopsy, vision ranged from 20/40 to NLP, with an average of ~HM (logMAR 2.22). Post-operative vision at last recorded visit ranged from 20/20-NLP with an average of ~LP (logMAR 2.73). Four (40%) patients had worsening of vision postoperatively, four (40%) had stable vision, and two (20%)
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had improved vision. Pathology was obtained via orbitotomy alone in eight patients, and in three cases via a transnasal skull base approach to the orbital apex or optic canal. Final pathology (Figure 1) showed neurosarcoidosis in three (27%) patients, optic nerve sheath meningioma in two (18%) patients, malignant optic glioma of adulthood (MOGA) in four (36%) patients, and diffuse large B-cell lymphoma in the remaining two (18%); of note, ON biopsy provided definitive diagnosis in all eleven patients. At most recent follow-up, eight (72%) of patients were alive with well-controlled or stable disease. The remaining three (27%) who died were all patients with MOGA.

Conclusions: The current analysis describes eleven patients in which an optic nerve biopsy was required to make a definitive diagnosis. Overall, 60% of patients maintained stable or improved vision with biopsy. The vast majority of optic nerve pathology can be diagnosed with a combination of history, examination, neuroimaging, and serologic work-up. However, optic nerve biopsy may be necessary in a small minority of atypical cases. In this case series, significant, potentially life-threatening diagnoses were made, allowing for appropriate therapeutic intervention.

Figures

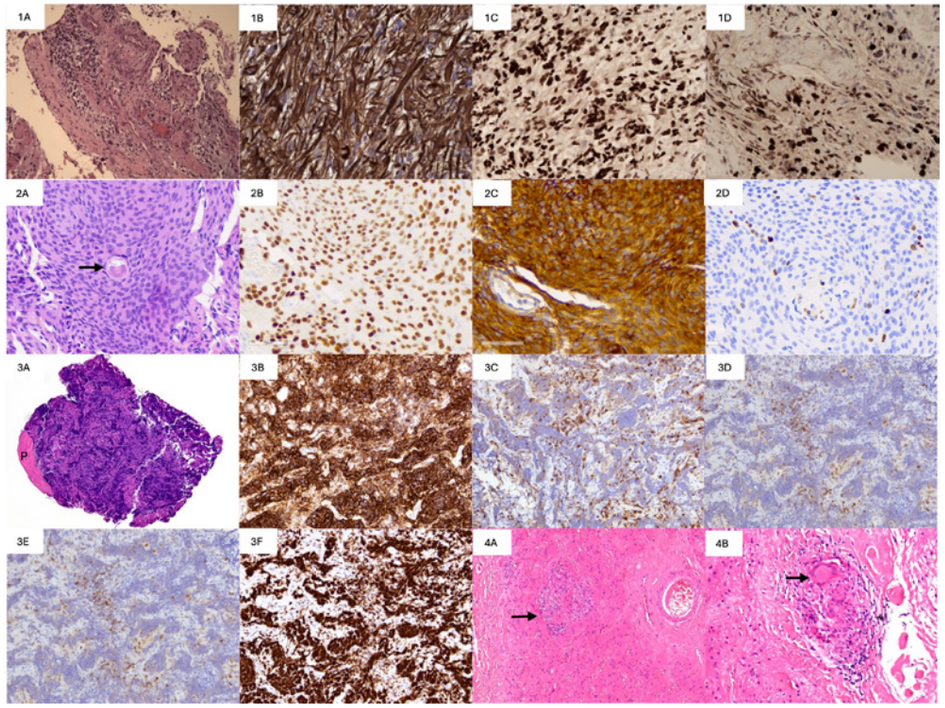

Figure Legend:

1A) An astrocytic neoplasm with microvascular proliferation(*) and high mitotic activity, immunohistochemistry was positive for GFAP (1B) and Olig2 (1C). Ki-67 index was elevated (1D). All together consistent with a malignant optic nerve glioma, Glioblastoma WHO grade 4.

2A) Neoplastic cells with minimally pleomorphic nuclei, and a lamellar extracellular calcification, "psammoma body" (arrow). No appreciable nuclear atypia, necrosis, or mitotic figures was noted. Immunohistochemistry noted a strong nuclear expression of progesterone receptors in neoplastic nuclei (2B) and immunoreactivity for somatostatin receptor 2 (2C). Ki-67 showed ~1% nuclei (2D). All together consistent with a meningothelial meningioma, WHO Grade 1.

3A) A cellular, diffuse, sheetlike infiltrate of lymphoid cells is present in the orbital soft tissue adjacent to the parenchyma (P). Atypical lymphocytes were positive for CD20 (3B) on immunohistochemistry, and negative for CD3 (3C), CD5 (3D), BCL2 (3E) and CD10. Ki67 showed a proliferative index of 90% (3F). The findings are compatible with diffuse large B-cell lymphoma.

4A) Non-necrotizing granulomas involve the parenchyma of the optic nerve (arrow).
4B) Higher magnification highlights the sarcoidal-type granuloma, composed predominantly of histiocytes with a narrow rim of lymphocytes. A Langhans-type giant cell is also present (arrow).

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10:43–10:49 am

Beyond the Eye: Eyelid Complications Following Brachytherapy for Intraocular Tumors

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Introduction: Brachytherapy for intraocular tumors can lead to long-term ocular complications, including keratitis, radiation cataract, neovascular glaucoma, retinopathy, and optic neuropathy. While these sequelae are well documented, the effects on adjacent ocular adnexa remain underreported. This study aimed to investigate the development of ipsilateral eyelid disorders (IEDs) in patients following brachytherapy.

Methods: We conducted a retrospective cohort study of all patients who underwent ocular brachytherapy between 2009 and 2023 at a single tertiary center. Data on tumor characteristics, brachytherapy parameters, and oculofacial examination findings were analyzed. The primary outcome was the association between brachytherapy and acquired IEDs.

Results: A total of 207 patients were included, with 107 females (51.6%) and a mean age of 63.5 ± 14.3 years. All tumors were malignant melanoma: choroidal (n = 167, 80.7%), ciliary body (n = 30, 14.5%), iris (n = 9, 4.3%), and anterior segment (n = 1, 0.5%). Isotopes used included Iodine-125 (n = 163, 78.7%) and Ruthenium-106 (n = 44, 21.3%), with a mean total radiation dose of 81.3 ± 3.5 Gy. Plaque insertion surgery required muscle disinsertion or diversion in 98 cases (47.3%).

IEDs developed in 44 cases (24.4%), predominantly affecting the upper eyelid. Ptosis was the most common finding (n = 39, 88.6%), followed by trichiasis (n = 1, 2.2%), ectropion (n = 1, 2.2%), and eyelid lesions (n = 3, 6.8%). The rate of IEDs was independent of gender, age, plaque diameter, radiation dose, laterality, isotope type, muscle manipulation, or use of tarsorrhaphy. However, upper eyelid ptosis was significantly associated with anterior tumor location (p = 0.04).

Conclusions: Brachytherapy for intraocular tumors can significantly impact the ipsilateral eyelid, most commonly causing acquired unilateral ptosis. Increased awareness of these potential sequelae and timely referral to oculoplastic specialists are advised.

10:49–10:55 am

Radiologic Features on MRI Correlated with Choice of Surgery (Eye-Sparing Vs. Orbital Exenteration) in Patients with Lacrimal Gland Adenoid Cystic Carcinoma

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Introduction: Eye sparing surgery for lacrimal gland carcinomas has become a more acceptable surgical option in recent decades but a small proportion of patients are still selected for orbital exenteration as the lesion is otherwise not amenable to gross total resection by the eye sparing approach. The goal of this study is to determine if certain features of lacrimal gland adenoid cystic carcinoma (LGACC) on pre-operative magnetic resonance imaging (MRI) were associated with the treatment decision to perform orbital exenteration versus eye-sparing surgery.

Methods: The MRIs of consecutive patients with LGACC treated by orbital exenteration (group1) versus eye-sparing surgery (group 2) from June 2007 through March 2024 were reviewed by a CAQ-certified neuroradiologist. Data analyzed included patient demographics, T category at presentation, and MRI features including T1 post-contrast enhancement patterns and T2 signal characteristics. The location of the LGACC including which quadrant of the orbit was involved and distance of the tumor margin from the superior orbital fissure (SOF), bone remodeling and destruction, involvement of the extra-ocular muscles (EOMs), temporal fossa, pterygopalatine fossa, sinonasal cavity, intracranial compartment, and the presence of perineural tumor spread were analyzed.

Results: : The study included 16 patients with a median age of 52.6 years (range: 32-70) in group 1 and 23 patients with a median age of 46.1 years (range: 13-73) in group 2. Several radiologic features were significantly correlated with the choice of surgery (Table 1). A greater T-stage and larger size of the tumor (average size - group 1: 3.8 cm; group 2: 2.9 cm) were significantly more common in group 1. Smooth tumor margins were significantly more common in Group 2, while irregular margins were significantly more common in Group 1. No significant difference was noted between T1 post-contrast patterns and T2 features. The distance from the tumor margin to the SOF [median - group 1: 7.5 mm (range: 0-23); group 2: 15 mm (range: 0-41)] was significantly less in group 1. Crossing the vertical midline of the orbit, bone destruction, and invasion of the EOMs were significantly more common in group 1. Extension to involve the cavernous sinus, pterygopalatine foramen, and sinonasal cavity, as well as perineural spread, were only present in group 1.

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Conclusions: MRI features of LGACC more commonly associated with orbital exenteration as a choice of surgery as opposed to eye-sparing surgery included larger size and irregular margins, as well as a location of the tumor margin closer to the SOF, crossing the vertical midline of the orbit, bony destruction, and involvement of the EOMS. Knowledge of these MRI features may aid oculoplastic surgeons in selecting patients with LGACC who may be candidates for successful eye-sparing surgery.

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11:06–11:12 am

Patient Perceptions of Oculofacial Plastic Surgeon Attire

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Introduction: Studies assessing patient preferences for physician attire have been conducted in various specialties, with notable findings on impact of attire on patient satisfaction and confidence in patient care.[1,2,3,4,5] A recent study assessing public perception of scrub color and style for plastic surgeons found that navy and blue fitted scrubs worn by plastic surgeons were more positively perceived as it relates to skill, trustworthiness, knowledge, and compassion by the public.[2] Another study showed white coat was the most preferred style among neurosurgery patients for their surgeons' attire[6]. There are few studies on patient perceptions of physician attire in ophthalmology [1,3] with differing results, suggesting that patient preferences may vary by specialty. Currently there are no studies in English literature exploring patient preferences specifically for oculofacial plastic surgeons' attire. Our study aims to explore patient preferences for oculofacial plastic surgeons' attire to better inform physician practices and enhance patient satisfaction.

Methods: In this multi-center cross-sectional survey study, patients across 5 different oculofacial plastic surgery clinics (3 academic, 1 private, 1 hospital-based) were given optional online surveys to assess preference on physician attire. Inclusion criteria were patients 20-79 years old with access to device to complete the online survey. Patients who had cognitive or visual impairments were excluded from the study. RedCap was used to create the 11-question anonymous survey. Images of physicians wearing different attire (scrubs and professional clothes both with and without white coats) were generated using Vivid AI, a text-to-image artificial intelligence application. All images were artificial and did not correspond to real-world persons. Responses were collected from March 31 to April 25, 2025. Descriptive statistics and chi-square analysis were used for analysis.

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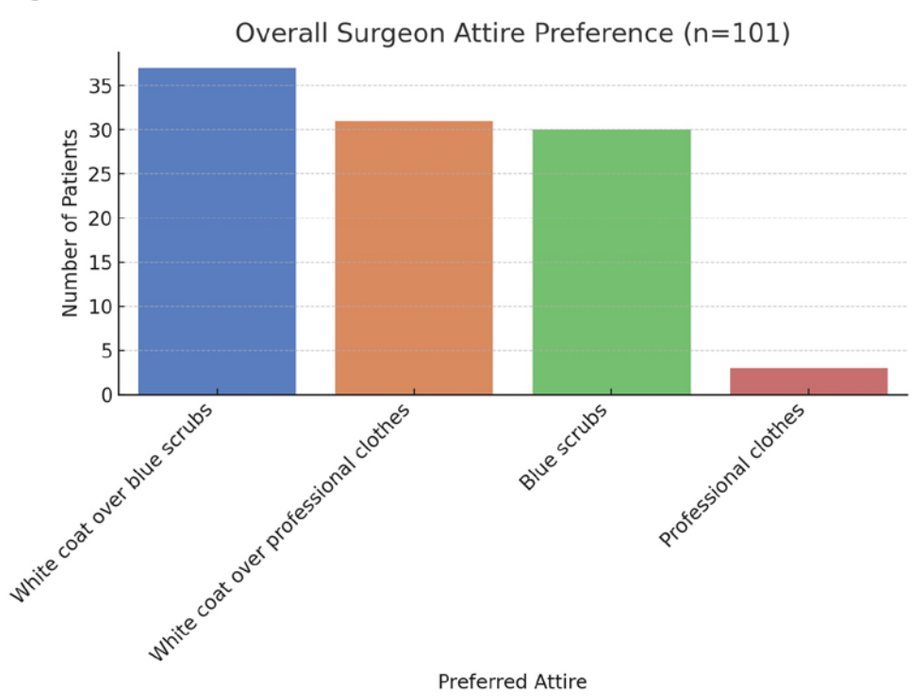
Results: A total of 101 patients completed the survey. 74% of respondents were female, 24% were male and 2% preferred not to disclose. The most common age group was 40-49 years (26% of cohort). Majority of respondents held bachelor's degree (29%) or master's degree (26%). The most common reason for visit was cosmetic (39%), followed by medical (33%). The majority of patients (46%) preferred their oculoplastic surgeon (regardless of gender) to wear blue scrubs with a white coat ($p<0.00001$). There was no statistically significant difference for preferences based on patient demographics, practice setting, or reason for visit using chi-square analysis. When evaluating scrub color, blue was significantly associated with the highest levels of trustworthiness, intelligence, and kindness for both male and female surgeons ($p<0.00001$).

Conclusions: In our study, patients significantly favored oculofacial plastics surgeons wearing blue scrubs when evaluating trustworthiness, intelligence and kindness, consistent with previous research in other surgical specialties assessing scrub color preference. However, unlike prior studies that demonstrated an overall preference for formal attire with a white coat, our patients preferred blue scrubs with a white coat. We believe this data can help inform physicians on patient preferences to enhance patient satisfaction and trust.

Figure 1



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11:12–11:18 am

How many Oculoplastic Fellowships are Needed to Meet the Future Demand for Ophthalmic Plastic Surgeons in the United States for the Next 10, 20, and 30 Years?

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Introduction: Investigate the number of oculoplastic surgeons in 2023 versus the expected future supply and demand for oculoplastic surgeons in the United States. Our study aims to provide data and analysis for the purpose of matching the number of fellowships to the expected demand as there has been no such study done by the American Society of Ophthalmic Plastic and Reconstructive Surgery executive board.

Methods: Data was collected on Ophthalmic Plastic Surgeons using the American Academy of Ophthalmology's membership directory. It was estimated that each surgeon's age in 2023 based on the year they graduated from medical school. Three models were used to estimate how many surgeons will retire in the next 10, 20, and 30 years. Model one assumes an average retirement age of 62, model two assumes an average retirement age of 65, and model three assumes an average retirement age of 69. The number of expected retirees to the number of newly graduated fellows entering the workforce was compared. Using the U.S. Census Bureau's population projections, the expected ratio of Ophthalmic Plastic Surgeons to the United States population for 2033, 2043, and 2053 was calculated.

Results: Assuming an average retirement age of 69, the estimated number of practicing OPS in 2023 was 735, making the OPS to population ratio 1 OPS per 455 000 people. If the number of Ophthalmic Plastic Surgery fellowships remains constant (57 two-year long fellowships), the OPS to population ratio in the year 2033 is estimated to be 1 per 449 000.

Conclusions: Assuming that the average OPS retires at the age of 69, no changes are necessary in the number of fellowships to maintain the 2023 OPS to population ratio until the year 2033. After 2033, there will likely be a slight oversupply of surgeons compared to the expected demand.

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AAO Membership Type	Number of OPS	Average Age
All Membership Types	973	59
Acitve	659	52
Life Fellow: limited benefits	169	74
Life fellow	116	71
Retired Life Fellow	16	83
Fellow: not practicing	8	76
Second Year Fellow	2	35
Life member	1	84
Past President fellow	1	62
Past president life fellow	1	67

2023 OPS per population ratio if counting	
all 973 AAO members is 1 OPS per :	343509
those younger than 62 years old is 1 OPS per:	594722
those younger than 65 years old is 1 OPS per:	521426
those younger than 69 years old is 1 OPS per:	454740

Table 2: OPS to population ratios for the year 2023 depending on different average retirement ages.

Fellowships needed to maintain 2023 ratio of 1 OPS per 454740 people assuming retirement at 69			
Year	Total OPS needed	Required reduction of OPS	Required change in yearly fellowships
2033	767	-9	-1
2043	786	-15	-2
2053	795	-90	-9

Fellowships needed to maintain 2023 ratio of 1 OPS per 454740 people assuming retirement at 65			
Year	Total OPS needed	Required change in number OPS	Required change in yearly OPS fellowships
2033	767	105	10
2043	786	80	8
2053	795	-63	-6

Fellowships needed to maintain 2023 ratio of 1 OPS per 454740 people assuming retirement at 62			
Year	Total OPS needed	Required change in number OPS	Required change in yearly OPS fellowships
2033	767	180	18
2043	786	138	14
2053	795	-61	-6

Table 5: Depending on the average retirement age of OPS, the changes in the number of fellowships needed to maintain the 2023 ratio of 1 OPS to 455 000 people varies from one less fellowship to 18 additional yearly fellowships.

tio if retirement at 62	OPS / Population ratio if retirement at 65	OPS / Population ratio if retirement at 69
95 000	1 / 521 000	1 / 455 000
92 000	1 / 525 000	1 / 449 000
51 000	1 / 505 000	1 / 450 000
23 000	1 / 422 000	1 / 408 000

ulation ratios over the next 3 decades based on three different average retirement ages.

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11:18–11:24 am

Lack of Oculofacial Plastics Subspecialty Representation among Ophthalmology State Society Leadership

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Introduction: State ophthalmology societies play a critical role in professional advocacy initiatives. Having diverse leadership allows for unique perspectives when influencing policy at the local and national level. The goal of this study was to evaluate the composition of ophthalmologists in leadership positions within all 52 U.S. state and territorial ophthalmology societies, including representation of subspecialties, gender, career stage, practice setting, and geographic region.

Methods: A cross-sectional analysis was conducted of 2024 board members from all 52 U.S. state and territorial ophthalmology societies identified in the American Academy of Ophthalmology directory. Board members were identified using state ophthalmology society websites and supplemental web searches. For each board member, demographic and professional information was determined through publicly available sources, including personal and institutional websites. Data included gender, subspecialty, career stage (early: 15 years), and practice setting (academic, private practice, or community). Geographic regions were categorized per U.S. Census Bureau classifications: Northeast, South, Midwest, West, or Territories. Statistical analysis, including chi-square goodness-of-fit tests, was performed using Excel and statistical software (α=0.05).

Results: Of 52 societies, 51 had identifiable presidents. 525 board members were identified; 16 states did not have board members publicly listed. After excluding trainees and retirees, 503 board members were included in analysis. Most board members were late stage (58.3%), male (67%), and affiliated with private practice (65.2%). The highest proportion of board members was located in the South (40%), followed by Midwest (22.7%), West (19.1%), Northeast (15.9%), and Territories (1.6%). The most common subspecialties represented included comprehensive (34%), retina (18.5%), glaucoma (12.1%), cornea (11.9%), pediatrics/strabismus (8%), and oculoplastics (7.2%). Uveitis (1.4%), neuro-ophthalmology (1.2%), and oncology (0.4%) were least represented. *Surprisingly, relative to subspecialty national society members, uveitis was most represented (6.33% of U.S.-based American Uveitis Society members), followed by oculoplastics (5.72% of ASOPRS in the US), glaucoma (5.57% of AGS), retina (4.72% of ASRS/Macula Society), and neuro-ophthalmology (2.3% of NANOS), with total membership numbers pending for AAPOS, ACRCS, and AAOOP.*

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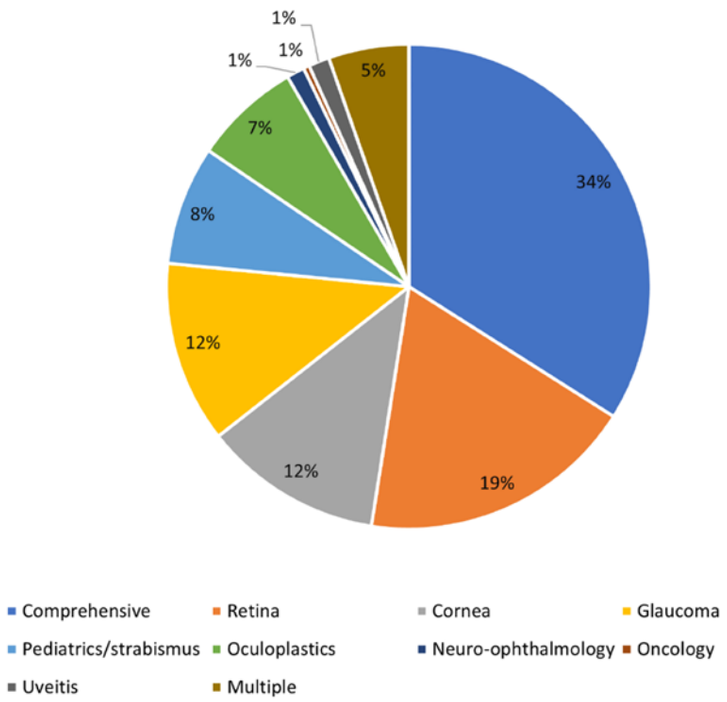
Among 44 oculoplastic surgeons identified, the majority (77.3%) were male (p<0.001). There were significantly more oculoplastic board members affiliated with private practices (61.4%) compared to academic (34.1%) and community health centers (4.5%, p<0.001). In addition, mid- (38.6%) and late-career (56.8%) oculoplastic specialists were significantly more represented than those early in their career (4.5%, p<0.001). More board members were based in the South (43.2%) and Midwest (22.7%), compared to the Northeast (18.2%) and West (15.9%) (p=0.042). Notably, 5 held dual degrees (1 PhD, 3 MBA, 1 MPH), and 8 received additional fellowship training in other specialties, including neuro-ophthalmology, pediatrics/strabismus, and ocular oncology/pathology. Chi-square goodness-of-fit testing revealed that differences in gender, affiliation, career stage, and geographic representation among oculoplastics did not significantly differ from the distribution in representation among all board members.

Conclusions: Our study shows disparities in subspecialty representation among the leadership of state academies of ophthalmology. Oculofacial plastics, in particular, was relatively underrepresented. Among state board members specializing in oculofacial plastics, most were male, late-career, and affiliated with private practice. Encouraging early-career engagement and improving representation across subspecialties, gender, affiliation, and geographic areas are critical to strengthening advocacy efforts for our subspecialty, and for Ophthalmology within the larger house of Medicine.

Figure 1



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11:24–11:30 am

Blast Impact: Periocular Firework Injuries Post-Legalization in Iowa

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Introduction: Firework use of handlers and innocent bystanders is associated with significant risk of harm and was responsible for up to 12,000 injuries and an average of 10 non-occupational firework-related deaths in the United States annually from 2008 to 2023.1 In addition to injuries to the face and hands, significant periocular injury and even loss of the eye leading to permanent disability can occur.

Legislation has been shown to affect the incidence of these injuries, with lower incidence reported in areas where firework sale and use are prohibited.3 On May 9, 2017, Iowa Senate Bill 489 (SB489) legalized fireworks sales for 63 days a year.4 Emergency department (ED) admissions for firework-related trauma surged with devastating eye, face, and hand injuries.5 This stressed trainees and faculty across multiple specialties at the University of Iowa necessitating call schedule changes. This study aims to evaluate the impact of SB489 on periocular injuries resulting from increased availability of these explosive devices.

Methods: An IRB-approved retrospective review of ED patients admitted with firework-related periocular injuries between June 1, 2014, and July 31, 2019 was performed. A sub-analysis of data from the University of Iowa Trauma Registry was performed. Injury incidence, severity, and treatments were assessed. The incidence of firework-related periocular injuries before and after legalization was compared using Poisson rate ratio testing. The average age at time of injury was compared using a two sample t-test. $P< 0.05$ was considered significant.

Results: Sixteen ED patients (4 in the 35 months pre- and 13 in the 26 months post-SB489) were admitted with firework-related periocular injuries. Mean ED admissions per year increased from 1.4 to 5.8 (RR = 4.0, 95% CI = 1.4–13.1, $p < 0.02$; Figure 1). Post-SB489, patients were younger (30 vs. 51 years, $p = 0.03$) and a higher proportion handled the fireworks (62% vs. 50%, $p = 0.04$; Table 1). Periorbital edema was the most common injury documented at presentation (21%, RR = 7.9, $p = 0.06$), followed by burns (15%) (Table 2). The most common surgical interventions were non-canalicular eyelid repairs (n=3) and tarsorrhaphies (n=3). During the study period, 3/17 (18%) patients required multiple periocular procedures on separate occasions (median = 2, range = 1-4; Table 3). Bodily injuries, in addition to periocular injuries, were documented in 8 of the 17 patients and included partial or complete digit amputation (24%), tympanic

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membrane rupture (24%), degloving injuries (18%), hand lacerations (18%), burns (12%), and fractures (12%). Billing data was available for three cases, with hospital costs ranging from $62,798.23 to $178,501.91 for all medical care associated with the firework-related injuries.

Conclusions: The legalization of fireworks in Iowa has been associated with a significant rise in firework-related periocular injuries managed at the University of Iowa. The fourfold increase in annual incidence demonstrates the public health implications of expanded access to these explosive products. Targeted strategies such as public education regarding safe handling and eye protection, stricter regulations, and reevaluation of current policy are necessary to prevent more victims of firework-related periocular trauma.

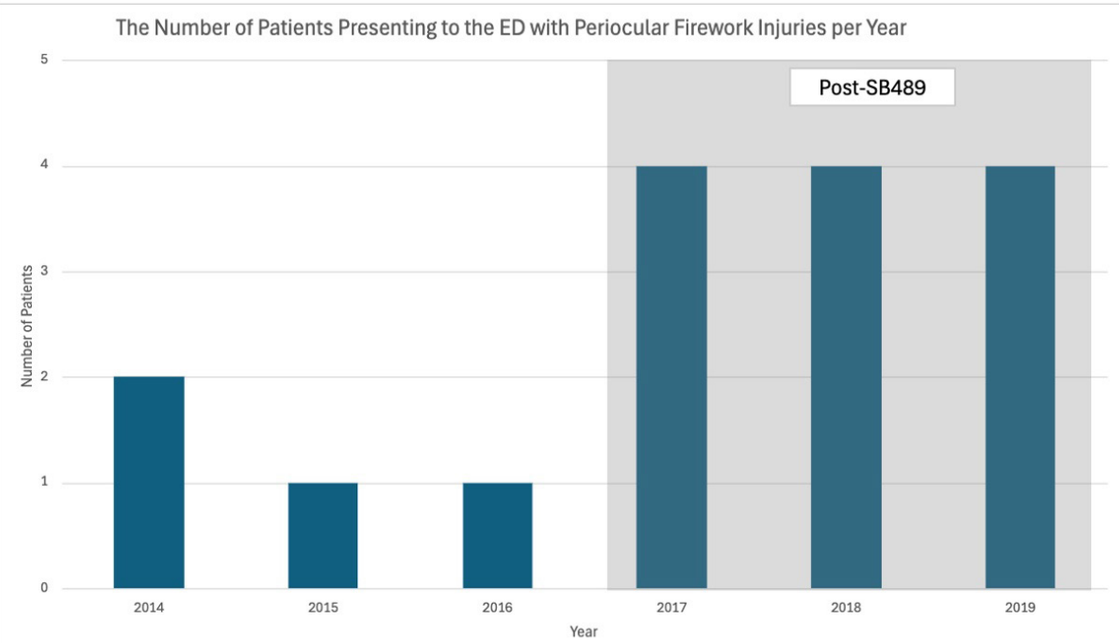

Figure 1 - Patients admitted to the University of Iowa Emergency Department (ED) with firework-related periocular injuries between 2014-2019.

Table 1

Demographic data of patients admitted to the University of Iowa Emergency Department with periocular firework injuries from 2014-2019

Demographic Data	Pre-SB489 (35 months)	Post-SB489 (26 months)	p-value
Age at Injury in years (range, SD)	51 (33-73, 17)	30 (12-54, 14)	0.03
Firework Proximity	Handler (2, 50%) Bystander (2, 50%) Unknown (0%)	Handler (8, 62%) Bystander (3, 23%) Unknown (2, 15%)	0.04 0.46 -

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Table 2

Characterization of firework-related periocular injuries

Periocular Firework Injuries	Percentage (%) of Total Patients	Percentage (%) of Patients Pre-SB489	Percentage (%) of Patients Post-SB489	Incidence Rate Ratio	p-value
Periorbital Edema	21.2	12.5	24.0	7.9	0.06
Periorbital Burns	15.2	12.5	16.0	5.3	0.14
Eyelid Lacerations (non-canalicular)	12.1	37.5	4.0	0.4	0.48
Eyelid Abrasions	12.1	0.0	16.0	11.9*	0.10*
Orbital Fractures	9.0	25.0	4.0	0.7	0.73

*Approximation based on 0.5 continuity correction

Table 3

Surgical management of all periocular firework injuries admitted to the University of Iowa Emergency Department from 2014-2019 inclusive of subsequent procedures required to reach maximum medical improvement

Periocular Surgeries	Number of Surgeries During Study Period
Eyelid repair (non-canalicular)	3
Tarsorrhaphy	2
Enucleation	2
Orbitotomy	1
MMCR	1
Orbital Volume Augmentation	1
Ectropion repair	1
Amniotic membrane placement	1

Note: MMCR – mullers muscle conjunctival resection.

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11:30–11:36 am

Botulinum Toxin Waste in Oculoplastic Procedures

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Introduction: In 2022, the Centers for Medicare & Medicaid Services (CMS) reported $36.8 million and $1.1 million spent on discarded units of onabotulinumtoxinA and incobotulinumtoxinA, respectively. While the U.S. Food and Drug Administration recommends using reconstituted botulinum toxin type A (BoNT-A) within 24 hours, prior studies demonstrate safety and efficacy up to six months (Table 1)[1-7]. OnabotulinumtoxinA and incobotulinumtoxinA are frequently utilized in oculoplastic procedures, such as the treatment of blepharospasm.

This study aims to quantify BoNT-A waste and costs associated with oculoplastics procedures nationally and at a single tertiary eye center. Understanding BoNT-A waste patterns may help identify opportunities to optimize drug utilization and reduce healthcare costs for oculoplastic procedures.

Methods: This is a retrospective cross-sectional study utilizing the Medicare Part B database and institutional billing records. Medicare Part B Physician and Other Practitioners and Spending by Drug databases for 2022 were analyzed to determine volume and payment for oculoplastics procedures nationally. Institutional billing and health records (2019–2024) were also reviewed to characterize utilization patterns at a single tertiary center. CPT code 64612 (chemodenervation of muscle innervated by facial nerve) and HCPCS codes J0585 (onabotulinumtoxinA) and J0588 (incobotulinumtoxinA) were queried. The primary outcome measures were the proportion of BoNT-A units discarded for oculoplastics procedures and the associated costs nationally and at our institution. Sensitivity analyses estimated potential waste and cost reduction at our institution if vial viability was extended beyond the FDA's 24-hour recommendation. Procedure scheduling was modeled by evenly distributing volume into biweekly and monthly intervals to simulate waste reduction scenarios. Volume over six months was projected from the monthly rate.

Results: In 2022, Medicare reported 25,929 oculoplastics procedures billed under CPT code 64612. Our institution averaged 64 oculoplastic chemodenervation procedures annually from 2019–2024. Average payment per unit was $5.27 for onabotulinumtoxinA and $4.94 for incobotulinumtoxinA, with no significant difference compared to CMS rates ($p>0.05$). Nationally, 72.3 units of onabotulinumtoxinA and 53.3 units of incobotulinumtoxinA were administered per procedure, while 35.3 and 50.4 units, respectively,

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were discarded. At our institution, an average of 47.3 units of onabotulinumtoxinA and 56.1 units of incobotulinumtoxinA were delivered per procedure, discarding 42.2 units of each. Overall, 46% of onabotulinumtoxinA utilized at our site was discarded. Based on CMS data, oculoplastic providers nationally discarded 32.6% of onabotulinumtoxinA used, compared to 8.76% across all Medicare providers. OnabotulinumtoxinA waste represented an estimated $4,087,678.83 (27.4% of payment) nationally and $12,083.23 (25.1% of payments) at our site. Sensitivity analyses projected that extending vial viability would reduce onabotulinumtoxinA waste and cost at our institution by 13.5%, 79.5%, and 88.0% if extended to two weeks, one month, and six months, respectively.

Conclusions: Under current guidelines, approximately one-third of reconstituted onabotulinumtoxinA is wasted in oculoplastics procedures. This waste accounts for roughly one-quarter of associated payments, representing a potentially avoidable healthcare cost. Extending the viable use period of reconstituted BoNT-A may offer an opportunity to reduce drug waste and oculofacial procedure costs.

Table 1: Literature Review

Study	Study Design	No. of Subjects	Outcome	Agent	Storage Method	Reconstitution Agent with or without Preservative	Tested Length of Efficacy	Length of Efficacy	Post-injection infection
Hexel et al. 2003	Prospective, multi-center, double blind	88 patients	Treatment of glabellar frown lines	Ona	Refrigerated	100 U/vial in 1 mL sterile saline 0.9% solution without preservative	43 days	43 days	0
Parsa et al. 2007	Prospective controlled study	80 patients	Treatment of glabellar frown lines, forehead transverse lines, lateral canthal rhytids	Ona	Frozen	100 U/vial in 5 mL saline solution without preservative	6 months	6 months	0
Yang et al. 2008	Prospective, double-blind randomized controlled trial	40 patients	Treatment of horizontal forehead rhytids	Ona	Frozen and refrigerated	100 U/vial in 2.5 mL sterile saline 0.9% solution without preservative	2 weeks	2 weeks	0
Park et al. 2013	Rater-blinded randomized study	94 patients	Treatment of extensor digitorum brevis muscle paralysis	Ona	Refrigerated	2.5 MU/0.1 mL Botox in 4 mL normal saline (use of preservative not specified)	4 weeks	4 weeks	0
Osaki et al. 2014	Prospective trial	88 vials	Bacterial or fungal growth after use for essential blepharospasm, hemifacial spasm, facial rejuvenation	Ona	Refrigerated	100 U/vial in 2 mL sterile saline solution without preservative	4 weeks	4 weeks	N/A
Shayesteh et al. 2024	Retrospective study	111 patients	Treatment of axillary hyperhidrosis	Ona and inco	Frozen	Not described	6 months	6 months	0

*ona – onabotulinumtoxinA; inco – incobotulinumtoxinA

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11:36–11:42 am

Reimagining the Operating Room in the Era of Spatial Computing

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Introduction: Spatial computing with devices such as the Apple Vision Pro™ (AVP) is an emerging technology that enables control of virtual content using the eyes, hands, and voice. In the healthcare setting, we utilized this technology to enhance the surgical experience during endoscopic dacryocystorhinostomy (DCR) and evaluated its cost-effectiveness within the operating room environment.

Methods: Institutional Review Board (IRB) approval was obtained for this study. We developed a low-latency workflow using the AVP as a virtual monitor for endoscopic DCR, integrating it with the surgical Endoscopy platform. For redundancy, the traditional endoscopic monitor was available as a failsafe, though the entire surgery was performed using two AVP headsets.

Results: A 50-year-old female with a right nasolacrimal duct obstruction underwent right endoscopic DCR performed entirely with the AVP (Figure 1). From incision to closure, the operation lasted 35 minutes. Within the fully immersive virtual surgical environment, pre-recorded teaching videos and clinical data were organized in a virtual workspace, providing 4K visualization to each eye. The use of AVP by both the surgeon and assistant allowed for a neutral posture without twisting or leaning to view the screen (Figure 2). Using the AVP's digital passthrough, surgeons were able to manipulate instruments in and out of the naris without breaking scrub. All manipulations within the virtual environment—via hand gestures and voice control—were performed in a sterile fashion.

Owing to its compact footprint, the AVP required minimal floor space in the operating room (Figure 3A). In a cost and space analysis of all capital equipment, AVP demonstrated the most favorable object share of cost-to-space ratio. Instruments occupied 41.5% of the space and accounted for 96% of the cost; in contrast, the AVP occupied only 0.42% of the space and 0.72% of the cost—highlighting its superior space and cost efficiency compared to traditional hardware such as the endoscopy tower and monitor (Figure 3B).

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Conclusions: Spatial computing with the Apple Vision Pro is reimagining the surgical experience and represents a disruptive technology that is available today. The AVP has the potential to replace bulky, costly hardware, freeing valuable operating room space. Benefits to the surgeon include unparalleled visualization, enhanced ergonomic comfort, and the potential for improved career longevity through better wellness and posture.

Figure 1: Virtual monitor through Apple Vision Pro

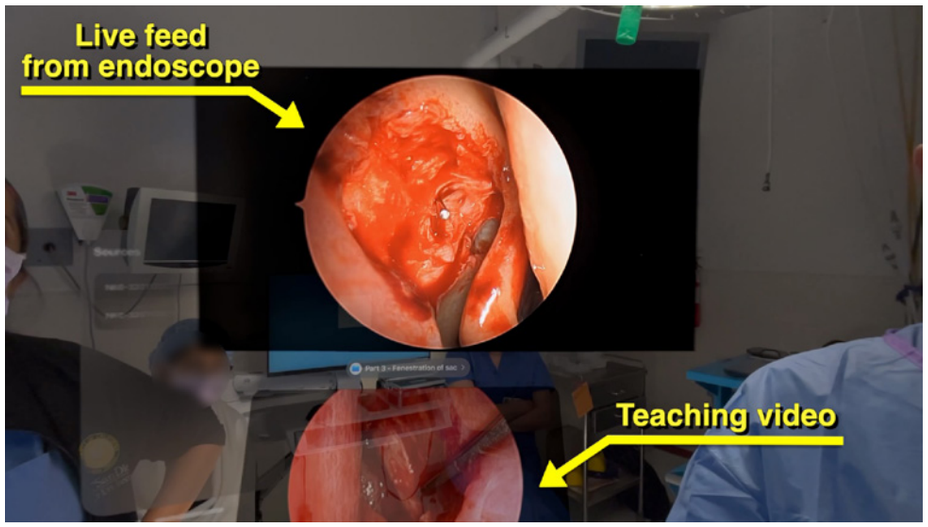
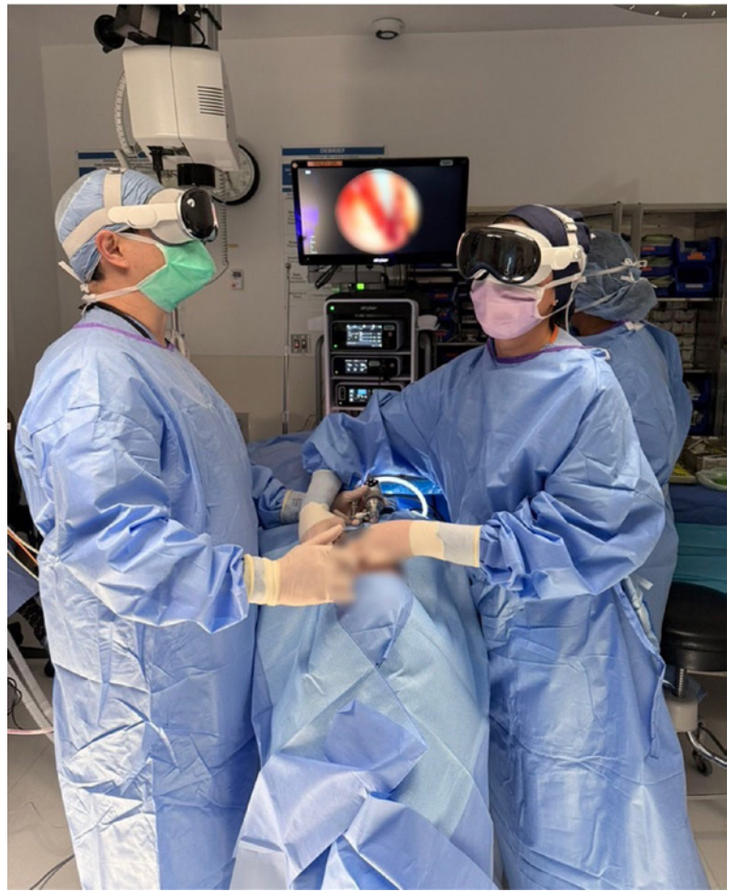


Figure 2: Attending and Fellow operating with the Apple Vision Pro, with enhanced ergonomics.



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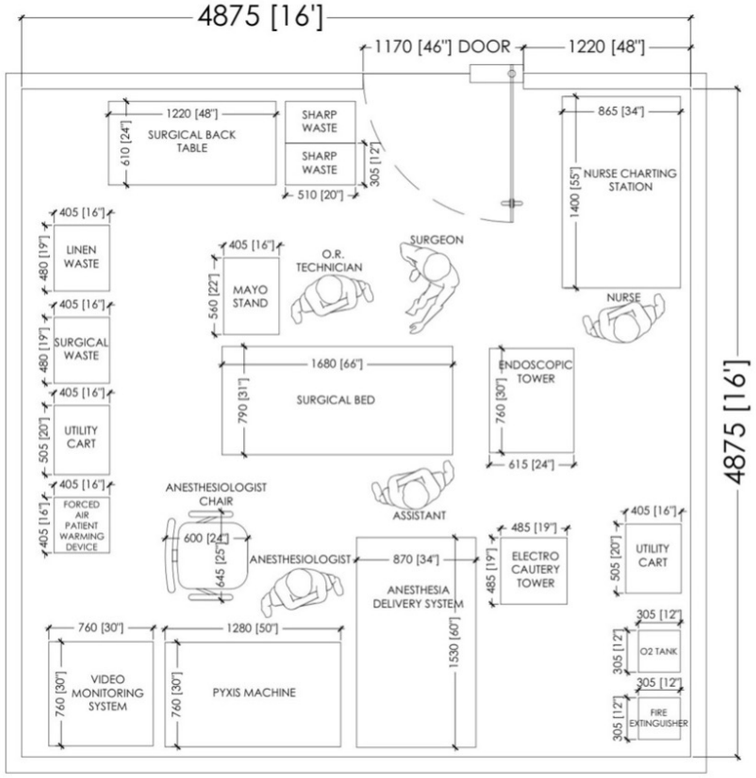
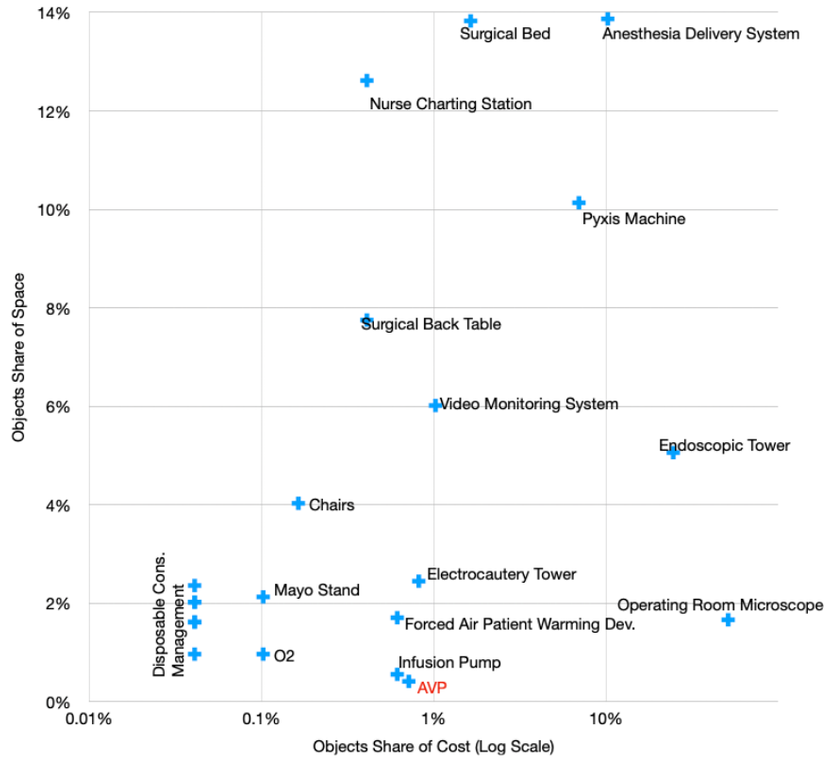
Figures 3A and 3B Share-of-budget X-Y plot showing the share of cost versus the share of space.





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12:51–12:57 pm

Periorbital Changes and Glucagon-Like Peptide-1 Receptor Agonists: A Retrospective Cohort Study on the Oculofacial Maladies, Procedures, and Surgeries following the Use of these Medications

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Introduction: Glucagon-like peptide-1 receptor (GLP-1R) agonists have garnered widespread attention for the rapid changes they may confer to patients.[1] GLP-1R agonists have been linked to accelerated facial aging and altered skin health, which ultimately compromise the structural integrity of the skin barrier and exacerbate a patient's age based on diminished facial muscle mass.[2,3] The purpose of this study is to evaluate whether GLP-1R agonists are associated with periorbital changes in patients with T2DM and/or obesity. A secondary aim of this study is to determine if those using GLP-1R agonists are more likely to undergo surgery to correct any periorbital changes incurred.

Methods: A retrospective cohort study was conducted using the TriNetX Research Network, a platform providing access to de-identified medical records from 140 million patients. Patients with type 2 diabetes mellitus (T2DM) or obesity treated with insulin or other antidiabetic or weight loss agents, but not with GLP-1R agonists, served as the control group. The study group consisted of patients with T2DM or obesity treated with GLP-1R agonists (either as combined or monotherapy). For the T2DM study group, data were harvested from April 2005 (when Exenatide became the first approved GLP-1R agonist) to August 2024. In the obesity study group, data were harvested from June 2021 (date of approval for expanded use) to August 2024. Propensity score matching was employed to minimize confounding.

Results: The number of participants for each pathology and procedure differed, but the group sizes ranged from 111 to 8,705 people who met inclusion criteria. Those with T2DM who received any GLP-1R agonists were significantly more likely to develop brow ptosis (relative risk (RR) = 1.251, p = 0) and undergo repair (RR = 1.25, p = 0.005) compared to controls. By contrast, this cohort was significantly less likely to develop blepharoptosis (RR = 0.821, p<0.001), dermatochalasis (RR = 0.83, p<0.001), and ectropion or entropion (RR = 0.617 , p<0.0001).

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In the obesity study group, those who received GLP-1R agonists were significantly more likely to develop blepharoptosis (RR=1.173, p<0.001), brow ptosis (RR=1.454, p<0.001), and dermatochalasis (RR=1.173, p<0.001), but not ectropion or entropion (RR=1.952, p=0.476). This cohort was also significantly more likely to undergo repairs for blepharoptosis (RR=1.45, p<0.001) and brow ptosis (RR=1.695, p<0.001) as well as cosmetic procedures, including blepharoplasty (RR=1.611, p<0.001), facelift (RR=2.313, p=0.003), and botox (RR=1.523, p<0.001).

Conclusions: In this study, the use of GLP-1R agonists by patients with obesity or T2DM resulted in periorbital changes and subsequent need for surgery. Patients using the medication for treatment of obesity observed more complications than those with TD2M, where GLP-1R agonists conferred a protective factor against changes in eyelid position or skin. The mechanisms underlying GLP-1R agonists may explain how these patients are at greater risk for periorbital changes when compared to controls.

