

SYLLABUS



New Orleans 2026

57th Annual Fall Scientific Symposium



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GENERAL INFORMATION

Continuing Medical Education

ASOPRS is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor the Continuing Medical Education (CME) for physicians. The American Society of Ophthalmic Plastic and Reconstructive Surgery designates this live activity for a maximum of **14 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 ASOPRS Continuing Medical Education (CME) program is to provide oculofacial plastic surgeons with high-quality educational opportunities in aesthetics, eyelid, lacrimal, and orbital diseases. Programs are designed to support positive changes in physician knowledge, competence, and performance, enabling participants to maintain and improve the skills necessary to provide the highest quality care for their patients.

The goal of the ASOPRS CME program is to promote lifelong learning through critical appraisal of emerging literature, engagement with peer-reviewed research, expert instruction, case-based discussion, and ongoing self-assessment of clinical practice. Participants are expected to strengthen existing clinical and operative techniques while appropriately adopting evidence-based medical, surgical, and non-surgical approaches, technologies, and treatment strategies.

The intended results of the CME program include improved diagnostic accuracy, clinical decision-making, procedural efficiency, and patient outcomes. Ultimately, programs are designed to enhance physician competence and performance, leading to safer surgical care, improved functional and aesthetic results, and higher overall quality of care within the specialty.

Ongoing assessment of the impact of the CME program is important in determining modifications to existing activities and the development of new activities.

Evaluations/CME Certificates

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 Scientific Symposia.

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.

ASOPRS requires disclosure of financial relationships with ineligible companies for the past 24 months from all individuals in control of content. **Ineligible companies** are defined as *companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients*. All financial relationships with ineligible companies are requested, regardless of the amount or the individual's perception of relevancy.

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.



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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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If an individual in control of content is suspected of wrongdoing in accordance with the CME Education Policy & Procedure, the Accreditation Committee will investigate and follow up with their determination in writing.

Individuals may appear under both the "Relevant" and "Not Relevant" headings if they have multiple roles or are associated with multiple abstracts.

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Greg Borschel	Presenter	Axogen Inc, Axocell Inc	Consultant/Advisor	No
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Patrick C. Demkowicz	Presenter	Roivant Sciences	Stocks	No
Raymond S Douglas	Co-Author	Sling Therapeutics	Consultant/Advisor	No
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Andrea Kossler	Co-Author	1-Amgen, Viridian, Kriya, Lassen, Ethyreal Bio, Genentech/Roche, Argenx, Immunovant, Axogen, Khartis Therapeutics 2-Amgen, Sling, Viridian, Kriya, Lassen	1-Consultant/Advisor 2-Independent Contractor	1-No 2-No
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Mark Lucarelli	Moderator	1-Amgen 2-Viridian	1-2-Consultant/Advisor	1-2-Yes
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Ronald Mancini	Co-Author	Squid Healthcare	Ownership interests	No
Tanuj Nakra	Panelist, Co-Author	Avya	Ownership interests	No
John Nguyen	Co-Author	1-Amgen 2-Viridian	1-Researcher 2-Researcher	1-No 2-No
Navdeep Nijhawan	Abstract Reviewer	1-Roche 2-Amgen 3-Viridian	1-Speakers Bureau 2-Speakers Bureau, Consultant/ Advisor 3-Researcher	1-Yes 2-3-No
Sathyadeepak Ramesh	Abstract Reviewer	1-Poriferous 2-Amgen 3-Viridian	1-Royalties or Patent beneficiary 2-Consultant/Advisor 3-Researcher	1-No 2-No 3-No
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Shoaib Ugradar	Presenter	1-Amgen 2-Viridian Therapeutics	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
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Bryan Winn	Co-Author	Genentech	Consultant/Advisor	Yes
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Anne Barmettler	Co-Author	Revance Therapeutics, Inc.	Other	No
César Briceño	Panelist	1-Roche 2-Genentech 3-Amgen 4-Argenx 5-Regeneron 6-Kriya Therapeutics	1-6-Consultant/Advisor	1-6-No
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Christopher Dermarkarian	Co-Author	ArgenX	Researcher	Yes
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Lora Glass	Moderator	1-Thieme Publisher 2-Ora Inc.	1-Royalties 2-Consultant/Advisor	1-2-No



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Don O. Kikkawa	Co-Author	Amgen, Immunovant, Genentech, Acelyrin, Lassen Therapeutics, Viridian, Ethyreal Bio, Crinetics	Consultant/Advisor	No
Bobby Korn	Moderator, Co-Author	1-Amgen 2-Acelyrin 3-Argenx 4-Genentech 5-Viridian 6-Immunovant	1-Consultant/Advisor 2-Consultant/Advisor 3-Consultant/Advisor 4-Consultant/Advisor 5-Consultant/Advisor 6-Consultant/Advisor	1-No 2-No 3-No 4-No 5-No 6-No
Andrea Kossler	Panelist	1-Amgen, Viridian, Kriya, Lassen, Ethyreal Bio, Genentech/Roche, Argenx, Immunovant, Axogen, Khartis Therapeutics 2-Amgen, Sling, Viridian, Kriya, Lassen	1-Consultant/Advisor 2-Independent Contractor	1-No 2-No
Wendy Lee	Co-Author	Allergan, Galderma, Revance, Evolus, Horizon, RVL, Tarsus, RoC, and Solta	Consultant/Advisor	No
Sophie Liao	Moderator	1-Immunovant 2-Tourmaline 3-Viridian 4-Kriya Therapeutics	1-4-Researcher	1-4-No
Catherine Y. Liu	Co-Author	1-Amgen 2-Genentech 3-Lassen Therapeutics 4-Viridian 5-Wolters Kluwer	1-Researcher 2-Researcher 3-Researcher 4-Consultant/Advisor 5-Royalties	1-No 2-No 3-No 4-No 5-No
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Name	Role	Company	Relationship	Ended
John Nguyen	Co-Author	1-Amgen 2-Viridian	1-Researcher 2-Researcher	1-No 2-No
Navdeep Nijhawan	Moderator	1-Roche 2-Amgen 3-Viridian	1-Speakers Bureau 2-Speakers Bureau, Consultant/ Advisor 3-Researcher	1-Yes 2-3-No
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Paul Phelps	Panelist, Co-Author	1-Lumenis 2-Amgen	1-Consultant/Advisor 2-Consultant/Advisor	1-No 2-No
Sathyadeepak Ramesh	Moderator, Presenter	1-Poriferous 2-Amgen 3-Viridian	1-Royalties or Patent beneficiary 2-Consultant/Advisor 3-Researcher	1-No 2-No 3-No
Kelsey Roelofs	Co-Author	Amgen	Consultant/Advisor	No
Roman Shinder	Co-Author	1-Amgen 2-Springer	1-Consultant/Advisor 2-Royalties	1-No 2-No
Erin Shriver	Co-Author	1-Amgen 2-Immunovant	1-Consultant/Advisor 2-Researcher	1-No 2-Yes
Ann Q. Tran	Moderator, Co-Author	1-Genentech 2-Axogen 3-Argenx	1-3-Consultant/Advisor	1-No 2-Yes 3-Yes
Ana Carolina Victoria	Panelist	1-Amgen 2-Viridian 3-Candela Medical	1-2-Speakers Bureau 3-Researcher	1-3-No
Sara Wester	Moderator, Co-Author	1-Amgen, Immunovant, Kriya Therapeutics, Lassen Therapeutics, Sling Therapeutics 2-Amgen, argenx, Immunovant, Lassen Therapeutics, Sling Therapeutics, Tourmaline Bio	1-Consultant/Advisor 2-Independent Contractor	1-No 2-No
Bryan Winn	Moderator	Genentech	Consultant/Advisor	Yes



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Name	Role	Company	Relationship	Ended
Michael Yen	Moderator, Co-Author	1-Amgen; Lassen Therapeutics; Tourmaline	1-Researcher	1-No
		Bio; Argenx; Viridian Therapeutics	2-Consultant/Advisor	2-No
		2-Argenx; Sling Therapeutics; Viridian	3-Consultant/Advisor	3-No
		Therapeutics	4-Consultant/Advisor	4-No
		3-Axogen	5-Consultant/Advisor	5-No
Michael Yoon	Co-Author	4-Ipsen Innovation		
		5-Kriya Therapeutics		
Sandy Zhang-Nunes	Presenter	1-Amgen	1-Researcher	1-No
		3-Viridian	2-Researcher	2-Yes
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All other individuals in control of content have declared that they had no financial relationships with ineligible companies in the last 24 months.