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12:57–1:03 pm

The FIRM Lift: Fat Integration and Resuspension for Malar-Mounds

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Introduction: Festoons and malar mounds present a persistent challenge in midface rejuvenation.1 Standard lower eyelid blepharoplasty often falls short in addressing festoons' multi-layered anatomic causes.2,3 The Fat Integration and Resuspension for Malar-Mounds (FIRM Lift) is a hybrid approach that integrates autologous fat grafting with transconjunctival blepharoplasty adjuncts such as skin pinch and midface lifting to comprehensively restore midface structure and contour. This study evaluates clinical outcomes of the FIRM Lift using a previously reported standardized photographic grading system.4

Methods: A retrospective chart review was conducted on all patients with documented festoons who underwent the FIRM Lift by the senior author between 2018-2025. All available standardized pre- and post-operative photographs were evaluated by three ASOPRS oculoplastic surgeons using a previously published 0–5 festoon grading scale.4 Images were randomized and de-identified. Statistical analysis was performed to assess change in festoon severity and inter-observer agreement. (Figures 1 & 2)

Results: A total of 20 patients met inclusion criteria, with a mean follow-up of 12 months (range: 7-26 months). Festoons were dry in 2 and wet in 18. Prior to FIRM surgery, 3 patients had a history of previous lower blepharoplasty, 2 facelift, 5 midface hyaluronic acid filler and 2 with laser resurfacing. (Figure 3)

Autologous fat was utilized in all cases and starting in 2022 was harvested preferentially from the lower inner thigh (n = 10). Prior to 2022 and thereafter where lower inner thigh fat was insufficient, peri-umbilical fat was used (n = 11). Fat was processed using low-speed centrifugation and injected via blunt cannulas into the pre-periosteal medial and lateral midface. The average volume injected was 1.5 mL to each medial midface and 3.3 mL to each lateral midface. Adjunctive Lower eyelid blepharoplasty techniques employed were: transconjunctival fat repositioning (n = 10), transconjunctival fat excision (n=7), pinch skin excision with pre-periosteal midface lift (n = 16), direct festoonectomy (n=2), CO2 laser resurfacing (n=2) chemical peel (n=1) and posterior lamellar hard palate grafting (n=1). Further secondary festoon improvement was obtained in 2 patients: direct festoonectomy in one (Figure 2b) and skin pinch with 35% TCA peel in the other (Figure 2c).

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In 15 patients where standardized before and after photos were available to randomize and grade, the average festoon severity score improved significantly from [1.84 ± 0.44] preoperatively to [0.71 ± 0.17] postoperatively ($p < 0.005$). (Figure 4) Inter-observer agreement was high, with an intraclass correlation coefficient of 0.81 individually and 0.93 on average. Adverse events noted at post-op week 8 or greater included residual midface edema (n = 4, 20%) which resolved at 4 months in 1 patient, 8 months in 2 patients and 10 months in 1 patient. There were no reported cases of increased dry eye, eyelid malposition, nodules or scarring.

Conclusions: The FIRM technique combines the benefits of regenerative fat grafting with multiplanar treatment modalities to address volume loss and tissue descent for festoon and malar mound correction. The procedure is typically performed in a single stage and shows significant objective festoon improvement. Prolonged midface edema occurs in 20% of cases with ultimate resolution in all. Fat grafting supplementation to transconjunctival blepharoplasty adjuncts represents a valuable addition to the festoon treatment armamentarium.

Figure 1: Pre and post FIRM patient photographs, all having autologous fat grafting and transconjunctival fat repositioning (repo). A. Wet festoon; 74 y/o female treated with fat repo, skin pinch and midface lift. Average score by graders improved from 4 to 1.66. **B.** Wet festoon; 85 y/o female with fat repo and direct festoonectomy. Average score 5 to 2. **C.** Wet festoon; 84 y/o female with fat repo and no skin pinch. Average score 0.66 to 0.

Figure 2: Pre and post FIRM patient photographs with fat grafting and transconjunctival fat excision. A: Dry festoon; 65 y/o female with lateral fat excision, skin pinch and midface lift. Average score 4 to 1. **B:** Wet festoon; 69 y/o male with with lateral fat excision and pinch followed by direct festoonectomy. Average score 4 to 1.66. **C:** Wet festoon; 58 male with lateral fat excision and CO_2 laser followed by skin pinch and 35% TCA peel. Average score 2.3 to 0.

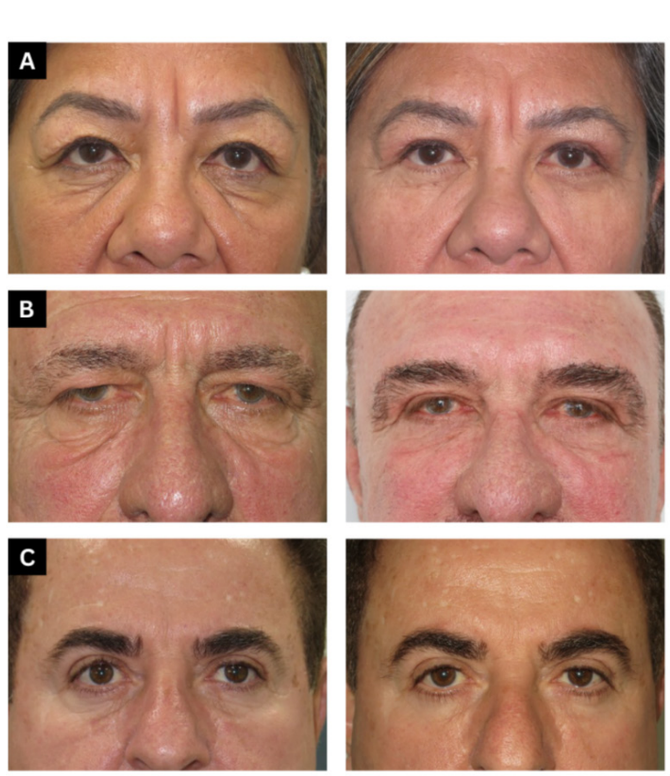

Figure 3: Demographic and Clinical Characteristics of the Study Population

Category	n (%)
Total Patients	20
Male	5 (25%)
Female	15 (75%)
Festoon Type	
Dry	2 (10%)
Wet	18 (80%)
Prior Treatments	
Lower Blepharoplasty	3
Facelift	2
Hyaluronic Acid Filler	5
Laser Resurfacing	2
Fat harvest source	
Lower Inner Thigh (T)	9
Periumbilical (P)	10
Combined (P + T)	1
Adjunctive Procedures	
Fat Repositioning	12
Fat Excision	6
Pinch Skin Excision + Midface Lift	16
Direct Festoonectomy	2
CO_2 Laser Resurfacing	2
Chemical Peel	1
Posterior Lamellar Hard Palate Grafting	1
Surgical Setting	
Office-based, Local Anesthesia	1
Ambulatory Surgery Center	19
Adverse Events	
> 2 Month Midface Edema	4 (20%)
Resolution of Residual Midface Edema	
4 Months	1
8 Months	2
10 Months	1

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Figure 4: Improvement in festoon scores as rated by oculoplastic surgeons before and after FIRM lift. Average festoon severity score improved significantly from a median of 1.3 (range 0-5) preoperatively to 0.7 (range 0-2) postoperatively ($p < 0.015$)

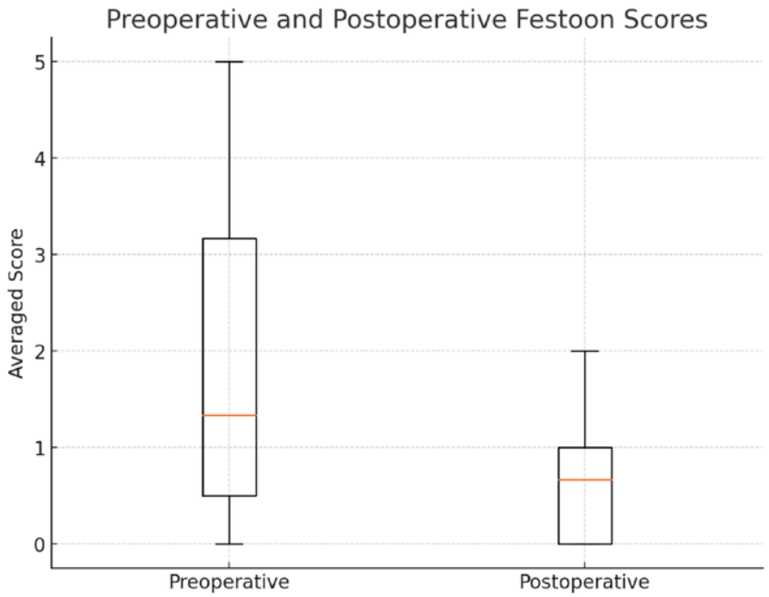
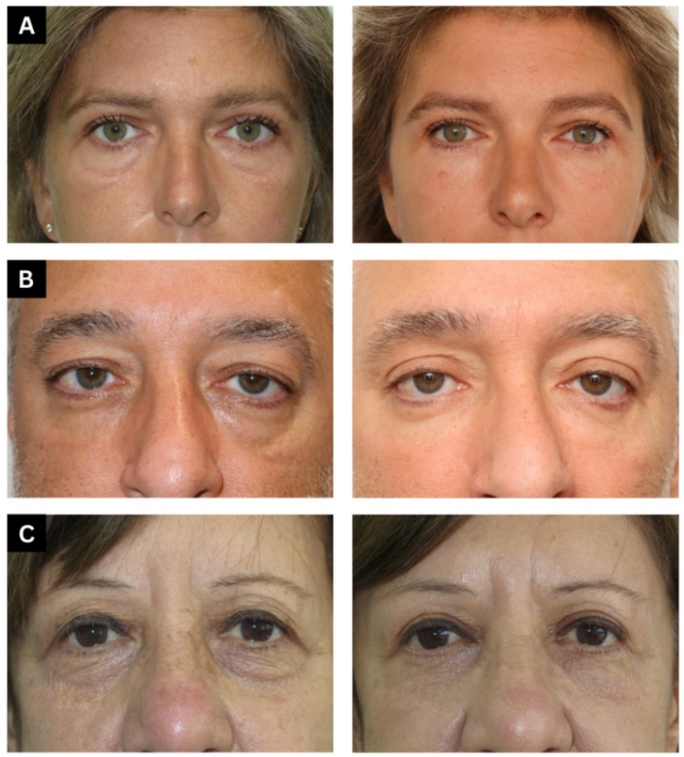


Figure 5: Before and After Photographs in Patients with Prolonged Edema
A: 43 y/o female smoker with post-op midface edema resolved at 4 months. **B:** 51 y/o male trace edema at 6 months post-op but resolved at 8 mo follow-up. **C:** 72 y/o female with midface edema resolving at 8 months post-op.



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1:03–1:09 pm

Analysis of Excised Fat Grafting to the Cheek Performed Simultaneously with Microscopic Deep Orbital Fat Decompression

Tomoyuki Kashima
Oculofacial Clinic Group, Tokyo, Japan

Introduction: In thyroid eye disease (TED), inflammation and fatty accumulation in the orbital tissues may lead to exophthalmos, often accompanied by dark circles under the eyes and lower eyelid retraction. Although many treatments have been reported for lower eyelid abnormalities in TED, most focus on functional aspects such as retraction and entropion. [1-4] Surgical techniques targeting dark circles, including removal of the orbicularis retaining ligament and repositioning of prolapsed orbital fat onto the cheek, have also been described.[5-9] Moreover, grafting of resected orbital fat into the cheek area has been reported as effective.[10-13] However, to date, no studies have described a single surgical procedure addressing both orbital protrusion and lower eyelid deformity in TED patients. We have developed a microscopic deep orbital decompression procedure that includes resection of retrobulbar orbital fat and reconstruction of the lower eyelid by resected fat grafting to cheek area. Here, we report the outcomes of this technique.

Methods: Subjects included 72 patients with TED who underwent microscopic deep orbital fat decompression at the Oculofacial Clinic Tokyo between January and June 2024. A M320 surgical microscope was used in all cases. Data collected included gender, age, changes in ocular protrusion, volume of fat resected, and occurrence of visual dysfunction.

Thirty-five patients who underwent orbital lipectomy alone were classified as Group A. Thirty-seven patients who underwent orbital lipectomy combined with autologous fat grafting (0.5 mL of resected fat transplanted after dissection of the orbicularis retaining ligament at the supraperiosteal plane) were classified as Group B. Four general medical office staff members (non-physicians, non-nurses) independently scored the severity of lower eyelid dark circles using the Dark Circle Severity Classification (DCSC) system on a 4-point scale (0–3) (Figure 1). Statistical analysis was performed using Microsoft Excel, with a P-value < 0.05 considered significant.

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Results: The mean age of the patients was 49.3 ± 17.7 years, and 63 (87.5%) were female. The mean follow-up period was 3.4 months. The average volume of orbital fat resected was 3.3 ± 1.3 mL. Ocular protrusion decreased from a mean of 19.2 mm preoperatively to 17.1 mm postoperatively, a reduction of 2.1 mm. No cases of visual impairment, mydriasis, or new-onset diplopia were observed. In Group A, the mean DCSC score improved from 1.69 ± 0.79 preoperatively to 0.55 ± 0.59 postoperatively ($P < 0.0001$), representing an improvement of 1.14 points (Figure 2). In Group B, the score improved from 2.26 ± 0.73 preoperatively to 0.26 ± 0.50 postoperatively ($P < 0.0001$), representing an improvement of 1.97 points (Figure 2). Postoperative DCSC scores were significantly lower in Group B compared to Group A ($P < 0.0001$). Improvement in DCSC score was also significantly greater in Group B than in Group A ($P < 0.0001$) (Figure 3).

Conclusions: TED often causes exophthalmos, dark circles under the lower eyelids, and lower eyelid retraction, resulting in facial disfigurement. The combined orbital fat decompression and resected fat grafting technique described here effectively improved all of these conditions with a low complication rate, suggesting that it is a safe and valuable surgical option for patients with TED.

Figure 1

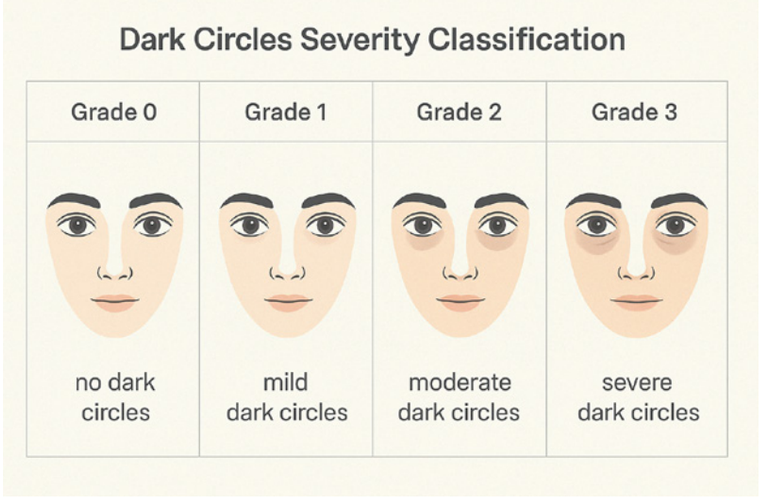

Figure 2

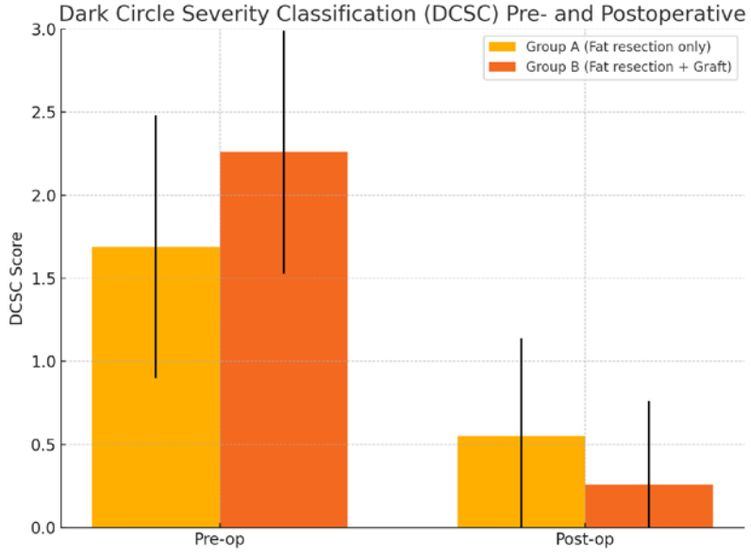

Figure 3

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1:09–1:15 pm

EndoStyle Brow Recontour without an Endoscope. A Case Series of 327 Patients

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Introduction: There are many well-described surgical approaches to improving brow aesthetics, ranging from the traditional open approaches to endoscopic techniques. Despite a relatively high satisfaction rate (70%)[1], there has been a recent decline in the number of endoscopic procedures used for brow rejuvenation. This is in part related to high instrument costs and increased operative times and learning curves associated with the use of an endoscope. In this study we describe our experience with an endostyle lift which employs the same surgical dissection planes as traditional endoscopic lifts, but without the use of an endoscope.

Methods: In this retrospective chart review, we evaluated consecutive patients (2022 to 2025) who underwent a cosmetic endostyle lift without the use of the endoscope. All complications including revision procedures within the first-year post surgery were identified. All patients were given a survey within 6 months post-surgery to evaluate satisfaction.

Results: This study included 327 patients (57 males and 270 females). The mean (SD) age was 56 (11) and the mean (SD) follow up was 18 months (6). Brow surgery was performed via a temporal incision (post-hairline) with dissection and tissue fixation carried out under direct visualization. Temporary sensory deficit (all resolved by 6 months) was found in 10% of patients. A motor deficit persisting beyond 2 weeks of surgery was found in 2% of cases and resolved in all cases within 6 months. Local alopecia was noted in 4% of patients and no patient asked for revision (excise bald spot). Wound override was seen in 3% of patients requiring in office revision. 2 patients required a redo lift for brow drop within 3 months of initial surgery. 94% of patients were satisfied with their surgical outcome.

Conclusions: The results of our study demonstrate the safety, efficacy, and satisfaction of an endo approach brow lift without using an endoscope. We present a video demonstration and photo documentation of patient outcomes.

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1:15–1:21 pm

Non-Surgical Management of Nodules After Lower Lid Blepharoplasty

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[1]Department of Ophthalmology and Visual Sciences, The Ohio State University, Columbus, Ohio, United States, [2]Department of Ophthalmology, Nationwide Childrens Hospital, Columbus, Ohio, United States, [3]Department of Ophthalmology, Division of Oculofacial Plastic and Reconstructive Surgery, Ohio University/OhioHealth Doctors Hospital, Columbus, Ohio, United States

Introduction: Lower lid blepharoplasty is one of the most commonly performed aesthetic facial procedures. Methods vary from transcutaneous to transconjunctival depending on surgeon preference and patient selection. Steps can involve purely subtractive fat excision, purely fat transposition or fact excision combined with fat transposition[1]. Transposition can be in a subperiosteal or preperiosteal plane depending on variables such as thickness of patient facial soft tissue, the plan for autologous fat transfer and physician preference[2]. One complication not often discussed in the literature is delayed nodule development that present in patients after lower lid blepharoplasty. The nodules present a challenge to physicians and patients alike, when the goals of aesthetic improvement are delayed due to the presence of these nodules. The described cases are a series of patients whose postoperative course was complicated by these nodules. In addition, a preferred therapeutic regimen to help avoid further surgical intervention is presented.

Methods: A case series is reported consisting of patients who underwent transconjunctival lower lid blepharoplasty from the years 2013 to 2024 who presented with nodules in the postoperative period. A chart review was performed, and pertinent exam findings and therapeutic interventions are discussed.

Results: 8 patients presented with nodules after lower lid blepharoplasty. 2 underwent lower lid blepharoplasty alone, 3 in combination with upper blepharoplasty, 1 in combination with direct brow lift, and 2 in combination with endoscopic forehead and brow lift and upper lid ptosis repair. 5 patients were female (62.5%) while 3 were male (37.5%). All cases were performed in the same outpatient surgery center setting using local anesthetic of 2% lidocaine with 1:200,000 epinephrine in a 1:1 mix with 0.75% bupivicaine as well as 10 units of hyaluronidase to a total 10mL. All local anesthetic was compounded by an in-house compounding pharmacy. Time to presentation of nodules after surgery ranged from 30 days to 80 days. One female patient underwent initial surgical excision with pathological examination, showing fibrocollagenous, muscular tissue with chronic inflammation and inflamed granulation tissue with foamy histiocytes in addition to foreign body reaction with granulation tissue (Figure 1). It did not stain for any organism. She then had recurrence within the first week.

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After initiation of a therapeutic regimen of clarithromycin 500mg twice a day for 30 days, oral prednisone 60mg daily with taper, and direct injection of triamcinolone 40mg/ML and 5-fluorouracil 50mg/mL in a 1:4 mix, 7 patients had full resolution reported, with all patients noting significant improvement within 7 days. 1 patient had significant improvement after 2 rounds of the intralesional injection, but preferred more prompt resolution and underwent direct excision without further recurrence. Figures 2-4 demonstrate patients' preoperative appearance (top), presentation of delayed nodule(s) (bottom left) and final photo with resolution (bottom right).

Conclusions: There is no definite agreement on the etiology of lower lid nodules after blepharoplasty. There has been speculation that it may be "ointment granuloma[3]," incarceration, subsequent vascular compromise and necrosis of fat transposition pedicles, indolent infection from atypical mycobacterium[4] or just an exaggerated inflammatory and immune response. The interesting observation in this case series is that some patients presented with nodules away from areas of fat transposition.

There is no evidence-based study on the management of these nodules, nor anecdotal agreement regarding treatment. At the 2025 WSOPRAS conference in Istanbul, Turkey, this topic was discussed and opinions greatly varied. Some advocate conservative measures with medication and local injection, while others believe excision with direct injection of steroid and antifibrotic agents into the tissue is required for resolution.

This case series demonstrates that, in this group of patients, the need for further surgery may be diminished with early multimodal medical management. An extended course of clarithromycin addresses possible contribution from atypical mycobacterium such as Mycobacterium Avium Complex, while oral and injected steroid decrease the inflammatory response contributing the formation and persistence of these lesions. Last, 5-fluorouracil contributes by reducing proliferation of fibroblasts.

It is of note that only two of these cases occurred prior to the Covid-19 pandemic, making the question arise whether previous infection with Covid-19 predisposes certain patients to a more profound inflammatory response to surgical manipulation of the lower lids. This aligns with Griffin et al whom, in 2024, noted a 2.188 times greater chance of developing post blepharoplasty granulomas during the pandemic period versus prior to the pandemic (p=0.03) with transconjunctival blepharoplasty 2.525 times more likely compared to transcutaneous blepharoplasty(p=0.01) (5).

Further studies could include a survey of ASOPRS members on their preferred approach to treatment of these granulomas. However, this case series gives hope that there are options that may preclude the need for further surgery in these patients with significant aesthetic demand and concern.

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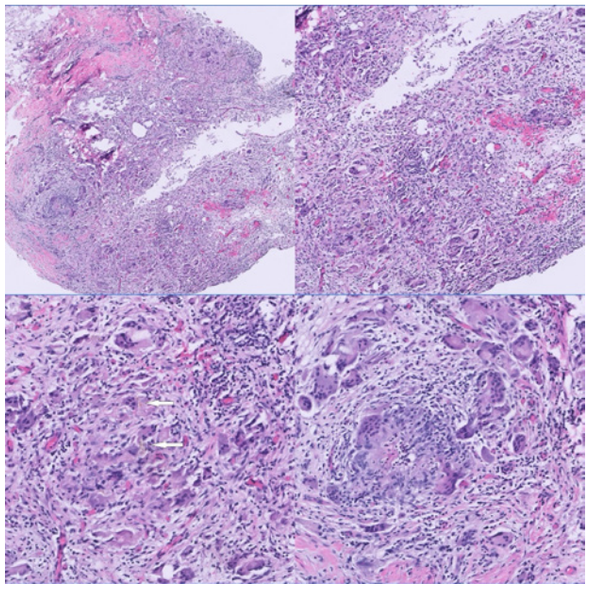
Figure 1



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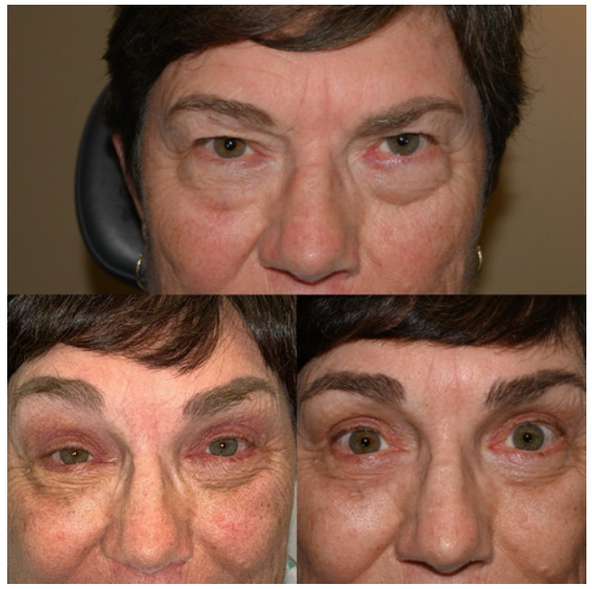

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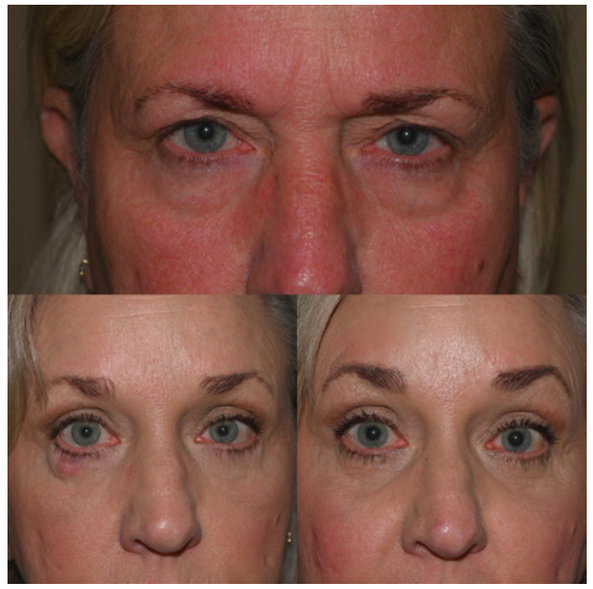

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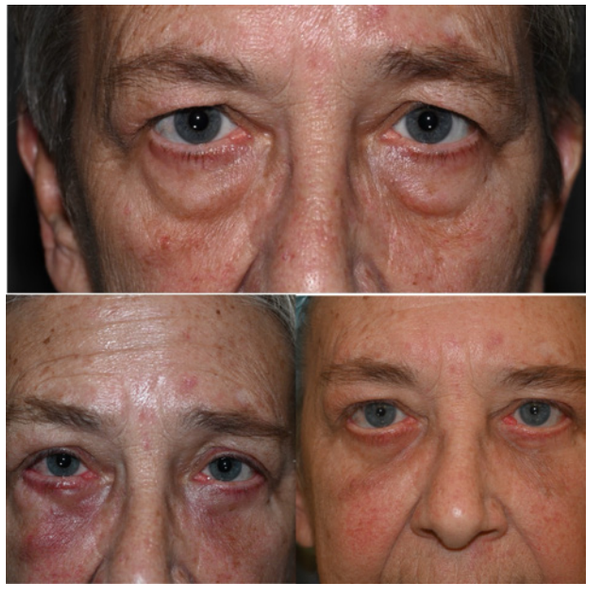

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1:21–1:27 pm

Dermis Fat Fascia Graft (DFFG) Prevents Glabellar Depression after Endoscopic Forehead/Eyebrow Lift with Corrugator Muscle Release

Nita Bhat, Ridhima Guniganti, Lyvia J. Zhang, Jeremy D. Clark, Christopher J. Compton, Mohsen B. Kashkouli
Department of Ophthalmology and Visual Sciences, University of Louisville School of Medicine, Louisville, Kentucky, United States

Introduction: In patients undergoing endoscopic forehead/eyebrow lift (FEL), presence of medial eyebrow ptosis or glabellar frown lines necessitates corrugator muscle release (excision, incision or disinsertion) for good cosmetic outcome.[1-4] Unfortunately, this release exposes patients to an increased risk of glabellar depression (1.1% vs 0% in patients who do not undergo release) and associated dissatisfaction with cosmetic outcome (Figure 1).[1] This report aimed to assess if adding a temporal scalp Dermis Fat Fascia Graft (DFFG) could improve outcomes, especially patient satisfaction, and to demonstrate DFFG technique (Video).

Methods: The senior author has been routinely performing DFFG since 2014. This retrospective study of patients undergoing FEL between 2014 and 2022 compared patients undergoing DFFG with patients who did not require corrugator muscle release and DFFG; the latter served as a positive control for patient satisfaction. Patients with previous trauma, surgery or less than 1 year follow up (FU) were excluded. To harvest DFFGs during FEL, bilateral elliptical grafts of temporal scalp skin, subcutaneous fat, and superficial temporalis fascia were first excised (Fig.2-A, B). Two DFFGs were then harvested from the excised flap (Fig2-C) by removing the hair bearing epidermis and superficial dermis (video). After corrugator muscle release (Fig.2-D), the DFFGs (Fig.2-E) were endoscopically implanted subperiosteally in the mid-glabellar region between the corrugator muscle cut edges (Fig.2-F, video). Any reported or observed glabellar depression by the patient or surgeon was documented. Patient satisfaction regarding postoperative glabellar appearance was recorded at least 1-year after the surgery using a visual analogue score (VAS, 0-100). Photographic documentation was also performed.

Results: Our study included 329 patients (90% female) who underwent FEL with a mean age of 45.2±9.7 years (range: 20-70) and follow-up of 27 months (12-48). Corrugator muscle release with DFFG was performed in 84% (276/329) of patients, who were significantly older (47.3±8.8 vs 34.5±6, $p<0.001$) than the control group (53/329). The mean patient satisfaction was similar between the DFFG group (82.1±10.2) and the control group (79.3±11.8) ($p=0.07$). No glabellar depression was reported or observed by the patient or surgeon after DFFG.

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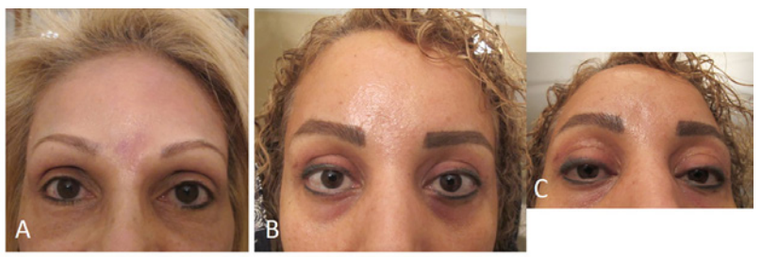
Conclusions: Temporal scalp dermis fat fascia grafting (DFFG) is a novel technique that may improve patient satisfaction with glabellar appearance after endoscopic forehead/eyebrow lift, potentially by decreasing postoperative glabellar depression in patients requiring corrugator muscle release (Fig.3). Larger controlled studies are needed to further evaluate this relationship.

Figure 1



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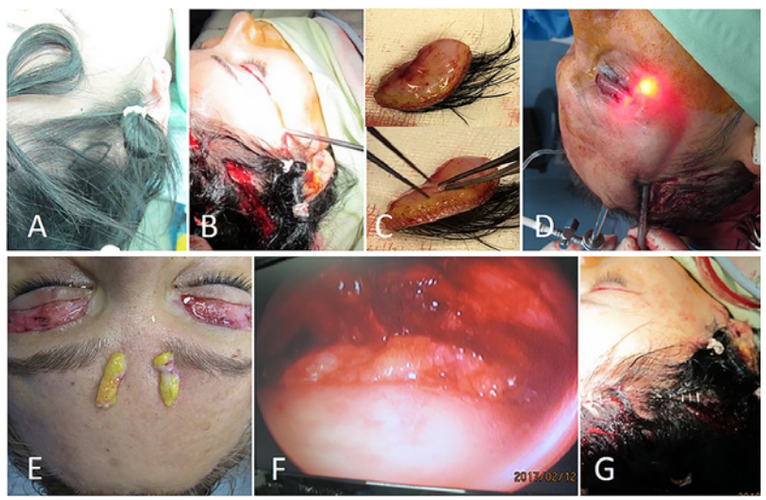

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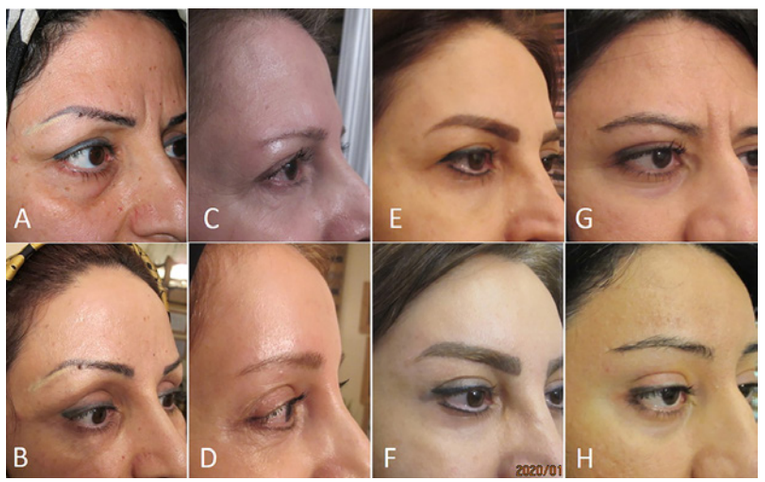

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FEATURED SPEAKER: WILL FLANARY, MD

Friday, October 17

Moderator: Erin M. Shriver

1:42–2:38 pm

Healthcare Social Media Ethics and the Influencer Economy

Will Flanary, MD

BREAKOUT SESSIONS ‘HOW I FIX IT’

Friday, October 17

3:20–5 pm

Aesthetics – Sebastian L-1&2

Moderator: Brian S. Biesman
Panelists: John P. Fezza, David B. Samimi, Martin H. Devoto, and Wendy W. Lee

Eyelid/Oncology – Sebastian I-1&2

Moderator: Philip L. Custer
Panelists: Brian Willoughby, Jill A. Foster, Andrew R. Harrison, and Elizabeth A. Bradley

Orbit/Thyroid Eye Disease – Sebastian K (General Session room)

Moderator: Suzanne K. Freitag
Panelists: Steven Couch, Daniel B. Rootman, Jurij R. Bilyk, and Louise A. Mawn

(continued)

1 Age-Related Changes of the Eyebrow Morphology

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[2]Department of Ophthalmology, Faculty of Medicine and University Hospital Cologne, University of Cologne, Cologne, Germany

Introduction: To determine age-and sex-related eyebrow changes in periocular morphology in Caucasians using a standardized protocol.

Methods: Healthy Caucasian volunteers aged 18–35 and 60–90 years old were recruited from the Department of Ophthalmology, Faculty of Medicine and University Hospital, Cologne, between October 2018 and May 2020. Volunteers with facial asymmetry, facial deformities, history of facial trauma, facial surgery, botox injection, eyelid ptosis, strabismus, or nystagmus, were excluded. Standardized three-dimensional facial photos of 68 young volunteers and 73 old volunteers were taken in this clinical practice. Eyebrow position changes from endocanthion, pupil center, and exocanthion line were analyzed in diferent age groups, including the eyebrow length (EL),The distance of the horizontal line connecting the endocanthion and medial end of the brow (MEHD), the highest point of the eyebrow (HEHD) and the lateral end of the eyebrow (LEHD), the distance between the medial end of the eyebrows(MED), the distance between the highest point of the eyebrows (HED), and the distance between the lateral end of the eyebrows (LED).

Results: There was no statistically significant difference in EL, HEHD and LED between the elderly group and the young group, MEHD and MED were significantly greater in the elderly group than in the young group (p=0 and 0.002 respectively), LEHD and HED were significantly smaller in the elderly group than in the young group (p=0 and 0.012 respectively).

Conclusions: On the vertical direction, the medial end of the brow in the elderly group is higher than those in the young group, but the lateral end of the eyebrows is lower than young group. On the horizontal direction, the medial end of the brow of the elderly group move towards the temporal side, but the highest point of the eyebrow is more inclined towards the nasal side compared with the young group. In conclusion, the eyebrows of the elderly become more curved, which jointly leads to an unnatural appearance of aging.

2 A Novel Curved Ptosis Clamp for Streamlined Sutureless Müller's Muscle-Conjunctival Resection

Henry Bair, Jacqueline R. Carrasco, Alison Watson, Karine Shebaclo, Charlotte L. Marous
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Introduction: Sutureless posterior ptosis repair techniques have historical precedent dating back to the description of the sutureless Fasanella-Servat procedure in the 1970s.[1] Building upon this, Müller's muscle-conjunctival resection (MMCR) has been demonstrated as a safe and effective technique for correcting mild to moderate blepharoptosis with good levator function.[2] Compared to traditional sutured methods, sutureless MMCR rely on the natural adhesive properties of the posterior lamella, thermal cauterization, and temporary mechanical tissue compression to achieve tissue approximation, thereby reducing operative time and minimizing complications such as corneal irritation, granuloma formation, and postoperative discomfort. Current sutureless approaches utilize existing surgical instruments not specifically designed for this purpose — such as combinations of hemostats and/or a Putterman clamp.[3,4] The multiple instrumentation and potential element of improvisation can introduce inconsistency in tissue clamping and present ergonomic challenges. Here, we present the first purpose-built surgical instrument that streamlines sutureless MMCR by providing uniform, anatomically contoured compression in a single instrument, enhancing both reproducibility and ease of use.

Methods: The novel instrument (Figure 1A – B) consists of a single integrated clamp with elongated, curved jaws designed to conform to the natural curvature of the upper eyelid. A slide lock design allows for precise and secure grip of the posterior lamellar tissue while easily locking and releasing. The inner surfaces of the jaws are serrated and toothed (Figure 1C) in order to optimize mechanical crushing of the tissue and facilitate adhesion. We report a representative experience utilizing the instrument on a patient undergoing sutureless MMCR.

Results: Our sutureless MMCR approach with the novel ptosis clamp is as follows (Figure 2). The upper eyelid is everted over a Desmarres retractor to expose the palpebral conjunctiva and Müller's muscle (2A). Using a caliper, the tissue to be excised (determined with the standard "4:1" rule — resecting approximately 4 mm of tissue for every 1 mm of desired eyelid elevation) is marked starting from the superior border of the tarsus (2B). Tractional sutures are placed through Müller's muscle to facilitate tissue lifting (2C – D). The novel ptosis clamp, with curved jaws contoured to match the arc of the upper eyelid, is then applied across the posterior lamella at the markers created by the caliper (2E – F). Once clamped, the targeted segment of Müller's muscle and conjunctiva is excised using a #15 blade (2G), and the exposed edge is treated with electrocautery to ensure hemostasis and promote adhesion (2H). No sutures are placed. The clamp is then released (2I), and the eyelid allowed to return to its normal position. Figure 3 shows representative pre-operative (3A) and 1-week postoperative (3B) images of a patient who underwent MMCR with the instrument.
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Conclusions: This novel ptosis clamp offers a practical and elegant solution for posterior ptosis repair using a sutureless MMCR technique. By reducing the instrumentation needed to a single device, the clamp simplifies intraoperative workflow (potentially facilitating completion of the procedure by a single surgeon), ensures even compression across the clamped tissue, and improves consistency without compromising surgical efficacy. Future research directions include cohort studies, multi-center validation, and surgeon-reported usability studies.

Figure 1

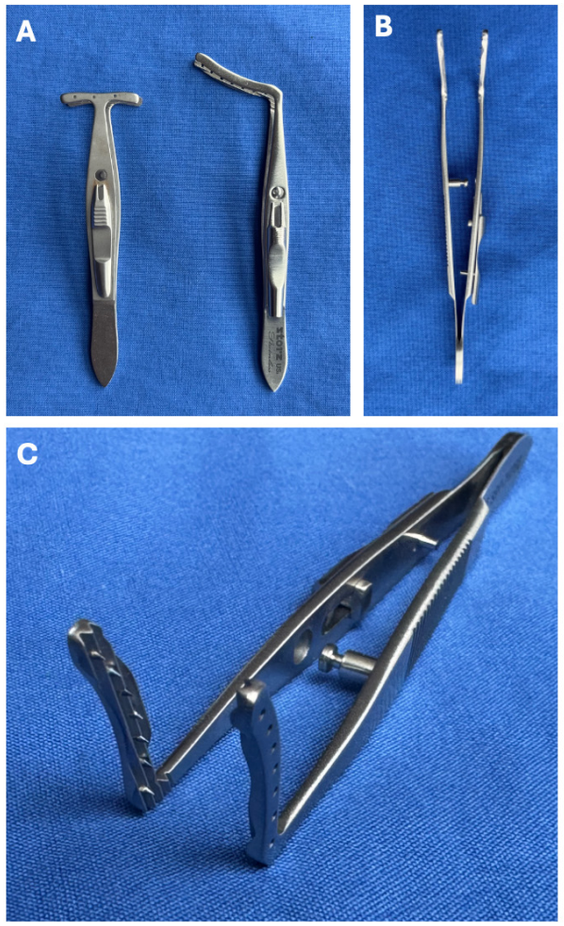

Figure 2

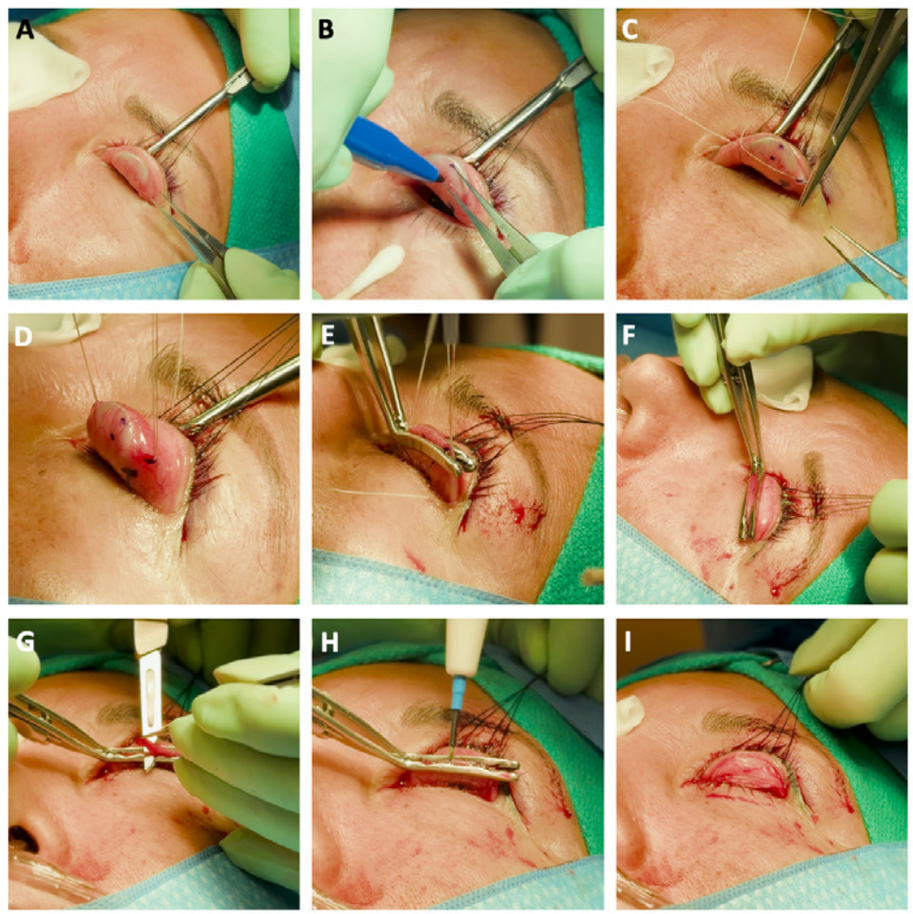

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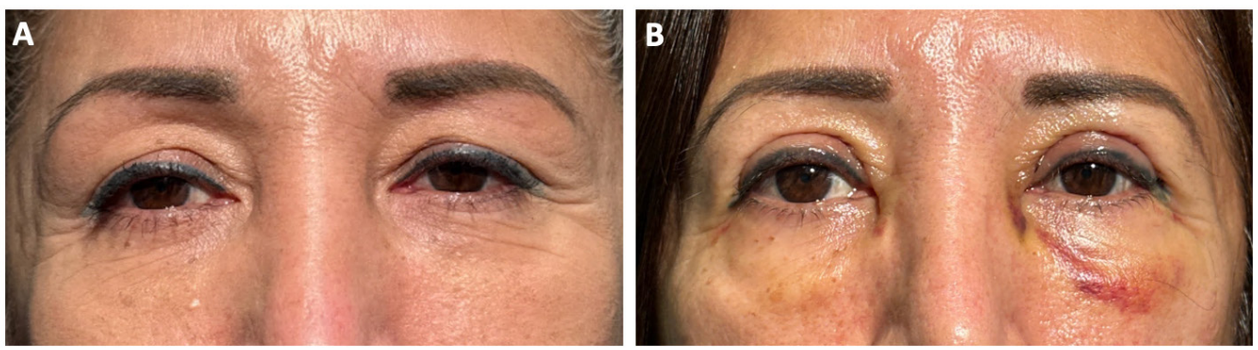
Figure 3



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3 Benign Essential Blepharospasm: Muscle Fiber, Connective Tissue and Metabolic Findings

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Introduction: Benign essential blepharospasm (BEB) is the most common focal cranial dystonia, characterized by progressive spasms caused by the involuntary contraction of the eyelid protractor muscles. It is a disabling disorder that interferes with daily activities and, in severe cases, leads to functional blindness. While the clinical presentation and therapeutic management of BEB, primarily with botulinum toxin, are well described, the underlying histopathological mechanisms contributing to muscle dysfunction remain poorly understood.

A critical gap exists in understanding whether structural and metabolic changes in the orbicularis oculi muscle contribute to or result from the dystonic activity seen in BEB. This study addresses that gap by examining the morphological characteristics of pre-septal orbicularis oculi muscle samples from treatment-naïve BEB patients, comparing them to control specimens. Clarifying these changes could help better understanding the pathophysiology of BEB.

Methods: This is a cross-sectional study. A total of seven orbicularis oculi muscle (OOM) samples from healthy subjects and seven OOM specimens from five untreated BEB patients were analyzed. Muscle samples were harvested from the pre-septal portion of the OOM during upper eyelid blepharoplasty and processed for histological analysis using hematoxylin and eosin (H&E), Gomori trichrome and combined C cytochrome oxidase/succinate dehydrogenase (COX/SDH) histochemical staining. Objective and qualitative evaluations were performed by two blinded investigators. The morphological assessment used a digital image analysis software (ImageJ). The outcomes included fiber count, connective tissue quantification, and muscle fiber area measurements. Statistical comparisons were made using Mann-Whitney U tests and the alpha error was set to 0.05.

Results: The mean age was 61.0 ± 7.9 years in the BEB group and 69.7 ± 6.4 years in the control group. Compared to controls, BEB patients showed a lower fiber count (Controls: 71.6 ± 14.3 vs. BEB: 51.7 ± 6.2), larger fiber area (Controls: 8.7 ± 1.6mmm² vs. BEB: 10.9 ± 1.4 mmm²), and a higher mean connective tissue rate (Controls: 10.6 ± 3.2% vs. BEB: 17.1 ± 4.7%), with statistical significance observed for all comparisons (p=0.002, p=0.013, and p=0.018, respectively).

Qualitative analysis of COX/SDH staining revealed a higher prevalence of mitochondrial abnormalities in the BEB group compared to controls.

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Conclusions: This study offers new insights into the untreated orbicularis oculi muscles of BEB patients, highlighting significant morphological and metabolic differences compared to controls. These findings enhance our understanding of the histopathological features of BEB. Future studies with larger cohorts and correlations with clinical severity and treatment outcomes are warranted to further elucidate these changes and explore potential therapeutic targets beyond symptomatic management.