Moderators: Carolina A. Chiou and Navdeep Nijhawan

7:31–7:34 am

Eyelid Ecchymosis as a Presenting Sign of Acute Infectious Purpura Fulminans

Libing Kathy Dong, Matthew Hoffman, Chau Pham
Iowa City, Iowa, United States

Introduction: Acute infectious purpura fulminans (AIPF) is a rare and rapidly progressive hematologic syndrome caused by uncontrolled systemic microvascular thrombosis. It is considered an extreme thrombotic type of disseminated intravascular coagulation and is often associated with an underlying bacterial bloodstream infection, leading to the triad of severe consumptive coagulopathy, systemic inflammatory response syndrome, and purpuric rash. The skin lesions in AIPF classically begin with painful well-demarcated purpuric lesions that progress into hemorrhagic bullae, ultimately forming necrotic eschars. This case demonstrates periocular findings of AIPF in a young child and describes eyelid ecchymosis as its presenting sign.

Methods: Case report

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Results: A previously healthy 9-year-old male was transferred to the University Hospital for acute onset bilateral asymmetric eyelid edema and ecchymosis in the setting of a concurrent upper respiratory infection. Upon arrival, the patient was found to be in septic shock and became hemodynamically unstable. He was immediately intubated and transferred to the intensive care unit. Laboratory findings were consistent with disseminated intravascular coagulation. Due to the eyelid ecchymosis being the primary abnormal external finding, evaluation for necrotizing fasciitis as the source of infection was undertaken. CT orbit showed small pockets of subcutaneous and intramuscular air within the right orbicularis muscle, corresponding to the area of eyelid ecchymosis. The patient was subsequently taken to the OR for exploration without findings of necrotizing fasciitis, and endoscopic sinus surgery was performed by the otolaryngology team. Intraoperative biopsies of the orbicularis muscle demonstrated multifocal capillary and small vessel fibrin thrombi with overlying hemorrhage. Over the course of the next two days, the purpuric rash developed on all four extremities and trunk, leading to the diagnosis of purpura fulminans secondary to staphylococcus pyogenes septicemia. The patient was treated with broad-spectrum antibiotics and correction of underlying coagulation and metabolic disorders, and was extubated on day 12 with progressive improvement in his eyelid ecchymosis. Photos from the duration of his hospital stay demonstrates the progression of his periorcular and systemic rash.

Conclusions: This is the first reported case of eyelid ecchymosis as the presenting sign of acute infectious purpura fulminans. Previously reported cases primarily involve the distal extremities but can also involve the acral facial structures (nose, lips, ears, scalp). Early recognition of AIFP is crucial for timely systemic support, as mortality rates are reported up to 50%. Differentiation from necrotizing fasciitis allows for conservative surgical debridement and improved functional and cosmetic outcomes.

(continued)

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Figure 1: Bilateral eyelid ecchymosis on presentation



Figure 2: Evolution of eyelid ecchymosis throughout hospitalization



References

1. Andreasen TJ, Green SD, Childers BJ. Massive infectious soft-tissue injury: diagnosis and management of necrotizing fasciitis and purpura fulminans. *Plast Reconstr Surg*. 2001;107(4):1025-1035. doi:10.1097/00006534-200104010-00019
2. Childers BJ, Cobanov B. Acute infectious purpura fulminans: a 15-year retrospective review of 28 consecutive cases. *Am Surg*. 2003;69(1):86-90.
3. Bendapudi PK, Whalen MJ, Lahoud-Rahme M, Villalba JA. Case 7-2021: A 19-Year-Old Man with Shock, Multiple Organ Failure, and Rash. *N Engl J Med*. 2021;384(10):953-963. doi:10.1056/NEJMcpc2027093
4. Abdul Gafoor SM, Gelson Thomas A, Boissiere J, Roberts L, Bernal W, Creamer D. Purpura fulminans: a dermatological emergency revisited. *Clin Exp Dermatol*. 2026;51(2):212-219. doi:10.1093/ced/llaf373

7:34–7:37 am

Coexisting Thyroid Eye Disease and IgG4-Related Ophthalmic Disease With Bilateral Superior Ophthalmic Vein-Associated Lesions: A Two-Patient Case Series

Tomoyuki Maeda, Tomoyuki Kashima, Saori Kotaki
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Introduction: Thyroid eye disease (TED) and IgG4-related ophthalmic disease (IgG4-ROD) are inflammatory orbital disorders that may share overlapping clinical and radiographic features, making diagnosis challenging in atypical cases.^{1–3} Superior ophthalmic vein (SOV)-associated lesions appear to be particularly uncommon within this overlap spectrum, and distinguishing simple venous enlargement from true perivenous disease is clinically important.⁴ Here, we report 2 men with long-standing TED who developed bilateral SOV-associated orbital lesions and underwent orbital decompression with lesion excision, with histopathologic findings supporting coexisting IgG4-ROD.

Methods: Retrospective single-center case series of 2 men with longstanding TED who developed bilateral SOV-associated orbital lesions. Both patients underwent orbital decompression and lesion excision, and all excised specimens were submitted for histopathologic evaluation including IgG4 immunostaining. Clinical history, orbital imaging, operative findings, histopathology, and postoperative outcomes were reviewed.

Results: Patient 1, a 73-year-old man with TED since 2007 and prior orbital decompression, thyroidectomy, and strabismus surgery, presented with severe bilateral proptosis, lid retraction, and diplopia in all gaze positions. MRI demonstrated marked orbital fat expansion, chronic extraocular muscle changes, and bilateral cord-like lesions extending from the eyelids to the posterior orbit. He underwent staged bilateral medial wall decompression, fat decompression, and lesion excision, followed by repeat right orbital lesion excision. Histopathology showed marked fibrosis and abundant IgG4-positive plasma cells (60–75/HPF; IgG4/IgG 52%–55%), supporting IgG4-related ophthalmic disease.

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Patient 2, a 56-year-old man with Graves disease diagnosed in 2017, presented with bilateral proptosis, diplopia in upgaze, lid retraction, and bilateral SOV enlargement on imaging. Despite periocular triamcinolone and 5 courses of intravenous methylprednisolone, sequential right and left orbital lesion excisions with adjunctive fat decompression were required. Right-sided pathology showed a fibrosing lymphocytic lesion in perisuperior ophthalmic vein tissue. Left-sided pathology showed lymphoid follicle formation, plasma cell infiltration, and fibrosis; immunohistochemistry demonstrated IgG4 positivity in >40% of IgG-positive plasma cells, with >10 IgG4-positive cells per high-power field and no evidence of malignancy, supporting IgG4-related ophthalmic disease. In both patients, surgery provided tissue diagnosis and was associated with improvement in proptosis and periocular contour, whereas diplopia changed little.

Conclusions: Coexisting TED and IgG4-related ophthalmic disease may present with bilateral SOV-associated lesions. In TED patients with atypical SOV enlargement, cord-like perivenous lesions, or tumor-like orbital findings, IgG4-related ophthalmic disease should be included in the differential diagnosis. Orbital decompression with lesion excision may clarify the disease process and can also improve proptosis and periocular deformity in selected cases.