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4 Comparative Analysis of Tearing Outcomes after Eyelid Surgery Versus Conservative Management

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Introduction: Epiphora is a common but challenging problem can be related to a range of ocular surface, eyelid and lacrimal outflow problems, and in many cases, maintains a multifactorial etiology. Surgery to manage eyelid laxity (ie: horizontal tightening) and/or punctoplasty is commonly offered to patients with symptomatic epiphora in the absence of nasolacrimal duct obstruction (NLDO). The efficacy of such procedures is debated. This study aims to understand the effect of varying eyelid procedures on symptomatic epiphora.

Methods: In this cross-sectional cohort study, records of patients presenting with epiphora were reviewed. The type of intervention (laxity surgery, punctoplasty, and conservative), history of ocular or eyelid surgery, diagnosis of dry eye syndrome, diagnosis of blepharitis, laterality of surgery, and postoperative patient-reported change in tearing symptoms were collected. Tearing outcomes were categorized into four ordered groups: worsened, no change, improved, and resolved.

Results: Ninety-one patients were included in this analysis, with 49 patients who underwent laxity surgery, 21 patients who underwent punctoplasty alone, and 21 patients managed with conservative measures. In the laxity surgery group, 55.1% of patients reported improvement in tearing symptoms postoperatively, 16.3% achieved complete resolution, 24.5% experienced no change, and 4.1% reported worsening. Among patients undergoing punctoplasty alone, 38.1% reported improvement, 14.3% achieved complete resolution, and 47.6% experienced no change, with no patients reporting worsening. In the conservative group, 19.0% of patients reported improvement, 76.2% reported no change, and 4.8% reported worsening; no patients achieved complete resolution (Figure 1).

No significant differences were found in history of ocular/eyelid surgery ($p = 0.1295$), dry eye syndrome diagnosis ($p = 0.4293$), blepharitis diagnosis ($p = 0.3924$), or laterality of surgery ($p = 0.8764$) between the groups.

In an ordinal logistic regression model accounting for the ordered nature of tearing outcomes (Worse <No Change <Improved <Resolved), both malposition repair and punctoplasty alone were associated with significantly better outcomes compared to conservative management. Malposition repair had 8.12 times higher odds of achieving a better outcome (OR 8.12, $p < 0.001$), while

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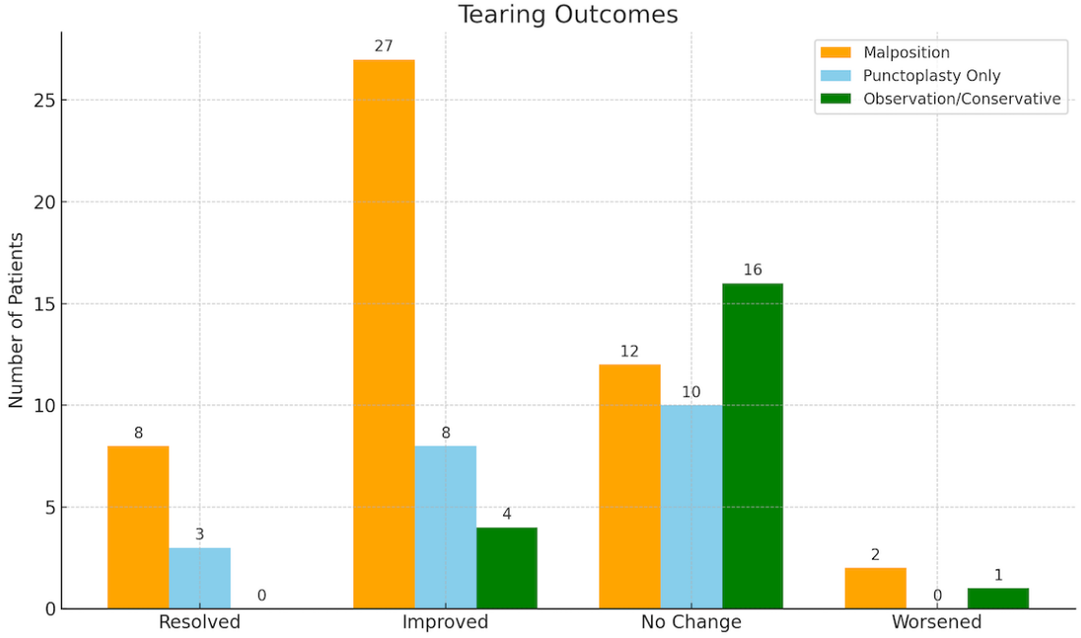
punctoplasty had 4.49 times higher odds (OR 4.49, p = 0.018). Laxity surgery and punctoplasty did not significantly differ in terms of outcome (p = 0.243).

Compared to conservative management, patients who underwent malposition repair had 10.6 times higher odds of achieving improvement or resolution (OR 10.63, p < 0.001), and those who underwent punctoplasty alone had 4.7 times higher odds of achieving a improvement or resolution (OR 4.68, p = 0.029). Comparing malposition repair to punctoplasty, malposition repair was associated with a non-significant higher odd of achieving a good tearing outcome (OR 2.27, p = 0.128).

Conclusions: Malposition repair and punctoplasty were both associated with significantly better postoperative tearing outcomes compared to observation/conservative management, however in both cases resolution was rare, and improvement overall was noted in approximately 50% of patients.

Figure 1



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5 From Periorbital Morphology to Functional Vision: Predicting Goldmann Visual Field with Machine Learning

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Introduction: To assess whether a superior visual field defect is significant in patients with blepharoptosis,[1] Medicare and most insurers require Goldmann Visual Fields (GVF) to be performed before surgical repair. This test can be time-consuming, requires specialized equipment and trained personnel. Automated prediction of GVF severity using readily obtainable clinical metrics, such as periorbital distances, could streamline initial screening.

Methods: A retrospective chart review of patients with blepharoptosis seen in the oculoplastics department was conducted to create a dataset. Variables collected included demographics, clinical measurements, and GVF values under taped and untaped conditions (Table 1, Figure 1). Periorbital distances were extracted from clinical images using a previously validated automated segmentation pipeline.[2] GVF measurements were converted to binary labels based on clinically significant cutoffs (taped: 40 degrees; untaped: 20 degrees). Random forest classifiers were trained separately for OD and OS eyes to predict high versus low GVF values from periorbital distances. Feature importance analyses and ablation studies were performed to identify key predictive features.

Results: Approximately 300 observations per GVF condition (taped vs untaped) were comprised in the dataset. Correlation analysis demonstrated modest associations between clinically collected levator function and MRD1 measurements with untaped GVF measurements (R^2 0.08-0.12, R^2 0.21-0.27, respectively). Random forest classifiers using periorbital distances achieved accuracies of 71-72% and AUROC values of approximately 0.73 for untaped binary GVF prediction (Table 2). Periorbital distances were unable to predict the taped GVF measurements. Feature importance analysis identified vertical palpebral fissure, MRD1, and MRD2 as the top contributors. Ablation studies confirmed that predictive performance was maintained only when multiple complementary features were included, emphasizing the collective clinical value of periorbital measurements (Table 2).

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Conclusions: Automated binary classification of GVF severity from periorbital distances is feasible and demonstrates meaningful predictive utility, highlighting its potential as an initial screening tool, especially in resource-limited environments. Poor predictive performance for taped GVF measurements is expected, as the periorbital distances were derived exclusively from untaped images, indicating that our approach is only suitable for predicting GVF from eyes at rest. The modest correlation between isolated clinical measurements and GVF further justifies the use of machine learning models that integrate multiple periorbital features. This is the first known study attempting automated GVF prediction, underscoring periorbital distances as easily deployable and accessible clinical features.

Figure 1

	Metric	Count
Ethnicity	White (Not Hispanic)	273
	Hispanic	196
	Black/ African American	78
	Asian	20
	Other	4
	Unknown	27
Gender	Male	369
	Female	228
	Unknown	1
Age (Mean (SD))	58.8 (18.99)	

Figure 2

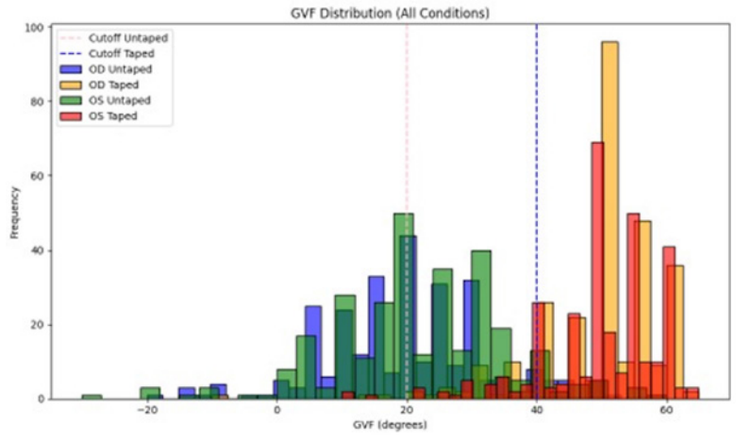

Figure 3

Laterality	Ablation	Accuracy	Precision	Recall	F1	AUROC +/- 95% CI
OS	none	0.72	0.71	0.67	0.68	0.73 +/- (0.67, 0.79)
	- top 1	0.7	0.68	0.65	0.66	0.7 +/- (0.64, 0.76)
	- top 2	0.67	0.65	0.63	0.63	0.67 +/- (0.6, 0.73)
	- top 3	0.64	0.6	0.58	0.58	0.67 +/- (0.6, 0.73)
	- top 4	0.65	0.61	0.6	0.6	0.64 +/- (0.57, 0.7)
	- top 5	0.64	0.6	0.58	0.58	0.63 +/- (0.56, 0.7)
OD	none	0.71	0.7	0.7	0.7	0.73 +/- (0.67, 0.79)
	- top 1	0.69	0.68	0.68	0.68	0.73 +/- (0.68, 0.79)
	- top 2	0.68	0.67	0.67	0.67	0.7 +/- (0.64, 0.76)
	- top 3	0.63	0.62	0.62	0.62	0.66 +/- (0.6, 0.72)
	- top 4	0.63	0.62	0.62	0.62	0.66 +/- (0.6, 0.72)
	- top 5	0.67	0.66	0.66	0.66	0.66 +/- (0.59, 0.72)

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6 Ocular Dominance and Its Association with Synkinesis Severity in Hemifacial Palsy Patients

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Introduction: Orofacial dyskinesias are a group of disorders characterized by involuntary muscular movements of the face, with facial synkinesis being common following facial nerve palsy.1 Facial synkinesis occurs when unintended muscular contractions are accompanied with voluntary facial movements, often resulting from abnormal nerve regeneration, ephaptic transmission, or nuclear hyperexcitability.1 Current management strategies focus on symptom control and facial retraining.2 Exploring the relationship between facial palsy and ocular dominance may improve early patient counseling and individualized care. Ocular dominance, the neurological preference for visual input from one eye,3 may offer a novel perspective in predicting post-palsy outcomes. This study aims to explore the relationship between ocular dominance and the degree and laterality of post-paralysis facial synkinesis.

Methods: This IRB-approved cross-sectional study included patients with a history of unilateral facial palsy, identified through ICD-10 diagnostic codes. Relevant clinical and demographic data, history and laterality of facial palsy, patient age, and gender, were extracted from electronic medical records. Eligible patients were contacted and invited to participate in a standardized survey, which utilized the Miles Test (Figure 1) to assess ocular dominance and the Synkinesis Assessment Questionnaire, a validated tool used to evaluate the frequency and laterality of facial synkinesis symptoms.4 Based on the relationship between the side of facial palsy and ocular dominance, participants were categorized into one of three groups:

Bilateral Dominance: Hemifacial palsy and bilateral (no discernable preference) ocular dominance

Same Dominance: Hemifacial palsy and ocular dominance on the same side

Opposite Dominance: Hemifacial palsy and ocular dominance on opposite sides

Statistical analysis was performed using the Kruskal-Wallis rank sum test with Bonferroni correction for multiple comparisons. Statistical significance was defined as $p < 0.05$.

Results: Of the 134 eligible patients contacted, 36 completed the survey, yielding a response rate of 26.87%. The average age of participants was 67.21 years. Among respondents, 55.55% were female and 44.45% were male. The distribution of the 36 respondents was as follows: 3 in the bilateral dominance group, 9 in the same dominance group and 21 in the opposite dominance group. Patients

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with hemifacial palsy with bilateral ocular dominance had significantly higher synkinesis scores compared to those with hemifacial palsy opposite to their ocular dominance (Z= 1.65, p= 0.023). The average synkinesis scores (± SD) were (figure 2):

Opposite Dominance Group: 31.32 ± 10.37

Same Dominance group: 41.98 ± 15.93

Bilateral Dominance group: 61.48 ± 12.83

No statistically significant differences were found when comparing the opposite dominance group to the same dominance group, or the bilateral dominance group to the same dominance group.

Conclusions: Patients with hemifacial palsy and bilateral ocular dominance had notably higher synkinesis scores compared to those with hemifacial palsy opposite to their ocular dominance. There may be a meaningful link between ocular dominance and the severity of facial synkinesis. Better understanding could not only guide future research but also inform more thoughtful, personalized conversations between patients and providers around this complex topic.

Figure 1

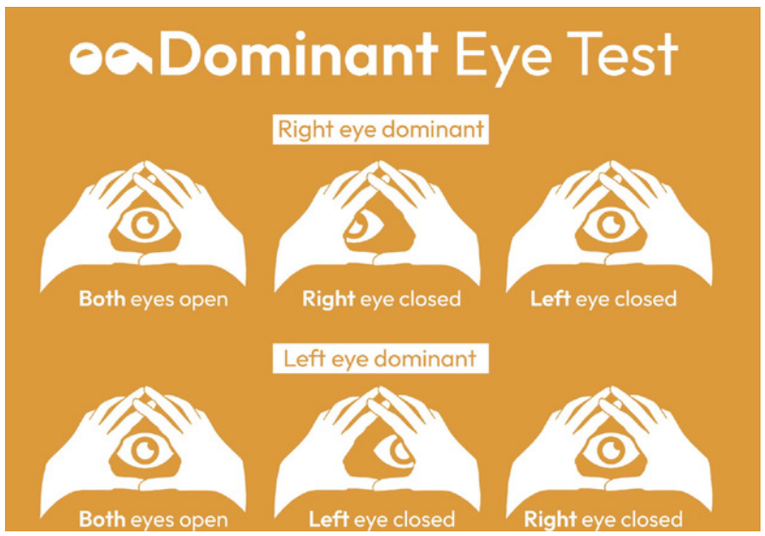
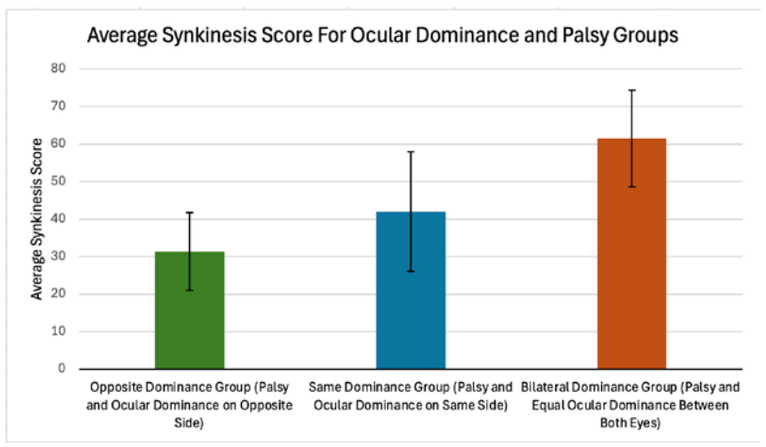


Figure 2



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7 Upper and Lower Eyelid Modified Bick Technique for the Surgical Correction of Floppy Eyelid Syndrome

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Introduction: Floppy Eyelid Syndrome (FES) is a condition characterized by excessive laxity of the eyelids associated with obstructive sleep apnea (OSA) and leading to chronic irritation and papillary conjunctivitis. Various surgical techniques have been described in the literature for FES that largely advocate upper lid tightening including the lateral tarsal strip, full-thickness wedge excision, canthal tendon plication, and canthal suspension.[1,2,3] The senior author (RS) has noted in practice that some patients with FES continue to have bothersome symptoms unless both the upper and lower lid laxity has been surgically addressed which has led some patients to have multiple surgeries. In this study, we describe our preferred surgical technique for FES using a modified Bick procedure to address both upper and lower eyelid laxity simultaneously.

Methods: This is a retrospective review of patients with symptomatic FES who underwent a concurrent modified Bick procedure for the upper and lower eyelids by a single surgeon (RS) between 2010–2024. Exclusion criteria included history of eyelid surgery or trauma, or follow up less than 6 months. All patients were first worked up for OSA if they did not already carry the diagnosis and medically optimized with relation to OSA when present. Prior to surgical consideration, medical therapy with lubricants and nighttime shielding was initiated for all patients for a minimum duration of 1 month. Only patients whose symptoms failed to improve with medical management or deferred long-term medical management were offered surgery. All procedures were performed under local anesthesia in the office setting. The surgical technique is illustrated in figure 1. First, a lateral canthotomy is performed, followed by inferior cantholysis. The lower eyelid is distracted towards the lateral orbital rim and redundant tissue is excised as a wedge with Westcott scissors. Pressure is applied to the lower lid while a mirror procedure is performed to the upper lid. A 5-0 double armed polypropylene suture is used to secure both the lower and upper lid tarsus and approximate them to the periosteum of the lateral orbital rim where it is left untied. The lateral canthal angle is reformed using a 6-0 plain gut suture. The polypropylene suture is then tightened to adequate lid tension and tied. The skin is closed with a 6-0 plain gut running suture. Ocular symptoms were noted pre- and post-operatively. Upper and lower eyelid laxity and distractibility along with degree of tarsal plate eversion were graded (fig. 2) and documented with exam and photos before and after surgery. Surgical complications and need for surgical revision were noted.

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Results: A total of 382 lids of 212 patients were included in the study, 194 (92%) of whom were male, 42 of whom had unilateral surgery, with a mean age of 59 yrs (23-84). 184 (87%) were diagnosed with OSA. Of the operated lids, 42 (11%) had grade 3 laxity, 233 (61%) grade 2, 107 (28%) grade 1, with a mean of 1.83. Symptoms improved in 203 patients (96%). Distractibility and tarsal plate eversion improved in all patients by a mean of 0.64 (0.51-0.77). Complications noted including: 1 case of superficial wound dehiscence which was treated conservatively with antibiotic ointment that resolved; 2 cases of polypropylene suture breakage who had revisions with the same procedure with an acceptable outcome; 7 patients had exacerbation of preoperative ptosis, 4 of whom had subsequent ptosis repair while 3 deferred further intervention. There were no cases of FES recurrence with a mean follow up of 11 months (range: 6-62).

Conclusions: The modified Bick procedures is an effective surgical technique for the concurrent correction of upper and lower eyelid laxity in FES, showing significant improvement in symptoms and lid laxity. Advantages of this technique include quick learning curve, speed of surgery, low complication rate, avoiding multiple surgeries, and high rate of patient satisfaction. Clinicians may consider this technique in the surgical management of FES patients.

Figure 1

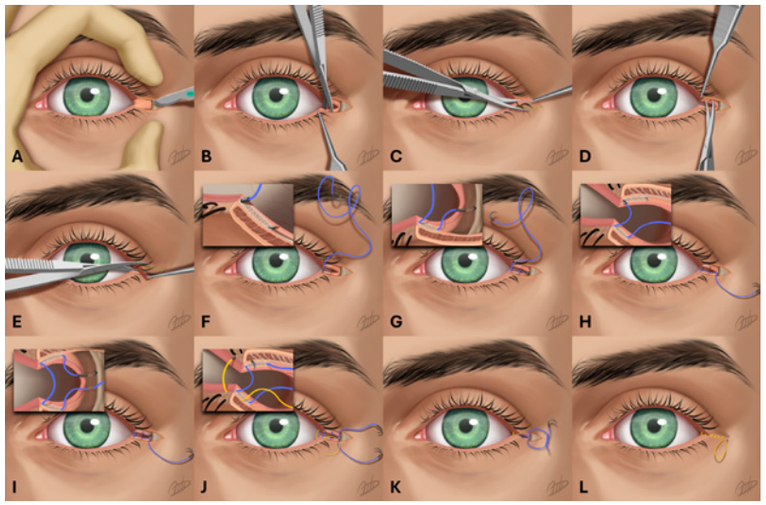
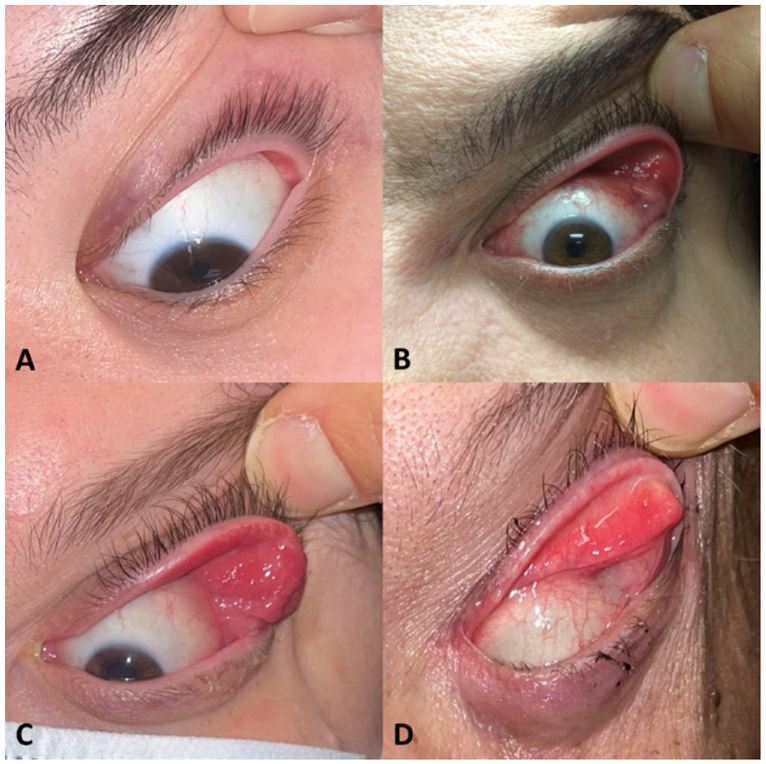


Figure 2



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8 A Novel Surgical Technique for Bicanalicular Intubation without the use of a Crawford Intubation Set

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Introduction: Bicanalicular intubation is conventionally performed using a Crawford intubation set. However, in certain cases, the set might be unavailable or intraoperative detachment of the silicone tubing from the olive tip may occur, generating the need of alternative approaches. We describe a modified technique that facilitates successful intubation using available surgical instruments.

Methods: Bicanalicular intubation is conventionally performed using a Crawford intubation set. However, in certain cases, the set might be unavailable or intraoperative detachment of the silicone tubing from the olive tip may occur, generating the need of alternative approaches. We describe a modified technique that facilitates successful intubation using available surgical instruments.

Methods: To perform this technique, a silicone tube, a Bowman probe, and a 5-0 Vicryl suture are required. First, the Bowman probe is passed through the lacrimal drainage system and retrieved from the corresponding nasal cavity. A “lasso” is then fashioned at the tip of the Bowman probe using the 5-0 Vicryl suture. Subsequently, the probe is gently pulled backward, allowing the suture to pass through the punctum with the other end exiting through the nose. The same lasso technique is repeated, this time securing the silicone tube. The Vicryl suture is then used to guide the silicone tube through the nasolacrimal system and out through the nasal cavity. The procedure is repeated on the contralateral punctum, resulting in both ends of the silicone tube exiting through the nose. Finally, the two ends are securely tied together within the nasal cavity to complete the Intubation.

Results: The described technique achieved successful bicanalicular intubation in all procedures, with accurate stent placement confirmed intraoperatively and postoperatively. No intraoperative complications, including canalicular injury, false passage formation, or difficulty in stent advancement, were encountered. Postoperative assessments demonstrated stable positioning of the silicone tube, and absence of adverse events such as stent extrusion, migration, or secondary obstruction throughout the follow-up period.

Conclusions: his modified technique provides a safe, effective, and reproducible alternative for bicanalicular intubation in situations where a standard Crawford intubation set is unavailable or malfunctioning. The use of readily available surgical instruments ensures procedural success without increasing the risk of intraoperative or postoperative complications. Adoption of this method may enhance surgical versatility in the management of lacrimal drainage disorders.

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9 Digital Subtraction Dacryocystography in the Evaluation of Patients with Epiphora

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Introduction: Abnormalities of the lacrimal drainage system are a common ophthalmologic complaint, and imaging plays a key role in identifying underlying causes, evaluating anatomy, and assessing adjacent structures. While conventional dacryocystography, MRI, and CT offer detailed anatomical information, they are limited by static imaging or higher radiation exposure. Dacryoscintigraphy, on the other hand, only evaluates functional issues. Digital subtraction dacryocystography (DS-DCG) enhances conventional methods by providing high-resolution, real-time visualization of tear flow with lower radiation exposure, making it the only modality to effectively combine dynamic and anatomical assessment. Despite its advantages, DS-DCG remains underutilized; this study presents our clinical experience using it to evaluate epiphora.

Methods: A retrospective case series was conducted. Medical records of nine patients over 18 years of age with epiphora who were evaluated during oculoplastic consultations between January 2024 and April 2025 and underwent DS-DCG were reviewed. Data collected included demographic characteristics, ophthalmologic history, and clinical findings related to the lacrimal drainage system. A total of 18 DS-DCG video studies were analyzed, with specific attention to lacrimal drainage patency. In cases of non-patency, the anatomical level of obstruction within the lacrimal system was identified.

Results: All patients (100%) were female, with a mean age of 68.3 years (range: 35–93 years). Four lacrimal systems had a history of previous endoscopic dacryocystorhinostomy (EN-DCR). The most common clinical findings prior to imaging were increased tear meniscus (observed in 8 lacrimal systems) and non-patent irrigation tests (8 systems).

DS-DCG revealed 7 patent lacrimal drainage systems, 6 non-patent systems, and 5 systems with partial patency due to significant narrowing. In one case, a silicone plug was visualized in real time within the lacrimal duct and was observed migrating toward the nasopharynx during the procedure.

Among the non-patent cases, the majority (5 lacrimal systems) showed nasolacrimal duct obstruction. Of these, 3 had a history of EN-DCR; all were found to be obstructed.

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Conclusions: DS-DCG is a readily available, rapid, and easy-to-perform diagnostic imaging modality. As a dynamic, high-resolution technique, it is particularly useful in the evaluation of patients with epiphora, especially those with prior DCR, suspected complex anatomy, potential foreign bodies (e.g., silicone plugs), or inconclusive irrigation test results (e.g., partial flow to the nasopharynx or patent irrigation despite persistent symptoms). DS-DCG uniquely combines detailed anatomical visualization with real-time assessment of tear dynamics, establishing it as an essential tool in the modern oculoplastic diagnostic armamentarium.

Figure 1

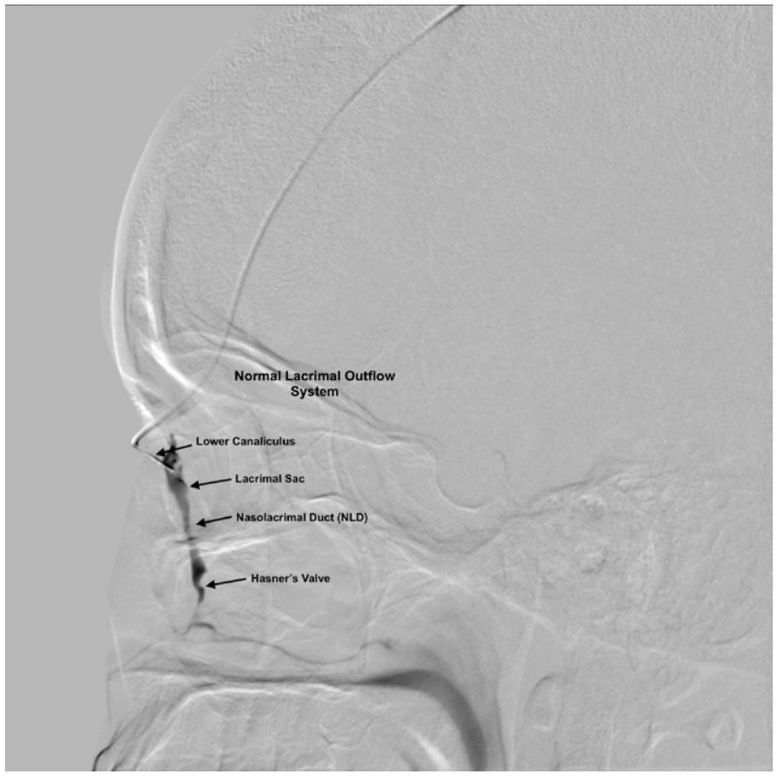

Figure 2

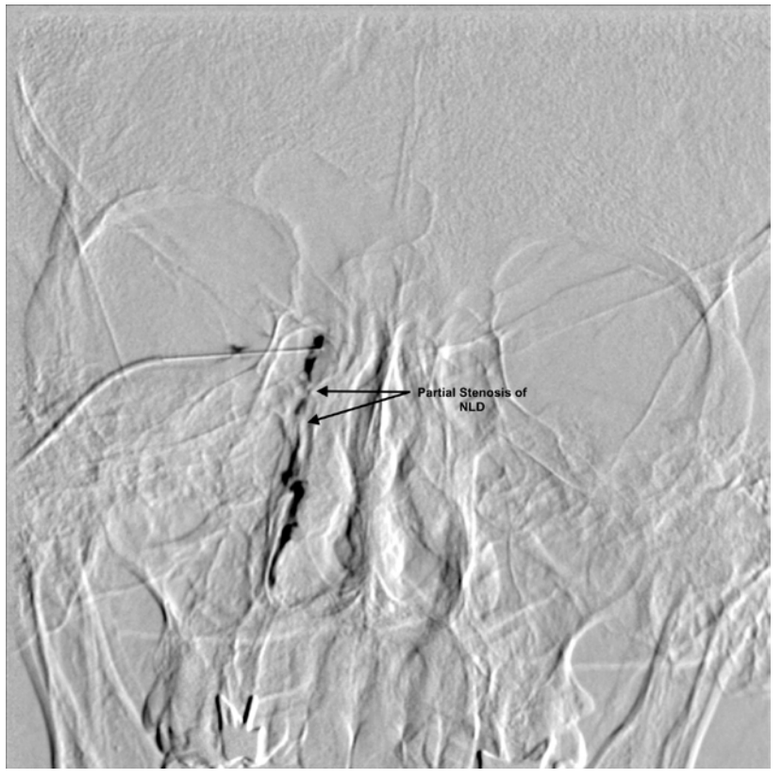

Figure 3

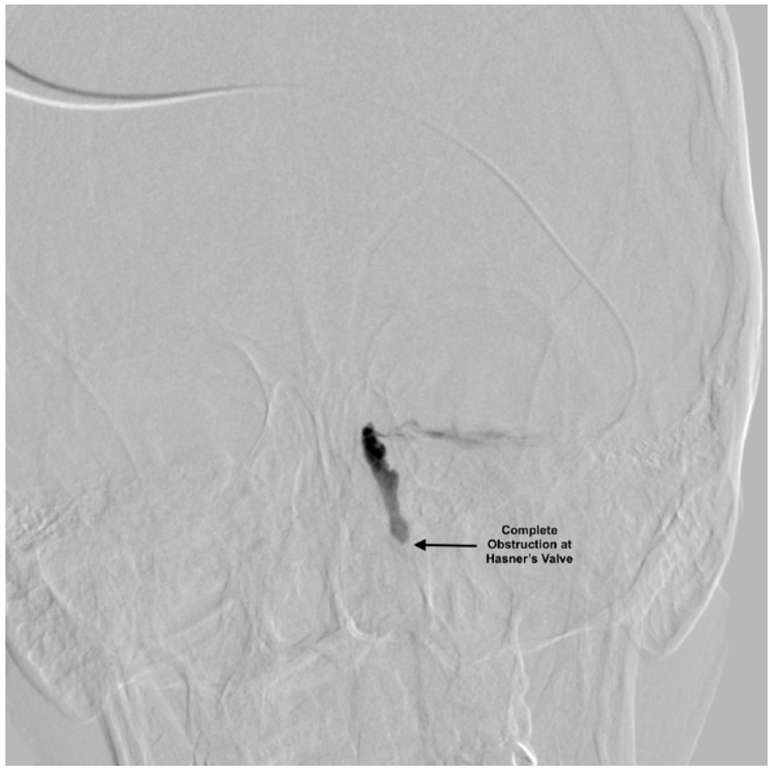

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Figure 4

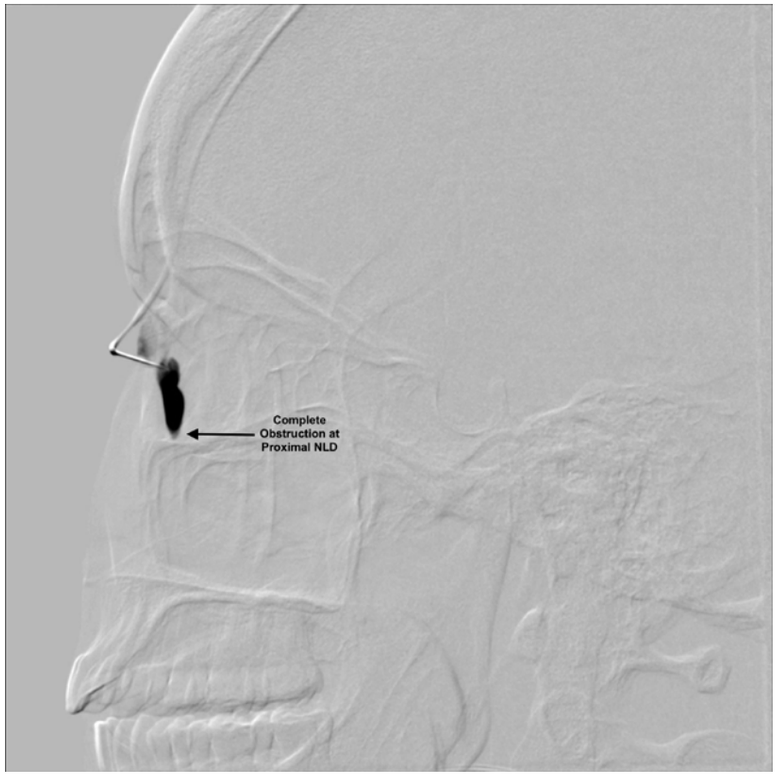
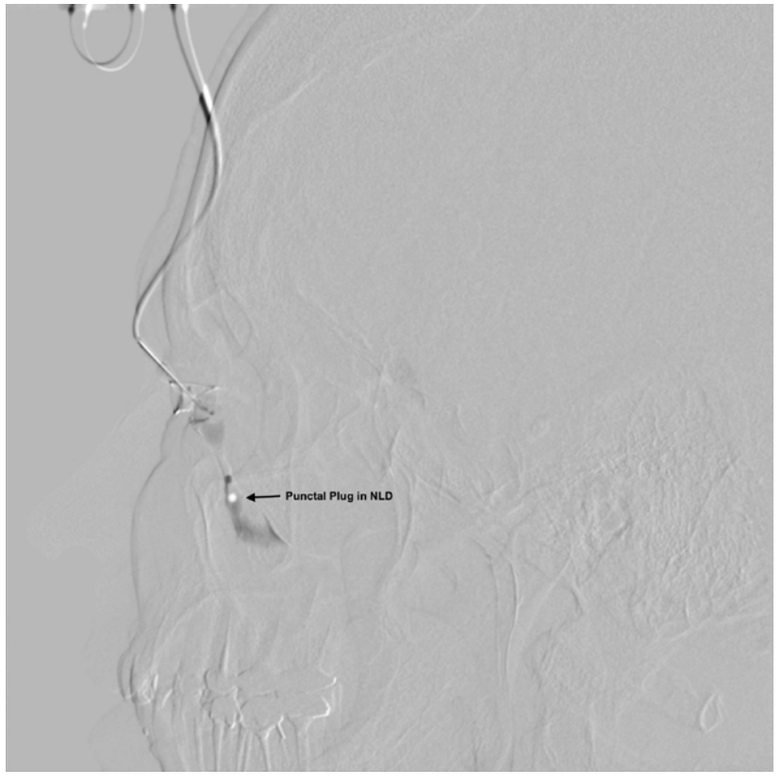


Figure 5



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10 Scintigraphic Evaluation of Radioactive Iodine Treatment on the Nasolacrimal Drainage System and Facial Glands in Patients with Thyroid Cancer

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Introduction: Radioactive iodine (I-131) remains a cornerstone in the management of differentiated thyroid carcinoma but carries recognized risks of salivary gland injury, chronic sialadenitis, and xerostomia[1], affecting up to 25% of patients receiving ≥100 millicurie (mCi)[2]. Nasolacrimal duct obstruction (NLDO) is a less frequent yet potentially significant complication that may necessitate subsequent dacryocystorhinostomy (DCR)[3,4]. Despite case reports suggesting a dose-dependent relationship between cumulative I-131 exposure and development of NLDO, this relationship has not been systematically quantified in a large cohort.

The purpose of this study was to quantify the incidence of NLDO and salivary gland dysfunction in a large I-131–treated thyroid cancer cohort; to determine cumulative radiation dose thresholds for each condition; and to evaluate whether I-131 glandular uptake (using post-therapy TSH levels as a proxy measurement for ablative success)[5,6] correlates with incidence of NLDO.

Methods: In this retrospective cohort study, we reviewed the medical records of 148 adults with a diagnosis of thyroid carcinoma who received I-131 between January 2002 and December 2022 at a single institution. Data collected included patient demographics, staging of thyroid carcinoma, cumulative I-131 dosage, pre- and post-therapy serologies (TSH, thyroglobulin tumor marker, thyroglobulin antibody), and salivary and lacrimal outcomes. NLDO was defined as patient-reported epiphora plus confirmation of obstruction by either dacryoscintigraphy, dacryocystography, or failed probing and irrigation. Salivary gland dysfunction was defined by any of: patient-reported xerostomia, need for sialendoscopy, documented sialadenitis, or post-therapy radiology imaging reports noting gland atrophy. We compared means with Welch's t-tests and NLDO rates across different dosages with Pearson's χ^2 test. A two-tailed $p<0.05$ was considered significant.

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Results: Among 148 patients (mean age 44.7 ±15.8 years; 54.1% with metastatic disease), the median cumulative I-131 dose was 101.5 mCi (mean 107.0 mCi; range 30–536 mCi). Seven of 148 patients (4.73%) developed NLDO, all of whom underwent DCR. These 7 patients received a higher mean RAI dose of 149.7 ± 10.6 mCi compared to the rest of the cohort (105.3 ± 84.1 mCi, Welch's t-test, $p<0.0001$). Mean post-RAI TSH was 107.9 ± 42.6 µIU/mL in patients without NLDO versus 124.9 ± 30.3 µIU/mL in those with NLDO. This difference was not statistically significant (Welch's t-test, $p = 0.20$). Dose-response in the NLDO cohort was stratified based on RAI cumulative dosage, where incidence of NLDO was 0% (0/58) at <100 mCi, 4.5% (3/67) at 100–150 mCi, and 17.4% (4/23) at >150 mCi (Pearson's, $p=0.004$). Salivary gland dysfunction was observed in 18.2% of patients (27/148), and xerostomia was reported by 24.3% (36/148).

Conclusions: In this large retrospective cohort, cumulative I-131 dose >150 mCi strongly correlated with NLDO (17.4% incidence) and salivary gland injury (18–24% incidence), whereas no cases of NLDO occurred at dosages below 100 mCi. Although post-therapy TSH tended to be higher in NLDO patients, indicating greater ablative success, this difference was not statistically significant. These findings support dose-stratified risk counseling, baseline ophthalmology/ENT evaluation for high-dose candidates, and proactive salivary gland–protective measures.

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11 Monopolar Electrocautery-Induced Axillary Burns from Aluminum-Containing Antiperspirant Deodorant Use during Blepharoplasty

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Introduction: Electrocautery, also referred to as diathermy, is a cornerstone surgical technique employed across surgical disciplines, primarily for tissue coagulation and hemostasis. In oculoplastic surgery, electrocautery is a fundamental tool for tissue dissection and vessel cauterization. While modern electrocautery systems maintain an excellent safety profile when used appropriately, potential complications include skin burns, bleeding, and infection.

Herein, the authors present a case of bilateral axillary burns following upper blepharoplasty, resulting from aberrant current pathways between the monopolar electrocautery and the patient's aluminum-containing antiperspirant deodorant. This incident underscores important safety measures for electrosurgical procedures.

Case Presentation: A 60-year-old woman presented with bilateral vision-impairing dermatochalasis and xanthelasma and underwent bilateral upper eyelid blepharoplasty with the use of monopolar electrocautery. At one-week post-operative, the patient presented with bilateral superficial, first-degree axillary burns (Figure 1A), which she had noted the night after surgery. The burns were treated with petroleum jelly and improved in appearance after 3 months with no further medical intervention (Figure 1B).

In this case, no intraoperative or external risk factors for electrocautery burns were identified. The grounding pad was firmly positioned on the patient's lateral thigh and the monopolar electrode was used exclusively on the upper eyelids. The patient was maintained in proper supine positioning without contact with external metal objects or pooled fluids. The patient did not wear metal jewelry and did not have implanted metal devices. The only identifiable conductive source, which aligns the anatomical location of the injuries, was the patient's aluminum chlorohydrate-containing antiperspirant deodorant (15% active ingredient), which she applied preoperatively.

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Conclusions: While rare, monopolar electrocautery carries an inherent risk of burns if improper grounding occurs. This case demonstrates a burn resulting from current diversion through aluminum-containing antiperspirant deodorant. Although cases have documented electrocautery-related burns and metal surgical, implanted metal devices, or metallic jewelry, burns resulting from metal-containing topical applications are rare. Clinicians should recognize that seemingly benign personal care products may contain conductive metals capable of altering current pathways that lead to unintended thermal injuries.

Figure 1

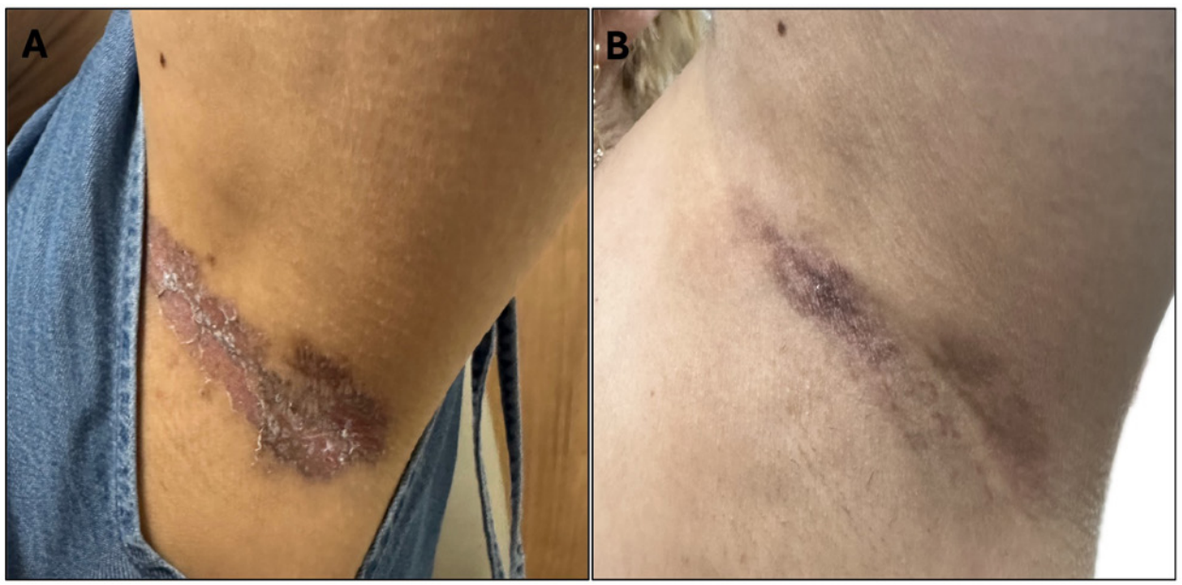

Figure 1. Clinical photographs of a 60-year-old woman who sustained bilateral superficial, first-degree axillary burns following a routine blepharoplasty. (**A**) Picture of the left axilla at one-week post-operative follow-up showing superficial burns. (**B**) Follow-up image of healed left axillary burns at 3-months post-operative visit.

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12 Impact of Socioeconomic and Demographic Factors on Biologic Use in Advanced Non-Melanoma Skin Cancer

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Introduction: Advanced non-melanoma skin cancer (NMSC) presents significant challenges, especially when locally advanced or metastatic. Advances in treatment, including Programmed Cell Death 1 (PD-1) inhibitors, Hedgehog Pathway inhibitors, and Cytotoxic T-Lymphocyte-Associated Protein 4 (CTLA-4) inhibitors, have improved outcomes[1–5]. However, socioeconomic disparities and demographic factors affect access to care and treatment outcomes[2,6–9]. This study evaluates the influence of these factors on biologic treatment access in advanced NMSC.

Methods: This study analyzed patients with NMSC treated with PD-1 inhibitors, Hedgehog Pathway inhibitors, and CTLA-4 inhibitors from January 1, 2014, to December 31, 2024. Data were collected using International Classification of Diseases, 10th Revision (ICD-10) and Current Procedural Terminology (CPT) codes to identify patients diagnosed with NMSC and treated with biologic therapies. Patient selection was performed using an electronic health record (EHR) platform and a data analytics tool. Prevalence rates were calculated, and Chi-square analysis of biologic use were performed to assess association.

Results: A total of 14,640 patients with NMSC were identified, of whom 0.49% were treated with biologic therapies. Most patients were male (41.7%), White (69.6%), not Hispanic (71.3%), and 65 years or older (81.8%). PD-1 inhibitors had the highest prevalence (34.8 per 10,000), followed by Hedgehog inhibitors (8.8 per 10,000) and CTLA-4 inhibitors (5.5 per 10,000) ($p < 0.001$).

Biologic use varied by insurance type. Commercial insurance and Medicare patients had higher prevalence of biologic use (26.1 per 10,000 for PD-1 inhibitors in commercial, 31.7 per 10,000 for Medicare), while Medicaid patients had lower prevalence of biologic treatments ($p = 0.032$).

Chi-square analysis revealed a significant association between Area Deprivation Index (ADI) and biologic use ($p < 0.001$). Patients from higher ADI areas had greater use of PD-1 inhibitors (7.7 per 10,000) compared to those from lower ADI areas (3.6 per 10,000).

Demographic disparities were also observed. Male patients had a higher prevalence of biologic use (32.8 per 10,000 for PD-1 inhibitors) compared to female patients (21.3 per 10,000) ($p < 0.001$). In terms of age, patients aged 18 to 64 had a higher prevalence of biologic use (69.2 per 10,000) compared to those aged 65 or older (27.6 per 10,000) ($p = 0.0023$).

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Ethnicity showed significant differences, with Hispanic patients having a higher prevalence of PD-1 inhibitors (347.6 per 10,000) compared to non-Hispanic patients (326 per 10,000, p = 0.043). However, Hispanic patients had a lower prevalence of Hedgehog inhibitors (27.7 per 10,000 vs 76.7 per 10,000 for non-Hispanic, p = 0.043).

Conclusions: This study highlights significant socioeconomic and demographic differences in the utilization of biologic therapies for advanced NMSC. PD-1 inhibitors had the highest prevalence of use, particularly among patients with commercial insurance and Medicare. Conversely, Medicaid and self-pay patients had lower prevalence of biologic treatments. Age, sex, and ethnicity also influenced treatment access, with Hispanic patients showing higher PD-1 inhibitor use but lower access to Hedgehog inhibitors. These findings emphasize the need for clinical strategies to ensure equitable access to biologic therapies for all patients, regardless of socioeconomic status or demographic factors.