Figure 1

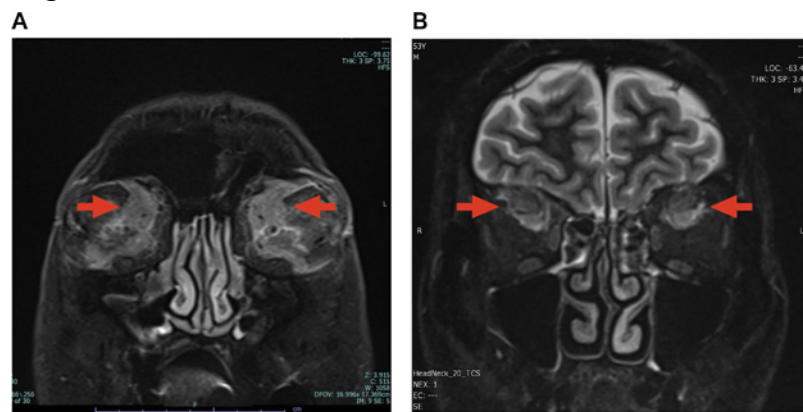


Figure 2

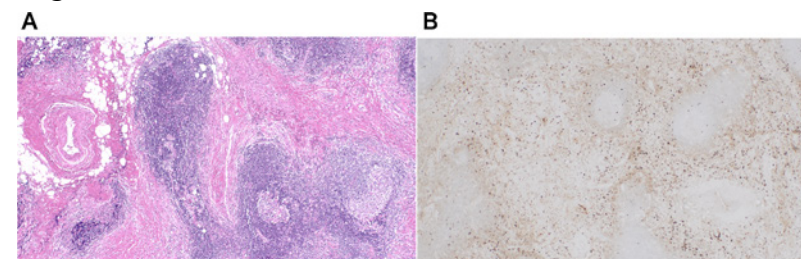


Figure 3



References

1. Takahira M, Goto H, Azumi A. The 2023 revised diagnostic criteria for IgG4-related ophthalmic disease. *Jpn J Ophthalmol*. 2024;68:293-301.
2. Khandji J, Campbell AA, Callahan AB, et al. IgG4-related orbital disease masquerading as thyroid eye disease, vice versa, or both? *Orbit*. 2018;37:239-242.
3. Tooley AA, Salomao DR, Bradley EA, Garrity JA. Distinguishing IgG4-Related Ophthalmic Disease From Graves Orbitopathy. *Ophthalmic Plast Reconstr Surg*. 2019;35:170-176.
4. Yamagishi A, Oshitari T, Tawada A, Baba T, Yamamoto S. The Case of IgG4-Related Ophthalmic Disease with Perivascular Lesions of Superior Ophthalmic Vein Associated with Optic Nerve Disturbance. *Neuroophthalmology*. 2018;42(4):251-255.

7:37–7:40 am

Primary Lacrimal Sac Melanoma: A Case Series

Alejandro Henao-Posada^{1,2}, Agni Kakouri³, J. Matthew Debnam⁴, Bitá Esmaeli^{5,6,7}

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Introduction: Primary malignant melanoma of the lacrimal sac is a very rare cancer with aggressive behavior and poor prognosis. Presentation often mimics chronic dacryocystitis or nasolacrimal duct obstruction, contributing to delayed diagnosis. We present 2 cases of primary lacrimal sac/duct melanoma and describe clinical presentation, diagnostic evaluation, treatment course, and outcomes, emphasizing multidisciplinary management.

Methods: This retrospective case series included 2 patients with histopathologically confirmed lacrimal sac melanoma. Clinical data reviewed included presenting symptoms, examination findings, biopsy results, imaging studies, multidisciplinary planning, operative management, and oncologic course. Primary endpoints were disease extent at presentation, interval progression, and treatment course.

Results: Case 1 was a 68-year-old woman who presented with left epiphora and intermittent bloody ocular and nasal discharge who was found to have some thickening of the lacrimal sac during a dacryocystorhinostomy. A biopsy confirmed the diagnosis of melanoma. A total body PET/CT showed an FDG-avid lesion involving the left lacrimal sac and nasolacrimal duct without distant metastasis. MRI demonstrated extension into the nasal cavity, inferior turbinate, and orbit. Despite neoadjuvant therapy with ipilimumab/nivolumab the patient experienced progression of disease. She had eye sparing surgery including resection of the orbital component of the mass and the nasolacrimal duct component of the mass and free flap reconstruction followed by radiation therapy. Pathology demonstrated in situ and invasive melanoma with lymphovascular invasion, microscopic satellitosis, 15-mm thickness, sinonasal tissue and bone invasion. During the procedure a left perifacial lymph node was biopsied and found to have metastatic melanoma. The patient unfortunately had a short interval local recurrence and subsequently had an orbital exenteration and adjuvant immune checkpoint inhibitor therapy. Despite these efforts, she passed away 12 months after initial presentation.

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Case 2 was a 41-year-old man with 5 months history of left sided epiphora developed a medial canthal/lacrimal sac mass, diplopia on awakening, headaches, and epistaxis. A biopsy of the lacrimal sac area showed melanoma, and MRI demonstrated a 2.6x1.4x2.4 cm enhancing anterior medial orbital mass with extension into the ethmoid sinus and orbital soft tissue. Systemic work up did not show distant metastasis; however a suspicious Level IB lymph node was noted on ultrasonography and subsequently biopsied and proved to harbour melanoma metastasis. The mass in the orbit grew rapidly with progressive orbital soft tissue and skull base involvement. He had urgent multi-disciplinary surgery to include en bloc radical resection including orbital exenteration, nasolacrimal system resection, ethmoidectomy, partial rhinectomy, frontal sinus and skull base resection, medial maxillectomy, neck dissection, and free flap reconstruction. He subsequently had adjuvant radiation therapy and adjuvant chemotherapy/immune checkpoint inhibitor therapy.

Conclusions: Together, these cases demonstrate the biologically aggressive nature of primary lacrimal sac/duct melanomas. Both patients had regional nodal metastasis and a rapid growth pattern. Immune checkpoint inhibitor therapy was tried in one patient and was not effective. Despite multi-disciplinary management the prognosis for primary lacrimal sac melanoma is guarded.

Figure 1



Figure 2



References

1. Goh LY, Limbachia K, Moonim M, Morley AMS. Primary lacrimal sac melanoma: a case report describing the novel use of fine needle aspiration cytology (FNAC) for diagnosis, together with literature review and immunotherapy treatment update. *Orbit*. 2022 Sep 7;1-10. doi:10.1080/01676830.2022.2119264.
2. Sitole S, Zender CA, Ahmad AZ, Hammadeh R, Petruzzelli GJ. Lacrimal sac melanoma. *Ophthalmic Plast Reconstr Surg*. 2007;23(5):417-419.

7:40–7:43 am

Asymmetric Clinical Response in Bilateral Conjunctival Squamous Cell Carcinoma: Implications of Tumor Profiling

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Introduction: Conjunctival squamous cell carcinoma (SCC) is the most common primary conjunctival malignancy.¹ Next-generation sequencing-based molecular profiling emerged as a promising avenue to guide management of SCC, including immune checkpoint inhibitor (ICI)-based therapies for advanced disease.^{2,3}

Methods: Case report.

Results: A 45-year-old African American female with no significant past medical or surgical history presented with a two-month history of right lower eyelid swelling associated with mucoid discharge. She was not taking medications. Social history was negative for tobacco, alcohol, and recreational drugs. She had not been vaccinated for human papillomavirus.

Eye examination was notable for dense conjunctival papillae bilaterally and a sessile 9mm x 10mm x 2mm lesion in the right inferior forniceal conjunctiva. The patient was lost to follow-up for 7 months. On return, examination demonstrated a 20mm x 20mm x 6mm mm firm sessile papillary mass with leukoplakia and overlying mucoid discharge in the right inferotemporal forniceal conjunctiva (Figure 1A) and a new 20mm x 10mm x 3mm mm sessile papillary mass with associated leukoplakia and pigmentation in the left inferior forniceal conjunctiva (Figure 1B).