Figure 1

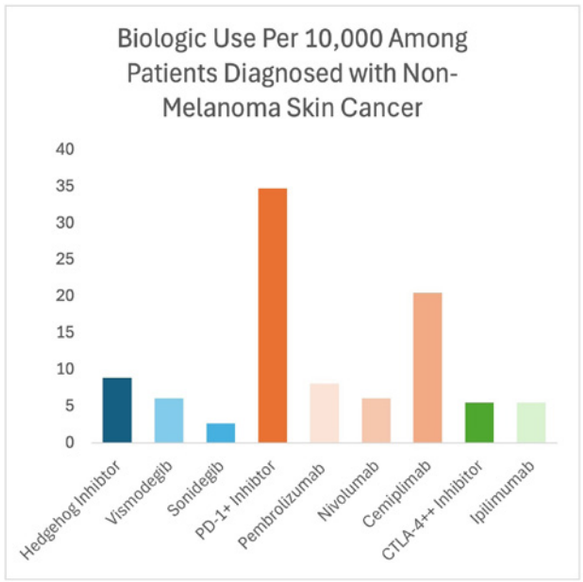

Figure 2

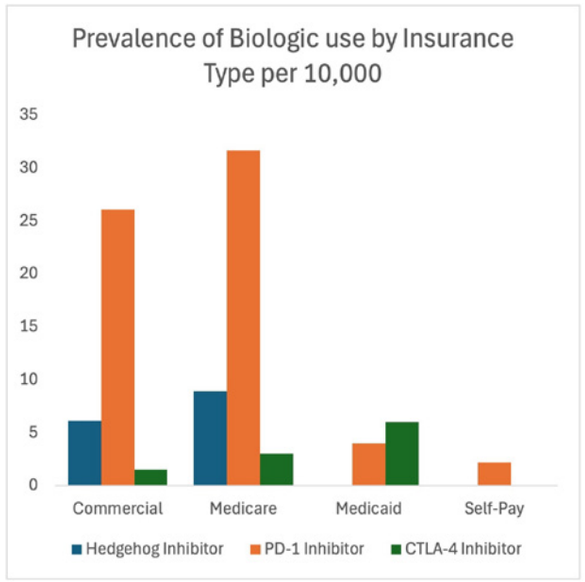

Table 1. Demographic characteristics of patients diagnosed with non-melanoma skin cancer (NMSC) at academic medical center and affiliated medical centers and clinics from 2015 to 2024 (n = 14,640)

Variable	Total n = 14,640 (%)
Age	
18-24	30 (0.2)
25-44	286 (2.0)
45-64	2,285 (15.6)
65 or older	11,978 (81.8)
Sex	
Female	6,104 (41.7)
Male	8,535 (58.3)
Unknown	1 (0.01)
Race	
African American or Black	68 (0.4)
American Indian or Alaska Native	65 (0.4)
Asian	118 (0.8)
Native Hawaiian or Other Pacific Islander	16 (0.1)
White	10,184 (69.6)
Other	612 (4.2)
Decline to State	1399 (9.6)
Ethnicity	
Hispanic	374 (2.6)
Not Hispanic	10,431 (71.3)
Declined to State	1,551 (10.6)
Payer/Insurance Type	
Commercial	6,512 (44.5)
Medicare	10,110 (69.1)
Medicaid	500 (3.4)
Self-Pay	9 (0.06)
Area Deprivation Index+	
Q1 (0-20)	1,039 (7.1)
Q2 (21-40)	2,620 (17.9)
Q3 (41-60)	4,012 (27.4)
Q4 (61-80)	3,409 (23.3)
Q5 (81-100)	12,297 (16.0)
Non-Melanoma Skin Cancer Type	
Basal Cell Carcinoma	9,052 (61.8)
Squamous Cell Carcinoma	6,388 (43.6)
Merkel Cell Carcinoma	36 (0.2)
Sebaceous Cell Carcinoma	12 (0.08)
Undifferentiated Malignancy of the Eye	816 (5.6)
PD-1 Inhibitors++	51 (0.4)
Pembrolizumab	12 (0.08)
Nivolumab	9 (0.06)
Cemiplimab	30 (0.2)
Hedgehog Pathway Inhibitors	13 (0.09)
Vismodegib	9 (0.06)
Sonidegib	40.03)
CTLA-4 Inhibitor+++	8 (0.05)
Ipilimumab	8 (0.05)

+ Area Deprivation Index organized in quintiles, ranging from 0 to 100
++ Programmed Death-1 Inhibitor
+++ Cytotoxic T-Lymphocyte-Associated Protein 4 Inhibitor›

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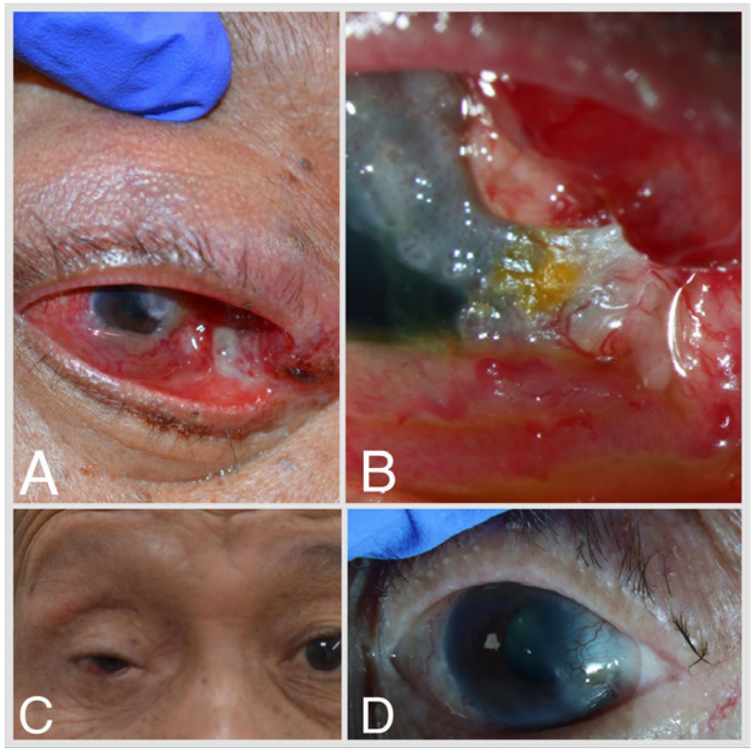
Figure 4

Table 2. Prevalence of biologic treatment use per 10,000 of patients diagnosed with non-melanoma skin cancer (NMSC) at academic medical center and affiliated medical centers and clinics from 2015 to 2024 (n = 14,640)

Variable	Prevalence per 10,000	p-value
Biologic use		<0.001
Hedgehog Inhibitors	8.9	
Vismodegib	6.1	
Sonidegib	2.7	
PD-1⁺ Inhibitors	34.8	
Pembrolizumab	8.1	
Nivolumab	6.1	
Cemiplimab	20.5	
CTLA-4⁺⁺ Inhibitor	5.5	
Ipilimumab	5.5	
Insurance/Payer and Biologic Used		0.032
Commercial-Hedgehog	6.1	
Commercial-PD-1⁺	26.1	
Commercial-CTLA-4⁺	1.5	
Medicare-Hedgehog	8.9	
Medicare-PD-1⁺	31.7	
Medicare-CTLA-4⁺⁺	3.0	
Medicaid-Hedgehog	0	
Medicaid-PD-1⁺	4.0	
Medicaid-CTLA-4⁺⁺	6.0	
Self-Pay-Hedgehog	0	
Self-Pay-PD-1⁺	2.2	
Self-Pay-CTLA-4⁺⁺	0	
Area Deprivation Index⁺⁺⁺		<0.001
Low Deprivation-Hedgehog	1.9	
Low Deprivation-PD-1⁺	3.6	
Low Deprivation-CTLA-4⁺⁺	0.6	
High Deprivation-Hedgehog	6.0	
High Deprivation-PD-1⁺	7.7	
High Deprivation-CTLA-4⁺⁺	1.3	
Sex		<0.001
Female-Hedgehog	9.8	
Female-PD-1⁺	21.3	
Female-CTLA-4⁺⁺	4.9	
Male-Hedgehog	8.2	
Male-PD-1⁺	32.8	
Male-CTLA-4⁺⁺	5.9	
Age		0.0023
18 to 64-Hegehog	11.5	
18 to 64-PD-1⁺	69.2	
18 to 64-CTLA-4⁺⁺	3.8	
65 or Older-Hedgehog	8.3	
65 or Older-PD-1⁺	27.6	
65 or Older-CTLA-4⁺⁺	5.8	
Race		0.063
African American or Black-Hedgehog	441.1	
African American or Black-PD-1⁺	1617.6	
African American or Black-CTLA-4⁺⁺	0	
American Indian or Alaska Native-Hedgehog	0	
American Indian or Alaska Native-PD-1⁺	317.7	
American Indian or Alaska Native-CTLA-4⁺⁺	0	
Asian-Hedgehog	169.5	
Asian-PD-1⁺	423.7	
Asian-CTLA-4⁺⁺	84.7	
Native Hawaiian or Pacific Islander-Hedgehog	0	
Native Hawaiian or Pacific Islander-PD-1⁺	625.0	
Native Hawaiian or Pacific Islander-CTLA-4⁺⁺	0	
White-Hedgehog	589.1	
White-PD-1⁺	3240.3	
White-CTLA-4⁺⁺	687.4	
Other-Hedgehog	163.3	
Other-PD-1⁺	163.3	
Other-CTLA-4⁺⁺	0	
Decline to State-Hedgehog	71.5	
Decline to State-PD-1⁺	0	
Decline to State-CTLA-4⁺⁺	0	
Ethnicity		0.043
Hispanic-Hedgehog	27.7	
Hispanic-PD-1⁺	347.6	
Hispanic-CTLA-4⁺⁺	53.5	
Not Hispanic-Hedgehog	76.7	
Not Hispanic-PD-1⁺	326.0	
Not Hispanic-CTLA-4⁺⁺	47.9	
Decline to State-Hedgehog	258.9	
Decline to State-PD-1⁺	258.9	
Decline to State-CTLA-4⁺⁺	64.5	

+ Programmed Death-1 Inhibitor
++ Cytotoxic T-Lymphocyte-Associated Protein 4 Inhibitor
+++ Area Deprivation Index organized in quintiles, ranging from 0 to 100

Figure 5



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13 Targeted Next-Generation Sequencing-Based Molecular Profiling of Ocular Sebaceous Carcinoma and Its Potential Application

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Introduction: As a periocular cancer, sebaceous carcinoma is a rare but aggressive, and the knowledge on its molecular biology is currently limited. The management of advanced sebaceous carcinoma is currently challenging. There is a big need for targeted therapies to improve the clinical management of these cases. Advances in our understanding of the molecular biology of sebaceous carcinoma might help us to identify and apply targeted therapies. In this study, we evaluated targeted next-generation sequencing-based genomic and transcriptomic analyses of ocular sebaceous carcinoma (OSC) samples using a panel of >1700 cancer-related genes.

Methods: A pilot cohort of 15 patients was analyzed using targeted or whole-exome sequencing.

Results: The mean age of patient was 74 years. The upper eyelid was involved in 5 patients, lower eyelid in 6 patients, both upper and lower eyelids in 2 patients. Pagetoid involvement was present in 6 cases and orbital involvement in 4 cases. Biallelic inactivation of *RB1* and *TP53* was observed in all patients, suggesting consistent tumor suppressor pathway disruption. *CCNE1* gain occurred in 33%of patients, as part of the most recurrent copy number alteration. Most tumors exhibited significant *ERBB2 (HER2)* expression, and one tumor harbored an *ERBB2* S310F mutation, an extracellular domain alteration known to sensitize cells to HER2 inhibitors. Additionally, two cases with biallelic *BRCA1* or *BRCA2* inactivation showed homologous recombination deficiency copy number signature, indicating possible responsiveness to PARP inhibitor therapy.

Conclusions: This study provides critical insights into the molecular biology of periocular sebaceous carcinoma, by identifying consistent genetic alterations and potential therapeutic vulnerabilities. While the therapy of the advanced sebaceous carcinoma is currently challenging, this study shows that targeted therapies could be an option for some patients.

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14 A Protocol for Hypochlorous Acid Treatment for Patients with Periorbital Necrotizing Fasciitis

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Introduction: Treatment of periorbital necrotizing fasciitis (PONF) with local administration of hypochlorous acid (HOCl) in addition to traditional treatment with debridement and intravenous antibiotics has been reported to yield results without loss of eye or loss of life at recent academic meetings.[1-3] However, given the lack of published data on the topic, there is no clear protocol to guide clinicians who wish to add HOCl to their PONF treatment regimen. The purpose of this study is to analyze the treatment regimen of patients treated with hypochlorous acid at the academic institution that first used hypochlorous acid treatment for PONF and share its treatment protocol with the academic community.

Methods: In this retrospective case series, records of patients treated for PONF with hypochlorous acid were pulled from the electronic medical record. The volume and frequency of HOCl flushes were recorded. In addition, data was recorded on the volume and frequency of local antibiotic flushes, number of debridements, and administration of intravenous antibiotics.

Results: 18 orbits from 15 patients qualified for the study. All orbits received intravenous antibiotics, surgical debridement, and local hypochlorous acid soaks. 17 of the 18 orbits and periocular tissues received HOCl flushes, with volume ranging from of 2-20 mL and frequency ranging from every 4 hours to every 12 hours (Table 1). 15 of the 18 orbits and periocular tissues received local antibiotic flushes, alternating with the HOCl, with volume ranging from 1-25 mL and frequency ranging from every 4 hours to every 12 hours. Orbital tolerance for the volume of flush was gauged in the operating room by palpation and assessment of intraocular pressure. The concentrations of pure hypochlorous acid used ranged from 0.01% to 0.033%. The volume and frequency of flushes were titrated based on the extent of the infection. In addition to the HOCl for the orbit, the total volume administered included any facial areas with disease that also required flow through cleaning. Figures 1-2 show cases that were treated with different frequencies and volumes of HOCl. The PONF treatment protocol employed at this institution is shown in Figure 3.

Conclusions: A retrospective case series of eighteen orbits from fifteen patients with periorbital necrotizing fasciitis who were treated with local administration of hypochlorous acid in addition to traditional treatment with intravenous antibiotics and surgical debridement showed volume and frequency of hypochlorous acid treatment varied from 2-20 mL every 4-12 hours according to the extent of the infection. The volume and frequency of HOCl administered in these cases were tolerated well by the patients, as none of

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the patients lost their eye or their life from the periorbital necrotizing fasciitis. These findings can be used to guide clinicians who employ hypochlorous acid in PONF treatment.

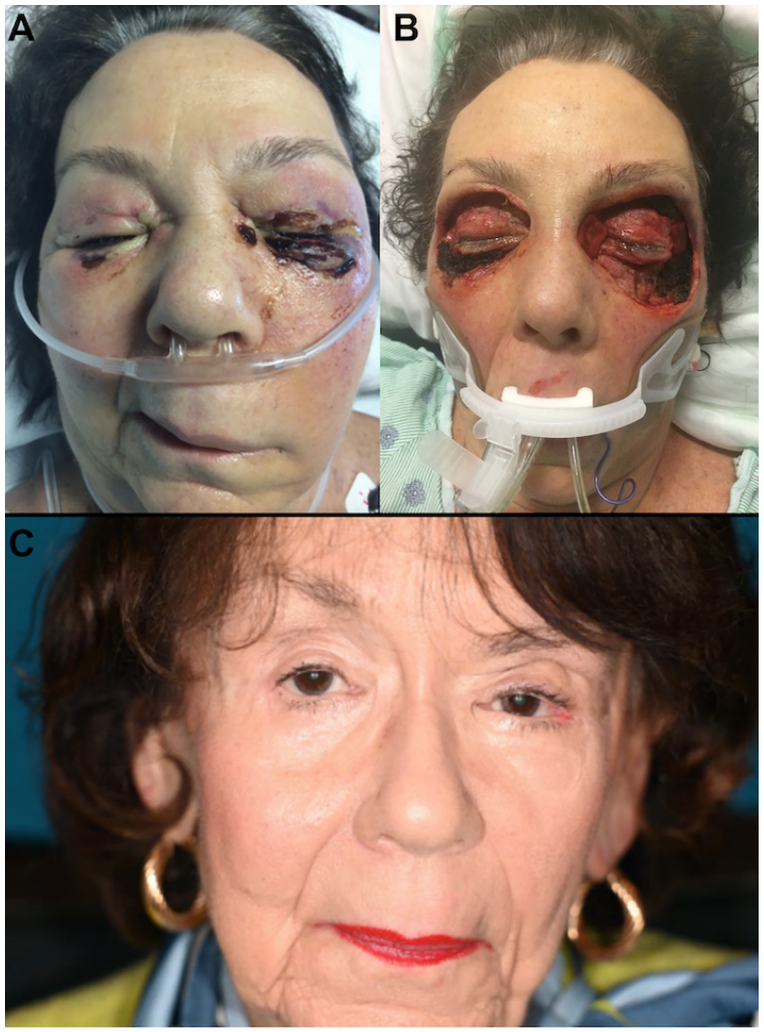

Figure 1: Photographs of Patient 1. A—Pre-treatment photograph of Patient 1. B—Photograph of patient on Day 8 of surgical and antibiotic treatment prior to hypochlorous acid treatment. C—Post-treatment photograph. Patient 1 was treated bilaterally with 10mL of hypochlorous acid flushes every 12 hours and 25mL of antibiotic flushes every 6 hours.

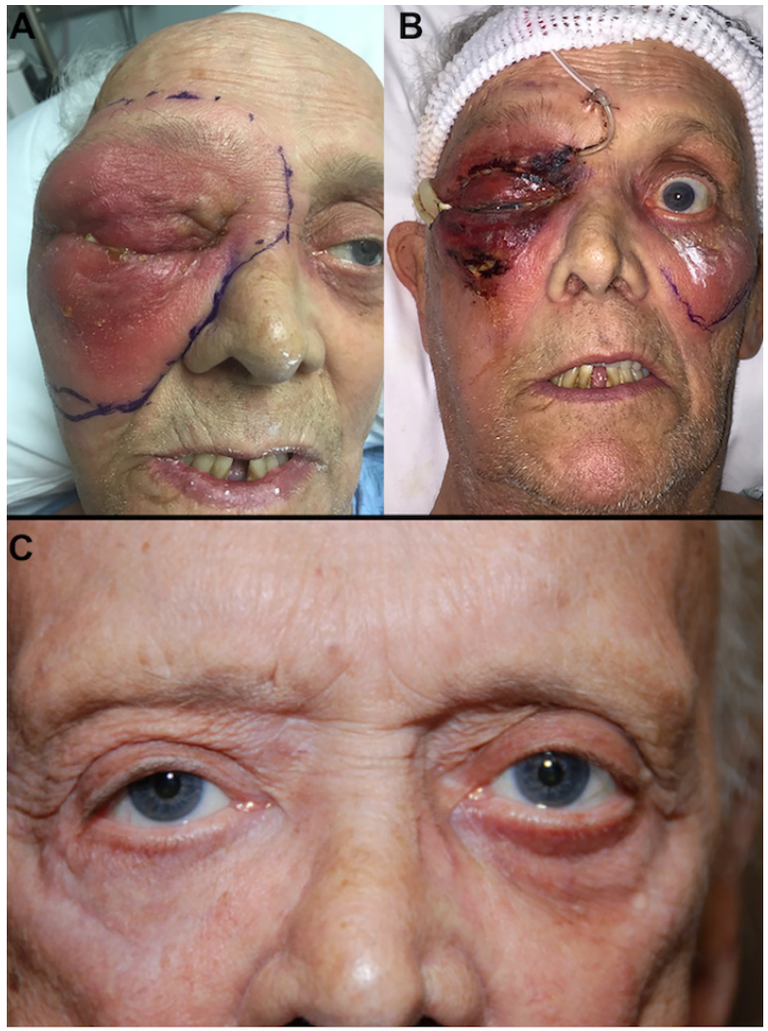

Figure 2: Photographs of Patient 2. A—Pre-treatment photograph of Patient 2. B—Mid-treatment photograph after catheter and drain placed. C—Post-treatment photograph. Patient 2 was treated unilaterally with 3mL of hypochlorous acid flushes every 4 hours alternating with 3mL of antibiotic flushes every 4 hours.

Periorbital Necrotizing Fasciitis Treatment Protocol

1) **Surgical Orbital and Periocular Soft Tissue Care**
   a. **Surgically place intraorbital and soft tissue fenestrated catheter(s) and Penrose Drain(s) to wound.**
   b. **Irrigate catheters with dilute pure hypochlorous acid (0.01% - 0.033%) using a 10cc syringe to catheters – volume (typically 2cc – 5cc) and interval (q4-q12) will vary depending on site of infection and number of catheters. Check for tolerance of the orbit to the volume irrigated by palpation and check of intraocular pressure.**
   c. **Alternate dilute pure hypochlorous acid irrigation with antibiotic solution (typically start with vancomycin 10mg/cc) – volume (typically 2cc – 5cc) and interval (q4-q12) will vary based on extent of infection. Irrigation antibiotic solution will vary by suspected or confirmed pathogen sensitivities (e.g. use Penicillin G for *Strep Pyogenes*). Check for tolerance of the orbit to the volume irrigated by palpation and check of intraocular pressure.**
2) **Topical Wound Care**
   a. **Dilute pure hypochlorous acid 0.01% sprayed to infected tissue, eyes, and exposed orbits q2h – q6h.**
   b. **Topical ophthalmic antibiotic solution (will vary by suspected or confirmed pathogen sensitivities):**
      i. ***Streptococcus Pyogenes*: Penicillin Ophthalmic solution (100,000 units per cc of hydroxypropyl methylcellulose tears). Drip 5 drops over infected tissue q2h – q6h.**
      ii. **Methicillin Resistant *Staphylococcus aureus*: Vancomycin Ophthalmic solution 10mg/cc. Drip 5 drops over infected tissue q2h – q6.**
   c. **Topical ophthalmic antibiotic ointment (will vary by suspected or confirmed pathogen sensitivities):**
      i. ***Streptococcus Pyogenes*: Bacitracin ophthalmic ointment – spread thin layer of bacitracin ophthalmic ointment over entire wound q4h – q6h.**
      ii. **Methicillin Resistant *Staphylococcus aureus*: Tobramycin ophthalmic ointment – spread thin layer of tobramycin ophthalmic ointment over entire wound q4h – q6h.**
3) **Topical Wound Dressing**
   a. **Use one 9 x 5 xeroform and place over the infected area (typically eyes, cheek, and nose).**
   b. **Place ABD pad folded in half over the eyes to absorb drainage, maintain moist wound bed, and hold ointment on the eyelid.**
   c. **Use Kerlix wrapped around the head (only requires a few wraps) as a compressive dressing to secure in place.**

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Table 1: Summary of Patient Data

Patient #	Age	Sex	Total Volume and Frequency of HOCl Flushes	Local Antibiotic Flushes	Concentration of HOCL	Number of Debridements	Loss of Eye	Death
1 (bilateral)	73	F	10mL q12h 10mL q12h	25mL q6h 25mL q6h	0.01%	5	No No	No
2	76	M	3mL q4h	3mL q4h	0.01%	2	No	No
3	72	M	2mL q12h	2mL q12h	0.01%	2	No	No
4	66	F	4mL q4h	2mL q12h	0.01%	5	No	No
5	82	M	10mL q6h	None	0.01%	3	No	No
6	56	M	20mL q12h	20mL q12h	0.033%	3	No	No
7	61	M	20mL q8h	20mL q8h	0.033%	5	No	No
8	49	M	5 mL q4h	5 mL q4h	0.033%	4	No	No
9 (bilateral)	58	F	20mL q6h 20mL q6h	2x10mL q6h 2x10mL q6h	0.01%	5	No No	No
10	19	M	10mL q12h	None	0.01%	1	No	No
11	59	M	10mL q12h	10mL q12h	0.01%	2	No	No
12 (bilateral)	55	M	2mL q12h 2mL q12h	2mL q12h 2mL q12h	0.01%	2	No No	No
13	29	F	2mL q6h	1mL q6h	0.01%	1	No	No
14	49	M	3mL q6h	None	0.025%	2	No	No
15	33	F	Flushed only once in OR	None	0.025%	2	No	No

Notes: VA=Visual Acuity, HOCl=hypochlorous acid. When possible, HOCl and antibiotic flushes were staggered by time so that patients received alternating flushes. Total volumes represent sum of HOCl titrated for orbit plus any used to treat surrounding facial areas with flow thorough cleansing. Patient 15 was flushed with HOCl once in the OR, but a catheter was decided not to be placed given operative findings

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15 Active Smokers Undergoing Teprotumumab Treatment for Thyroid Eye Disease May Experience Greater Improvement in Proptosis and Lid Position Than Non-Smokers

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Introduction: Smoking is associated with the development and progression of thyroid eye disease (TED) as well as diminished responses to immunosuppressive therapies. However, the impact of smoking on outcomes following teprotumumab treatment for TED remains poorly understood. This study aims to evaluate differences in treatment outcomes between active smokers and non-smokers who underwent teprotumumab therapy for TED.

Methods: This is a single-center retrospective cohort study of TED patients who completed an 8-infusion course of teprotumumab from January 1, 2022 to April 1, 2025. Outcomes of clinical activity score (CAS), diplopia (Gorman Score), proptosis of each eye (Hertel exophthalmometry), and margin reflex distance-1 (MRD1) of each eye were measured at the clinic visit prior to initiation of teprotumumab, first visit post-teprotumumab, and most recent follow-up. Active smoking was defined as cigarette smoking throughout teprotumumab treatment and follow up. Fisher's exact test was used to compare distributions of CAS and Gorman Score between groups. Multivariable mixed effects models were used to compare exam outcomes in active smokers and non-smokers in the above three time points with random effects for patient and eye, and covariates for age, sex, race, prior orbital decompression, teprotumumab retreatment, and pre-teprotumumab exam. Inverse probability weighting using propensity scores from patient baseline characteristics was applied to mixed effects models to distribute the effects of confounders equally between groups.

Results: One-hundred sixty patients completed teprotumumab treatment, of which 12 (7.5%) were active smokers. Active smokers were more likely to have undergone prior orbital decompression surgery than non-smokers (25% vs. 6.8%, p=0.026). All other demographic characteristics, pre-teprotumumab outcome measurements, and time between the three visits were not significantly different between groups (Table 1). The median time between the last teprotumumab infusion and the most recent visit for all patients was 15 months (IQR 8-27). There was no significant difference in the distribution of CAS (Figure 1) or Gorman Scores (Figure 2) between active smokers and non-smokers at any timepoint. However, in multivariable ordinal logistic regression of pre-teprotumumab CAS, active smokers

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had a 2.67 times higher odds (95% CI 1.17-11.48) of having a higher CAS than non-smokers. In multivariable mixed effects linear models, active smokers had a 1.6 mm greater reduction (95% CI –2.6, -0.6, p=0.002) in proptosis than non-smokers from the pre-teprotumumab visit to the most recent visit (Figure 3). In similar models, there were no significant changes in the percent proptosis reduction from pre-teprotumumab. There was significantly more reduction in MRD1 in active smokers compared to non-smokers from the pre-teprotumumab to the post-teprotumumab visit (-1.2 mm; 95% CI -1.9, -0.5, p=0.002) and to the most recent visit (-1.0 mm; 95% CI –1.8, -0.2, p=0.027) (Figure 4).

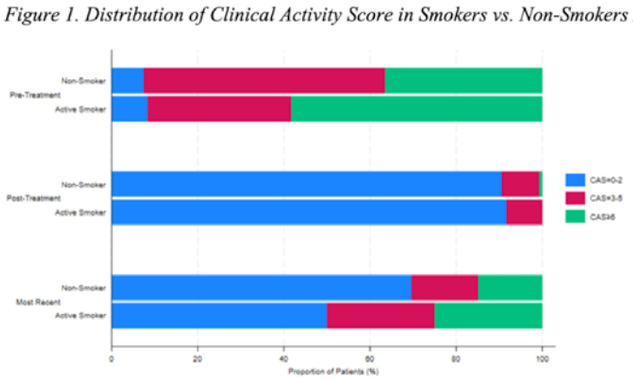
Conclusions: TED patients that actively smoked throughout teprotumumab treatment and follow-up experienced greater long-term improvement in proptosis and sustained larger improvements in MRD1. However, active smokers had higher odds of presenting with more severe baseline inflammation than non-smokers, suggesting that they may derive greater relative benefit from teprotumumab treatment. More long-term data is needed to understand TED re-flare after teprotumumab treatment in this subset of patients.

Table 1. Patient Characteristics by Smoking Status

	Total	Non-smoker	Active smoker	P-value
	n=160	n=148	n=12	
Age at Initiation of Teprotumumab*	57.6 (46.3-67.1)	58.0 (46.3-66.8)	56.3 (42.8-68.1)	0.74
Female Sex†	116 (72.5%)	110 (74.3%)	6 (50.0%)	0.07
White Race	122 (76.2%)	113 (76.4%)	9 (75.0%)	0.92
Pre-Teprotumumab Clinical Activity Score (CAS)				0.13
0	3 (1.9%)	3 (2.0%)	0 (0.0%)	
1	6 (3.8%)	6 (4.1%)	0 (0.0%)	
2	3 (1.9%)	2 (1.4%)	1 (8.3%)	
3	10 (6.2%)	10 (6.8%)	0 (0.0%)	
4	35 (21.9%)	34 (23.0%)	1 (8.3%)	
5	42 (26.2%)	39 (26.4%)	3 (25.0%)	
6	36 (22.5%)	34 (23.0%)	2 (16.7%)	
7	18 (11.2%)	14 (9.5%)	4 (33.3%)	
8	4 (2.5%)	3 (2.0%)	1 (8.3%)	
9	1 (0.6%)	1 (0.7%)	0 (0.0%)	
10	2 (1.2%)	2 (1.4%)	0 (0.0%)	
Pre-Teprotumumab Diplopia (Gorman's Score)				0.74
0	46 (28.7%)	43 (29.1%)	3 (25.0%)	
1	37 (23.1%)	34 (23.0%)	3 (25.0%)	
2	42 (26.2%)	40 (27.0%)	2 (16.7%)	
3	34 (21.2%)	30 (20.3%)	4 (33.3%)	
Pre-Teprotumumab Proptosis OD (mm)	22 (19.5-25)	22 (19.25-24.75)	23.5 (21-27.5)	0.23
Pre-Teprotumumab Proptosis OS (mm)	23 (21-25.5)	23 (21-25.5)	24 (22-28.5)	0.16
Prior Orbital Decompression	13 (8.1%)	10 (6.8%)	3 (25.0%)	**0.026**
Subsequent Oculoplastic Surgery	44 (27.5%)	39 (26.4%)	5 (41.7%)	0.25
Retreatment with Teprotumumab	28 (17.5%)	25 (16.9%)	3 (25.0%)	0.48
Months from last Teprotumumab Dose to Post-Teprotumumab Visit Date	1 (0-2)	1 (0-2)	0.5 (0-1)	0.12
Months from Last Teprotumumab Dose to Most Recent Visit Date	15 (8-27)	15 (9-27)	16 (4-25)	0.62

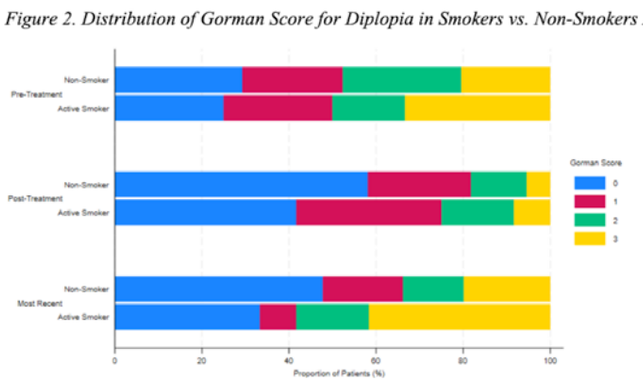
*Median (Interquartile Range), p-value based on Wilcoxon Rank-Sum Test
†Proportion (%), p-value based on Fisher's Exact Test

Figure 1. Distribution of Clinical Activity Score in Smokers vs. Non-Smokers Across Visits



None of the distributions between groups in each time point were significantly different by Fisher's Exact Test.

Figure 2. Distribution of Gorman Score for Diplopia in Smokers vs. Non-Smokers Across Visits



None of the distributions between groups in each time point were significantly different by Fisher's Exact Test

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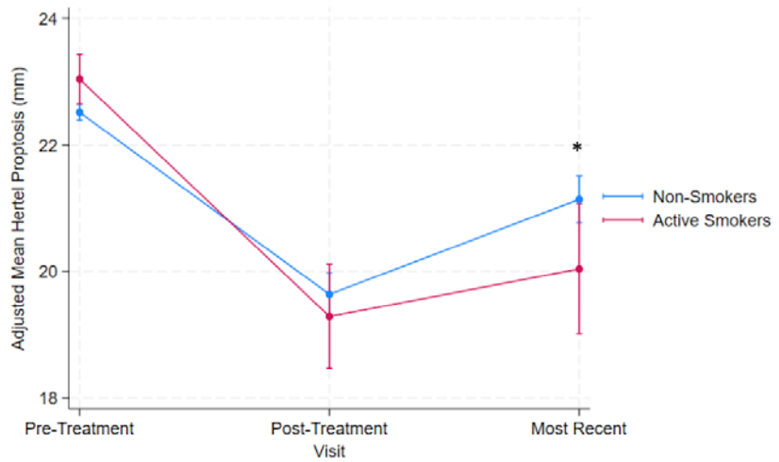
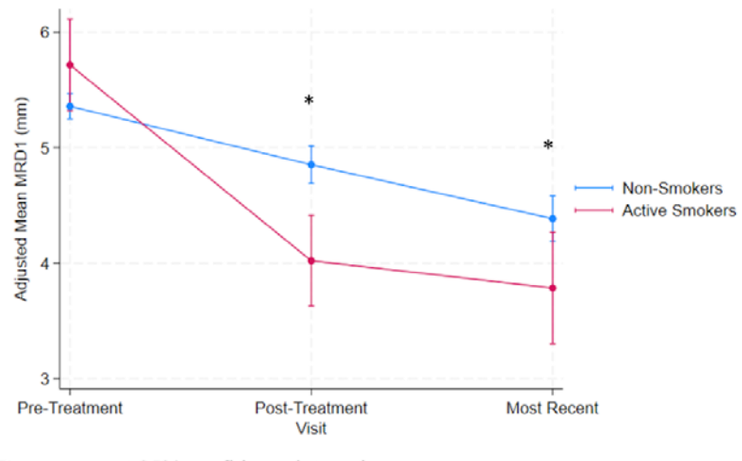
Figure 3. Adjusted Mean Hertel Proptosis Between Smokers and Non-Smokers Over Time Based on Marginal Standardization from Mixed Effects Linear Regression Model



Bars represent 95% confidence interval.
*p<0.05 Significant Difference in Change in Proptosis from Pre-Teprotumumab Visit Between Active Smokers and Non-Smokers

Figure 4. Adjusted Mean Margin Reflex Distance 1 (MRD1) Between Smokers and Non-Smokers Over Time Based on Marginal Standardization from Mixed Effects Linear Regression Model



Bars represent 95% confidence interval.
*p<0.05 Significant Difference in Change in MRD1 from Pre-Teprotumumab Visit Between Active Smokers and Non-Smokers

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16 Impact of Cannabis Consumption on Thyroid Eye Disease Severity and Thyroid Markers

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Introduction: Thyroid eye disease (TED) is a multifactorial autoimmune disease most commonly associated with hyperthyroidism (Graves' disease). Ocular manifestations of TED include lid retraction, exophthalmos, strabismus, optic neuropathy, and vision loss.[1-3] Tobacco smoking has been shown to exacerbate the severity and progression of TED.[4-12] It is well established to be the strongest modifiable risk factor. The biologic mechanisms by which smoking aggravates the clinical course remains unclear. Postulated theories suggest that smoking may directly irritate the eye, thereby promoting inflammation, or it may enhance cytokine secretion by inducing hypoxia in the retrobulbar space.[10]

Over the years, cannabis use in the United States has increased following its legalization in 24 states. In 2023, 61.8 million people in the United States used marijuana that year.[13] Although the association between tobacco smoking and thyroid eye disease is widely recognized, the relationship between cannabis use is not well established. To date, only two published studies have investigated the correlation. One study identified a positive association between cannabis use and orbitopathy in patients with thyrotoxicosis.[14] Another study demonstrated that cannabis users were more likely to develop TED within one year following a diagnosis of Graves' disease.[15]

This study investigates the association between cannabis use and TED in patients with Graves' disease by analyzing clinical activity scores (CAS), exophthalmos measurements, and thyroid function markers in cannabis users and matched controls.

Methods: This retrospective cohort study was conducted on patients with thyroid eye disease who were evaluated at Boston Medical Center between January 2020 and March 2025. These patients were newly diagnosed with TED. The primary outcome was initial TED presentation, assessed through pre-treatment CAS scores and exophthalmos measurements via a Hertel exophthalmometer in cannabis users and controls. Secondary outcomes included thyroid markers, such as thyroid stimulating hormone (TSH), free t4, total t3, thyroid peroxidase antibodies (TPO), and thyroid stimulating immunoglobulin (TSI). Matching was performed to control for cigarette smoking. The t-score was calculated for each outcome.

Results: Of the 28 patients with Graves' disease, 14 were cannabis users and 14 were control patients. Of the 14 cannabis users, 10 inhaled cannabis, 3 orally consumed it, and 1 reported both inhalation and oral consumption. Matching was performed to control for

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tobacco smoking. Within both groups, there were 6 current tobacco smokers, 3 former tobacco smokers, and 5 individuals who had never smoked tobacco. Cannabis users were 1.5 times more likely to have higher CAS scores compared to non-cannabis users (p-value 0.0058). They also had worsening exophthalmos compared to the control group (p-value 0.0024). Cannabis users were also 2 times more likely to have elevated free t4 levels (p-value 0.0017). TSH, total t3, TPO, and TSI were not statistically different between the groups.

Conclusions: Individuals who use cannabis through inhalation or oral consumption are at a significantly higher risk of having worse thyroid eye disease and elevated levels of free t4 compared to those who do not use cannabis. Therefore, marijuana use should be assessed when evaluating patients for TED.

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17 Longitudinal Glycemic Outcomes in Patients with Thyroid Eye Disease Treated with Teprotumumab

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Introduction: While teprotumumab has demonstrated efficacy in thyroid eye disease (TED), clinical trials report hyperglycemia in 10% of treated patients.[1] The proposed mechanism involves insulin-like growth factor-1 receptor inhibition, resulting in elevated growth hormone, increased glucose production, and insulin resistance.[1,2] Prior studies evaluating teprotumumab-associated hyperglycemia have been limited by small sample sizes and short follow-up.[2,3] Therefore, this study aims to assess long-term glycemic trends in TED patients treated with teprotumumab.

Methods: A retrospective cohort study was performed at a single institution including TED patients who started treatment with teprotumumab and had pre- and post-treatment hemoglobin A1c (HbA1c) measurements. Patients were categorized as prediabetic or diabetic if they had physician documentation of either condition or any prior recorded HbA1c value meeting American Diabetes Association diagnostic criteria (prediabetes: 5.7–6.4%; diabetes: ≥ 6.5%). Otherwise, patients were classified as normoglycemic (HbA1c ≤ 5.6%). Up to ten HbA1c values were recorded per patient, beginning with the measurement closest to teprotumumab initiation. Changes in HbA1c were assessed overall and by baseline category using Wilcoxon signed rank and Kruskal-Wallis tests.

Results: Sixty-seven patients met inclusion criteria: 39 (58.2%) normoglycemic, 18 (26.9%) prediabetic, and 10 (14.9%) diabetic. Median intervals from first infusion to first post-treatment HbA1c and most recent follow-up were 10.4 months (range: 2.7–39.5) and 29.5 months (range: 5–52), respectively. Median HbA1c rose by 0.2 (range: –1.3–2.2) at first posttreatment measurement and peaked at a 0.3 increase (range: 0–3.6) ($p < 0.05$) (Table 1, Figure 1). Overall, 43.3% of patients experienced an HbA1c increase ≥ 0.5 at any point.

Among normoglycemic patients, 16 (41.0%) progressed to prediabetes at a median of 5.6 months after first infusion, with 43.8% reverting to normoglycemia after a median of 6.6 months from initial rise (median 8.8 months after treatment completion). None developed diabetes.

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Among patients with prediabetes, seven (38.9%) progressed to diabetes at a median of 5.0 months (range: 3.4–8.4) after first infusion. Of these, four returned to baseline prediabetes status with lifestyle management alone within a median of 7.7 months after initial rise in HbA1c (median 7.0 months after treatment completion). One patient initiated metformin but discontinued it nine months later after achieving prediabetes-range HbA1c. Two patients required medication changes maintained throughout the follow-up period: one started metformin, and the other was already on metformin but required a dose increase to maintain glycemic control.

Among patients with diabetes, nine (90%) experienced HbA1c elevations (median peak change: 1.4, range: 0–3.6) at a median of 5.4 months after first infusion. Two increased insulin, four started or adjusted non-insulin therapies, and four remained on stable regimens. Eight of these nine recovered to baseline HbA1c a median of 8.6 months after final infusion. Two patients discontinued teprotumumab due to hyperglycemia. No hyperglycemiarelated hospitalizations occurred.

Conclusions: Teprotumumab was associated with short-term HbA1c elevations, particularly among patients with preexisting glucose intolerance. Baseline glycemic status can inform monitoring strategies for patients undergoing treatment. Most glycemic abnormalities resolved after treatment completion and were managed without major clinical interventions, suggesting that teprotumumab may be safely administered with appropriate glycemic surveillance.

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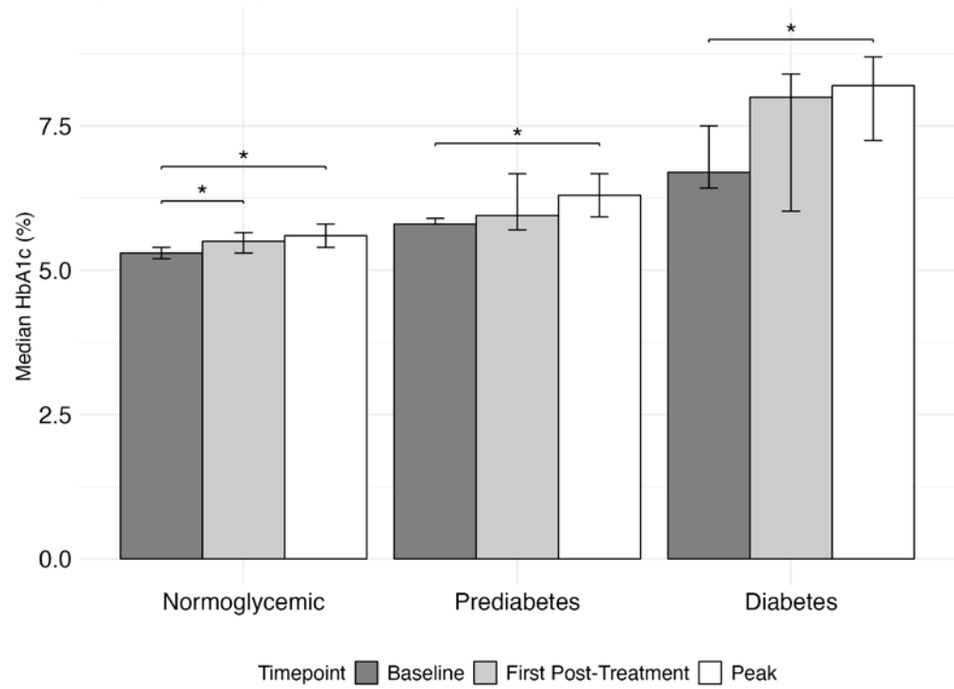
Table 1. Baseline, First Post-Treatment, and Peak Hemoglobin A1c (HbA1c) in Patients Treated with Teprotumumab

Baseline Glycemic Status	Timepoint	HbA1c (%) median (IQR)	Change from Baseline HbA1c median (IQR)	Time Interval, Months, median (IQR)	P-Value
Normoglycemia	Baseline	5.3 (5.2, 5.4)			
n=39	First Post-Treatment	5.5 (5.3, 5.7)	0.2 (0.1, 0.4)	12.2 (6.4, 18.6)	**< 0.001**
	Peak	5.6 (5.4, 5.8)	0.3 (0.2, 0.5)	13.2 (5.6, 30.4)	**< 0.001**
Prediabetes	Baseline	5.8 (5.8, 5.9)			
n = 18	First Post-Treatment	6.0 (5.7, 6.7)	0.2 (-0.2, 1.0)	11.6 (7.5, 16.0)	0.083
	Peak	6.5 (5.9, 6.7)	0.7 (0.03, 1.0)	7.7 (4.3, 18.7)	**< 0.01**
Diabetes	Baseline	6.7 (6.4, 7.5)			
n=10	First Post-Treatment	8.0 (6.0, 8.4)	0.6 (-0.2, 1.5)	7.0 (6.5, 8.8)	0.153
	Peak	8.2 (7.3, 8.7)	1.4 (1.1, 1.5)	4.8 (2.9, 6.9)	**< 0.01**
Overall	Baseline	5.5 (5.3, 5.8)			
n=67	First Post-Treatment	5.7 (5.5, 6.0)	0.2 (0.0, 0.5)	10.4 (6.6, 16.2)	**< 0.001**
	Peak	5.9 (5.6, 6.4)	0.3 (0.2, 0.7)	8.0 (4.0, 26.4)	**< 0.001**

Peak HbA1c refers to the highest recorded value following the initiation of teprotumumab. Time intervals to both the first post-treatment HbA1c and peak HbA1c are calculated from the date of the first infusion. IQR = interquartile range; HbA1c = hemoglobin A1c.

Figure 1. Hemoglobin A1c (HbA1c) Before and After Teprotumumab by Baseline Glycemic Status



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18 Pathological Findings in Enucleations, Evisceration, and Exenterations Due to Ocular Malignancy: Insights from a Tertiary Care Center

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Introduction: Eye removal surgeries—enucleations, eviscerations, and exenterations—are critical procedures performed for various indications, including malignancies, trauma, and infections. These interventions involve complex clinical and pathological considerations, particularly in cases of malignancy, where timely diagnosis and treatment are crucial for patient outcomes. This retrospective study aims to provide a comprehensive analysis of patients undergoing these procedures at Tampa General Hospital over a 13-year period. By examining demographic data, surgical indications, histopathological findings, and outcomes, we highlight the trends in eye removal surgery secondary to malignancy, which underscore the importance of early detection and tailored surgical approaches to improve patient care.

Methods: A retrospective chart review was conducted on patients who underwent enucleations, eviscerations, and exenterations at Tampa General Hospital between October 2011 and October 2024. Data collected included demographics, surgical indications, and histopathologic findings, with analysis of descriptive statistics.

Results: Of 288 cases reviewed, 87 (30.2%) were malignancies. The median patient age was 66 years (range 36-94, SD=13.3). Enucleations accounted for 58.6% (n=51), exenterations 39% (n=34), and eviscerations 2.3% (n=2). Uveal melanoma was the most common malignancy (56.3%, n=49), followed by squamous cell carcinoma (20.7%, n=18) and basal cell carcinoma (10.3%, n=9). Other malignancies included neuroendocrine neoplasms, adenoid cystic carcinoma, and metastatic lesions. Tumor size ranged from 0.35cm to 7.7cm (median 1.8cm, SD=2.2cm). Positive margins were identified in 21.8% (n=19) of cases, whose tumors were more advanced and predominantly required exenterations (89.5%), a more invasive procedure, rather than enucleation (10.5%). Tumors with positive margins were significantly larger (median 5.7cm vs. 1.5cm, $p < 0.001$). Extraocular extension, perineural invasion, or lymphovascular invasion was noted in 84.2% of tumors with positive margins. Among TNM-staged cases, pT4a was most common (41.6%), followed by pT3 (20.8%). Immunohistochemical analysis most commonly identified SOX10 in melanoma, CK5 and EMA in squamous cell carcinoma, and CK7 in basal cell carcinoma; however, these markers were not present in all samples of their respective subtypes. Orbital implants were inserted in 49.4% of cases, most commonly the 20mm hydroxyapatite, 22mm silicone, and 20mm MedPor.

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Conclusions: These findings highlight the diverse histopathological features encountered in ocular malignancies requiring enucleation, evisceration, or exenteration, underscoring the complexity of surgical management in these cases. The high prevalence of advanced tumors with positive margins emphasizes the need for early detection and timely intervention to improve surgical outcomes. The variability in immunohistochemical marker expression suggests a role for expanded diagnostic panels to better characterize tumor subtypes and guide treatment decisions. Further investigation into strategies for enhancing margin control and optimizing reconstructive approaches may improve long-term outcomes for patients undergoing these procedures.

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19 The Long-term Efficacy of Teprotumumab in Geriatrics Patients: A Multi-Center Study

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Introduction: As individuals age, physiological changes can significantly alter their responses to medications. Teprotumumab is highly effective in the acute phase of thyroid eye disease (TED), with approximately a 50% regression rate in early outcomes. However, the long-term durability of these responses, particularly in older adults, remains under investigation.

Methods: This is a multi-center cohort study of patients aged 75 and older, treated between February 2020 and September 2023 across ten tertiary institutions. Patients were included if they had moderate-to-severe TED and at least one infusion of teprotumumab. Long-term efficacy outcome measures included sustained improvement in clinical activity score (CAS), proptosis, and Gorman diplopia score (GDS), as well as evaluation of proptosis regression and reactivation rates at 6 months, 12 months, and 2.5 years.

Results: Fifty patients (40 females, 10 males) with an average age of 79.2 years were evaluated. Patients received an average of 6.9 infusions. Mean baseline CAS reduction was 4.0±1.1 at short-term follow-up of 11.3±17.9 weeks after treatment cessation. Proptosis improved by ³2 mm in 86.0% (43/50) of patients, with a mean reduction of 4.24 mm. At 6-month follow-up (28.2±6.7 weeks), 85.7% (30/35) of patients sustained CAS reduction, 83.3% (10/12) maintained diplopia improvement, and 40.6% (13/32) of patients with an initial proptosis response demonstrated regression (mean 1.92 mm; range 0.25–8.0 mm), with 16.0% (5/32) showing >2 mm regression. At 12 months (55.8±7.2 weeks), 73.1% (19/26) maintained CAS reduction, 70.0% (7/10) sustained diplopia improvement, and 62.5% (15/24) demonstrated further proptosis regression (mean 1.6 mm; range 0.5–7.0 mm), with 45.8% (11/24) achieving >2 mm regression. At 2.5 years (134.2±48.2 weeks), 83.3% (25/30) sustained CAS reduction, 61.5% (8/13) maintained diplopia improvement, and 62.5% (15/24) showed proptosis regression (mean 2.9 mm; range 0.5–7.0 mm), with 50.0% (12/24) experiencing >2 mm regression. TED reactivation occurred in 27.9% (12/43) of patients at a mean of 49.8 weeks (range 24.0–79.6 weeks) after treatment completion; 75.0% (9/12) of those with reactivation had completed all 8 infusions. Management strategies for reactivation included intravenous steroids (n=1), repeat teprotumumab therapy (n=2), orbital radiation (n=1), and orbital decompression (n=4). Of note, TAEs were reported by 78.0% (39/50) of patients, with 30% (15/46) experiencing moderate TAEs and 14% (7/50) severe TAEs. TAEs led to treatment discontinuation in 34.0% (17/50) of patients.

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Conclusions: While most patients maintained their initial CAS response, 62.5% of patients showed regression of proptosis within 2.5 years, with 50.0% experiencing a reduction greater than 2 mm. These findings, coupled with the substantial risk of severe treatment-associated adverse events, elevated rates of treatment discontinuation, and a 27.9% rate of disease reactivation, warrant extreme caution when considering teprotumumab for the treatment of thyroid eye disease in this population. Larger, multicenter studies with standardized long-term follow-up protocols are critical to validate these findings and to further elucidate the complex interactions between aging physiology, thyroid eye disease, and therapeutic interventions.

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20 Triglycerides as a Predictor of Activity and Severity in Thyroid Eye Disease: A Multicenter Study

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Introduction: This study investigated the association between dyslipidemia and thyroid eye disease (TED) activity and severity using a multicenter dataset from South Korea.

Methods: A retrospective, multicenter study included adult patients (aged ≥19 years) with TED and elevated thyroid autoantibody levels, including thyroid-stimulating immunoglobulin (TSI) > 140% and TSH-binding inhibiting immunoglobulin (TBII) > 1.5 IU/L. Patients previously treated with systemic steroids were excluded. TED activity was defined by a Clinical Activity Score, and severity was categorized as mild or marked based on the NOSPECS classification. Logistic regression analyses identified associations between lipid profiles and TED activity/severity. Subgroup analysis excluded statin users. Receiver operating characteristic curves determined optimal TG cutoff values.

Results: Of 330 patients (71.3% women; mean age, 45.7 ± 13.2 years), elevated TG levels was independently associated with TED activity (odds ratio [OR] = 1.005, 95% CI: 1.001–1.008, P = 0.011) and severity (OR = 1.004, 95% CI: 1.001–1.007, P = 0.014). Optimal TG cutoff values were 104 mg/dL for active TED and 108 mg/dL for marked severity. These associations remained consistent in non–statin users with similar cutoff values. Elevated intraocular pressure and smoking were significantly associated with increased disease severity. Subgroup analysis excluding statin users revealed significant associations of total cholesterol and LDL cholesterol with TED activity.

Conclusions: Elevated TG levels are significantly associated with TED activity and severity, highlighting the potential clinical value of measuring TG for risk stratification and disease management. Further studies should explore whether TG-lowering interventions improve TED outcomes.

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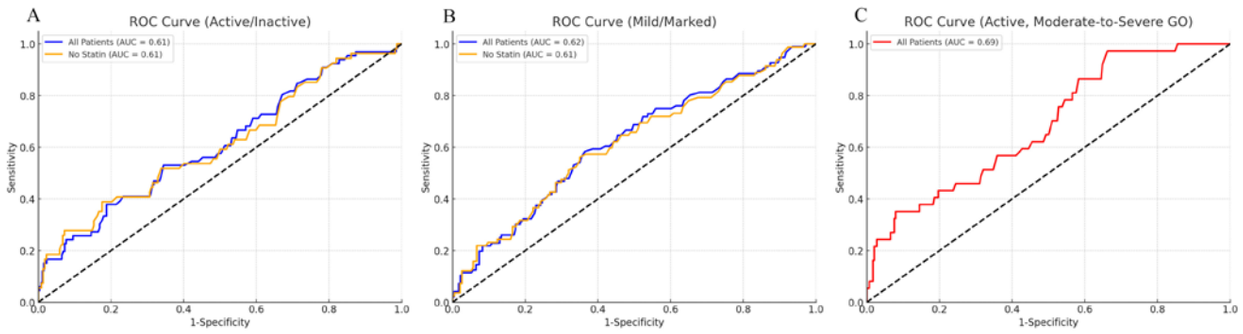
Figure 1



		AUC	95% confidence intervals		Se	Sp	P-value	Cutoff value
			Inferior	Superior				
Activity	TG	0.611	0.533	0.689	0.378	0.812	0.005	104
	TG (No-statin)	0.609	0.521	0.697	0.388	0.824	0.001	100.5
Severity	TG	0.621	0.554	0.688	0.583	0.636	0.001	108
	TG (No-statin)	0.615	0.542	0.688	0.561	0.649	0.003	101.5
Active, moderate-to-severe	TG	0.685	0.598	0.771	56.5	59	<0.000	107.5

CAS, clinical activity score; TG, triglyceride; AUC, area under curve

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21 Vertical Lid Split Orbitotomy for Management of Orbital Compartment Syndrome

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Introduction: Orbital compartment syndrome (OCS is a vision-threatening entity that requires early recognition and early intervention, as blindness can happen quickly. Historically, the gold standard for emergent treatment of OCS was the lateral canthotomy and cantholysis (LC/C). Previous studies have shown that inadequate decompression can often occur due to inadequate canthal tendon release. We have previously described a simplified technique to release orbital pressure known as the vertical lid split (VLS).1 The purpose of this study is to assess the VLS in the treatment of emergent OCS in vivo.

Methods: This was a retrospective study of all patients in our center who had a vertical lid split procedure for orbital compartment syndrome. Intraocular pressure was measured before and after completion of the procedure as a surrogate for orbital pressure. Information regarding mechanism of injury as well as ophthalmic exam was reviewed.

Results: Eight patients were included, three of which were bilateral, for a total of 11 eyes. Average age of the patients was 44.9 years (19-82 years). Gunshot wounds were the most common mechanism of injury (50%). Four eyes in 3 patients had prior failed canthotomy and cantholysis prior to presentation by an outside provider. Average IOP prior to intervention as 51.3 mmHg (39-60 mmHg). Average post-intervention IOP was 21.2 mmHg with all patients achieving adequate reduction of pressure below 30 mmHg (15-27 mmHg). This resulted in an average reduction in pressure of 30.1mmHg (20-36 mmHg), or 58.7%. No patients in the study had iatrogenic globe injury.

Conclusions: Orbital compartment syndrome poses a time-sensitive threat to vision. This is the first study of the use of the vertical lid split to decompress the orbit in a clinical setting. Our results show that the VLS is a quick, effective, and safe alternative to the lateral canthotomy and cantholysis for treatment of orbital compartment syndrome.

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22 Clinical Characteristics and Risk Factors of Pediatric Thyroid Eye Disease

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Introduction: The clinical characteristics and natural history of thyroid eye disease (TED) can vary according to the patient's age at diagnosis.[1–5] While the features of TED are generally well established in the adult population,[6,7] many aspects of TED including variations in risk factors, symptomatology, clinical severity, and disease course remain relatively understudied in children and adolescents.[1,2]

Our study sought to bridge the gap between the pediatric and adult literature on TED as we report the largest cohort of pediatric patients with confirmed TED in North America to date. We aimed to first describe the temporality of TED activity in children, which may be less distinctly characterized by Rundle's curve,[1,6-7] by evaluating clinical activity scores (CAS) and Hertel measurements across ophthalmic encounters. Moreover, we sought to identify previously undescribed risk factors for both pediatric TED development and severity across a racially and ethnically diverse study cohort.

Methods: Our study is a retrospective case series of consecutive children diagnosed with TED between 2013 and 2023 presenting to Texas Children's Hospital. International Classification of Diseases, 10th Revision codes were used to identify patients with autoimmune thyroid disease and documented ocular manifestations associated with TED. Patients were manually filtered to include only those under the age of 18 with TED, who had been evaluated by an ophthalmologist. A diagnosis of TED was defined according to the criteria proposed by Bartley and Gorman.[8] Patient charts were reviewed for patient demographics, ocular exam findings, disease progression, and management across ophthalmic encounters. Descriptive statistical analysis in addition to Wilcoxon Signed Ranks tests were performed to identify factors correlated with TED severity while chi-square testing was used to evaluate categorical variables.

Results: Seventy-eight patients met the inclusion criteria. Most children with TED were female (78.2%), White (66.7%), non-Hispanic (59.0%), hyperthyroid (85.5%), and had a family history of autoimmune disease (57.1%). Smoking (1.3%) and secondhand smoke exposure (6.4%) were uncommon; the latter was associated with the risk of orbital decompression surgery ($p < 0.001$). Higher Clinical Activity Score (CAS) values were recorded in female ($p = 0.022$), non-Hispanic, non-White patients, and those with a family history of autoimmune disease ($p < 0.001$). Hyperthyroidism at presentation predicted the need for surgical intervention. Just 23% of children recorded a non-zero CAS on at least one visit, and children were seen by an ophthalmologist nearly one year after symptom onset on average.

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Conclusions: Among children with TED, female and non-White patients may experience more severe disease symptoms, while a family history of autoimmune disease may predispose children to TED. Secondhand smoke exposure may also be a risk factor for needing orbital decompression surgery. Children with TED typically follow a benign clinical course but may face greater delays in receiving timely ophthalmic care for their symptoms.

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23 Comparing Management of Superior Orbital Abscesses in the Pediatric Population with and without Penrose Drain Placement

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Introduction: Pediatric orbital cellulitis is a commonly managed disease amongst oculofacial plastic surgeons, while many patients can be successfully managed with medical therapy alone, others require surgical intervention. Indications for surgical intervention in children have been well described.[1-4] It has been shown that superior orbital abscesses have been are more likely to necessitate surgical intervention as compared to abscesses in other regions of the orbit.[5] In surgical management of a superior orbital abscess, the decision to place or not place a drain at the time of surgical intervention is based on surgeon preference as there are no studies comparing outcomes with and without drain placement. In this study, we review cases of superior orbital abscesses that underwent surgical intervention to compare management with and without placement of Penrose drain.

Methods: This was a retrospective cohort study completed at a single pediatric tertiary care center in the Midwest of patients who underwent drainage of superior orbital abscesses between April 2014 and March 2024. The patients were studied for age, race, duration of symptoms, abscess volume, antibiotics coverage, culture positivity, total length of stay, and duration of hospital stay after surgery. Statistical analysis was performed to compare those who had a Penrose drain placed to those who did not and to determine if length of stay was shortened by placement of a Penrose drain.

Results: 374 charts were reviewed, and 24 patients who underwent a total of 27 surgeries met the inclusion criteria of having a superior orbital abscess requiring surgical drainage. The patients studied had a mean age of 11 years and included 9 females and 15 males. 20/24 (83.3%) of patients were Caucasian. Duration of symptoms before surgery was a median of 6 days. 26/27 (96.3%) of abscess drainage surgeries were performed alongside concomitant functional endoscopic sinus surgery. Abscess cultures were positive in 22/27 (84.6%) of surgeries, with most cultures being polymicrobial. In 7/27 (25.9%) of surgeries, a Penrose drain was placed for an average of 2.57 days. Those who had a Penrose drain placed had similar demographic variables as compared to those who did not have a Penrose drain placed. Abscess volumes were similar in both groups. Duration of hospital stay after surgery was a median of 6 days without a Penrose drain placed, and 5 days when a Penrose drain was placed (p =0.635). In 3/27 (11.1%) of surgeries was a Penrose drain placed primarily. Three patients underwent reoperation, two of whom were operated on twice and one of whom was operated on three

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times. Re-operation was a risk factor for Penrose drain placement as all patients undergoing a re-operative surgery had a Penrose drain placed in the subsequent surgery.

Conclusions: Placement of a Penrose drain may not be necessary during initial surgical intervention of pediatric patients with superior orbital abscesses. We found that 75% of patients did well without drain placement. Placement of drains improved outcomes in patients with recurrent abscess collections as only one patient with a drain placed required subsequent orbital surgery.

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24 Orbital Asymmetry in Children with Congenital Ptosis

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Introduction: Congenital ptosis is a condition attributed to dysgenesis of the levator palpebrae superioris. Previous studies have demonstrated associated facial asymmetry with congenital ptosis.[1] Here, we specifically report the orbital characteristics associated with congenital ptosis.

Methods: This was a prospective, observational study. Consecutive patients with congenital ptosis were enrolled. Age, sex, ethnicity, laterality of ptosis, and associated ophthalmic and orbital conditions were documented. Exophthalmometry was performed using Hertel and Naugle devices by 2 independent observers, and average inter-eye differences were calculated. Measurements were obtained upright in clinic, or for younger children, under general anaesthetic at the time of ptosis surgery. Where cooperation permitted, axial length was measured using optical biometry. Descriptive and analytical statistics were performed using statistical software. Research ethics approval was obtained from the University of Calgary Research Ethics Board.

Results: 19 patients were enrolled from November 2023 to April 2025. 11 patients (58%) were female. Average age was 6.7 ± 6.3 years (range 7 months to 23 years). The right eye was more ptotic in 10 cases (53%). 4 cases (22%) were bilateral. Associated conditions were observed in 9 patients (47%), and were all encountered on the more ptotic side. These included NLDO (n=3), superotemporal orbital dermoid cysts (n=3), and Marcus-Gunn jaw wink (n=3). Blepharoptosis-phimosis epicanthus inversus syndrome (n=1) was seen in 1 patient. Exophthalmometry consistently demonstrated relative enophthalmos on the more ptotic side (n=18, 95%), with an average of -1.23 ± 0.54 mm of inter-eye difference ($p<0.001$, t-test). Relative enophthalmos was independent of differences in axial length ($R^2 = -0.02$, $p=0.41$) or age ($R^2 = 0.03$, $p=0.45$) by multiple linear regression. For the more ptotic side, average difference in axial length was -0.14 ± 0.38 mm between eyes, which was not significant ($p=0.29$, t-test).

Conclusions: Congenital ptosis was reliably associated with relative enophthalmos independent of globe size, and a high incidence of other orbital conditions, namely NLDO, orbital dermoids, and synkinetic innervation. In addition to facial asymmetries previously reported in association with congenital ptosis,[1] we posit whether deficits in orbital volume, or other processes in orbital embryogenesis, may also be implicated in this syndrome.

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25 Evaluating the Stability of Local Anesthetic Mixtures in Surgical Environments

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Introduction: While clinical studies support the efficacy of buffered anesthetic combinations commonly used in oculoplastic surgery, the stability of these mixtures remains unknown.[1,2] Given recent Food and Drug Administration (FDA) oversight of compounded medications, establishing the stability profile of anesthetic combinations is important for patient safety, as drug concentrations must be above 90% of their theoretical values at time of administration.[4] This study investigates the stability profile of local anesthetic mixtures containing lidocaine, bupivacaine, epinephrine, and tranexamic acid (TXA) buffered with sodium bicarbonate over 24 hours in conditions common to clinical practice settings.

Methods: High-performance liquid chromatography-mass spectrometry (HPLC-MS) was used to evaluate the concentrations of each component of a 10 mL anesthetic mixture at 0, 1, 3, 6, 9, 12, and 24 hours. The mixture contained 4.5 mL of 0.75% bupivacaine hydrochloride, 4.0 mL of 2.0% lidocaine hydrochloride with epinephrine (1:100,000), 1.0 mL of 1.0% TXA, and 0.5 mL of 8.4% sodium bicarbonate. It was kept at room temperature of 25.6°C and indoor lighting. The protocol was repeated for 6 total trials. Statistical analysis was performed using a paired T-test and ANOVA testing.

Results: Initial concentrations of all compounds were above 97% of theoretical values. All compounds except epinephrine maintained concentrations above 90% of theoretical values across the 24-hour period. Epinephrine had a concentration of 90.2% (± 0.7%) at hour 6 and 89.2% (± 0.6%) at hour 9 (Figure 2). A paired T-test comparing 0-hour and 24-hour concentrations showed statistically significant degradation for TXA ($p=0.03$), bupivacaine ($p=0.02$), lidocaine ($p=0.003$), and epinephrine ($p<0.001$). A repeated measures ANOVA comparing degradation rates between compounds over the 24-hour period found significant differences between epinephrine and the other components ($df=3.24$, $F=4.33 > 3.01$ for $\alpha=0.05$).

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Conclusions: This study demonstrates that lidocaine, bupivacaine, and TXA remained stable in a buffered mixture for 24 hours at room temperature, maintaining concentrations above the 90% threshold of theoretical concentration per FDA guidelines. Epinephrine in anesthetic mixtures is stable above 90% until 6 hours before exhibiting further degradation. These findings suggest that while buffered anesthetic mixtures with epinephrine can be compounded in advance, they should be used within 6 hours of preparation to ensure adequate epinephrine concentration at administration.

Figure 1

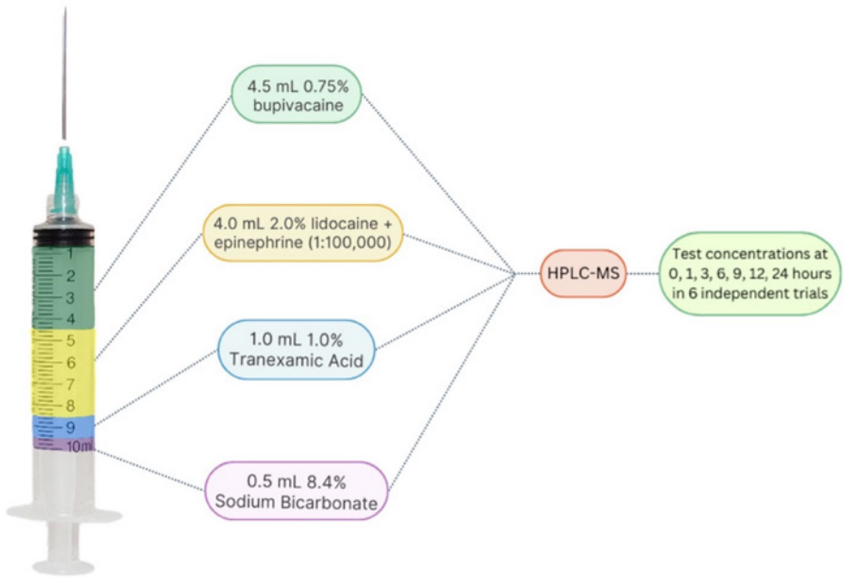
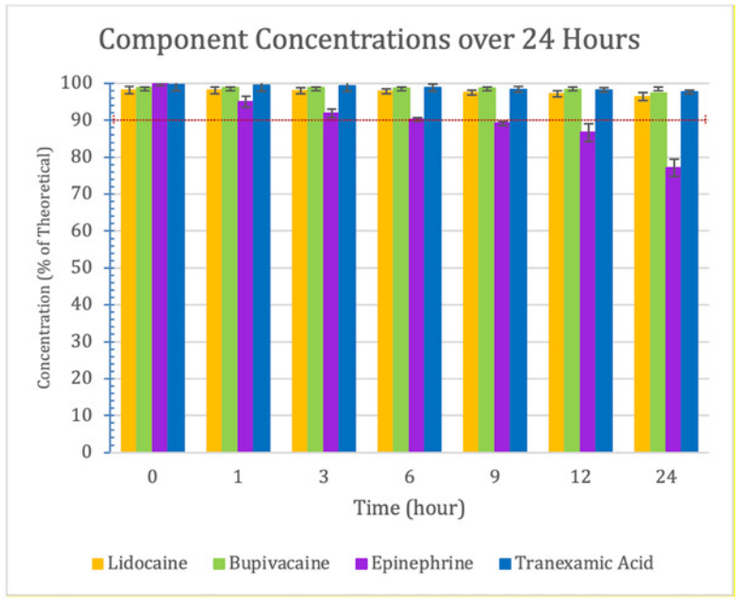


Figure 2



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26 Improving Periorbital Distance Prediction with Semi-Supervised Learning

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Introduction: Manual measurement of periorbital anatomical distances is time-consuming and subject to intergrader variability. Deep learning (DL) models have shown promise in automating these tasks, but their performance is limited by the size of labeled datasets. We evaluated a semi-supervised learning (SSL) strategy for improving segmentation quality and periorbital distance (PD) prediction using a large corpus of unlabeled clinical images.[1]

Methods: Two deep convolutional neural network-based models were compared for periorbital segmentation and PD extraction: (1) A 5-class model trained on 2,015 labeled images with expert PD annotations, and (2) a 5-class semi-supervised model trained using ST++ with the same labeled set and 28,000 unlabeled images from the same distribution.[2-3] A holdout test set of 827 images was used for evaluation. All models were assessed on segmentation accuracy (Dice score) and PD prediction accuracy (mean absolute error, MAE) against expert annotations. Seven clinically relevant distances were analyzed: MRD1, MRD2, intercanthal distance (ICD), outer canthal distance (OCD), inferior scleral show (ISS), superior scleral show (SSS), and horizontal fissure width. Pixel-to-millimeter conversion was performed using the horizontal diameter of the iris (11.7 mm) as a reference. Ground truth intergrader variance was established using five expert annotators on 100 healthy images (Table 1).

Results: The SSL-enhanced model achieved superior segmentation accuracy (average Dice: 0.87), outperforming the supervised 5-class model (Dice: 0.86) across all anatomical labels (Table 2). For PD prediction, the SSL model demonstrated consistently lower MAEs across all seven distances (Table 3). For MRD1 and MRD2, the SSL model achieved MAEs of 0.30 mm and 0.28 mm, respectively—well below the intergrader threshold of 0.5 mm. In healthy images, 86% of measurements fell within the intergrader error range using the SSL model, compared to 78% with the supervised 5-class model (Table 4). Improvements were similarly observed across images from patients with TED, cleft palate, craniosynostosis, and other craniofacial diagnoses.

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Conclusions: A semi-supervised deep convolutional neural network model using ST++ and unlabeled clinical images significantly improves periorbital segmentation and measurement accuracy compared to fully supervised baselines. The SSL model not only achieves lower MAEs than intergrader variability, but also demonstrates more consistent performance across diagnostic categories. Clinically, this approach offers a scalable, objective, and efficient method for computing periorbital distances, with the potential to reduce clinician workload and enhance reproducibility in oculoplastic and craniofacial care. Future work will explore other semi-supervised approaches to leverage unlabeled data, as well as downstream clinical applications of PDs.

Structure	MRD 1	MRD 2	ICD	OCD	ISS	SSS	HF
STD:	0.54	0.499	2.049	1.088	0.109	0.041	1.23

Table 1: Intergrader variability for seven clinically relevant periorbital distance measurements in millimeters.

Abbreviations: Standard deviations (STD), margin-reflex distances (MRD1 and MRD2), intercanthal distance (ICD), outer canthal distance (OCD), inferior scleral show (ISS), superior scleral show (SSS),horizontal fissure (HF).

Segmentation Model	Brow	Sclera	Iris	Caruncle	Lid	Average
5 Class DLV3	0.86	0.86	0.94	0.75	0.87	0.86
SSL	**0.87**	0.87	**0.95**	**0.78**	**0.88**	**0.87**

Table 2: Segmentation performance (Dice score) across five anatomical classes for two models: (1) a 5-class DeepLabV3 model trained on 2,015 labeled clinical images, and (2) a 5-class semi-supervised DeepLabV3 model trained using the ST++ algorithm with 28,000 additional unlabeled images. Values represent Dice coefficients for each structure (brow, sclera, iris, caruncle, lid), as well as the average Dice across all available labels. Bold denotes highest score for each class

	Segmentation Model	MRD 1	MRD 2	ICD	OCD	ISS	SSS	Horiz. Fissure
Healthy	5 Class DLV3	0.32 ± 0.23	0.40 ± 0.28	**1.49 ± 0.94**	4.41 ± 1.63	0.09 ± 0.15	**0.00 ± 0.00**	1.50 ± 0.83
	5 Class DLV3+SSL	**0.30 ± 0.14**	**0.37 ± 0.18**	1.87 ± 0.66	3.60 ± 0.93	**0.05 ± 0.09**	**0.00 ± 0.00**	**0.96 ± 0.46**
TED	5 Class DLV3	**0.39 ± 0.28**	**0.37 ± 0.24**	**1.11 ± 0.88**	2.39 ± 1.81	0.15 ± 0.22	0.05 ± 0.12	1.15 ± 0.84
	5 Class DLV3+SSL	0.41 ± 0.18	0.41 ± 0.20	1.37 ± 0.73	**1.80 ± 1.32**	**0.08 ± 0.13**	**0.03 ± 0.07**	**0.71 ± 0.54**
Cleft Palate	6 Class DLV3	0.21 ± 0.11	**0.22 ± 0.13**	0.97 ± 0.78	1.29 ± 1.11	**0.00 ± 0.00**	**0.00 ± 0.00**	**0.47 ± 0.31**
	5 Class DLV3+SSL	**0.20 ± 0.11**	0.29 ± 0.06	1.08 ± 0.56	**0.53 ± 0.29**	**0.00 ± 0.00**	**0.00 ± 0.00**	0.56 ± 0.25
Craniosynostosis	5 Class DLV3	**0.22 ± 0.09**	0.27 ± 0.09	1.01 ± 0.46	1.80 ± 1.79	**0.01 ± 0.03**	**0.00 ± 0.00**	0.65 ± 0.45
	5 Class DLV3+SSL	0.30 ± 0.11	**0.22 ± 0.10**	**0.55 ± 0.44**	**1.27 ± 0.95**	**0.01 ± 0.03**	**0.00 ± 0.00**	0.38 ± 0.27
Facial Asymmetry	5 Class DLV3	**0.14 ± 0.13**	0.19 ± 0.07	**0.60 ± 0.36**	**1.30 ± 0.71**	**0.00 ± 0.01**	**0.00 ± 0.00**	**0.63 ± 0.34**
	5 Class DLV3+SSL	0.26 ± 0.15	**0.16 ± 0.06**	1.15 ± 0.42	1.62 ± 0.64	**0.00 ± 0.01**	**0.00 ± 0.00**	0.95 ± 0.40
Syndrome	5 Class DLV3	0.41 ± 0.15	**0.29 ± 0.19**	**0.91 ± 0.63**	**1.40 ± 0.90**	**0.05 ± 0.11**	**0.00 ± 0.00**	**0.69 ± 0.30**
	5 Class DLV3+SSL	**0.30 ± 0.16**	0.36 ± 0.18	1.26 ± 0.91	1.53 ± 1.24	0.07 ± 0.11	**0.00 ± 0.00**	0.83 ± 0.43
Unknown/Other Craniofacial	5 Class DLV3	**0.37 ± 0.15**	0.27 ± 0.15	**0.74 ± 0.53**	**1.53 ± 1.07**	**0.01 ± 0.04**	**0.00 ± 0.00**	**0.55 ± 0.38**
	5 Class DLV3+SSL	0.38 ± 0.16	**0.24 ± 0.19**	1.31 ± 0.69	1.55 ± 1.13	0.02 ± 0.04	**0.00 ± 0.00**	0.65 ± 0.43

Table 3. Mean absolute error (MAE) of seven periorbital distance measurements across multiple clinical classes. Each row represents a patient group (e.g., healthy, TED, cleft palate), and each column represents a specific periorbital measurement. Two segmentation models were evaluated: (1) a 5-class DeepLabV3 model trained on 2,015 labeled images, and (2) a 5-class semi-supervised DeepLabV3 model trained using ST++ on the same labeled data and 28,000 unlabeled images. Values are reported as mean ± standard deviation. **Bold** font indicates the lowest MAE for that measurement across all models. *Underlined* values fall below the intergrader variability threshold for that specific measurement, which was defined using annotations from five expert graders on 100 healthy eyes.

MODEL:	5 Class DLV3	5 Class DLV3+SSL
Healthy	0.71	0.86
TED	0.43	0.86
Cleft Palate	0.86	1.00
Craniosynostosis	0.86	0.86
Facial Asymmetry	0.86	0.86
Syndrome	0.86	0.86
Unknown/Other Craniofacial	0.86	0.71
Total	0.78	0.86

Table 4: Percentage of periorbital distance measurements below the intergrader variability threshold across different clinical categories. The table compares two segmentation models: (1) a supervised 5-class DeepLabV3 model, and (2) a semi-supervised 5-class DeepLabV3 model trained using the ST++ algorithm. Each value represents the proportion of measurements in which the predicted value was within the intergrader error margin (0.5 mm) for seven key distances (e.g., MRD1, MRD2, ICD). Higher values indicate closer agreement with expert annotations.

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27 Optimizing Infratrochlear Nerve Block: Emerging Point Relative to the Nasion and Its Surgical Significance

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Introduction: Infratrochlear nerve (ITN) block is widely utilized for achieving surgical anesthesia, reducing postoperative pain, and treating neuralgia. The aim of this study was to identify the emerging point of the ITN (EP-ITN) in the medial orbital margin with reference to the nasion in order to enhance the effectiveness of regional ITN block in craniofacial surgery.

Methods: Thirty-eight hemifaces from 19 embalmed Korean cadavers were dissected. Measurements were made of the vertical distances from the EP-ITN to key landmarks such as the nasion, the inferior border of the trochlea, and the medial canthus. The study also analyzed facial morphology by measuring the horizontal and vertical dimensions of the midface and orbit. The spatial relationships between these landmarks and the EP-ITN relative to the dimensions of the midface and orbit were also evaluated.

Results: The distances from the EP-ITN to the nasion, trochlea, and medial canthus were 1.6±1.3 mm (mean±standard deviation), 19.7±1.7 mm, and 11.7±2.0 mm, respectively. The distance between the trochlea and the EP-ITN also tended to increase as the horizontal dimensions of the midface and orbit increased. However, the dimensions of the midface and orbit did not significantly affect the distance from the nasion to the EP-ITN.

Conclusions: In conclusion, the nasion is located nearer to the EP-ITN than to other landmarks and maintains a consistent spatial relationship that is unaffected by variations in the size of the midface or orbit. This means that it can serve as a reliable external landmark for guiding the ITN block technique.

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Figure 1

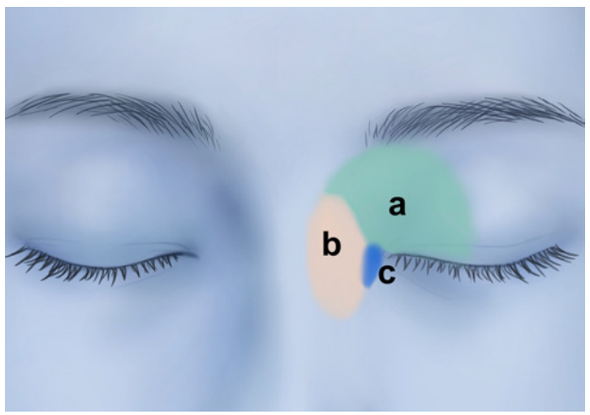


Figure 2

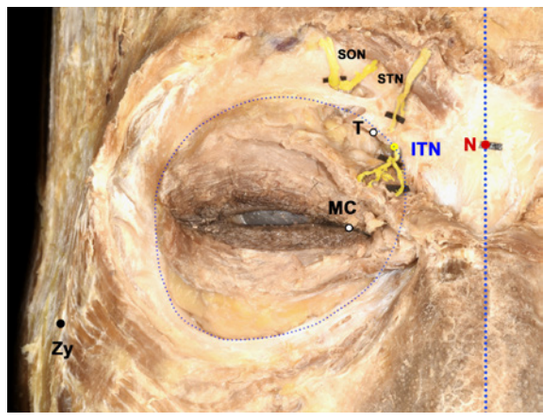
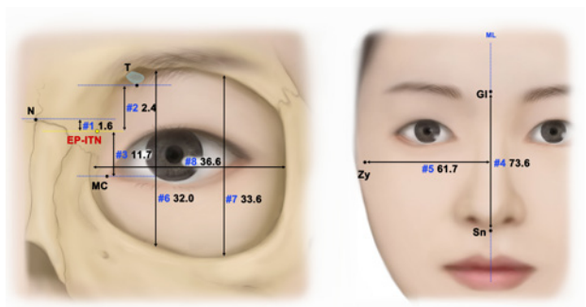


Figure 3



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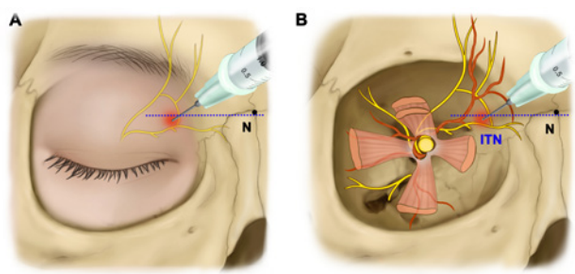

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28 Quality of Facial Photographs in the Ophthalmic Plastic and Reconstructive Surgery Journal

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Introduction: In oculofacial plastic surgery, photography is important in planning, documentation, and education. Standardized, high quality photo documentation is key. Proper positioning with reproducible angles (frontal, oblique, and lateral views), uniform illumination, focus, perspective to avoid distortion, and neutral background to avoid color casts are recommended parameters.1,2 Current guidelines for clinical photographs published in Ophthalmic Plastic and Reconstructive Surgery (OPRS) only require image resolution of 300 dpi and documented consent. On the other hand, other journals such as Aesthetic Surgery Journal (ASJ) and Plastic and Reconstructive Surgery (PRS), list additional guidelines regarding exposure, distance and angle, body pose, background color, and lighting.3,4The purpose of this study is to analyze the quality of facial photographs published in OPRS.

Methods: This was an observational study evaluating articles with patient face photographs published in OPRS from 2015-2024. The following parameters were collected: type of study, number of patients and patient photographs, documentation of consent in the methods section, lighting (low light, ambient, flash), focus, background (colored, white, black), color tones(warm, neutral, cool), patient position, and presence of distortion(barrel, pin-cushion).

Results: The study included 587 articles (158 original investigations, 290 case reports, 11 major reviews, 4 perspectives, 33 surgical technique, 3 anatomy and physiology, 66 OPRS images, 22 letters to the editor) with a total of 915 patients photographed in 2159 facial photographs. There was documentation of patient photograph consent in the method section of 306 (52%) articles. 336 photos (16%) were in black and white, so they were not assessed for lighting, background, or color tones. Of the 1823 remaining, 6 had low light, 475 had ambient light, and 1342 had flash photography; 936 had colored backgrounds, 55 had white backgrounds, and 18 had black backgrounds; 1110 had neutral color tones, 337 warm tones, and 130 cool tones. Most photographs were in focus (1903, 88%) and were cropped to the area of focus (1957, 91%). Patient positions were mostly frontal (1857, 86%); other views included oblique ranging 15 degrees to 75 degrees (219, 10%), lateral 90 degrees (67, 3%) and worm's eye (16, <1%). Barrel distortion was present in 91 (4%) photos.

Conclusions: Photographic inconsistences were identified in facial photographs published in OPRS. Additional photography guidelines may be warranted for the journal to standardize the literature and elevate the quality of published images.

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29 Range of Surgical Practice of ASOPRS Members

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Introduction: The American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) oversees fellowship training programs. Competence in eyelid, lacrimal, and orbit surgery in adult and pediatric patients are program objectives and requirements for society membership.[1] The degree to which ASOPRS member surgeons continue to practice this full range of surgeries post-training has not been characterized.

Methods: This observational study queried the oculofacialsociety.org membership directory, websites, and direct contact of surgeons' practices. The inclusion criteria were ASOPRS fellowship-trained individuals in current surgical practice and for whom data were available. For each surgeon, data of physician whether they offered surgery for the eyelids, lacrimal system, orbit, or the pediatric population. Physicians were categorized by number of years since completing an ASOPRS fellowship with groups of 2-6, 7-11, 12-16, 17-21, 22-26, 27-31, 32-36, 37-41, and 42+ years of experience.

Results: Of 668 ASOPRS physicians included in the study, 657 (98.4%) operate on lids, 531 (79.5%) perform lacrimal surgery, 524 (78.4%) perform orbital surgery, and 168 (25.1%) operate on pediatric patients. The correlation coefficients between years of experience and the proportion of practitioners that still operate on the lacrimal system, orbit, and pediatric population were found to be -0.83, -0.82, and -0.45 respectively.

Conclusions: Assuming they were trained in these procedures, 20.5% of surgeons relinquished lacrimal surgery, 21.6% relinquished orbital surgery, and 74.9% relinquished pediatric surgery. Nearly all included ASOPRS (98.4%) offer eyelid surgery. Range of practice was inversely correlated with years of experience.

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30 The Impact of Obesity on Operative Time and Complications During Oculofacial Surgery

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Introduction: Obesity is a public health crisis that has reached pandemic proportions. In the most recent 2021 to 2023 data, the prevalence of obesity in adults, defined as a body mass index (BMI) ≥30, in the U.S. was 40.3% which equates to over 100 million adults. Data on the impact of obesity on intra- and post-operative outcomes is limited, particularly within oculofacial surgery. This is highlighted in a narrative review performed by Rana et al. on the overweight and obese patient in oculofacial surgery, which discusses the unique challenges that are posed to the surgeon and the need for further studies in our field. The goal of this study was to evaluate the impact of obesity on oculofacial surgery time and operative complications.

Methods: Retrospective chart review of patients who underwent bilateral external levator advancement with blepharoplasty, bilateral lateral direct browplasty with blepharoplasty, and bilateral indirect browplasty with blepharoplasty. Patient characteristics including body mass index, comorbidities, pre-operative margin-reflex distance 1 (MRD1), surgical and anesthesia times, and post-operative complications were collected from patient records.

Results: There were 220 patients included in this study from August 2022 to March 2024 with 133 being non-obese (60%) and 87 (40%) being obese. Obese patients were more likely to have diabetes mellitus II (p <0.001), obstructive sleep apnea (p <0.001), hypertension (p <0.001), cardiovascular disease (p 0.028), and be on a blood thinner (p 0.012). Surgical times were longer in obese patients (p 0.035). In multivariate analysis, obesity, presence of a trainee, American Society of Anesthesiologists (ASA) score of 4, and the bilateral external levator advancement with blepharoplasty procedure were all independently associated with longer surgical time. Obese patients had lower pre-operative MRD1 compared to non-obese patients (p 0.003). There were similar rates of complications in obese and non-obese patients.

Conclusions: Obesity is correlated with longer surgical times in commonly performed upper eyelid and eyebrow procedures. In this study, there was no difference in rate of complications between obese and non-obese patients.

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1 Deep Plane Vertical Facelift Restore with Chin Augmentation: A Novel Approach to Comprehensive Facial Rejuvenation

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Introduction: To evaluate the synergistic benefits of combining chin augmentation with the Deep Plane Vertical Facelift Restore (VFR) technique, aiming to enhance jawline definition, facial harmony, and overall aesthetic outcomes in aging patients.

Methods: A retrospective review of 30 patients undergoing the Deep Plane Vertical Facelift Restore with simultaneous chin augmentation was conducted. The VFR technique involved sub-SMAS dissection for vertical facial elevation, while chin implants (silicone or porous polyethylene) were placed via a submental approach. Implants were shaped and fixated with titanium screws. Outcomes were assessed using standardized preoperative/postoperative photographs.

Results: Jawline Definition: Cervicomental angle improved by 14°±3).

Facial Harmony: Chin projection increased by 4.3±1.3 mm, enhancing lower facial balance.

Complications: Minimal (3% transient mental nerve hypoesthesia, resolved by 6 weeks; no implant malposition or infection).

Conclusions: Chin augmentation integrated with the Deep Plane Vertical Facelift Restore technique safely optimizes facial contouring, addressing both gravitational descent and skeletal deficiency. This combined approach surpasses traditional facelifts in achieving a harmonious, V-shaped jawline while avoiding the lateralized "pulled" appearance. Long-term follow-up (>12 months) demonstrates sustained aesthetic outcomes, supporting its use for comprehensive facial rejuvenation.

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2 Is TXA in your local anesthesia syringe? Effect of Subcutaneous Tranexamic Acid on Hemostasis and Ecchymosis in Oculofacial Procedures: a Double-Blind, Placebo-Controlled, Randomized Trial

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Introduction: Intraoperative bleeding can prolong surgical time, obscure exposure, increase cautery use with subsequent scarring, and necessitate using expensive hemostatic products. Postoperative bleeding may lead to delayed healing, patient discomfort, anxiety, and trips to the ER. Tranexamic acid (TXA) is a lysine analogue that acts as an antifibrinolytic by preventing plasminogen activation to plasmin. Recent studies have emerged which suggest that local TXA may decrease ecchymosis after blepharoplasty, brow lifts, and other procedures.[1,2,3] The aim of this study was to assess the hemostatic effect of subcutaneous TXA in varied oculofacial procedures.

Methods: This is a prospective, randomized, placebo-controlled, double-blind study of consecutive patients undergoing oculofacial procedures by a single surgeon (RS) between July 2020-July 2024. Exclusion criteria included age 200 mmHg, prior history of oculofacial surgery or trauma, and follow-up < 1 month. Antithrombotics were held seven days prior to surgery. Patients were randomized to either receive local anesthesia with or without TXA that was drawn up by a nurse. The same volume of local anesthetic was injected in all similar surgeries. For bilateral procedures (ex blepharoplasty) patients were randomized to receive TXA solution in one eyelid while the contralateral lid received placebo. The TXA solution contained equal volumes of 1% lidocaine with epinephrine 1:100,000 and 0.5% bupivacaine with epinephrine 1:200,000 in addition to 100 mg/ml TXA to yield a concentration of 1mg TXA/1 ml local anesthetic. The placebo solution replaced the TXA with normal saline (fig. 1 shows an example of 2 ml solutions). Patient and surgeon were blinded to which solution was being injected. Most procedures were performed in an office-based procedure room under local anesthesia utilizing high temp handheld cautery when needed. DCR represented an exception which was performed in an operating room under general anesthesia utilizing monopolar cautery when needed. Cautery was not used in conjunctiva muller muscle resection, entropion/ectropion repair, or levator advancement procedures. Hemostatic agents were not used in any cases. Operative and cautery time were recorded by nursing staff. Photos were taken at postoperative day (POD) 7. Two blinded oculoplastic surgeons scored ecchymosis using the 4-point Winker-Black bruising scale (fig. 2). Patients recorded the POD the ecchymosis resolved.

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Results: A summary of patient outcomes is illustrated in Table 1. Treatment groups for all procedures were similar in terms of gender, age, medical history, and ultimate histopathologic diagnosis when biopsy was performed. Duration of cautery and surgery, ecchymosis grade on POD 7 (examples in fig. 3), and duration to ecchymosis resolution were all significantly less for the patients treated with TXA for all surgical procedures. No complications including thromboembolic events were noted in the TXA group.

Conclusions: Subcutaneous TXA in local anesthetic proved safe and effective at reducing bleeding, surgical time, ecchymosis at POD 7, and a shorter overall duration of ecchymosis in this cohort. Clinicians may wish to consider the use of TXA when performing oculofacial procedures. Future studies are warranted to investigate ideal route and dose of TXA, utilization in patients taking anticoagulants, and for other oculofacial surgeries.

Figure 1

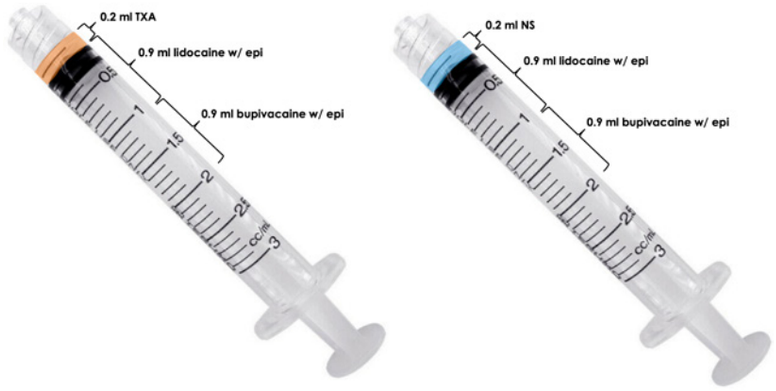

Figure 2

Figure 3

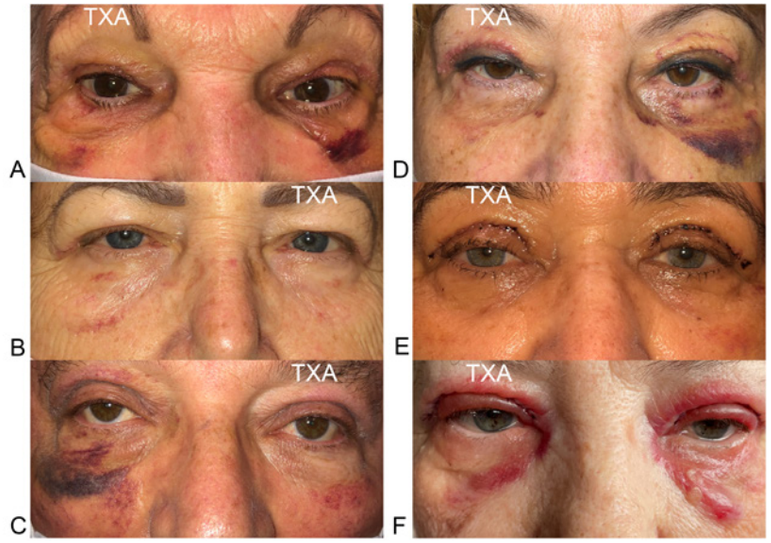

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Figure 4

Criteria/Demographics	TXA	Placebo	P-value
Lacrimal gland biopsy 68 Patients (M=34%, F=66%); Mean age = 56.2 years (range = 24-87)			
Duration of surgery (minutes)	22.3	26.2	0.022
Duration of cautery (seconds)	10.5	27.2	<0.01
POD 7 ecchymosis (0=none, 1=mild, 2=moderate, 3=severe)	1.1	2.6	<0.01
Days until ecchymosis resolution	8.6	12.8	<0.01
Upper Blepharoplasty 1340 Patients (M=37%, F=63%); Mean age = 65.9 years (range = 38-89)			
Duration of surgery (minutes)	11.9	13.9	0.026
Duration of cautery (seconds)	22.6	74	<0.01
POD 7 ecchymosis	0.8	1.8	<0.01
Days until ecchymosis resolution	12.1	15.7	0.021
DCR 304 Patients (M=34%, F=66%); Mean age = 67.8 years (range = 36-92)			
Duration of surgery (minutes)	26.1	29.9	<0.01
Duration of cautery (seconds)	3.3	17.1	<0.01
POD 7 ecchymosis	1.0	2.5	<0.01
Days until ecchymosis resolution	8.1	12.2	0.019
CMMR 1198 Patients (M=33%, F=67%); Mean age = 64.2 years (range = 24-98)			
Duration of surgery (minutes)	4.0	4.8	0.022
POD 7 ecchymosis	0.4	1.4	<0.01
Days until ecchymosis resolution	6.1	8.7	<0.01
Involutional Entropion 124 Patients (M=49%, F=51%); Mean age = 65.8 years (range = 57-101)			
Duration of surgery (minutes)	9.4	11.0	0.017
POD 7 ecchymosis	0.7	1.4	0.024
Days until ecchymosis resolution	7.1	9.1	0.021
Involutional Ectropion 142 Patients (M=46%, F=54%); Mean age = 69.1 years (range = 56-91)			
Duration of surgery (minutes)	8.1	10.1	<0.01
POD 7 ecchymosis	0.7	1.4	0.016
Days until ecchymosis resolution	7.0	9.2	0.021
External Levator Advancement 58 Patients (M=36%, F=64%); Mean age = 65.6 years (range = 31-86)			
Duration of surgery (minutes)	18.1	22.5	0.017
POD 7 ecchymosis	0.5	1.3	0.024
Days until ecchymosis resolution	6.7	8.4	0.014

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3 Hydrocolloid Dressings for Oculofacial Plastic and Reconstructive Surgery Wound Healing

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Introduction: The use of hydrocolloid dressings (HCDs) is well-documented in chronic wound care. HCDs are cost-effective dressings (<$2 per patch) that facilitate wound healing through various mechanisms. HCDs promote cell turnover, create a moist environment, and strengthen the barrier to bacterial wound entry. Recently, HCDs have demonstrated utility in wound care after post-excisional dermatological surgeries. HCDs have also shown improvement in the appearance of hypertrophic scars after post-excisional surgeries. No current studies explore the role of HCDs in periocular wound healing after oculofacial plastic and reconstructive surgeries

Methods: This is a randomized controlled prospective study comparing conventional wound care (topical ointment application) to HCD application for patients undergoing brow ptosis repair via a direct suprabrow approach or periocular skin reconstructive surgery. Subjects were consented to receive one of two post-operative care regimens: 1) Twice daily topical antibiotic ophthalmic ointment application for one week (the standard of care at our institution) or 2) One time HCD application in the operating room. The HCDs were removed at the post-operative week 1 visit. Scars were aesthetically analyzed by two oculoplastic surgeons for aesthetic appearance at post-operative month 3. Patients and observers analyzed the scar using the Patient and Observer Scar Assessment Scale. Patients were given a survey (wound healing questionnaire) to assess comfort and convenience post-operatively on each regimen. Patients with an allergy to pectin, gelatin, or sodium carboxymethylcellulose were excluded from the study.