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The patient underwent incisional biopsy of the right conjunctival lesion with pathology showing invasive moderately differentiated squamous cell carcinoma, clear cell variant (Figure 2). Incisional biopsy of the left lower eyelid lesion showed similar pathology (Figure 2). Systemic workup and imaging were negative for orbital invasion but revealed hypermetabolic bilateral cervical nodes compatible with nodal metastasis, consistent (AJCC 8th ed., T2, N1). Systemic therapy with cemiplimab was initiated, along with topical and intralesional 5-fluorouracil to both lower eyelids. The right-sided lesion showed complete, histopathologically-confirmed response (Figure 1C), whereas left conjunctival tumor persisted (Figure 1D). Treatment was escalated to carboplatin and paclitaxel chemotherapy, and immunotherapy was transitioned to pembrolizumab for further neoadjuvant cytoreduction prior to surgical resection. Given persistent incomplete response of the left conjunctival tumor, posterior lamellar resection with reconstruction using a buccal mucosal graft with ophthalmic conformer with amniotic membrane plus ring and temporary tarsorrhaphy was performed (Figure 1E and 1F). Pathology revealed transformation to poorly differentiated squamous cell carcinoma and spindle cell squamous cell carcinoma (sarcomatoid carcinoma) (Figure 3). Sixteen months post-operatively, she remains under close local and systemic surveillance with a multidisciplinary team with no evidence of residual disease.

Comprehensive genomic profiling of the right and left conjunctival lesions showed pathogenic variants in *TP53*. However, right conjunctival tumor had tumor mutational burden (TMB) of 8 mutations/megabase (mut/Mb) of DNA and *NOTCH1* and *FAT1* pathogenic variants, potent sensitizers to standard ICI therapy, while the initial biopsy of the left conjunctival tumor had TMB of 5 mut/Mb and *PIK3CA* amplification, associated with tumor aggressive behavior and resistance to traditional ICI therapy. The residual/recurrent poorly differentiated left conjunctival SCC additionally showed *MTAP* deletion, associated with sarcomatoid carcinoma.

Conclusions: This case illustrates the impact of genomic landscape on biologic behavior of clinically similar (T2 N1) bilateral conjunctival SCC. Incorporation of molecular profiling in diagnostic arsenal of conjunctival SCC may allow for identification of molecularly and biologically distinct SCC subtypes and inform management.