Results: 20 patients were included in this study. Patients who received the HCD reported increased comfort and convenience compared to patients applying ophthalmic ointment to their wounds. Patients who received the HCD noted less blurry vision related to topical ointment application and less irritation from sutures. No patients reported unfavorable reactions to the HCD. No infections or complications to the HCDs were noted. Scar appearance was similar in both groups.

Conclusions: In the immediate postoperative period, HCDs may offer increased comfort and convenience compared to frequent topical ointment applications. HCDs reduce irritation from sutures and limit changes in vision related to ointment near the eyes. Additionally, a surgeon's one-time application of an HCD in the operating room can simplify post-operative care. These factors are important considerations for the elderly patient population commonly undergoing periocular surgeries with limited wound care ability. Further studies are needed to assess the utility of HCDs and their effects on scar appearance.

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4 Incidence, Risk Factors, and Surgical Interventions for Eyelid Malposition Following Glaucoma Surgery: A Multi-institutional Study Using SOURCE Database

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Introduction: Post-surgical blepharoptosis is a known complication of cataract surgery with an estimated prevalence of 3%. However, data on eyelid malposition following glaucoma surgery remains limited. This study aims to determine the incidence of post operative eyelid malposition following glaucoma surgery, identify associated risk factors, and assess the rate of subsequent corrective eyelid procedures.

Methods: In this retrospective cohort study, adult patients who underwent glaucoma surgery from the Sight Outcomes Research Collaborative (SOURCE) database between 2009 and 2023 from 16 different academic health systems, were analyzed. Patients with pre-existing eyelid malposition, prior or concurrent retinal/corneal surgeries, or multiple glaucoma surgeries were excluded. Postoperative eyelid malposition was defined as new onset of blepharoptosis, ectropion, entropion, and eyelid retraction 90 days after initial glaucoma surgery. Dermatochalasis was not classified as a postoperative eyelid malposition, and blepharoplasty was excluded as a corrective eyelid procedure for eyelid malposition. Stepwise logistic regression was used to identify demographic, ocular, and systemic risk factors associated with the development of malposition and the need for corrective eyelid surgery.

Results: Among 10,423 eligible patients (mean age 67.7±13.2 years, 49.8% male), 419 (4.0%) developed postoperative eyelid malposition. The most common eyelid malposition following glaucoma surgery was blepharoptosis (3.06%, n=319), followed by ectropion (0.56%, n=58), entropion (0.48%, n=50), and eyelid retraction (0.43%, n=45). Fifty patients (11.9% of those with malposition; 0.5% of the total cohort) required corrective eyelid surgery. Surgical intervention rates were the highest for ectropion (48%, n=28/58), followed by entropion (22%, n=11/50), eyelid retraction (20%, n=9/45), and blepharoptosis (7%, n=23/319). Significant risk factors for developing post-operative eyelid malposition included history of collagen vascular disease (OR=5.82), dry eye syndrome (OR=2.23), Asian ethnicity (OR=1.91), Hispanic ethnicity (OR=1.82), obstructive sleep apnea (OR=1.72), and use of beta-blocker eye drops (OR=1.51). Angle implant surgeries were

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protective (OR=0.18). Factors associated with higher risk of requiring surgical correction included pre-existing dermatochalasis (OR=6.6), use of Rho kinase inhibitor drops (OR=3.4), and undergoing Xen ab interno gel stent implantation (OR=3.4) or trabeculectomy (OR=2.5).

Conclusions: Eyelid malposition occurs in 4% of patients after glaucoma surgery, with blepharoptosis being the most frequent. However, ectropion carries a much higher likelihood of requiring surgical correction. Identifying risk factors—such as collagen vascular disease, dry eye, certain ethnicities, and specific glaucoma procedures—can help clinicians better counsel patients preoperatively, anticipate complications, and consider modifying surgical approaches for high-risk individuals to reduce postoperative eyelid malposition.

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5 Opioid Usage Trends with Reduced Prescriptions after Oculoplastic Procedures

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Introduction: When grouped by subspeciality, oculoplastic has the highest rate of opioid prescription within ophthalmology.[1] Studies have also shown that many opioid prescriptions sent are much higher than what the patients need.[2,3] A prior study showed that when given 20 tablets of tramadol following oculoplastic procedures, patients took on average 3.02 tablets.[4] In the cornea literature, it was found that when the number of opioids prescribed after corneal surgeries decreased, the amount taken by patients also decreased.[2] The goal of this study is to examine the impact of reducing the quantity of prescribed opioids on opioid use following oculoplastic surgery.

Methods: This is a prospective study at a tertiary oculofacial plastic surgery practice from 5/2024 to 2/2025. All patients that underwent an oculoplastic procedure were eligible for inclusion. Prior to surgery, all patients were provided information about the study and had the opportunity to opt-out. Following surgery, patients were prescribed 10 tablets of tramadol 50 milligram, with instructions to take one tablet every 6 hours as needed for pain. At their post-operative week 1 (POW1), each participant in the study had the remaining number of opioid tablets counted. The number of tablets taken was calculated by subtracting the remaining number of tablets from the original prescribed amount.

Results: 243 patients were eligible for inclusion, of which 91 were included and 152 were excluded for not having their medication at their POW1 appointment. The average number of tramadol tablets taken for patients undergoing any oculoplastic procedure was 3.13 (95% CI, 2.40-3.86).

The average number of opioids taken for patients having any eyelid procedure was 3.10 (95% CI, 2.37-3.84). When subcategorized (Figure 1), the average for procedures on only upper eyelids was 1.69 (95% CI, 0.77-2.42), only lower eyelids was 4.29 (95% CI, 0.48-8.08), and both eyelids was 3.75 (95% CI, 2.71-4.79). There was no statistically significant difference in opioid usage between only upper lids and only lower lids ($p=0.08$) as well as only lower lids and both eyelids ($p=0.82$). There was a statistically significant difference between upper lids only and both eyelids ($p<0.01$).

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The average number of tablets taken for cosmetic surgery was 3.73 (95% CI, 2.40-5.07) and for functional surgery was 2.80 (95% CI, 1.91-3.68). There was no statistically significant difference in the number of tablets taken between cosmetic surgery and functional surgery (p = 0.21).

Conclusions: Unlike the literature in cornea, decreasing the amount of tramadol prescribed did not result in a statistically significant difference in the overall amount of tramadol used following oculoplastic procedures (p=0.99). However, the greatest difference found was the number of unused tramadol tablets with patients. This study shows that adequate pain control can be obtained despite halving the number of opioids prescribed. This study also continues to show that those undergoing surgical procedures involving both upper and lower eyelids at the same time do require more opioids for pain control. Lastly, this study reinforces that cosmetic patients do not require more opioids for pain control than those undergoing functional surgeries.

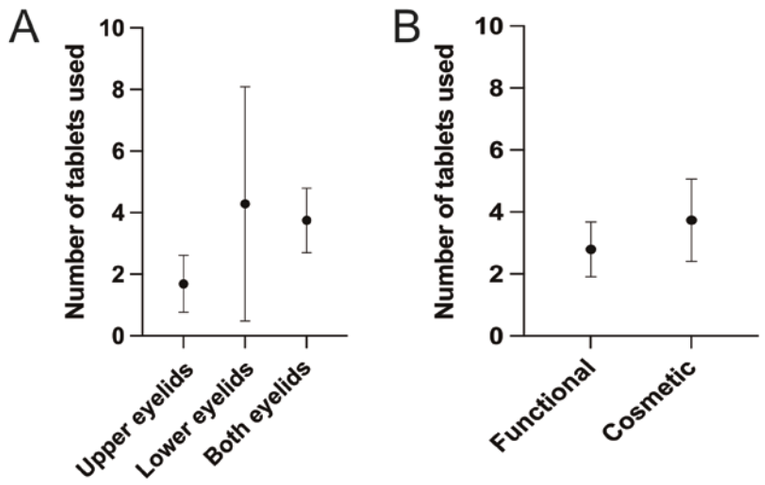

Figure 1: Graph showing the mean and 95% confidence interval of the number of tramadol tablets used for A) upper eyelids, lower eyelids, and both eyelids and B) functional and cosmetic procedures.

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6 Semaglutide Use and New-Onset Ptosis: A Retrospective Cohort Study

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs), particularly semaglutide, have rapidly become a mainstay in the management of obesity and type 2 diabetes due to their demonstrated benefits in weight loss and cardiovascular outcomes.[1] However, their impact on periorbital structures is less understood. Anecdotal reports have described facial volume loss—sometimes called "semaglutide face"—following GLP-1 RA use, suggesting a potential link between these agents and periorbital changes.[2] Despite these observations, the association between GLP-1 RA use and eyelid ptosis has not previously been investigated. This study aims to evaluate whether semaglutide use is associated with an increased risk of new-onset ptosis.

Methods: A retrospective cohort study was conducted using TriNetX, a federated electronic health record platform. Adult patients with obesity were identified and divided into two cohorts: those prescribed semaglutide (n=98,595) and those prescribed non-GLP-1 RA anti-obesity medications (n=31,716). Patients with a pre-existing diagnosis of ptosis were excluded. A 365-day observation window was applied, beginning one day after medication initiation. Propensity score matching was used to balance baseline characteristics, yielding 31,684 patients in each cohort. Incidence of new-onset ptosis was compared using risk difference (RD), relative risk (RR), odds ratio (OR), and p-values.

Results: Ptosis occurred in 0.21% of semaglutide users versus 0.12% of comparators. The risk difference was 0.001 (95% CI: 0.000–0.001, p=0.008), reflecting an absolute increase of 0.1%. The relative risk was 1.692 (95% CI: 1.139–2.513), and the odds ratio was 1.693 (95% CI: 1.139–2.517), indicating a statistically significant 69% relative increase in ptosis risk with semaglutide. Although the event remains rare, the relative association is notable.

Conclusions: This large-scale retrospective analysis identifies a statistically significant association between semaglutide use and new-onset ptosis. Given the increasing use of GLP-1 RAs, these findings may warrant consideration during oculofacial evaluations. However, the absolute risk remains low, and causality cannot be established based on these data alone. This study is limited by its retrospective design and reliance on coded data, which may not capture medication compliance, dosage, or ptosis severity. Additionally, while propensity score matching was used, unmeasured confounders may persist. Ptosis is associated with other risk factors, including age,

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diabetes, and obesity, which may not be fully adjusted for in this dataset. Further prospective research is needed to clarify underlying mechanisms, including the potential roles of facial fat redistribution or neuromuscular effects.[3]

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7 The Association between Congenital Ptosis and ADHD: A National, Cross-Sectional Study

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Introduction: Over the past decade, several studies have explored the correlation between visual processing abnormalities and Attention-Deficit/Hyperactivity Disorder (ADHD). However, to the best of our knowledge, the association between congenital ptosis and ADHD has not been investigated. This study aims to examine the association between congenital ptosis and ADHD.

Methods: This was a national, retrospective, cross-sectional study. The diagnosis of blepharoptosis was confirmed by an ophthalmologist, while cognitive assessments and ADHD diagnoses were conducted by a neurologist using standardized clinical criteria. The study collected demographic data, ocular and systemic medical history, ptosis characteristics, surgical details, ADHD diagnoses, and ADHD medication use.

Results: A total of 866 patients (485 males, 381 females) were diagnosed with congenital ptosis, with a mean age at diagnosis of 3.66 years. Among them, 673 patients (76%) underwent ptosis surgery, with frontalis sling being the most common procedure (34.4%). ADHD was diagnosed in 156 patients (18.01%, compared to 5.6-7.6% in the general pediatric population), and Methylphenidate was the most frequently prescribed medication (64%). Several factors were significantly associated with an increased risk of ADHD, including male sex, a diagnosis of ptosis after the age of one year, undergoing eyelid patching for amblyopia, the presence of residual ptosis, a history of ptosis surgery, and undergoing levator advancement surgery ($p < 0.05$).

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Conclusions: This national cross-sectional study is the first to investigate the association between congenital ptosis and ADHD, revealing that nearly 20% of patients with congenital ptosis developed ADHD. Male patients, those diagnosed after the age of one, individuals with residual ptosis, and those who underwent eyelid patching, ptosis surgery, and levator advancement surgery were identified as high-risk groups. Given these findings, early ADHD screening should be considered for patients with congenital ptosis exhibiting these risk factors, allowing for timely intervention and appropriate treatment.

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8 Trends and Outcomes of Endoscopic Vs. External Dacryocystorhinostomy: A 20-Year Retrospective Analysis using a Multi-Institutional Database

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Introduction: Acquired nasolacrimal duct obstruction (NLDO) is a common condition in adults, with an annual incidence of approximately 20 per 100,000.[1] Dacryocystorhinostomy (DCR) is a surgical procedure used to manage NLDO by creating an alternative drainage pathway for tears between the lacrimal sac and nasal cavity, bypassing the nasolacrimal duct. It can be performed via either an external approach (EX-DCR) or an endoscopic endonasal approach (EN-DCR). Advantages of EX-DCR include direct visualization of the lacrimal sac and the ability to create and suture mucosal flaps, which is thought to contribute to its higher success rates than EN-DCR. Drawbacks of the external approach are the cutaneous scar and potential disruption of the lacrimal pump function. EN-DCR avoids a skin incision and preserves the pump mechanism while allowing simultaneous treatment of intranasal pathology, but it has a learning curve and requires specialized instruments with associated cost.[2,3]

EX-DCR has long been considered the gold standard treatment for NLDO, with high success rates noted in literature.[4] Recent comparative studies also indicate that endoscopic DCR outcomes are equal to the external approach,[5] reflecting advances in EN-DCR techniques. This study compares the global trends in using EX-DCR versus EN-DCR over the past 20 years and their respective reoperation rates.

Methods: A retrospective cohort study was performed using the TriNetX global federated research network. Trend analysis evaluated patients undergoing primary EX-DCR or EN-DCR from December 31, 2004, through December 31, 2024. To compare outcomes, EX-DCR patients were propensity score-matched 1:1 to EN-DCR patients. Revision rates at 1, 10, and 20 years were assessed, and risk ratios (RR) were calculated.

Results: Over the study period, EX-DCR rates decreased by 31.5% (87.07% to 59.95%), while EN-DCR rates increased by 209.74% (12.93% to 40.05%). In 2004, EX-DCR was performed 6.7 times more often than EN-DCR (87.07% vs.12.93%); by 2014, this ratio declined to 3.1 times (76.07% vs 23.93%), and by 2024, to 1.5 (59.95% vs 40.05%). EX-DCR use declined an average of 1.74% per year, while EN-DCR increased by 7.33% annually. Patients who underwent EX-DCR, 8,919, were matched to 3,704 who underwent EN-DCR. Matched analysis revealed comparable revision rates at 1 year (EX, 9.0%; EN, 8.6%; RR, 1.042; 95% CI, 0.893-1.215; *p=0.605*), 10-years (EX, 14.5%; EN, 13.6%; RR, 1.064; 95% CI,

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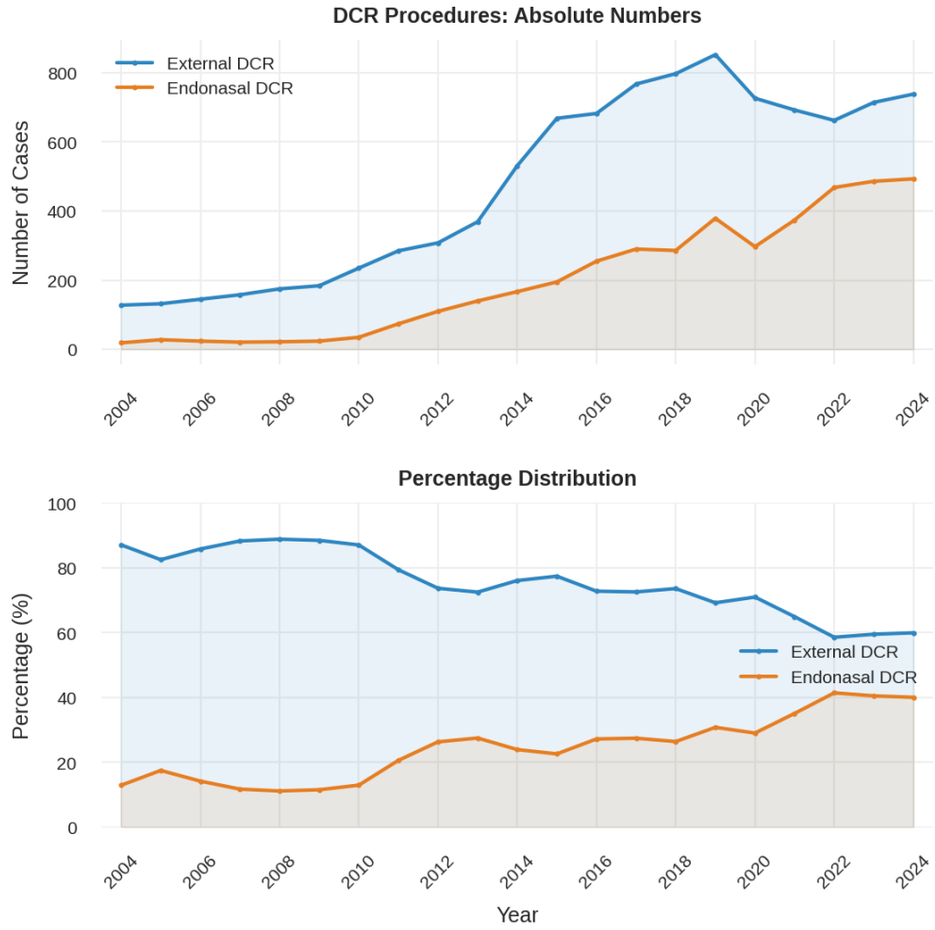
0.945-1.198; *p=0.307*), and 20-years (EX, 14.7%; EN, 13.7%; RR, 1.072; 95% CI, 0.953-1.206; *p=0.247*). Overall success rates, defined as no need for revision, ranged between 85% and 91%. Patients initially undergoing EX-DCR were 2.7 times more likely to have a subsequent EX-DCR at 1 year (RR, 2.793; 95% CI, 2.180–3.577; p<0.001). EN-DCR patients were 2.4 times more likely to undergo EN-DCR revisions (RR, 0.415; 95% CI, 0.328–0.526; p<0.001), with consistent trends across all timepoints.

Conclusions: Over the past 20 years, endoscopic DCR has gained popularity, with steadily increasing use and comparable revision rates to external DCR.

Table 1. Baseline Characteristics between the external DCR and endoscopic DCR

	Before Propensity Matching			After Propensity Matching		
Variable	**EX-DCR (n=8,919)**	**EN-DCR (n=3,704)**	**Standard difference**	**EX-DCR (n=3,342)**	**EN-DCR (n=3,342)**	**Standard difference**
Age at index, yr	58.3 ± 21.0	53.0 ± 22.3	0.245	52.9 ± 22.5	53.4 ± 22.6	0.025
Female	5,829 (65.7%)	2,494 (67.4%)	0.038	2,285 (68.4%)	2,242 (67.1%)	0.028
Race						
White	6,035 (68.0%)	2,410 (65.2%)	0.06	2,250 (67.3%)	2,192 (65.6%)	0.037
Black/African American	532 (6.0%)	255 (6.9%)	0.037	229 (6.9%)	220 (6.6%)	0.011
Asian	721 (8.1%)	302 (8.2%)	0.002	275 (8.2%)	280 (8.4%)	0.005
Ethnicity						
Not Hispanic/ Latino	6,769 (76.2%)	2,992 (80.9%)	0.114	2,700 (80.8%)	2,678 (80.1%)	0.017
Comorbidities						
Chronic Sinusitis	884 (10.0%)	926 (25.0%)	0.405	729 (21.8%)	721 (21.6%)	0.006
Other nose/sinus dxs	1,119 (12.6%)	1,436 (38.8%)	0.629	1,072 (32.1%)	1,081 (32.3%)	0.006
T2DM	968 (10.9%)	339 (9.2%)	0.058	307 (9.2%)	318 (9.5%)	0.011
Nicotine dependence	455 (5.1%)	194 (5.2%)	0.005	179 (5.4%)	171 (5.1%)	0.011
Head Injuries	954 (10.7%)	382 (10.3%)	0.014	389 (11.6%)	344 (10.3%)	0.043



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9 Ophthalmic Outcomes of Adult-Onset Sinonasal Rhabdomyosarcoma with Orbital Extension

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Introduction: Sinonasal rhabdomyosarcoma (SNRMS) is an extremely rare and aggressive soft tissue malignancy. Most literature discusses SNRMS in the pediatric population; however, it is even more rare in adults and correspondingly less is known about the disease in this population compared to in children[1,2] Adult-onset SNRMS has been reported to have a propensity for meningeal and intracranial spread,[1,2] yet no paper has examined orbital involvement in these patients. The purpose of this study is to present ophthalmic outcomes in adults-onset SNRMS with orbital extension.

Methods: A retrospective chart review was performed to identify all patients with a histopathologic diagnosis of SNRMS at a single comprehensive cancer center from 2000 to 2024. To be included in the study, all patients had to have a primary SNRMS diagnosis made at or after 18 years of age; recurrent disease in patients with a prior history of pediatric RMS were excluded. Information about demographics, clinical presentation, tumor characteristics, management and outcomes were collected.

Results: Eight cases of adult-onset SNRMS were identified (5 female, 3 male). All tumors were the alveolar subtype of RMS. The average age at presentation was 34 years (range 21-72 years). All 8 cases had orbital extension without widely metastatic disease at presentation. The most common presenting symptoms were diplopia (n=3, 37.5%) blurred vision (n=4, 50%), proptosis (n=4, 50%) and periorbital pain (n=5, 62.5%). Average visual acuity of the affected eye at presentation was logMAR 0.68 (between 20/80 and 20/100). Initial neuroimaging demonstrated isolated medial orbital extension in 4 cases, and simultaneous orbital and intracranial involvement in 4 cases. Two of these cases required urgent transnasal endoscopic orbital decompression for vision loss. All patients underwent chemotherapy and radiation over an average of 28.25 weeks. During treatment, ophthalmic complications included early cataract related to radiation (n=3), radiation retinopathy (n=2), lagophthalmos requiring placement of gold weights (n=2) and in one case cicatricial ectropion requiring multiple surgical interventions for exposure keratopathy. Average visual acuity at the conclusion of treatment was 0.06 logMAR (20/80). Ultimately, four patients passed away (average time between presentation and death was 525 weeks), two were lost to follow up, and two are in remission.

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Conclusions: Adult SNRMS is an exceptionally rare malignancy which represents unique diagnostic and therapeutic challenges, given its late presentation and aggressive nature. This study shows that SNRMS has a propensity for spread into the orbits, and that treatment itself can result in potentially blinding ocular complications. Thus, early and prompt multidisciplinary care with oculofacial plastic surgeons and other ophthalmology specialties is crucial to prevent vision loss.

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10 Vision Loss and Use of Urgent Radiation Therapy in High-Risk Neuroblastoma With Orbit or Skull Base Disease Treated with Anti-GD2 Monoclonal Antibody

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Introduction: Patients with newly diagnosed high-risk neuroblastoma (HRNBL) frequently have orbit and skull-based disease, placing them at risk of optic nerve compression and vision loss. In this setting, systemic steroids are often administered concurrently with chemotherapy in an attempt to preserve visual function. Advances in HRNBL therapy using chemoimmunotherapy, in which an anti-GD2 monoclonal antibody is added to a chemotherapy backbone, have demonstrated significant efficacy.

However, concurrent systemic steroids given to protect vision may decrease the efficacy of chemoimmunotherapy. We report the vision outcomes of patients with newly diagnosed HRNBL with orbit and skull-based disease at diagnosis treated with chemoimmunotherapy during induction and the clinical and radiological characteristics which may predict need for urgent radiation treatment.

Methods: Electronic medical records of patients treated on a phase 2 single institution trial evaluating chemoimmunotherapy in patients treated for HRNBL were reviewed. Clinical characteristics and treatment of patients with periorbital and skull-based disease were recorded. The primary outcome was vision loss. The incidence of vision loss in eyes with periorbital or skull-based disease was stratified by anatomic risk features and interventions (including radiotherapy).

Results: Sixty-four patients were treated in the original phase 2 trial. Twenty subjects and thirty-six eyes demonstrated orbit or skull-base disease at diagnosis. Systemic steroids were avoided, and radiation was pursued in cases of visual compromise. Visual decline and incidence of new afferent pupillary defects occurred in 0 of 36 eyes. The median time from diagnosis to start of chemoimmunotherapy treatment was two days. There was no observable difference in incidence of vision loss between eyes with orbit or skull base disease and those without. Five subjects required urgent radiation therapy for acute visual compromise. Vision loss on presentation (p=0.009) and orbital apex involvement (p=0.001) were significant predictors of need for urgent radiation treatment.

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Conclusions: The exclusion of systemic steroids in treating patients with high risk neuroblastoma with periorbital and skull-base disease did not lead to an increased risk of vision loss for those treated with anti-GD2 immunotherapy added to a chemotherapy backbone. Patients needing urgent intervention were able to promptly receive radiation therapy and begin chemoimmunotherapy as scheduled.

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11 Clinical Outcomes of the Superior Ophthalmic Vein Approach for Closure of Carotid Cavernous Fistulas

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Introduction: Carotid cavernous fistulas (CCFs) are a potentially blinding, debilitating, and life threatening disease[1]. Given the challenge of closure, the superior ophthalmic vein (SOV) approach is a viable alternative when conventional approaches fail[2,3,4,5,6].

Methods: An IRB approved, retrospective analysis from 2010 to 2024 for patients who underwent closure of CCF via planned SOV approach was performed. Data was collected including age, gender, clinical presentation, pre-operative vision and imaging findings, occlusion result, post-operative vision, and any sequelae in follow-up. Preoperative neuroimaging findings were reviewed and the SOV diameter and cross-sectional area measured on coronal views. Associations of the SOV diameter with success of cannulization were determined using Fisher's exact test.

Results: A total of 31 patients were included in the study. Mean age was 66 years (23-88 years) and the majority of patients were female (68%). The most common findings were conjunctival injection, chemosis, proptosis, and diplopia. Mean preoperative intraocular pressure (IOP) was 25 mm Hg (12-57 mm Hg) and mean vision was 20/50 (20/15 - CF). On imaging, the mean widest SOV diameter was 5.37 mm (3.1-9.2 mm). 94% of SOVs were successfully cannulized, with complete closure was obtained in 93%. There was no statistically significant association between SOV width and success of cannulization. Five patients (16%) were noted to have posterior cortical venous drainage (PCVD) on cerebral arteriography, and this finding correlated with abnormal FLAIR signal and cerebral ischemia on preoperative MRI. The most common periocular sequelae was upper eyelid ptosis (68%). Preoperative diplopia resolved in 73% of patients, with 10% of patients requiring strabismus surgery. 10% of patients required canthotomy/cantholysis for orbital compartment syndrome (OCS) following embolization.

Conclusions: In this series, the SOV approach for closure of CCF was effective and relatively safe, achieving a 93% closure rate. Severe iatrogenic visual loss was uncommon from the procedure. Patients need to be closely monitored immediately postoperatively for OCS (10%). Postoperative ptosis is a common complication. Sixteen percent of patients presenting with periocular findings of CCF also demonstrated PCVD on angiography, predisposing them to potential progressive neurologic deficits.

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Figure 1

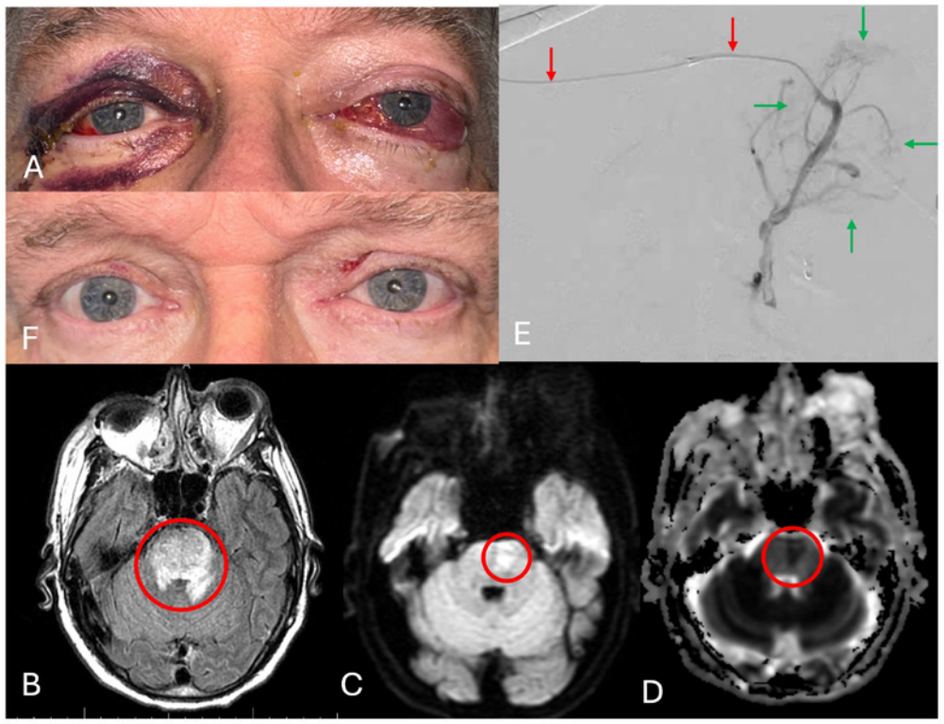

Fig. 1. 63 year old patient with PCVD and progressive dysarthria and right sided hemiparesis. A. Pre-operative clinical photos with left orbital congestion consistent with CCF. B. MRI FLAIR image demonstrating pontine edema (circle). C & D. DWI and ADC showing pontine stroke (circles). E. Cerebral arteriography demonstrates micro-catheter within SOV and cavernous sinus (red arrows). Note PCVD on contrast injection (green arrows).

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12 Comparative Outcomes of Medical Therapy Versus Medical Therapy with Adjuvant Ultrasonic-Assisted Debulking Surgery in Optic Nerve Tumours: Insights from a Case Series

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Introduction: Optic nerve tumors, while uncommon, can cause significant and often irreversible visual impairment. Among them, optic nerve gliomas(ONGs) and optic nerve sheath meningiomas(ONSMs) represent the frequent primary tumors of Optic Nerve. ONGs typically occur in children, especially those with neurofibromatosis type1, and account for 3–5% of paediatric central nervous system tumors(1). In contrast, ONSMs usually affect middle-aged adults and represent about 2% of all orbital tumors(2). Additionally, these tumours often cause functional and cosmetic abnormalities.

Amongst the medical Therapy(MT), Chemotherapy(CT) is considered the first-line treatment for ONGs, whereas radiotherapy(RT) for ONSMs, particularly when vision is still salvageable(3). However, some tumours may not respond to MT, necessitating adjuvant debulking surgery(DS) as disease progresses.

Methods: A retrospective analysis was conducted on patients diagnosed with ONG or ONSM. All were treated initially by MT for an year. Based on response, they were divided into two groups: Group1 (favourable response to MT) and Group 2 (poor response to MT, requiring DS with an ultrasonic aspirator). Outcomes were assessed using a standardized proforma, focusing on clinical reduction in proptosis (≥2 mm by Hertel's exophthalmometry), radiological tumor size reduction, and visual acuity improvement.

Results: A total of 11 patients were included: 5 with ONG (mean age: 3.3 years) and 6 with ONSM (mean age: 49.6 years). The overall male-to-female ratio was 1:10. Group1 comprised 4 patients(5eyes) and Group 2 had 7 patients(7eyes). The minimum follow-up was 2 years. In Group1, vision was retained in 4 out of 5 eyes and decreased in one eye; proptosis reduced in 3 out of 5 eyes though not significant. In Group 2, vision was preserved in 3 out of 7 eyes, while all eyes showed a significant reduction in proptosis both clinically and radiologically ($p < 0.001$).

On comparative analysis of ONG and ONSM cases, among ONG patients, one patient responded to chemotherapy with vision retained at 6/18, while another with bilateral glioma showed no response to palliative MT. Three ONG patients underwent DS with globe preservation; two maintained stable visual acuity, and one experienced vision decline to negative perception of light(NPL) over

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two years. Among ONSM patients, two responded to radiotherapy with vision preserved at 6/60, while four underwent DS, all showing decreased vision but with complete resolution of proptosis by the end of follow-up.

Conclusions: This study has shown that MT can help preserve vision in patients with ONG and ONSM. However radioresistant ONSMs and Chemo-resistant ONGs may benefit from DS for better tumour control and proptosis reduction. Surgical debulkment of tumors using ultrasonic aspiration system successfully resolved proptosis, with no recurrence observed over a two-year follow-up period; though vision loss after surgery was noted in 71.4% of cases.

Figure 1

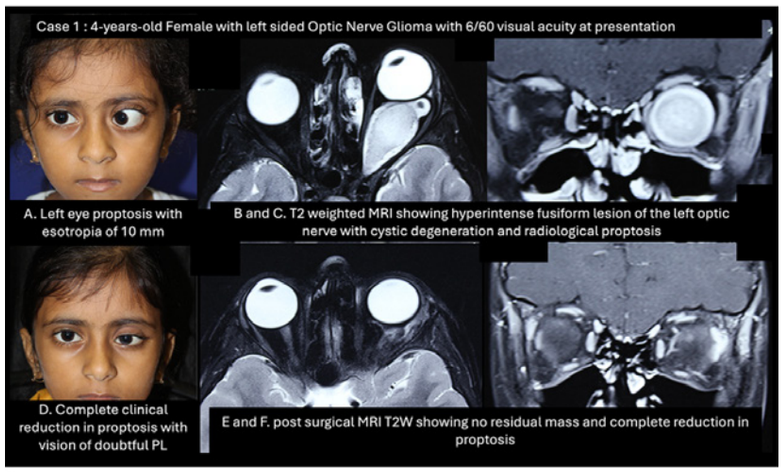

Figure 2

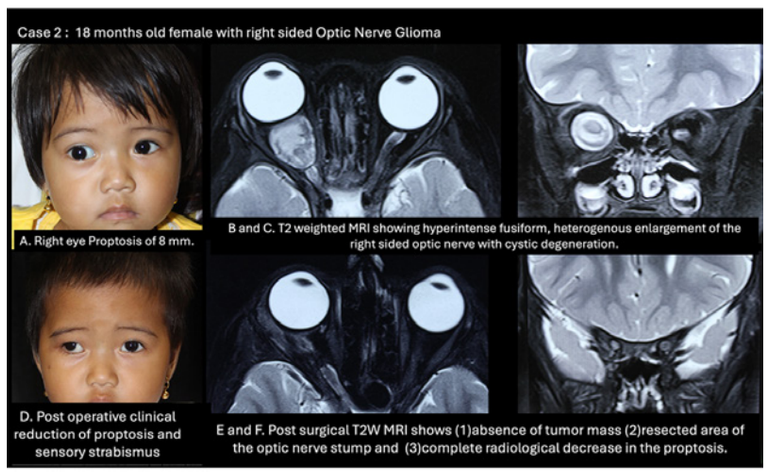

Figure 3

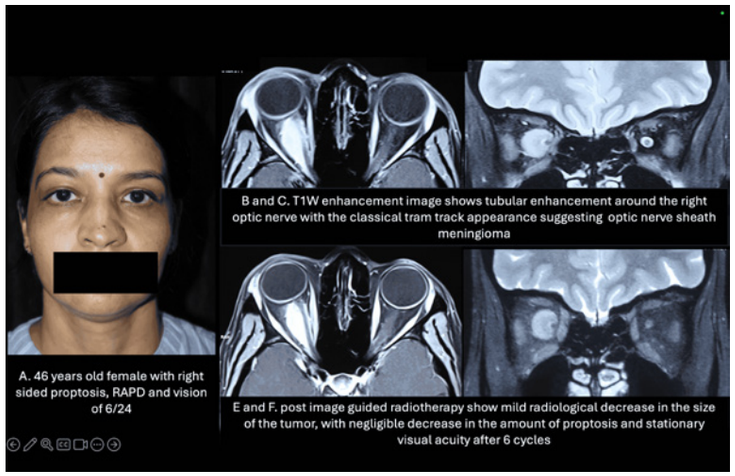

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Figure 4

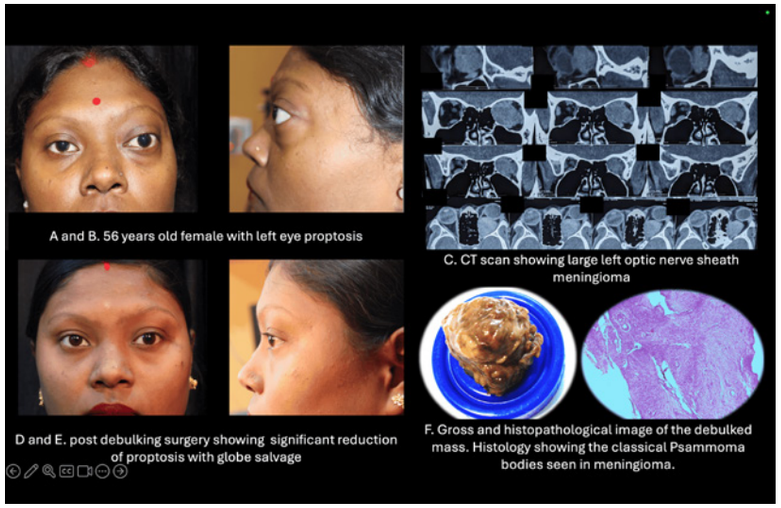

Table 1A – Treatment response in patients of Optic Nerve Glioma

Cases no.	Age (years)	Sex (M/F)	Laterality	Pre – treatment BCVA (Snellen's)	Pre-treatment proptosis (mm)	Treatment given (MT/CT/RT/Sx)	Post-treatment BCVA after 1 year (Snellen's)	Post treatment proptosis (mm)	Radiological reduction post treatment
1	4	F	Left	6/36	10	MT + Sx	6/36	0	Yes
2	1.5	F	Right	Follows light	8	MT + Sx	PL negative	0	Yes
3	2	M	Bilateral	BE follows light	Right: 6 Left: 2	MT	RE cannot follow light , LE follows light	Right: 6 Left: 2	No
4	4	F	Right	FCCF	6	MT + Sx	FCCF	0	Yes
5	5	F	Right	6/18	4	MT	6/18	0	Yes

Table 1B – Treatment response in patients of Optic Nerve Sheath Meningioma

Cases no.	Age (years)	Sex (M/F)	Laterality	Pre-treatment BCVA (Snellen's)	Pre-treatment proptosis (mm)	Treatment given (MT/CT/RT/Sx)	Post-treatment BCVA after 1 year (Snellen's)	Post treatment proptosis (mm)	Radiological reduction post treatment
1	56	F	Left	HMCF	10	RT + Sx	PL negative	0	Yes
2	46	F	Right	6/60	3	RT	6/60	2	Negligible
3	44	F	Right	6/60	4	RT	6/60	2	Yes
4	50	F	Left	FCCF	8	RT + Sx	HMCF	0	Yes
5	58	F	Right	FCCF	10	RT + Sx	PL negative	0	Yes
6	44	F	Left	FCCF	8	RT + Sx	Pl negative	0	Yes

M – Male; F – Female; BCVA – Best Corrected Visual Acuity; mm – millimetres; MT – Medical Therapy; CT – Chemotherapy; RT – Radiotherapy; Sx – Surgery; FCCF – Finger counting close to face; HMCF – Hand movement close to face; BE – both eyes; PL – Perception of light

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13 Demographic, Clinical, and Mechanistic Predictors of Orbital Fracture Type and Management among Adults

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Introduction: Orbital fractures, commonly resulting from facial trauma, can manifest in various patterns and warrant medical and/or surgical interventions. Published literature has characterized surgical management of fractures and their associated ophthalmic complications, but the ways in which demographic, clinical, and mechanistic variables predict both fracture type and therapeutic approaches are not elucidated.[1] The present study aimed to identify specific predictors of fracture characteristics and treatment in adult orbital trauma, with the goal of informing standardized, evidence-based protocols to optimize patient triage and care.

Methods: A retrospective cohort study was conducted at a tertiary care center using an electronic medical record search of billing codes to identify patients who presented with an orbital fracture from January 1, 2014, to September 30, 2024. Inclusion criteria consisted of radiographic evidence of orbital fracture and age 18 years or older at the time of presentation. Data collected included patient demographics, mechanism of injury, orbital fracture location, presence of additional facial fractures, presence of retrobulbar hemorrhage on radiography, ophthalmic findings at presentation, medical therapies administered, and surgical procedures undertaken. Orbital cellulitis incurred within 30 days of fracture presentation was recorded. Statistical analyses used Chi-square test and multivariable logistic regression to identify factors associated with fracture characteristics and treatment modalities. A p-value threshold of 0.05 indicated statistical significance.

Results: Of 1,776 adults (mean age 53 ± 23.0 years; 62.0% male) with orbital fractures confirmed on radiography, 1,140 (64.2%) had floor fractures, 355 (19.8%) medial wall, 96 (5.4%) lateral wall, and 185 (10.4%) combined floor/medial. Blunt trauma accounted for 88% of cases—with leading mechanisms consisting of object strike (28.9%), fall (26.4%), and assault (25.9%). Lateral wall fractures were associated with older age (p<0.002) and falls (p<0.001), and combined floor/medial wall fracture were significantly linked to assault and motor vehicle accidents (p<0.001). Ophthalmic findings demonstrated that orbital hemorrhage was most strongly associated with floor fractures (p=0.019), while decreased presenting visual acuity (p<0.001) and elevated intraocular pressure (p=0.008) were most likely with medial wall fractures. Hospital-based systemic antibiotics and corticosteroids were administered to 54 (3.0%) and 18 (1.0%) patients, respectively. At discharge, 269 (15.1%) received outpatient oral antibiotics and 146 (8.2%) received outpatient oral steroids. Treatment patterns were significantly predicted by fracture type. Floor fractures exhibited the highest rates of discharge antibiotics (68.0%, p<0.026)

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and steroids (64.9%, $p<0.005$), while combined floor/medial wall fractures were most likely to receive steroids (38.9%, $p<0.042$). Notably, comorbid sinusitis was not associated with antibiotic or steroid therapy. Surgical intervention was performed in 430 patients (24.2%), with combined floor/medial fractures being the most likely to undergo surgery (OR 1.74, $p=0.004$). Orbital infection following fracture was rare, occurring in only 4 patients (0.2%), with no significant differences based on fracture type ($p=0.591$), mechanism of injury ($p=0.775$), or surgical repair ($p=0.245$).

Conclusions: Demographic, clinical, and mechanistic variables are independently predictive of both orbital fracture pattern and management strategies in adult trauma patients. These findings underscore the necessity for injury-specific evaluation and management to optimize clinical care and patient outcomes in orbital trauma.

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14 Effect of Teprotumumab, Orbital Decompression, and Conventional Topical Therapy on Dry Eye Symptoms in Thyroid Eye Disease

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Introduction: Approximately 65-85% of thyroid eye disease (TED) patients experience ocular discomfort due to dry eye symptoms.[1–3] Teprotumumab and surgical decompression have both been associated with improvements in clinical outcomes such as proptosis and clinical activity score, which may alleviate TED-related dry eye symptoms. However, the direct effect of these treatments on dry eye symptoms has not been well investigated. In this study, we evaluated changes in dry eye symptoms among TED patients treated with teprotumumab, surgical decompression, or conventional topical therapy.

Methods: In this cross-sectional cohort study, patients with TED were categorized into three groups according to primary intervention: teprotumumab, orbital decompression, and conventional topical therapy. Baseline dry eye symptoms were assessed using the Ocular Surface Disease Index (OSDI) prior to treatment initiation. Follow-up OSDI scores were collected either after completion of teprotumumab, ≥ 3 months following surgical decompression, or at a routine follow-up visit for the topical therapy group. The primary outcome evaluated was change in OSDI score between baseline and follow-up for each group, where positive change indicated symptom improvement. Additional data collected included time between baseline and follow-up OSDI administration, prior dry eye treatment, prior TED treatment, age, sex, duration of TED, and presence of lagophthalmos, punctate epithelial erosions or superior limbic keratoconjunctivitis at baseline. Patients presenting with only mild dry eye symptoms at baseline (OSDI ≤ 22) were excluded. Statistical analysis included multivariate linear regression, post-hoc pairwise comparison with Bonferroni correction, analysis of variance, and Chi-squared tests. All analyses were performed using R (version 4.4.0).

Results: Sixty-two patients were included (21 treated with teprotumumab, 18 with orbital decompression surgery, and 23 controls, Table 1). Mean ± SD improvement in OSDI scores for the teprotumumab, decompression, and control groups were 18.6 ± 21.5, 23.3 ± 16.9, and 6.5 ± 14.0, respectively. After adjusting for covariates age, sex, time between OSDI surveys, prior dry eye treatment and prior TED treatment, duration of TED, and baseline ocular surface findings, both teprotumumab and decompression demonstrated significantly greater improvement in OSDI scores compared to treatment with conventional topical therapy alone (adjusted mean difference 20.6 points, $p = 0.004$ and adjusted mean difference 20.3 points, $p = 0.012$, respectively). Post-hoc comparisons revealed no difference in OSDI improvement between the teprotumumab and decompression groups (p=1.00).

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Conclusions: Both teprotumumab and surgical decompression were individually associated with significantly greater improvements in dry eye symptoms in TED patients compared to conventional topical therapy alone. No difference in dry eye symptom improvement was observed between teprotumumab and decompression treatments.

Table 1. Baseline patient characteristics.

Characteristic	Control	Teprotumumab	Decompression	p-value[2]
N	23	21	18	
Age (years)	50.4 ± 14.0	58.1 ± 13.5	42.9 ± 11.9	0.003
Female sex	23 (100%)	14 (67%)	18 (100%)	<0.01
Duration of TED (months)	17 ± 22	13.0 ±15.6	42.6 ± 71.3	0.07
Time between OSDI surveys (months)	3.4 ± 2.5	8.8 ± 6.5	10.5 ± 6.5	<0.01
Dry eye treatment				0.330
None	10 (43%)	5 (24%)	3 (17%)	
Drops only	10 (43%)	15 (71%)	13 (72%)	
Plugs only	1 (4%)	0 (0%)	1 (6%)	
Combination	2 (9%)	1 (5%)	1 (6%)	
Prior TED treatment				0.582
None	13 (57%)	9 (43%)	6 (33%)	
Medical therapy only[1]	10 (43%)	11 (52%)	9 (50%)	
EBRT only	0 (0%)	1 (5%)	0 (0%)	
Decompression	0 (0%)	0 (0%)	1 (6%)	
Combination	0 (0%)	0 (0%)	2 (11%)	

[1]Selenium, steroids, and/or rituximab.
[2]ANOVA or Chi-squared.
Data are presented as mean ± SD or n (%).

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15 Improvement of Diplopia in Steroid Pulse-Resistant Thyroid Eye Disease Using Sheath-Guided Deep Orbital Triamcinolone Injection (SG-DOTI): A Case Report

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Introduction: Thyroid eye disease (TED) often develops during the active stages of life. When inflammation of the extraocular muscles leads to diplopia, it can severely impact daily activities.[1,2] We report a case of steroid pulse-resistant TED-associated diplopia that showed improvement following treatment with sheath-guided deep orbital triamcinolone injection (SG-DOTI).[3]

Methods: A 40-year-old woman with a history of Graves' disease developed TED. She visited our hospital for the first time one year after disease onset. Diplopia was observed across the entire range on binocular single vision field testing. Orbital MRI showed enlargement and inflammation of the extraocular muscles. She underwent steroid pulse therapy with methylprednisolone (500 mg intravenously, once a week). Each course consisted of four infusions (4 weeks), and treatment continuation was determined after each course based on subjective symptoms, MRI findings, binocular single vision fields, Hess chart results, and assessment of side effects. Relapse occurred approximately three months after cessation of weekly steroid pulses. Over a 16-month period, the patient underwent seven courses of steroid pulse therapy (total methylprednisolone dose: 14 g). Despite these treatments, diplopia in the primary and downward gaze persisted, severely affecting her daily life. Therefore, we performed a new method of SG-DOTI on the right eye, which showed more severe ocular motility restriction. The SG-DOTI procedure involves puncturing the orbital septum using a 24-gauge needle with outer sheath, followed by the insertion of a 27-gauge, 40-mm cannula needle through the sheath targeting deep portion of inflamed extraocular muscles and inject TA. In this case, the deep half of inferior rectus muscle, which was considered the primary cause of diplopia and showed marked inflammation on MRI, was targeted by puncturing two sites at the medial and lateral sides of inferior rectus muscle through lower eyelid, with a total 40 mg of TA injected at medial and lateral site to sandwich the inferior rectus muscle.

Results: Two SG-DOTI procedures were performed at one-month intervals, resulting in a marked improvement in diplopia. The percentage of Hess area ratio (HAR%) improved from 47.1% before the first injection to 75.4% after one month, and to 89.3% after three months (Figure1-3).[4] MRI also showed resolution of inflammation in the orbit, including the right inferior rectus muscle, and suppression of disease activity was maintained (Figure 4). Orbital fat decompression surgery was subsequently performed five months after the SG-DOTI procedures.

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Conclusions: SG-OTI may be a useful treatment option for diplopia associated with steroid pulse-resistant TED, as demonstrated in this case.

Figure 1

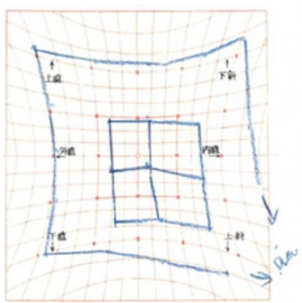


Figure 2

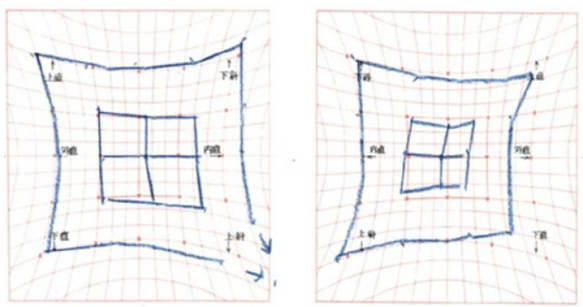


Figure 3

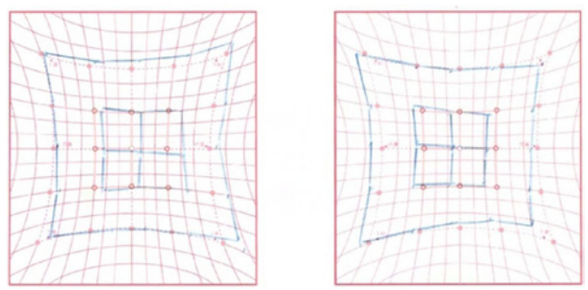
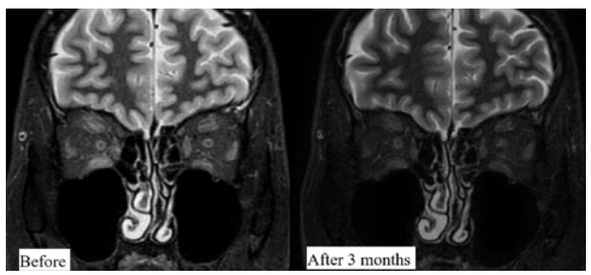


Figure 4



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16 Is a Postoperative Eye Patch Necessary for Orbital Surgery? A Study of Ocular Compression Eye Patches Using Orbital Fat Decompression

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Introduction: Compression eye patches are commonly used after orbital surgery to prevent retrobulbar hemorrhage and swelling. However, few previous studies have evaluated their necessity. In this report, we evaluate the efficacy of eye patches for orbital surgery with simultaneous bilateral orbital fat decompression surgery.

Methods: This was a prospective study of patients who underwent bilateral orbital fat decompression at the Oculofacial Clinic Tokyo between June 2024 and February 2025. A total of 98 patients (22 male, 76 female) with a mean age of 40.10 ± 17.31 years who underwent orbital fat decompression for ocular proptosis were observed. Of these, 88 had thyroid eye disease and 10 had congenital proptosis. None of the patients had a history of bleeding disorders or antithrombotic medications. Patients underwent surgery under general anesthesia as day surgeries using a transconjunctival approach without sutures. They received bilateral surgery on the same day. Follow-up was at six months. In this study, a compression eye patch was applied for 2 hours immediately after surgery to the left eye only, but not to the right eye. The patient rested in the recovery room for 2 hours postoperatively and was instructed to rest and ice both eyes at home until the next day. Outcomes were assessed the following day using a standardized scoring chart evaluating bruising color, area, swelling, and complications in each eye.

Results: The amount of orbital fat resection was 3.20±1.13 cc in the right eye and 3.47±1.13 cc in the left eye, with no significant difference (p=0.14). When scoring the color of the internal hemorrhage on the day after surgery, hemorrhage color ≥ Grade 2 occurred in 72 (right eyes) and 71 (left eyes); ecchymosis area ≥ Grade 2 in 47 (right eyes) and 49 (left eyes); swelling ≥ Grade 2 in 23 (both eyes). No significant differences were found between eyes (p=0.90–0.99). No major complications, including retrobulbar hematoma or vision loss, occurred.

Conclusions: There were no differences between the two eyes in any of the evaluation criteria. This result suggests that compression eye patches may be unnecessary in orbital surgery.

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Figure 1

Score	0	1	2	3
Color	No change	Yellow	purple	Red or black
Area	No change	Only lower eyelid	Beyond the orbital margin or subconjunctival hemorrhage	Extend to the upper eyelid
Eyelid Swelling	No tension	mild tension (MRD-2 change is 1-2mm compared to pre-operation)	moderate tension (MRD-2 change is ≧3mm compared to pre-operation)	severe tension (MRD-2 change is ≧3mm compared to pre-operation and it is difficult to open eyelid)

Figure 2

Complication Outcomes	Right Eye (n)	Left Eye (n)	P Value
Color (Score)			
0	0	0	
1	26	28	
2	69	67	
3	3	4	0.90
Range (Score)			
0	0	0	
1	51	49	
2	41	42	
3	6	7	0.93
Tension of Eyelid (Score)			
0	27	29	
1	48	46	
2	14	14	
3	9	9	0.99

Figure 3

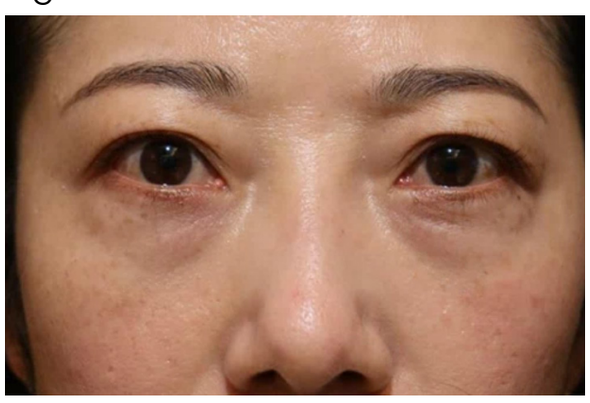


Figure 4

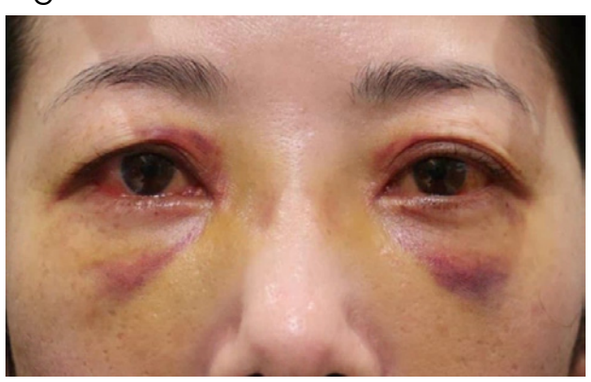
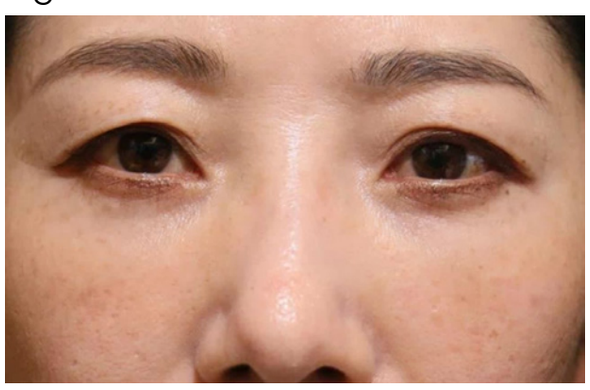


Figure 5



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17 Ophthalmic Manifestations of Orbital Fibrous Dysplasia

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Introduction: Fibrous dysplasia (FD) is a rare, benign developmental bone disorder caused by post-zygotic activating mutations in the *GNAS* gene, often affecting the craniofacial region[1]. The ophthalmic manifestations of FD span from facial asymmetry to devastating optic neuropathy[2-3]. However, due to its rarity and varying clinical presentations, robust study of the ophthalmic manifestations of FD has been limited. The purpose of this study is to describe the ophthalmic manifestations of orbital FD seen in a tertiary referral center.

Methods: This multi-center retrospective cohort study included all patients with imaging and/or pathologic diagnosis of fibrous dysplasia involving the orbit from January 1, 1988 to December 31, 2024. The medical record of each patient was reviewed for clinical characteristics, patterns of orbital bony involvement, and ophthalmic exam findings. Patients with other bony malformations and those evaluated by electronic consultation only were excluded.

Results: Over the 37-year study period, 867 unique patients were identified with FD, 414 of whom had craniofacial involvement. Orbital involvement occurred in 141 patients, 19 of whom had FD in the context of McCune-Albright syndrome. Mean age at diagnosis was 29 years (range 4 months – 74 years), and 55% were female. The most common presenting symptoms were facial asymmetry and headaches. One hundred-four patients with orbital involvement had at least one documented eye exam, and over half (58.6%) of the exams had at least one abnormality attributed to FD. Mean presenting visual acuity in was 20/25 in the affected eye(s) (range 20/15 – no light perception), and 6 patients were 20/200 or worse. Orbital bones most often affected were the sphenoid (47.5%), frontal (42.6%), and ethmoid (29.8%) bones. The most common ophthalmic findings included globe dystopia (22.1%), eyelid asymmetry (13.5%), strabismus (13.5%), optic neuropathy (13.5%), exposure keratopathy (7.0%), and amblyopia (7.0%). Compressive optic neuropathy was only seen in patients with sphenoid (12/14) or ethmoid (2/14) involvement, and those with McCune-Albright syndrome or polyostotic FD were not at increased risk of compressive optic neuropathy ($p>0.05$). Nearly half (46.8%) of patients underwent at least one surgery related to FD for an average of 1.9 surgeries per patient.

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Conclusions: This is the largest reported cohort of patients with orbital fibrous dysplasia, which found that orbital bones are involved in one-third of patients with craniofacial disease, most commonly in the sphenoid and frontal bones. More than half of patients had at least one abnormality attributable to FD on eye exam, though presentations varied widely from cosmetic concerns to vision loss. Fortunately, the risk for significant vision loss was lower in this cohort than prior case series[2-3]. Ophthalmologists play a key role in the multidisciplinary evaluation and management of patients with orbital FD.

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18 Periorbital Distances are High Quality and Generalizable Features for Disease Classification

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Introduction: Effective disease classification using deep learning (DL) is limited by poor model generalization to new datasets, especially for oculofacial and craniofacial syndromes which can present with overlapping clinical features. To address this limitation and facilitate broad clinical deployment, we evaluated periorbital anatomical distances as robust and generalizable features for automated classification of oculofacial and craniofacial diseases.

Methods: A deep convolutional neural network segmentation model was trained on healthy eyes to extract 48 periorbital distances from clinical images (n=2742) spanning 13 distinct oculofacial and craniofacial classes (e.g., Crouzon, Apert, Pfeiffer, Goldenhar syndromes, thyroid eye disease (TED), ptosis, and healthy controls) (Table 1)[1]. The deep convolutional neural network model was trained exclusively on healthy eyes, ensuring no disease-specific information was present during distance extraction, thereby improving generalizability. Extracted distances were then used to train two classification models (XGBoost and LASSO) (Figure 1). Performance was evaluated using accuracy, recall, precision (PPV), F1 score, and area under the receiver operating characteristic curve (AUROC) on a held-out in-distribution (ID) test set and an external out-of-distribution (OOD) dataset (n=88) which was sourced separately (Table 2). Classification performance using periorbital distances was benchmarked against a traditional convolutional neural network (ResNet-18 CNN) trained directly on images (Figure 1).

Results: On the ID test dataset, periorbital distances achieved superior accuracy (XGBoost: 76.8%; LASSO: 66.4%) and AUROC (XGBoost: 0.976; LASSO: 0.958) compared to CNN (accuracy: 73.0%; AUROC: 0.957). Performance gains were even more pronounced on the OOD dataset, where periorbital-distance-based models significantly outperformed the CNN. Specifically, the CNN achieved only 13.6% accuracy, whereas XGBoost achieved 63.2% accuracy (4.6-fold improvement) and LASSO achieved 67.8% accuracy (5-fold improvement) (Table 3). Feature importance analyses highlighted margin-to-reflex distance and canthal tilt among the key measurements driving classification accuracy.

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Conclusions: Periorbital distances extracted via deep learning segmentation models are highly robust and generalizable features for classifying oculofacial and craniofacial disorders. These features demonstrate substantial improvements in accuracy and model robustness to dataset shifts, outperforming traditional CNN models, particularly in out-of-distribution contexts[2]. Clinically, this approach has significant potential for developing accessible screening tools suitable for deployment in regions with limited specialist access, both domestically and internationally. Future work will explore real-time clinical implementation, incorporation of multimodal data (e.g., demographics, clinical history), and refinement of disease-specific anatomical signatures.

Figure 1

Disease	CAP	Craniosynostosis	Facial Asymmetry	Fibrous Dysplasia	Goldenhar	Healthy Adult
Count:	129	379	144	26	317	826
Source:	UIC-CFC	UIC-CFC	UIC-CFC	UIC-CFC	UIC-CFC	CFD

Disease	Healthy Ped.	Misc. Syndrome	Nager Syndrome	Parry Romberg	Ptosis	Ted	Treacher Collins
Count:	389	111	35	46	80	198	62
Source:	UIC-CFC	UIC-CFC	UIC-CFC	UIC-CFC	UIC-OPH	UIC-OPH	UIC-CFC

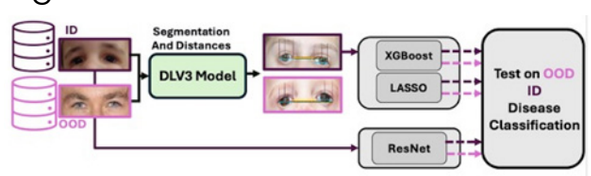
Figure 2

	CAP	Goldenhar	Healthy Adult	Ptosis	TED	TC
Images	18	6	20	13	20	11
Source	WEB	WEB	WEB	WEB	WEB	WEB

Figure 3

Dataset	Classification	Accuracy	Recall	PPV	F1 Score	AUROC
ID	XGB	**0.768**	**0.750**	**0.773**	**0.761**	**0.976 [.969-.981]**
	LASSO	0.664	0.627	0.668	0.647	0.958 [.949-.964]
	CNN	0.730	0.669	0.751	0.708	0.957 [.947-.967]
OOD	XGB	0.632	0.577	**0.870**	**0.694**	0.911 [.864-.954]
	LASSO	**0.678**	**0.638**	0.713	0.673	**0.928 [.888-.959]**
	CNN	0.136	0.105	0.355	0.162	0.585 [.524-.639]

Figure 4



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19 Quantifying the Performance and Financial Impact of Oculofacial Injuries in Major League Baseball

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Introduction: In the United States, baseball is responsible for nearly 15% of sports-related ocular injuries[1,2]. Oculofacial injuries in Major League Baseball (MLB) can be severe and significantly alter a player's career[3,4].

Prior studies have evaluated the consequences of oculofacial injuries in professional basketball; however, the impact of these injuries on performance and financial outcomes in MLB has not been quantified[5,6]. This study aimed to measure the competitive value lost and financial burden resulting from oculofacial injuries in MLB.

Methods: We conducted a retrospective cohort review of publicly verified oculofacial injuries sustained by MLB players between 2019 and 2024. Injuries were included if they involved the globe, periorbital region, or other facial structures, caused missed games, and had associated data on player Wins Above Replacement (WAR), salary, and days missed. The primary outcome measures were competitive value lost, defined as the reduction in player contribution to team success, and inactive salary expense, defined as the financial resources paid to players during injury. Competitive value lost was calculated by prorating each player's seasonal WAR over a 187-day season and multiplying by the number of days missed. Inactive salary expense was determined by prorating the player's annual salary over the season and applying it to the period of injury. Injuries were categorized by mechanism of injury and anatomical site. Descriptive statistics were calculated, and comparisons of competitive value lost across anatomical sites, mechanisms of injury, seasons, and positions were performed using Kruskal-Wallis tests.

Results: Sixty-six injuries met the inclusion criteria, affecting players from 25 of 30 MLB teams. The total competitive value lost over the study period was 2.18 WAR, which falls above the league median and approximates forfeiting a full season of performance from a starter (Figure 1) (7,8). The average competitive value lost per season was 0.363 WAR (SD ± 0.370), and the average competitive value lost per injury was 0.033 WAR (SD ± 0.103) (Figure 2). Of the injuries analyzed, 10 (15.2%) directly involved the globe, 16 (24.2%) involved the periorbital region, and 28 (42.4%) involved other facial structures (Figure 3). Bat-related trauma and direct ball impacts each accounted for 16 injuries (24.2%), followed by player collisions (18.2%), other or uncategorized mechanisms (18.2%), chronic or non-traumatic

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etiologies (12.1%), and fielding injuries (3.0%) (Figure 4). No statistically significant differences in competitive value lost were observed across anatomical sites (p = 0.095), mechanisms of injury (p = 0.08), season (p = 0.116), or position (p = 0.13). Inactive salary expense totaled $11.7 million, approximately $2.0 million (SD ± $377,000) per season. Financial and performance losses were observed across all subgroups and remained consistently distributed over multiple positions and teams.

Conclusions: Oculofacial injuries in MLB result in meaningful, consistent reductions in competitive output, underscoring the sport-wide performance and financial burden of facial trauma. These findings parallel those reported in the NBA and reinforce the importance of targeted prevention strategies.

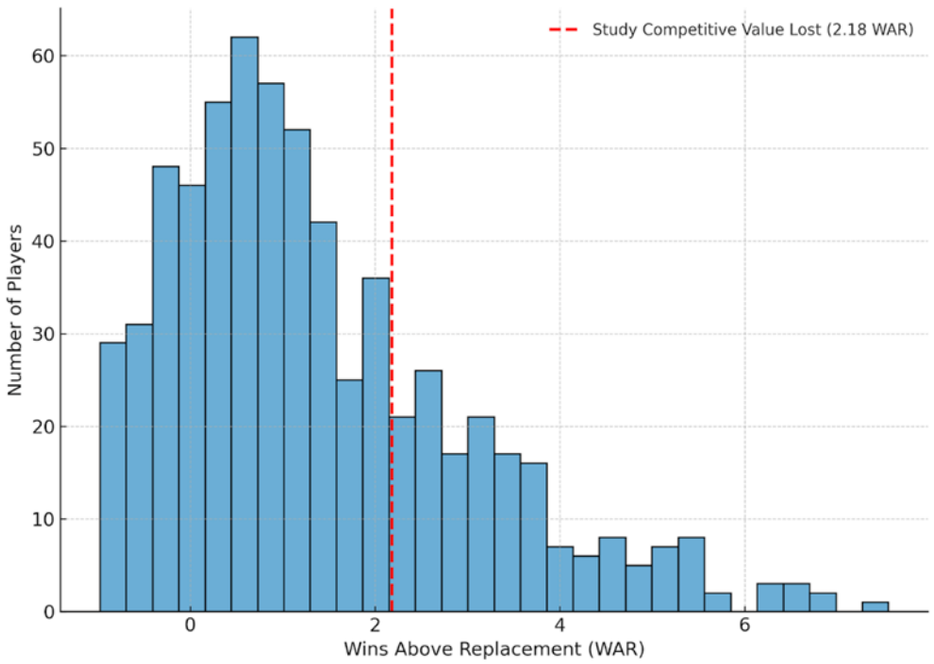

Figure 1: Distribution of MLB players Wins Above Replacement (WAR) values, modeled after publicly available data from FanGraphs. The dashed red line indicates the cumulative competitive value lost in this study (2.18 WAR), which lies above the 75th percentile of MLB players.

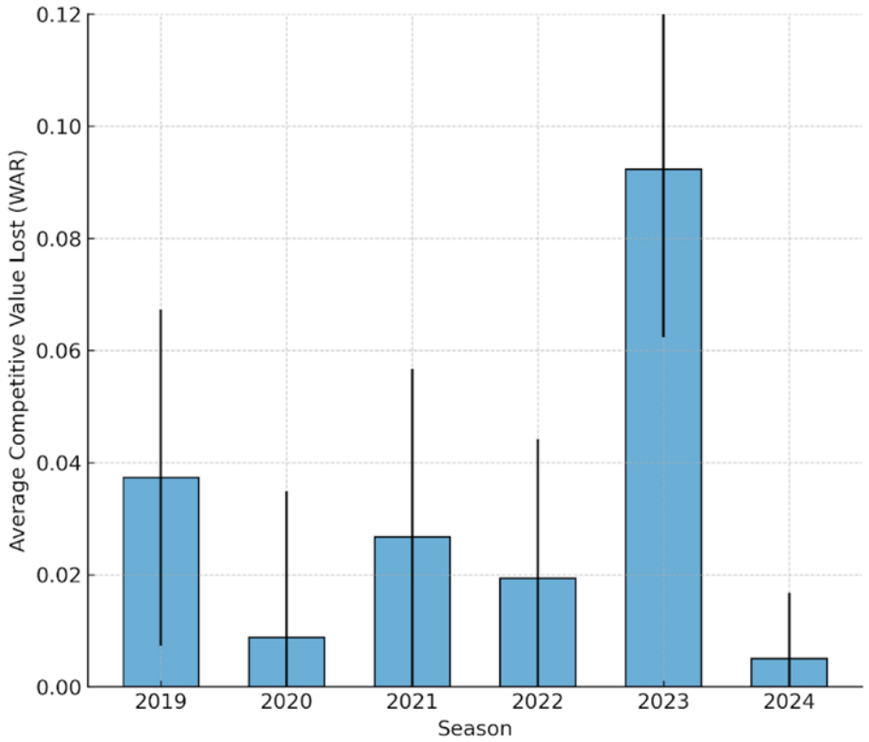

Figure 2: Average competitive value lost per injury per season due to oculofacial injuries among MLB players (2019-2024).

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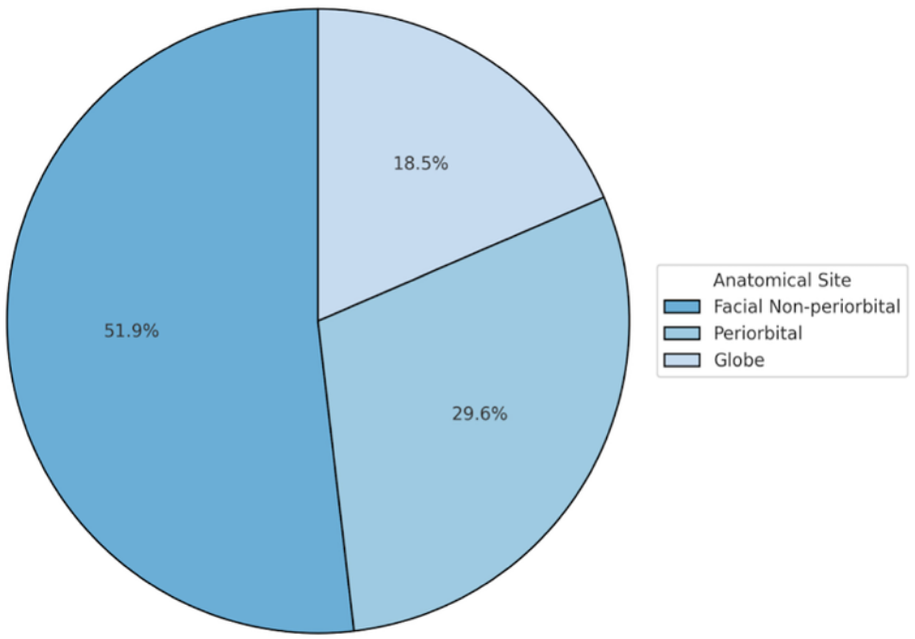

Figure 3: Distributions of anatomic sites involved in oculofacial injuries among MLB players (2019-2024)

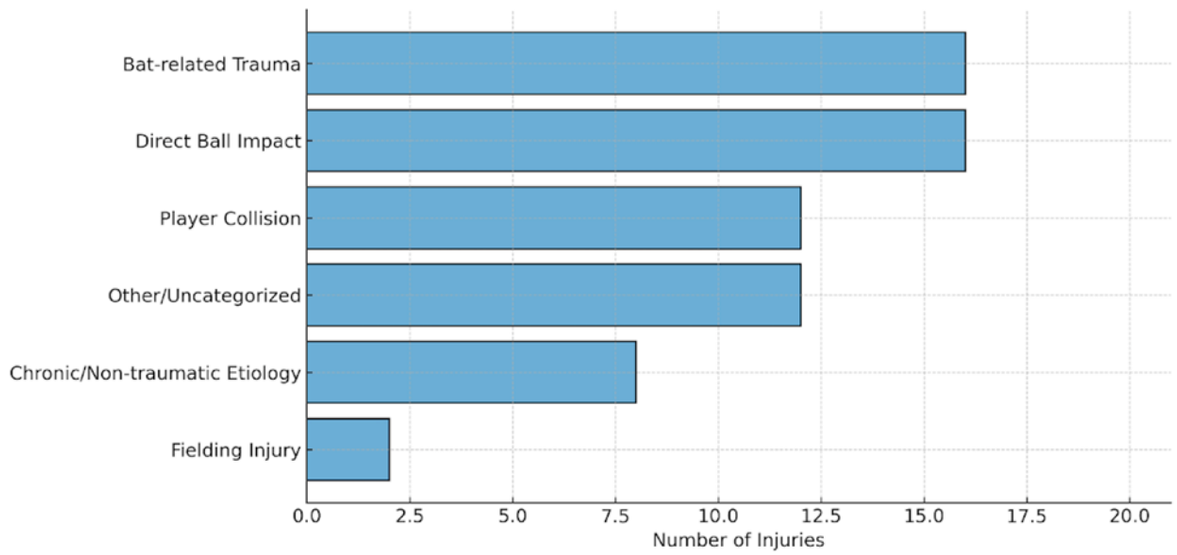

Figure 4: Distribution of mechanisms of injury among MLB players sustaining oculofacial injuries (2019-2024)

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20 Response to Teprotumumab in Thyroid Eye Disease Patients of Long Duration and High Disease Activity

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Introduction: Thyroid eye disease (TED) is an autoimmune condition with variable clinical manifestations. Although TED is traditionally characterized by an active inflammatory phase that transitions into a stable chronic phase, some patients deviate from this trajectory, experiencing persistent or progressive symptoms that pose a significant clinical challenge to treat. Teprotumumab, a monoclonal antibody targeting the insulin-like growth factor 1 receptor, has shown efficacy in initial trials for acute, active TED. Subsequent studies expanded its proven benefits to broader patient populations, including those with chronic, low-activity TED,[1] extended disease duration,[2] or cases recalcitrant to other treatment modalities.[3] This study aims to evaluate the efficacy of teprotumumab in TED patients with prolonged disease duration and high clinical activity.

Methods: This is a retrospective study of all TED patients who underwent eight infusions of teprotumumab treatment and had a consistently documented clinical activity score (CAS) ≥ 4 for at least 2 years prior to teprotumumab initiation at a single institution. Primary outcome measures included pre-treatment proptosis response (measured by Hertel exophthalmometry), CAS response, and diplopia response (≥1 point improvement in Gorman diplopia score) compared to post-treatment measurements at the immediate follow-up visit using Mann-Whitney U testing. Results were considered significant if $p<0.05$.

Results: Of 198 patients who initiated teprotumumab treatment from April 1, 2020 to March 31, 2024, 8 patients met inclusion criteria with TED duration greater than 2 years and CAS ≥ 4. Demographic data are shown in table 1; most patients were older (age 63.9), female (87.5%), white (87.5%), and former smokers (50%). The median TED duration measured from first clinic visit to the clinic visit closest to initiation of teprotumumab was 42.3 months, and the average follow up interval post-treatment was 4.9 months. Over 16 eyes from the 8 patients, the median pre-treatment Hertel measurement was 24.25 (IQR 4.88) compared to a post-treatment measurement of 21 (IQR 4.63) ($p<0.001$), resulting in a mean proptosis reduction percentage of 13.6%. The median pre-treatment CAS was 5 (IQR 1) compared to a post-treatment CAS of 1 (IQR 2.25) ($p<0.001$). The median pre-treatment diplopia score was 1.5 (IQR 1.25) compared to a post-treatment score of 0.5 (IQR 1.0) ($p=0.04$). Over an average of 32.7 months of follow-up, one of the eight patients underwent retreatment with teprotumumab.

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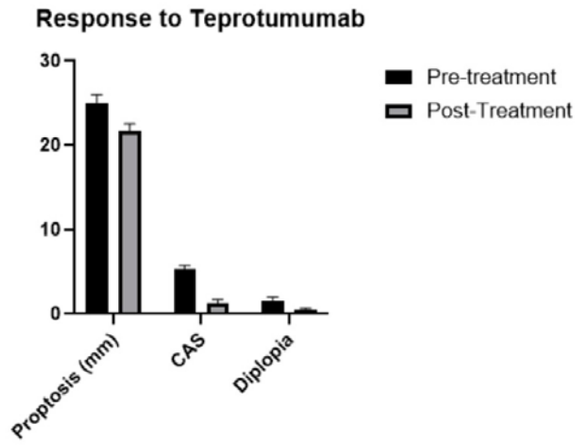
Conclusions: This retrospective study suggests teprotumumab can be an effective treatment for patients with thyroid eye disease who have prolonged disease duration and high clinical activity. Significant improvements were observed in proptosis, clinical activity score, and diplopia following teprotumumab treatment. Further studies with larger sample sizes are warranted to confirm these results and explore long-term outcomes in this patient population, including disease recurrence and need for retreatment.

Figure 1

Age, mean (sd)	63.9 (9.5)
Sex, Female, n (%)	7, (87.5%)
Smoking Status (%)	
Never	4 (50%)
Former	4 (50%)
Active	0
Ethnicity (%)	
White	7 (87.5%)
Asian	1 (12.5%)
Hispanic	0
Black	0
Other	0

Figure 2



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21 Revisiting the 50% Rule: A Multicenter Study Using Segmentation and Quantitative Analysis of Orbital Floor Fractures to Predict Enophthalmos

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Introduction: While numerous studies have examined the development of enophthalmos following orbital fractures, predicting this late complication remains challenging. Established in 1983, the 50% rule suggests that orbital floor fractures involving more than half of the floor on radiographic imaging should be considered for surgical repair[1]. Since this description, publications have focused on measuring the fracture defect itself, rather than its relationship to the entire orbital floor. However, despite their widespread use, these measurements are prone to inter-rater variability[2]. Orbital volume measurements have been shown to outperform fracture area but are time-consuming and require specialized software[3]. We aim to present a precise and accessible method for measuring the orbital floor using an open-source application.

Methods: A retrospective review was conducted across three tertiary care centers between 2016 and 2024. Patients with unrepaired, unilateral, isolated orbital floor fractures were included. Enophthalmos was evaluated by the ophthalmology department at a minimum of 4 weeks following the initial injury. The CT scans were analyzed by measuring the greatest width and length of the fractures. The product of these measurements was calculated to determine the fracture area (FA). The residual, intact portions of the affected floor and contralateral intact floors were segmented (Figure 1) to create 3D reconstructions using the application ITK-SNAP[4] (Figure 2). Quantitative analysis of the segmentations provided volumetric measurements of the floors. The orbital floor ratio (OFR) was calculated as: (1 - [residual floor/contralateral floor]). Statistical analysis was performed using logistic regression and receiver operating characteristic (ROC) curve analysis.

Results: A total of 33 patients met inclusion criteria, of which 10 patients developed late enophthalmos. There were no statistically significant differences in age, sex, follow-up duration, CT slice number, or slice thickness between patients with and without enophthalmos. The average segmentation time was 7 minutes, with a range of 3 to 15 minutes. FA values greater than 2 cm^2, 3.12

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cm², and an OFR > 50% were not significantly associated with enophthalmos (p = 0.21, p = 0.49, p = 0.14). However, an OFR threshold > 39% was significantly associated with enophthalmos (p = 0.039, AUC = 0.68), with a sensitivity of 80% and specificity of 65% for predicting enophthalmos.

Conclusions: The orbital floor ratio is a novel and reproducible CT-based metric that shows potential as a predictor of enophthalmos, surpassing the widely-used 2 cm² fracture area threshold[5] and the 3.12 cm² threshold identified in a recent pooled regression analysis[6]. Involvement of more than 50% of the orbital floor has been a commonly used threshold since its introduction[7], but it has not been critically re-evaluated since its original publication. To our knowledge, this is the first study to precisely segment and quantitatively assess the fractured orbital floor as a relative ratio, rather than using the defect's absolute size as a surgical threshold. Further studies are needed to validate this novel approach.

Figure 1

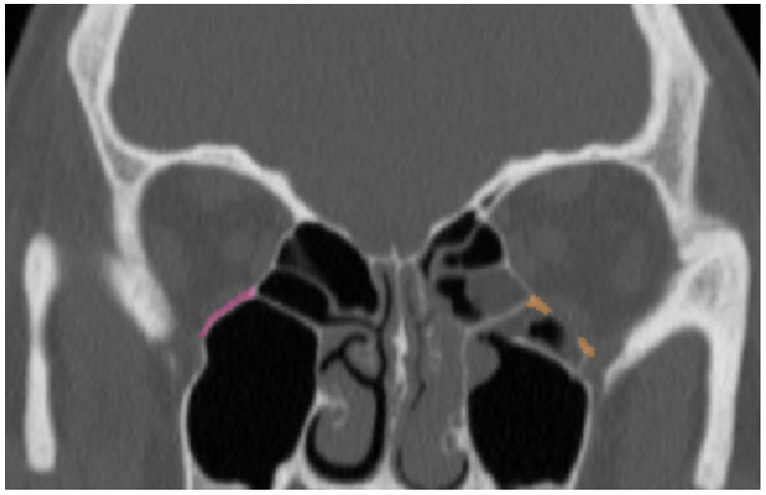
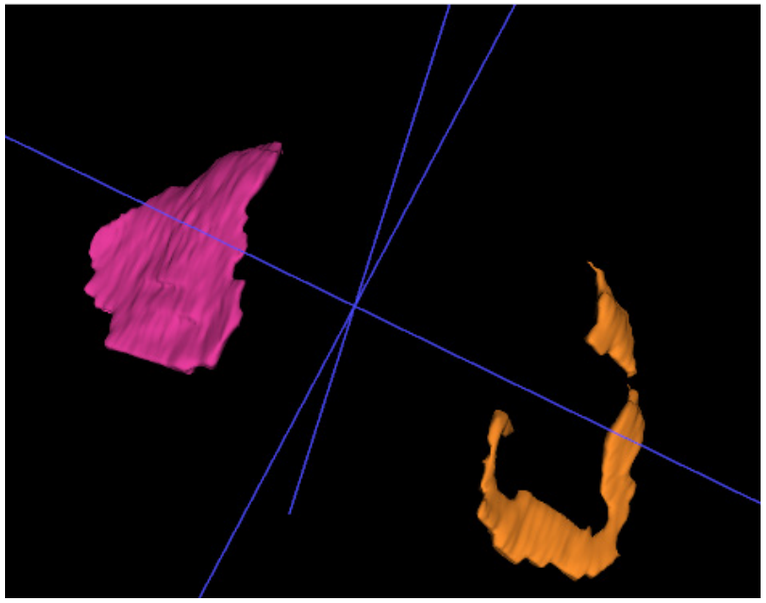


Figure 2



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22 Social Determinants of Health Associated with Orbital Trauma in the United States using the NIH All of Us Research Program

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Introduction: Orbital fractures are among the most common injuries seen following facial trauma with a significantly increased incidence observed in recent population studies.[1] The trauma may pose detrimental biopsychosocial effects at the individual, community, and societal levels. Prior literature on risk factors for orbital trauma were primarily conducted at single institutions, with limited data access largely from several decades ago.[1–4] The relationship between social determinants of health (SDOH) and orbital trauma has yet to be investigated at the national level.

The *All of Us* Research Program is a National Institutes of Health (NIH) diverse database seeking to incorporate those historically underrepresented in biomedical research, and has been leveraged to investigate sociodemographic factors in a variety of ocular conditions.[5–10] Here, the authors investigate the SDOH associated with orbital trauma at a national scale to highlight potential health disparities to inform future initiatives aimed at providing more equitable care to oculofacial plastic surgery patients.

Methods: A retrospective cohort study was performed analyzing electronic health records and survey data from the *All of Us* Research Program. Orbital trauma cases were defined by adult participants with qualifying conditions of orbital fractures or facial fractures according to Systematized Nomenclature of Medicine (SNOMED) codes (Supplemental Table 1). A randomized 1:4 case/control ratio was implemented to generate a control sample. Univariate (T test and $\chi 2$) and multivariable logistic regression were utilized in R within the *All of Us* Researcher Workbench to analyze associations between SDOH factors (demographics, lifestyle, socioeconomic, overall health) and orbital trauma.

Results: A total of 5,796 adults diagnosed with orbital or facial fractures and 23,184 control participants were identified. Table 1 showcases demographic factors significantly associated with orbital trauma, including male gender (odds ratio OR 2.09 [1.99-2.21], $P<0.001$), American Indian race (OR 3.08 [2.68-3.53], $P < 0.001$), and Black race (OR 1.53 [1.44-1.64], $P<0.001$). Table 2 demonstrates lifestyle factors strongly correlated to orbital trauma, including alcohol (≥10 drinks daily, OR 4.59 [3.76-5.6], $P<0.001$), cigarette smoking (OR 2.18 [2.05-2.31], $P<0.001$), and various recreational drugs most notably street opioids (OR 3.53 [3.09-4.02], $P<0.001$). Table 3 highlights

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socioeconomic factors related to orbital trauma, including education level (9th–11th, OR 1.38 [1.22-1.55], *P*<0.001), unhoused status (OR 4.23 [3.31-5.36], *P*<0.001), and poverty (<$10k, OR 3.02 [2.68-3.41], *P*<0.001). Table 4 illustrates overall health factors linked to orbital trauma, including Medicaid insurance (OR 2.41 [1.85-3.16], *P*<0.001), poor mental health (OR 1.82 [1.47-2.25], *P*<0.001), poor quality of life (OR 2.31 [1.83-2.93, *P*<0.001), and difficulty with health literacy (OR 2.72 [2.16-3.47], *P*<0.001).

Conclusions: The present study of a diverse nationwide cohort provides evidence that major SDOH disparities exist in orbital trauma. The strongest predictors of sustaining orbital trauma were alcohol use disorder and unhoused status. Other underserved groups at high risk were American Indians and Black race, opioid use disorder, and poverty. These findings highlight the need for further efforts to reduce health inequities in those experiencing orbital trauma and offer guidance to inform resource allocation amongst the groups of highest risk.

Table 1. Demographics Significantly Associated with Orbital Trauma

	Orbital Fracture Cases (N=5,796)	Controls (N=23,184)	Univariate *P* Value	Odds Ratio (95% CI)	Multivariate *P* Value
Age (yrs)	58.5 ± 16.54	55.3 ± 17.03	< 0.001	1.01 (1.01-1.01)	< 0.001
Gender					
Male	3117 (54.5%)	8398 (36.5%)		2.09 (1.99-2.21)	< 0.001
Female	2555 (44.7%)	14308 (62.1%)	< 0.001	Reference	
Other[a]	50 (0.9%)	331 (1.4%)			
Race					
White	2928 (58.6%)	12801 (65.4%)		Reference	
Black	1267 (25.4%)	3574 (18.2%)		1.53 (1.44-1.64)	< 0.001
Asian	62 (1.2%)	784 (4.0%)	< 0.001	0.33 (0.26-0.43)	< 0.001
American Indian/Alaska Native	203 (4.1%)	256 (1.3%)		3.08 (2.68-3.53)	< 0.001
Middle Eastern/North African	22 (0.4%)	120 (0.6%)		0.74 (0.47-1.09)	0.153
Other[b]	515 (10.3%)	2049 (10.5%)			
Ethnicity					
Hispanic or Latino	851 (15.3%)	4128 (18.3%)	< 0.001	0.8 (0.74-0.86)	< 0.001
Not Hispanic or Latino	4724 (84.7%)	18465 (81.7%)		Reference	

Data are presented as mean ± standard deviation or number (%)
T test was performed for comparison of continuous variables. Chi-Square test was performed for comparison of categorical variables
Multivariable logistic regression was then performed
[a]*Non Binary, Transgender, or Prefer Not to Answer*
[b]*Hawaiian/Pacific Islander, Multiple, None of these, or Prefer Not to Answer*

Table 2. Lifestyle Factors Significantly Associated with Orbital Trauma

	Orbital Fracture Cases (N=5,796)	Controls (N=23,184)	Univariate *P* Value	Odds Ratio (95% CI)	Multivariate *P* Value
Alcohol (daily)					
1-2	2395 (61.9%)	16892(75.2%)		Reference	
3-4	830 (21.4%)	3924 (17.5%)		1.48 (1.35-1.61)	< 0.001
5-6	348 (9.0)	1103 (4.9%)	< 0.001	2.3 (2.02-2.61)	< 0.001
7-9	131 (34%)	284 (1.3%)		3.59 (2.89-4.44)	< 0.001
≥10	167 (4.3%)	259 (1.2%)		4.59 (3.76-5.6)	< 0.001
Tobacco					
Smoker	3228 (56.7%)	8894 (38.6%)	< 0.001	2.18 (2.05-2.31)	< 0.001
Non-smoker	2323 (40.8%)	13706 (59.5%)		Reference	
Recreational Drugs					
Cocaine	1701 (14.4%)	2333 (10.3%)		2.25 (2.07-2.44)	< 0.001
Hallucinogens	945 (8.0%)	1722 (7.6%)		1.69 (1.53-1.86)	< 0.001
Inhalants	381 (3.2%)	611 (2.7%)		1.91 (1.66-2.19)	< 0.001
Marijuana	3273 (27.7%)	7023 (30.9%)		1.43 (1.34-1.54)	< 0.001
Methamphetamine	742 (6.3%)	1002 (4.4%)		2.29 (2.05-2.55)	< 0.001
Rx Opioids	775 (6.6%)	1269 (5.6%)	< 0.001	1.98 (1.78-2.20)	< 0.001
Rx Stimulants	698 (5.9%)	1256 (5.5%)		1.70 (1.53-1.89)	< 0.001
Sedatives	764 (6.5%)	1315 (5.8%)		1.80 (1.62-2.00)	< 0.001
Street Opioids	576 (4.9%)	493 (2.2%)		3.53 (3.09-4.02)	< 0.001
Other	53 (0.4%)	76 (0.3%)		2.88 (1.97-4.20)	< 0.001
None	1707 (14.4%)	5282 (23.2%)		Reference	

Data are presented as number (%)
Chi-Square test was performed for comparison of categorical variables
Multivariable logistic regression was then performed

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Table 3. Socioeconomic Factors Significantly Associated with Orbital Trauma

	Orbital Fracture Cases (N=5,796)	Controls (N=23,184)	Univariate *P* Value	Odds Ratio (95% CI)	Multivariate *P* Value
Education (Highest)					
Never Attended School	7 (0.1%)	29 (0.1%)		0.69 (0.28-1.50)	0.378
1st-4th grade	33 (0.6%)	176 (0.8%)		0.52 (0.35-0.74)	0.001
5th-8th grade	167 (3.0%)	415 (1.8%)		0.93 (0.77-1.12)	0.457
9th-11th grade	581 (10.4%)	1141 (5.0%)	< 0.001	1.38 (1.22-1.55)	< 0.001
12th or GED	1545 (27.5%)	4138 (18.2%)		Reference	
College 1-3 years	1534 (27.3%)	6189 (27.3%)		0.65 (0.6-0.71)	< 0.001
College graduate	929 (16.6%)	5412 (23.9%)		0.46 (0.42-0.5)	< 0.001
Advanced degree	815 (14.5%)	5186 (22.9%)		0.42 (0.38-0.46)	< 0.001
Housing					
Family	323 (33.6%)	12538 (54.6%)		Reference	
College Campus	3 (0.3%)	658 (2.9%)		0.18 (0.04-0.47)	0.003
Friend	134 (13.9%)	2819 (12.3%)		1.83 (1.48-2.24)	< 0.001
Motel Hotel	10 (1.0%)	264 (1.1%)		1.48 (0.73-2.67)	0.267
Outside	93 (9.7%)	847 (3.7%)	< 0.001	4.23 (3.31-5.36)	< 0.001
Residential Facility	43 (4.5%)	561 (2.4%)		2.91 (2.07-3.99)	< 0.001
Shelter	192 (20.0%)	1967 (8.6%)		3.91 (3.24-4.7)	< 0.001
Temporary Institute	62 (6.5%)	571 (2.5%)		4.12 (3.08-5.43)	< 0.001
Transitional	54 (5.6%)	1017 (4.4%)		2 (1.47-2.66)	< 0.001
Other	47 (4.9%)	1726 (7.5%)		1.08 (0.78-1.46)	0.620
Annual Income					
<$10k	1393 (26.0%)	2640 (12.1%)		3.02 (2.68-3.41)	< 0.001
$10k-25k	859 (16.0%)	2572 (11.8%)		1.93 (1.71-2.20)	< 0.001
$25k-35k	351 (6.6%)	1705 (7.8%)		1.22 (1.05-1.42)	0.011
$35k-50k	352 (6.6%)	1921 (8.8%)		1.04 (0.89-1.21)	0.634
$50k-75k	446 (8.3%)	2649 (12.2%)	< 0.001	Reference	
$75k-100k	294 (5.5%)	2058 (9.5%)		0.85 (0.72-0.99)	0.040
$100k-150k	377 (7.0%)	2574 (11.8%)		0.87 (0.75-1.00)	0.058
$150k-250k	157 (2.9%)	1188 (5.5%)		0.79 (0.65-0.96)	0.021
>$200k	232 (4.3%)	1632 (7.5%)		0.85 (0.71-1.00)	0.058

Data are presented as number (%).
Chi-Square test was performed for comparison of categorical variables
Multivariable logistic regression was then performed

Table 4. Overall Health Factors Significantly Associated with Orbital Trauma

	Orbital Fracture Cases (N=5,796)	Controls (N=23,184)	Univariate *P* Value	Odds Ratio (95% CI)	Multivariate *P* Value
Health Insurance					
None	400 (6.2%)	707 (5.7%)		Reference	
Insured	5194 (79.9%)	10459 (84.1%)		0.83 (0.73-0.95)	0.005
Medicaid	164 (2.5%)	135 (1.1%)	< 0.001	2.41 (1.85-3.16)	< 0.001
Medicare	250 (3.8%)	255 (2.0%)		1.62 (1.31-2.01)	< 0.001
Private	171 (2.6%)	476 (3.8%)		0.59 (0.48-0.73)	< 0.001
Mental Health					
Poor	306 (5.4%)	840 (3.7%)		1.82 (1.47-2.25)	< 0.001
Fair	1143 (20.2%)	3374 (14.7%)		1.74 (1.51-2.00)	< 0.001
Good	1741 (30.8%)	6890 (30.1%)		1.37 (1.21-1.55)	< 0.001
Very Good	1485 (26.2%)	7296 (31.8%)		1.07 (0.94-1.21)	0.301
Excellent	740 (13.1%)	3597 (15.7%)	< 0.001	Reference	
Quality of Life					
Poor	273 (4.9%)	551 (2.4%)		2.31 (1.83-2.93)	< 0.001
Fair	1058 (18.9%)	3018 (13.2%)		1.79 (1.55-2.05)	< 0.001
Good	1908 (34.1%)	7075 (31.0%)	< 0.001	1.34 (1.19-1.50)	< 0.001
Very Good	1545 (27.6%)	7926 (34.8%)		0.94 (0.83-1.06)	0.297
Excellent	818 (14.6%)	4271 (18.7%)		Reference	
Health Literacy - Difficulty					
Never	3368 (60.1%)	16103 (70.7%)		Reference	
Occasionally	855 (15.3%)	3358 (14.7%)		1.12 (1.01-1.25)	0.038
Sometimes	847 (15.1%)	2260 (9.9%)	< 0.001	1.71 (1.51-1.93)	< 0.001
Often	259 (4.6%)	584 (2.6%)		2.23 (1.78-2.80)	< 0.001
Always	274 (4.9%)	485 (2.1%)		2.72 (2.16-3.47)	< 0.001

Data are presented as number (%)
Chi-Square test was performed for comparison of categorical variables
Multivariable logistic regression was then performed

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Supplemental Table 1. Cohort definition of patients with orbital fracture or facial fracture in *All of Us*. Patients with the Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT) codes listed below were included in the cohort.

Diagnosis Cohort	SNOMED-CT Code	Description
Orbital Fracture	56863004	Closed fracture of orbit
	49346003	Closed fracture of orbital floor (blow-out)
	263168002	Fracture of medial wall of orbit
	73521000119108	Closed fracture of medial wall of orbit
	263169005	Fracture of lateral wall of orbit
	3421000	Open fracture of orbital floor (blow-out)
		Link to branching logic and sources: https://databrowser.researchallofus.org/ehr/conditions/orbit%20fracture
Facial Fracture	157176002	Fracture of bone of face
	263152008	Multiple face fractures
	37655003	Late effect of fracture of skull AND/OR face bones
		Link to branching logic and sources: https://databrowser.researchallofus.org/ehr/conditions/face%20fracture

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23 Three Cases of Dysthyroid Optic Neuropathy Dramatically Improved by Sheath-Guided Triamcinolone Orbital Injection: A Case Report

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Introduction: Dysthyroid optic neuropathy (DON) is a serious complication of thyroid eye disease (TED). However, current treatment options remain limited[1]. We report three cases in whom DON was successfully treated using only a sheath-guided orbital triamcinolone injection (SG-OTI), a novel orbital injection technique.

Methods: Three untreated patients diagnosed with DON and referred to our institution were treated with SG-OTI (Figure 1). The treatment outcomes and associated complications have been evaluated up to April 2025.

Results: Case 1: A 66-year-old female presented to a local clinic with visual impairment and color vision deficits and was diagnosed with DON, for which she was referred to our hospital. She underwent six biweekly SG-OTI treatments, and visual improvement was achieved after five sessions. Best-corrected visual acuity (BCVA) improved from 20/32 (decimal visual acuity: 0.7) to 20/16 (1.2) in the right eye and from 20/500 (0.04) to 20/20 (1.0) in the left eye. Critical flicker fusion frequency improved from 20.3/9.3 Hz to 35.0/31.0 Hz, clinical activity score (CAS) from 7 to 1, and exophthalmos from 21/21 mm to 21/18 mm. The average coronal cross-sectional area of the extraocular muscles (EOM) on magnetic resonance imaging (MRI) was reduced by 56.7% (Figure 2). The only complication observed was subcutaneous hemorrhage, with no elevation in intraocular pressure (IOP).

Case 2: A 67-year-old female presented with a 6-month history of diplopia and progressive visual loss. She was diagnosed with DON based on optic disc edema and MRI findings. She received a total of seven biweekly SG-OTI treatments, and visual improvement occurred after four sessions. BCVA improved from 20/25(0.9) to 20/16 (1.2) in the right eye and from 20/100 (0.2) to 20/16 (1.2) in the left eye. CAS improved from 7 to 3, and exophthalmos from 19/20 mm to 17/17 mm. The average cross-sectional area of the EOM on MRI was reduced by 61.2% (Figure 3). No complications were observed, with no elevation in IOP.

Case 3: An 81-year-old female, previously under treatment for TED at a local clinic, was referred to our institution because of progressive visual loss and diagnosed with DON. She underwent three monthly SG-OTI treatments, and visual improvement was achieved after three sessions. BCVA improved from 20/200 (0.1) to 20/16 (1.2) in the right eye and from 20/100 (0.2) to 20/25 (0.8) in the left eye.

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Exophthalmos improved from 15/15 mm to 12/12 mm, and CAS from 3 to 0. The average cross-sectional area of the EOM on MRI was reduced by 62.9% (Figure 4). No complications were noted, and there was no elevation in IOP.

Conclusions: In this report, we present three cases of DON that were successfully treated with biweekly SG-OTI alone. This treatment approach is cost-effective, feasible in an outpatient setting, and potentially beneficial for patients who are contraindicated for surgical intervention or systemic corticosteroid therapy.

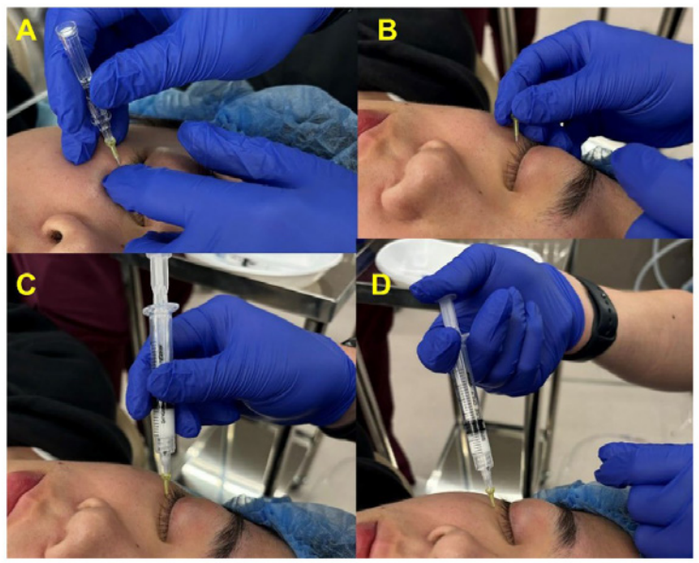

Figure 1: Procedure of sheath-guided orbital triamcinolone injection (SG-OTI)
A: First, puncturing the orbital septum using a 24-gauge 19-mm needle
B: Indwelling cannula
C: Passing a 27-gauge 40-mm dull needle through the cannula to target the orbital muscle at four sites (the medial and lateral aspects of the upper and lower eyelids)
D: Injecting a total of 1 mL of triamcinolone acetonide (40 mg/mL) inside the orbital rim

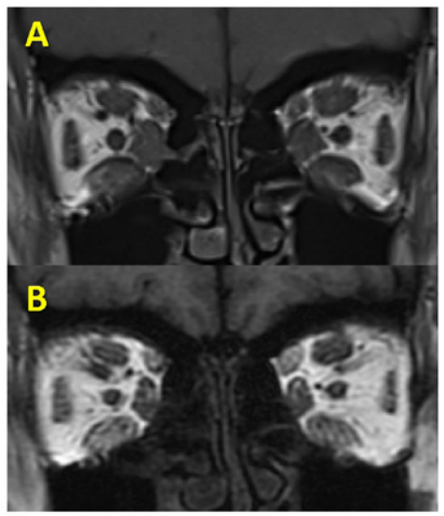

Figure 2: MRI T1 (Case1)
A: Pre injection, B: Post injection (Final)

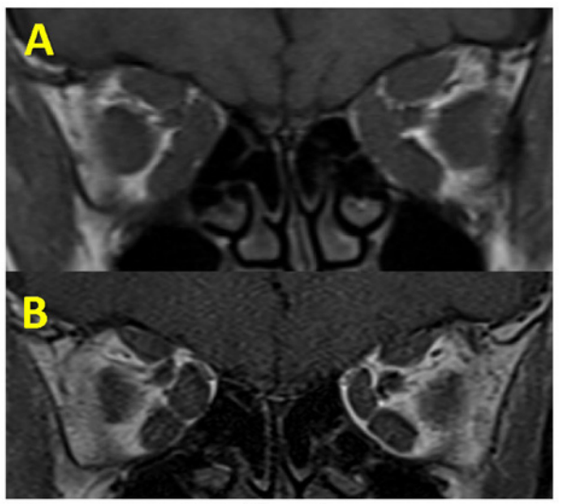

Figure 3: MRI T1 (Case2)
A: Pre injection, B: Post injection (Final)

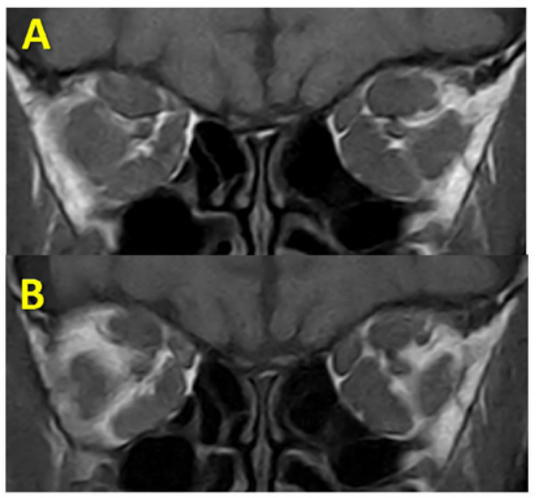

Figure 4: MRI T1 (Case3)
A: Pre injection, B: Post injection (Final)

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24 Clinical Characteristics and Management of Orbital Fractures in the Pediatric Population

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Introduction: Orbital fractures in the pediatric population pose evaluation and management considerations distinct from those of adults due to anatomic and developmental stage differences.[1] Rates of urgent extraocular muscle entrapment, cited to range from 28-93% in the literature, are higher among children.[2] While these "trapdoor fractures" have been described, literature on the presentation, mechanism of trauma, medical management, and non-urgent surgical treatment of pediatric fractures overall are limited. The present study aimed to characterize demographic and clinical features of pediatric orbital fractures and evaluate associations with management and outcomes.

Methods: A retrospective cohort study was conducted at a tertiary care center using billing codes to identify patients who presented with an orbital fracture from January 1, 2014 to September 30, 2024. Inclusion criteria were radiographic evidence of orbital fracture and age >20/40 by Snellen acuity. Surgical repair was defined as early if time from presentation to surgery was <14 days and delayed if surgery occurred >14 days. Statistical analyses used Chi-square test and logistic regression. A *p*-value threshold of 0.05 indicated statistical significance.

Results: A total of 398 children (mean age 11.4 ± 5.0 years, 23.1% female) were included. The most frequent fracture location was isolated floor (74.4%), followed by isolated medial wall (12.5%), combined floor/medial wall (9.6%), and isolated lateral wall (3.5%). Blunt trauma was the most common mechanism of injury (81.9%)—ascribed to assault (26.2%), sports injury (20.3%), and fall (19.8%). Orbital hemorrhage was noted in 9.6% of cases, most commonly in floor fractures (81.8%). Among patients who had ophthalmic evaluation at presentation (70.9%), 45.6% had intact vision. The risk of decreased vision was significantly higher in fractures from assault compared to object strike (OR=0.02, p=0.03). Hospital-administered antibiotics were given to 13.1% of children and steroids to 2.8%. At discharge, 22.6% were prescribed oral antibiotics and 8.3% were prescribed oral steroids. No associations were identified between variables and antibiotic/steroid administration. Of 80 (20.1%) surgical patients, 57 (71.3%) had early repair and 23 (28.8%) delayed repair. No associations were identified between variables and surgical repair. However, preoperative discharge antibiotics were associated with early repair (OR 0.08, p=0.04), and implanted orbital hardware during surgery was associated with delayed repair (OR 10.60, p=0.03). Associated orbital cellulitis occurred in 5 cases (1.3%) at an average of 1.0 ± 1.7 days after fracture presentation. Among these 5, two received in-hospital antibiotics, all received discharge antibiotics, and none received steroids or underwent surgery.

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Conclusions: Pediatric orbital fractures, most commonly involving the floor, result from assault, sports injury, and falls. Assault, predictive of decreased vision, may warrant early ophthalmic evaluation. Antibiotics may be warranted among children who undergo early repair. Findings support a role for sports injury prevention and guide further research into evaluation and management strategies that optimize fracture outcomes among children.

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25 Neonatal Eyelid Photo Atlas: Characterizing Eyelid Growth and Development in Premature Infants

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Introduction: A significant improvement in the gestational age of viability over the past decades allows visualization of neonatal eyelid development in vivo. Previous fetal histological studies have suggested that eyelids take a nearly developed shape at 24 weeks gestational age, but with some notable changes still to occur.[1] This includes the extension and differentiation of the orbicularis oculi, development of meibomian glands, and appearance of preseptal fat pads.[1,2] In premature infants, these final developments are occurring ex utero, and the relative changes in external structures and vascularity should be observed.

The authors sought to visually depict eyelid development in a photographic atlas to improve our characterization and understanding of this vital process. The authors also sought to provide expected growth patterns of external landmarks and discern how different features appear across a diverse range of skin tones.

Methods: Frontal digital photographs of newborns admitted to the Neonatal Intensive Care Unit were obtained weekly to allow for longitudinal monitoring of eyelid changes. A metric ruler was included in each photograph for the calibration of measurements. The image analysis software ImageJ was used to obtain measurements for the horizontal palpebral fissure (HPF), upper eyelid to brow distance (UEB), medial intercanthal distance (MID), and lateral intercanthal distance (LID). Digital measurements were performed by two researchers (GG, AK), and the average of the two was taken for analyses. Agreement was measured using the intraclass correlation coefficient (ICC). Estimated growth rates for each of the measurements were estimated using mixed effects linear regression using each subject's intercept as a random effect. Significance was determined using Wald z-tests.

Results: A total of 95 photographs were taken from 19 infants and included in this study. Figure 1 shows the demographics for each infant as well as characteristics including Fitzpatrick skin type and presence of vascularity throughout admission. Notably, eyelid vascularity was seen in a higher proportion of infants with lighter skin types.

Measurements were recorded for 68 photographs from 10 subjects born at a gestational age less than 37 weeks. The ICC was 0.992 (95% CI: 0.986 – 0.994), indicating excellent reliability between graders. Figure 2 shows the eyelid measurements plotted against these subjects' gestational age in weeks. The estimated growth rates in mm per week as determined by the mixed effects linear regression

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are shown in Figure 3. Despite variability in week-to-week measurements, approximate growth rates were appropriately calculated for each measurement.

Conclusions: By studying an inpatient population, we compiled a photo atlas of neonatal eyelids, offering longitudinal insights into premature infant eyelid development. While variability in recorded measurements was likely influenced by localized swelling and distortion induced by pressure from respiratory assistance devices, the growth rates of all four measurements were effectively characterized using linear regression analysis.

Figure 1

	n (percent)	Mean (SD)
Subjects	19	
Number of photos	95	5 (3.43)
Gestational age at birth (weeks)	19	32.65 (8.76)
Gestational age at first exam (weeks)	19	34.4 (9.05)
Eyelashes present at first exam	19 (100)	
Eyes spontaneously open at any exam	8 (42)	
Eyelid swelling at first exam	5 (26)	
Swelling at any exam	9 (47)	
Fitzpatrick Skin Types		
1	3 (16)	
2	6 (32)	
3	6 (32)	
4	0 (0)	
5	1 (5)	
6	3 (16)	
Visible vasculature at any exam (n=19)	12 (63)	
Fitzpatrick skin types 1-2 (n=9)	8 (89)	
Fitzpatrick skin types 3-4 (n=6)	3 (50)	
Fitzpatrick skin type 5-6 (n=4)	1 (25)	
Vascular blush at any exam	6 (32)	
Fitzpatrick skin types 1-2	5 (56)	
Fitzpatrick skin types 3-4	1 (17)	
Fitzpatrick skin type 5-6	0 (0)	

Figure 2

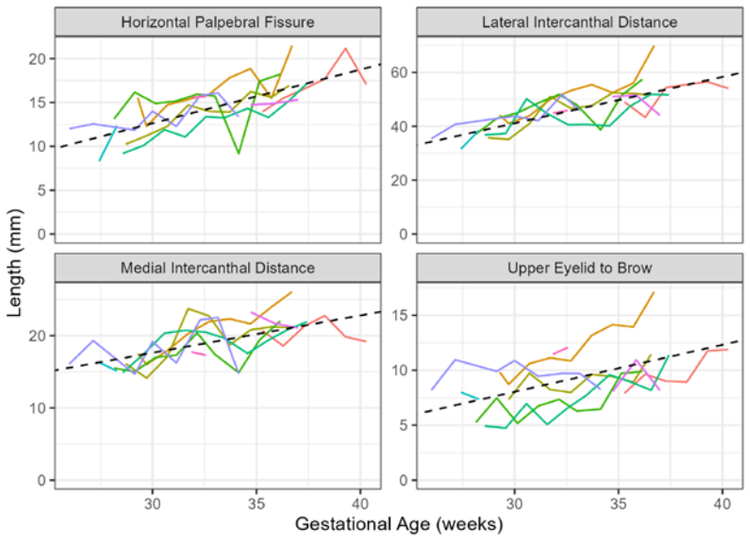

Figure 3

Measurement	Estimated Slope (mm/week)	Standard Error	P-value
Horizontal Palpebral Fissure	0.6117	0.0802	<0.001
Upper Eyelid to Brow	0.4274	0.0718	<0.001
Medial Intercanthal Distance	0.5169	0.0942	<0.001
Lateral Intercanthal Distance	1.7188	0.2029	<0.001

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26 Pediatric Oculofacial Injuries from Dog Bites: A Retrospective Analysis of Injury Patterns, Management, and Outcomes at a Level 1 Trauma Center

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Introduction: Dog bite injuries are common causes of pediatric emergency department presentations.[1] Children ages 5-9 experience dog bites most frequently, while those under 5 are more likely to be hospitalized for severe injury and complications.[2] The head and neck are commonly injured, with bites directed at the lips, nose, and periorbital area.[3] These injuries result in long term functional and aesthetic complications.

There is limited research on dog bite-associated periocular injuries. No large studies have comprehensively examined injury patterns, management strategies, and clinical outcomes. These injuries often require surgical repair and may be complicated by infection, eyelid malposition, and scarring. This study characterizes pediatric dog bite-associated oculofacial injuries at a Level 1 Trauma Center between 2009 and 2024.

Methods: A single-site, retrospective chart review was performed on patients presenting with oculofacial dog bite injuries. Patients were identified using ICD codes for dog bites. Patients with bites from other animals or age >18 years were excluded. Patient demographics, location and severity of injury, medical or surgical interventions, complications, and ophthalmologic follow-up were analyzed. Descriptive and contingency analyses were used to correlate patient factors, injury patterns, and complications.

Results: 818 charts were reviewed. 81 eyes suffered periocular injuries. The mean age of those with periocular injuries was 5.88 years with equal gender distribution (Table 1). The most frequently injured periocular sites were the lower eyelid, upper eyelid, and eyelid margin (64%, 38%, and 31%, respectively). Upper eyelid injuries were 5.33 times as likely in young children compared to the oldest age group ($p<0.05$). Lower eyelid injuries were more likely in the oldest age group compared to the youngest (OR = 2.7, $p=0.128$) (Figure 1). The medial canthus was 11.7 times more likely to be involved in the youngest age group compared to the oldest ($p<0.05$).

Injury severity was classified as full thickness (26%) vs. partial thickness (74%) laceration, and further divided based on canalicular involvement. Of the full thickness injuries, 33% involved the canaliculus. Though full vs. partial thickness injuries did not vary significantly with age, canalicular injuries tended to decrease with increased age (Figure 2). One open globe was observed.

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Half of the patients required repair in the operating room. 80.2% were prescribed prophylactic oral antibiotics (Table 2). Early complications included corneal abrasions (9.9%), wound infection (6.2%), ectropion (3.7%), and rarely vision loss (2.5%) (Table 3). Late complications included ptosis (7.4%), surgical revision (4.9%), and lagophthalmos (3.7%) (Table 3). Long-term oculoplastic care was required in 13.6% of patients.

Conclusions: Periocular injuries are common among patients presenting for dog bites and demonstrate age-related patterns. The high frequency of eyelid involvement without associated open globe injuries suggests that laceration or avulsion may be more common than direct puncture. Canalicular integrity should be carefully evaluated in younger children with dog bite injuries, particularly those under 3 years. Findings reveal risk factors for a complex post-injury recovery and underscore the importance of early oculoplastic involvement.

Table 1: Demographics

Variable	Statistics
Age	Mean: 5.88 years (Range: 0.68 - 17.65 years)
Gender	Female: 41 (50.6%) | Male: 40 (49.4%)
Race	White: 43 (53.1%) | Black: 12 (14.8%) | American Indian: 4 (4.9%) | Other: 22 (27.2%)
Ethnicity	Not Hispanic, Latino/a, or Spanish origin: 53 (85.5%) | Hispanic or Latino/a: 9 (14.5%)

Table 2: Management Approaches

	n	%
Management		
Oral Antibiotic Prophylaxis	65	80.20%
Operating Room Required	46	58.20%
Procedures		
Primary Closure	49	61.20%
Canalicular Repair/Stent	10	12.30%
Canthoplasty	3	3.70%
Skin Graft	3	3.70%

Table 3: Complication Rates

	n (%)	Average Time of Onset
Early Complications (hours to days)		
Corneal Abrasion	8 (9.9%)	Immediately (0)
Infection	5 (6.2%)	9.3 ± 6.8 days
Blood Loss	5 (6.2%)	Immediately (0)
Ectropion	3 (3.7%)	4.5 ± 3.6 days
Vision Loss	2 (2.50%)	3.5 ± 3.5 hours
Late Complications (months to years)		
Ptosis	6 (7.4%)	6.0 ± 8.0 months
Surgical Revision	4 (4.9%)	19.0 ± 20.9 months
Lagophthalmos	3 (3.7%)	3.9 ± 2.4 months

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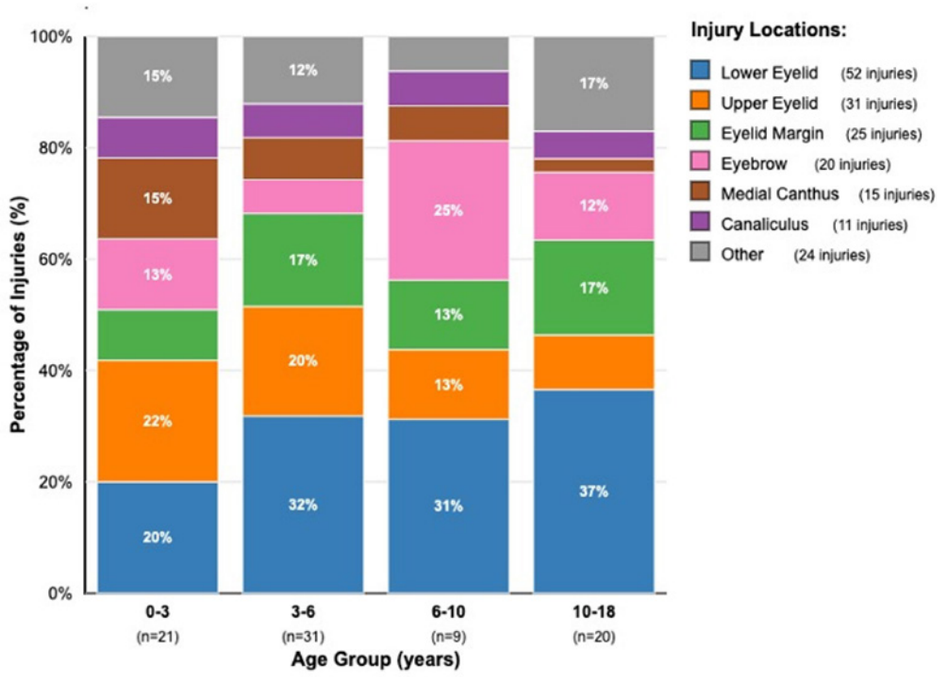

Figure 1: Distribution of dog bite injury anatomy by age. Some eyes had multiple structures injured. Notably, only 1 globe injury was present.

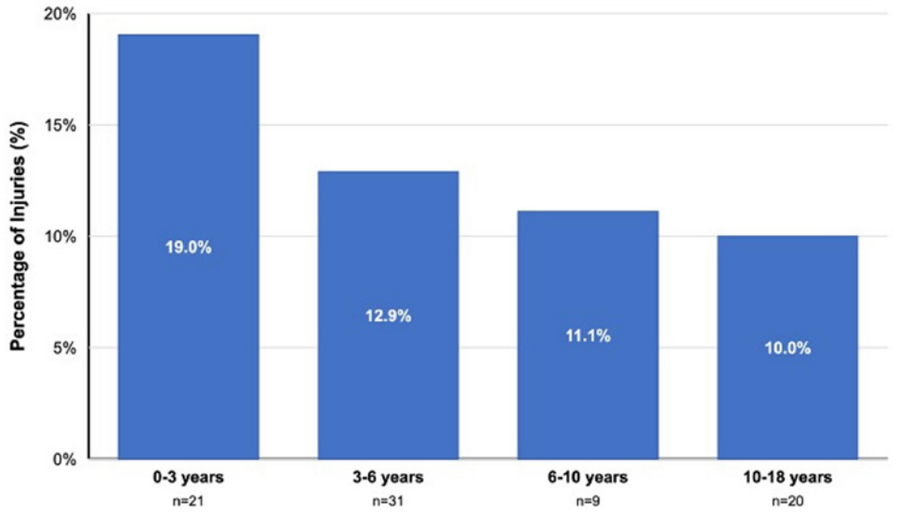

Figure 2: Frequency of Canalicular injury by age.

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27 Sensitivities and Microbiology of Pediatric Orbital Cellulitis: An Updated Report

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Introduction: Pediatric orbital cellulitis is a serious infection requiring prompt diagnosis and appropriate antimicrobial therapy.[1-4] Since the 2007 publication of McKinley et al.'s study on the microbiology of pediatric orbital cellulitis, changes in pathogen prevalence and antibiotic resistance patterns have emerged.[4] This study aims to provide an updated analysis of microbial trends in pediatric orbital cellulitis to guide effective clinical management.

Methods: This is a retrospective study analyzing changes in diagnostic trends and clinical presentation of orbital cellulitis in pediatric patients treated between 2011 and 2023, including during the SARS-CoV2 global pandemic. Data was collected on patient age, history, microbiology results of blood cultures or tissues aspirates, and surgical intervention.

Results: A total of 390 pediatric cases of orbital cellulitis were identified; the mean age was 7.7 years and 63.8% of patients were male (n=249). In those patients presenting with constitutional symptoms (92.1%, n=359), the most common were fever (74.9%, n=269), headache (49.9%, n=179), nausea/vomiting (28.4%, n=102), and lethargy/fatigue (28.1%, n=101).

Orbital subperiosteal abscesses were found on initial imaging in 249 (n=63.8%) of patients, most commonly along the medial wall (84.3%, n=210), followed by the superior (31.3%, n=78), inferior (10.8%, n=27), and lateral (6.0%, n=5) walls. Positive cultures were isolated from the middle meatus (36.9%, n=144), ESS (29.7%, n=116), and the orbit (12.6%, n=49). Cultures were most often positive for methicillin susceptible Staphylococcus aureus (MSSA) (24.3%, n=75), Staphylococcus intermedius (20.1%, n=62), Coagulase-negative staphylococci (CoNS) (17.8%, n=55), Streptococcus pyogenes (12.6%, n=39), Corynebacterium (7.4%, n=23), and methicillin resistant Staphylococcus aureus (MRSA) (6.8%, n=21).

Surgical intervention was required in 47.2% (n=184) of patients. All patients were managed medically with a combination of intravenous and oral antibiotics, for an average of 8.8 days during admission. Sixty-four patients (16.4%) received steroid treatment during admission.

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Conclusions: Sinusitis and orbital subperiosteal abscesses remained highly prevalent in these patients, with MSSA emerging as the most common causative organism. While CoNS, Staphylococcus intermedius, and Streptococcus pyogenes were also frequently isolated, MRSA was less commonly identified compared to prior reports.[2,4] Nearly half of the patients required surgical intervention, highlighting the importance of multidisciplinary care. These findings underscore evolving microbiologic trends and support the continued need for targeted diagnostic and therapeutic strategies in the management of pediatric orbital cellulitis.

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28 AI-Based Smartphone Application for Real-Time Blinking Assessment

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Introduction: Blinking can be affected in various conditions, such as blepharospasm, hemifacial spasm, dry eye and lagophthalmos. Objective quantification of blinking requires methods to capture images of the patient's face, along with specialized software to recognize and analyze eyelid movements and the eye-opening status. Image capture can be done using external cameras or the built-in cameras of mobile devices. Most studies on blinking have relied on manual counting of eyelid movements or complex two-step systems, which involve using external cameras for image capture and desktop software for subsequent analysis. These methods are often impractical for clinical use. This study aims to introduce the AI-based application developed for real-time blinking assessment on a smartphone platform.

Methods: This is a cross-sectional, observational study. Spontaneous blinking was recorded bilaterally using the AI-based smartphone application. Additionally, standard videos were recorded with the smartphone (iPhone 13, Apple Inc, Cupertino, California) camera for one minute. All recordings were made with participants in the primary gaze position under standardized conditions. Participants with conditions affecting the eyelids, ocular surface, or neurological function that could influence blinking were excluded.

The AI-based smartphone application uses the smartphone camera to capture images, and a customized software has been developed to accurately identify the eyes, determine their opening status, and generate statistical insights from the blink analysis in real time. The software was built on the Flutter cross platform framework, incorporating machine learning tools. The app is also capable of analyzing pre-recorded videos, which were included in this study. To evaluate the effectiveness of the application in detecting blinks, the blink counts generated by the app were compared with manually recorded counts. The analysis utilized the root mean square error (RMSE) for comparison. The RMSE values range from 0.0 to 1.0, with lower values indicating greater predictive accuracy of the model.

Results: The AI-based smartphone application analyzed both real-time videos (captured by the application) and pre-recorded videos. A total of 50 assessments (n=50) were conducted involving 27 participants; four videos were excluded due to issues with image quality. The mean age of the participants was 33.6 ±13.86 years. The app recorded a mean blink count of 23.60 ± 12.31, compared to a mean count of 23.31±12.27 derived from manual observations. The app's accuracy, as measured by RMSE, was 0.11, indicating a high level of precision in blink detection.

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Conclusions: The specialized AI tool for real-time and offline blink analysis on a smartphone platform, demonstrated reliable performance in detecting blinking patterns. A more refined version of this system could facilitate blinking assessments in various conditions, enabling patients to monitor disorders such as blepharospasm, hemifacial spasm and lagophthalmos from facial palsy. The system also shows potential for integration with telemedicine platforms, facilitating personalized treatment and supporting clinical research. Ongoing development efforts aim to incorporate additional analysis parameters, further enhancing the app's value for clinical practice and broader adoption within the medical community.

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29 Core Oculoplastic Procedure Skills for the Comprehensive Ophthalmologist: A Consensus by Delphi Methodology

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Introduction: The Accreditation Council for Graduate Medical Education (ACGME) requirements for ophthalmology mandate that residents perform a minimum number of essential surgical procedures in assigned case categories.[1] The National Resident Report for ophthalmology residents completing residency in 2023-2024 demonstrates a large variation in the type and numbers of oculoplastic cases logged.[2] For example, while the mean reported number of eyelid laceration repairs as primary surgeon was 11.5, the range was 3-91 (SD 10). Variability in surgical minimums recorded was observed across all tracked oculoplastic procedures and suggests inconsistent experience and exposure in the area of oculoplastic surgery.

To focus the oculoplastic experience on high yield procedures, this study utilized Delphi methodology to reach consensus on scope-appropriate oculoplastic procedural skills for a comprehensive ophthalmologist, and that a graduate of a U.S. ACGME-accredited ophthalmology residency should be able to perform independently in a competent manner.

Methods: An IRB-exempt survey-based study using Delphi methodology was used.3 Content experts at the study institution generated a list of 26 oculoplastic procedural skills, established and recruited participants for the Core Oculoplastic Content Working Group (COC), and did not participate in the Delphi voting rounds.

COC participants included: 1) ophthalmology residency program directors and assistant program directors, 2) oculoplastic surgeons, and 3) comprehensive ophthalmologists. To ensure Delphi validity, a minimum of 30 panelists for this heterogeneous group was recruited.[1,2,4]

Surveys for each Delphi round were distributed via online questionnaire (Qualtrics), and survey respondents were asked the question:

"Which of the following oculoplastic procedural skills are within the scope of a comprehensive ophthalmologist, and should a graduate of a U.S. ACGME accredited ophthalmology residency be able to perform independently in a competent manner?"

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The presentation order of survey items was randomized. A summary of the survey workflow can be found in Figure 1. Consensus was defined as ≥ 80% panelist agreement for the first and third round or as an average aggregate score of ≥ 4 on a Likert scale for the second round (5 equating to "strongly agree").

Results: Thirty-four stakeholders were recruited to participate. Two-thirds of participants were from the Midwest and West regions of the United States and practice in an academic setting (Table 1).

The response rate for the first survey was 91.2% (31/34). Eight of 26 procedures met the threshold for agreement and moved to the third round. Five additional procedures were added (Table 2). One suggestion was merged with an item on the first survey. A total of 23 items were advanced to the second survey.

The response rate for the second survey was 82.3% (28/34). Eight of the 23 procedures met the threshold for agreement and were moved to the third survey (Table 3).

The third survey included 16 items. The response rate was 82.3% (28/34). Thirteen procedures met the established threshold and comprised the final list (Table 4).

Conclusions: A list of 13 scope-appropriate oculoplastic procedural skills for a graduate of an ophthalmology residency was generated by Delphi consensus. This list may aid in curricular development and be utilized to generate oculoplastic competencies for ophthalmology residency graduates.

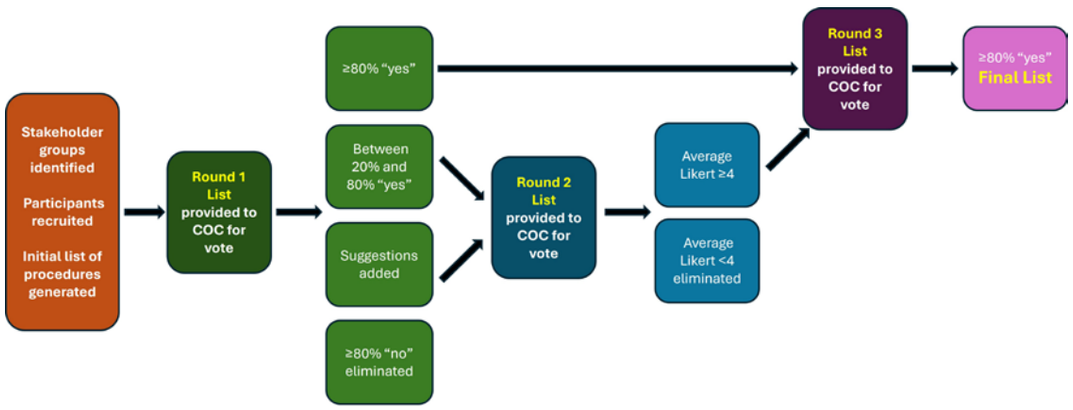

Figure 1: Delphi Methodology Flow. The Educational Task Force (ETF) established the COC working group and the initial list of oculoplastic procedures to be voted on. The participants selected "yes", "no", or "maybe/unsure" for round 1. The procedures that met the pre-established threshold were automatically advanced to the third round. The items that fell below the threshold were advanced to the second round. Round 2 voting used a Likert scale (5 corresponding to "strongly agree" and 1 corresponding to "strongly disagree". The items that met the threshold for agreement in round two were advanced to the third round. The items that did not meet the threshold were eliminated from the study. The list for round three was comprised of items from round one and round two with ≥80% "yes" on round one or an average Likert scale of ≥4 from round two. Participants were given "yes" and "no" options for whether they believed the procedure was scope-appropriate for a comprehensive ophthalmologist. The final list was comprised of items that received ≥80% "yes" on the third round.

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Stakeholder Group	
*Educational Leadership**	11 (32.3%)
*Oculofacial Plastic Surgeons**	11 (32.3%)
Comprehensive Ophthalmologists	16 (47.1%)
Practice Setting	
Academic	20 (58.8%)
Community/Private	14 (41.2%)
Geographic Region of Practice	
Southeast	5 (14.7%)
Midwest	10 (29.4%)
Southwest	3 (8.8%)
Northeast	3 (8.8%)
West	13 (38.2%)
Year of Ophthalmology Certification	
Median	2015.5
Range (SD)	1974-2024 (9.04)

Table 1: Summary of COC Survey Participant Demographics (n=34). *Two of the oculofacial plastic surgeons also participate in educational leadership.

Round 1 Procedure List	% Yes	% No	% Maybe
Canthotomy/Cantholysis	100	0	0
Chalazion Excision	100	0	0
Trichiasis - Epilation	100	0	0
Eyelid Laceration - Simple, non-margin	97	0	3
Eyelid Laceration - Margin Involving	90	6	3
I & D - Eyelid Abscess	90	3	6
Tarsorrhaphy - Temporary Suture/Frost	84	13	3
Biopsy - Incisional	81	16	3
Biopsy - Shave	77	10	13
Blepharoplasty - upper, no fat	77	13	10
Biopsy - Punch	71	16	13
I & D - Dacryocystitis	71	23	6
Punctoplasty - Snip	71	26	3
Entropion - Quikert Suture	65	19	16
Ectropion - Lateral Tarsal Strip	58	32	10
Botox - Cosmetic	55	29	16
Tarsorrhaphy - Permanent	55	42	3
Botox - Spastic Entropion	48	35	16
Botox - Chemical Tarsorrhaphy	42	35	23
Ptosis - MMCR/Posterior Repair	42	48	10
Ectropion - Medial Spindle	35	39	26
Enucleation	32	52	16
Evisceration	26	55	19
Nasolacrimal Duct Intubation for Congenital NLDO	23	61	16
Botox - Lacrimal Gland for Epiphora	19	71	10
Eyelid Laceration - Canalicular	19	61	19
Recommended Additions to Procedure List	Comment		
NLD Probing without Intubation	2 respondents		
Direct Browplasty	3 respondents		
Ptosis - Levator Advancement Entropion - Lateral Tarsal Strip Dacryocystorhinostomy Wedge Resection	1 respondent each		

Table 2: Results of Round 1 Voting. The established threshold for agreement on Round 1 was ≥80% "yes". The procedures met the threshold and were moved to Round 3 (n=8). Procedures with ≥80% no were eliminated from the list (n=0). The procedures that did not meet either of these thresholds were moved to Round 2. Five additional procedures were suggested and added to the list for Round 2. The suggestion of "Entropion – Lateral Tarsal Strip" was combined with the Round 1 "Ectropion – Lateral Tarsal Strip" into "Lateral Tarsal Strip" for Round 2. I & D: Incision and Drainage; MMCR: Muller's Muscle-Conjunctival Resection; NLDO: Nasolacrimal Duct Obstruction; NLD: Nasolacrimal Duct.

≥80% Responded "Yes"
50% ≤ Responded "Yes" < 80%
40% ≤ % Responded "Yes" < 50%
< 40% Responded "Yes" AND < 80% Responded "No"
≥ 80% Responded "No"

Round 2 Procedure List	Disagree 1	2	Likert score 3	4	Agree 5	Average	Minimum	Maximum
Biopsy - Incisional	0	0	1	8	19	4.64	3	5
Biopsy - Shave	0	1	2	6	19	4.54	2	5
Blepharoplasty - upper, no fat	0	1	2	6	19	4.54	2	5
Biopsy - Punch	0	1	3	7	17	4.43	2	5
NLD probing without intubation	1	2	2	4	19	4.36	1	5
Tarsorrhaphy - Permanent	0	2	1	12	13	4.29	2	5
Entropion - Quickert Suture	1	2	4	7	14	4.11	1	5
Punctoplasty - Snip	2	0	3	12	11	4.07	1	5
Botox - spastic entropion	0	1	5	15	7	4	2	5
I&D - Dacryocystitis	1	1	7	8	11	3.96	1	5
Lateral Tarsal Strip	2	3	3	7	13	3.93	1	5
Botox - cosmetic	1	3	6	9	9	3.79	1	5
Enucleation	2	4	3	9	10	3.75	1	5
Botox - chemical tarso	1	4	7	7	9	3.68	1	5
Ptosis - MMCR/Posterior repair	3	4	3	8	10	3.64	1	5
Ptosis - Levator advancement	4	3	3	9	9	3.57	1	5
Wedge Resection	2	7	3	7	9	3.5	1	5
Direct Browplasty	2	8	3	6	9	3.43	1	5
Evisceration	4	3	6	9	6	3.36	1	5
Eyelid laceration - canalicular	3	8	3	6	8	3.29	1	5
NLD intubation for congenital NLDO	3	7	5	5	8	3.29	1	5
Ectropion - Medial Spindle	3	7	4	7	7	3.29	1	5
Dacrycystorhinostomy	10	7	3	4	4	2.46	1	5
Botox - lacrimal gland	6	11	6	3	2	2.43	1	5

Table 3: Results of Round 2 Voting. All procedures were rated on a Likert scale from 1-5 by respondents. Items with an average Likert score ≥4 were moved to Round 3 (n=8). The procedures with an average Likert score less than 4 were eliminated. NLD: Nasolacrimal Duct; I & D: Incision and Drainage; MMCR: Muller's Muscle-Conjunctival Resection; NLDO: Nasolacrimal Duct Obstruction.

Final List (n=13)
Biopsy - Incisional
Biopsy - Punch
Biopsy - Shave
Blepharoplasty - upper, no fat
Canthotomy/Cantholysis
Chalazion Excision
Eyelid Laceration - Margin Involving
Eyelid Laceration - Simple, non-margin
I & D - Eyelid Abscess
NLD probing without intubation
Punctoplasty - Snip
Tarsorrhaphy - Temporary Suture/Frost
Trichiasis - Epilation

Table 4: Final List of Procedures Deemed Scope-Appropriate for a Graduating Ophthalmology Resident. These procedures received ≥80% "yes" on round three.

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30 Persistent Opioid Use in Opioid Naïve Patients Following Orbital, Eyelid, and Lacrimal Surgery

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Introduction: Opioid prescriptions filled at the time of ophthalmic surgery have been associated with persistent narcotic use extending well beyond recovery[1] and remain an independent risk factor for increased opioid overdose rates, hospitalizations, and mortality over time.[2] To be sure, managing postoperative pain remains a difficult balancing act for ocular surgeons. However, the rate of filled opioid prescriptions following incisional ophthalmic surgery was previously found to be increasing over time.[3] Reflecting the nature of surgical intervention, oculoplastic surgeons tend to prescribe narcotics at rates that far exceed that of other ophthalmic surgeons.[4,5]

Opioid needs immediately following surgery tend to vary according to the length and character of oculofacial plastic surgery performed.[6,7] However, it is unclear how varying opioid needs translate to prolonged usage over time. Understanding which surgical candidates and what types of oculoplastic surgery predispose patients to chronic narcotic use is necessary for recalibrating prescription patterns to minimize risk while maintaining appropriate pain control. As such, the purpose of the following study was to assess the risk of persistent opioid use in patients undergoing orbital, eyelid, or lacrimal surgery with a perioperative opioid prescription and to identify those patients who may be especially susceptible to persistent narcotic use.

Methods: A retrospective cohort study was conducted using data from TriNetX, a global health research network of aggregated and de-identified electronic medical records. Patients aged 13 or older undergoing oculofacial plastic surgery were included if they filled a perioperative oral opioid prescription 14 days before and up to 3 days following surgery. Surgical cohorts were divided between patients who underwent orbital, eyelid, or lacrimal surgery as identified by Current Procedural Terminology codes. Patients were excluded if they had filled an opioid prescription in the year preceding surgery other than in the perioperative window, underwent anesthesia or surgery within 15 months of their oculofacial plastic surgery, or had a documented history of opioid dependence or abuse. A cohort of surgical controls without perioperative opioid exposure was identified with one-to-one propensity score matching. Risk ratios (RRs) with 95% confidence intervals (CIs) were then calculated.

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Results: After propensity score matching, 82,969 orbital, 53,000 eyelid, and 6,750 lacrimal surgery patients with and without perioperative opioid prescription exposure were identified. Compared to narcotic-free controls, patients prescribed opioids for postoperative pain following orbital (RR, 1.47; 95% CI, 1.37-1.58), lacrimal (RR, 3.44; 95% CI, 2.67-4.41), and eyelid (RR, 1.56; 95% CI, 1.45-1.69) incisional surgery showed a significantly increased risk of persistent opioid use 180 days following surgery. Perioperative opioid exposure continued to be a strong independent risk factor for persistent opioid use up to one year after orbital (RR, 1.48; 95% CI, 1.39-1.57), lacrimal (RR, 2.73; 95% CI, 2.24-3.33) and eyelid (RR, 1.70; 95% CI, 1.59-1.81) incisional surgery.

Conclusions: Perioperative opioid prescriptions for oculofacial plastic surgery are associated with a risk of persistent opioid use in opioid naïve patients. Those undergoing lacrimal surgery may be especially vulnerable to persistent opioid use for up to one year following their operation.

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