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Figure 1

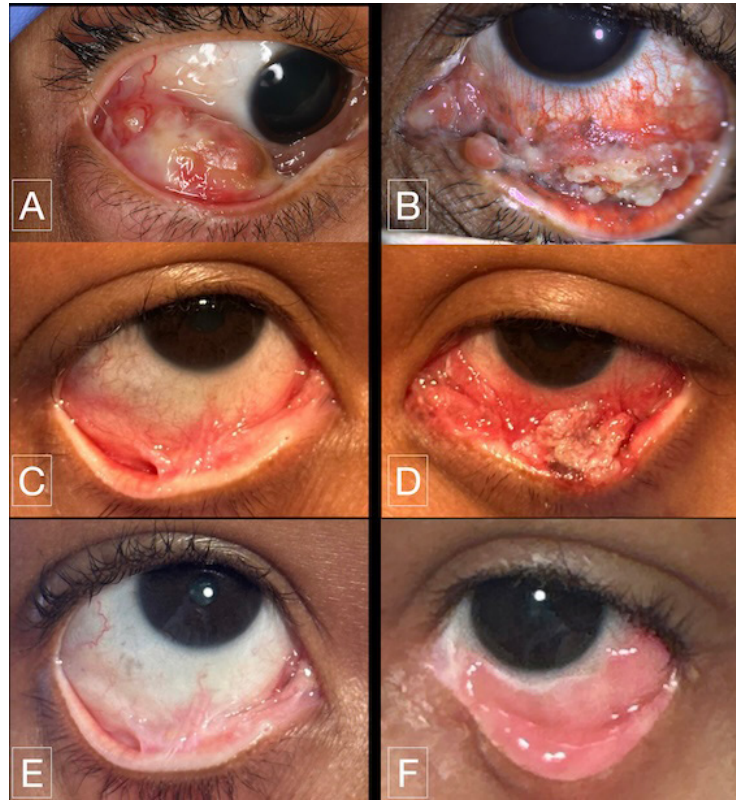


Figure 2

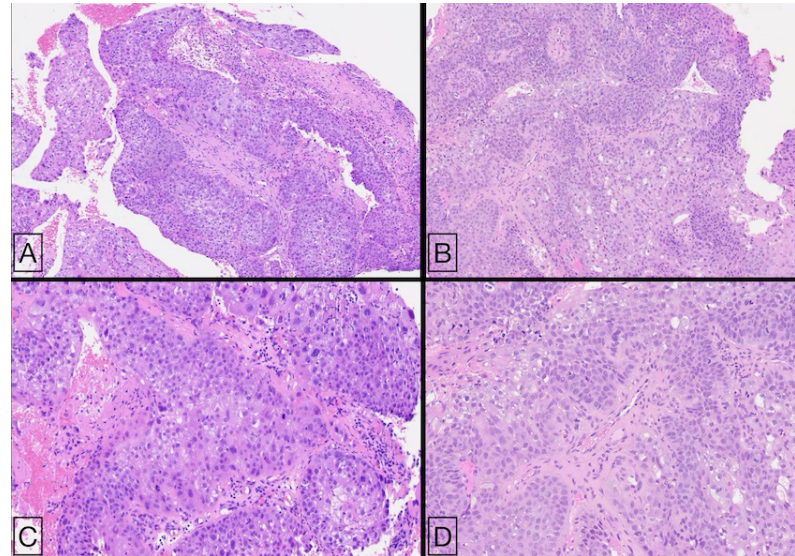
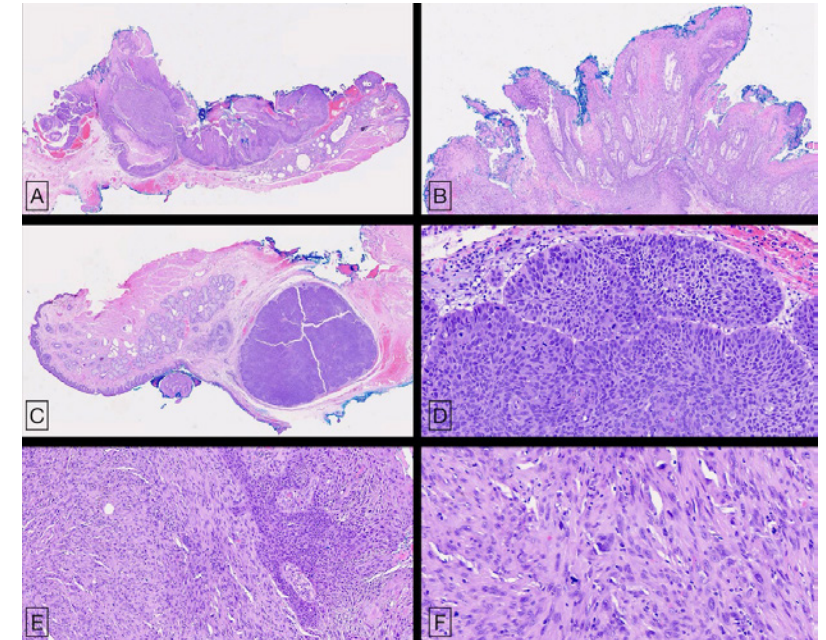


Figure 3



References

1. Shields CL, Demirci H, Karatza E, Shields JA. Clinical survey of 1643 melanocytic and nonmelanocytic conjunctival tumors. *Ophthalmology*. 2004;111(9):1747-1754.
2. Demirci H, Vo JN, Wu YM, et al. Next-Generation Sequencing-Based Molecular Profiling of Conjunctival Squamous Cell Carcinoma and Its Potential Application for Therapy. *Ophthalmol Sci*. 2025;5(5):100801. Published 2025 Apr 23.
3. Demirci H, Elner VM, Demirci FY, et al. Immunotherapy for Conjunctival Squamous Cell Carcinoma with Orbital Extension. *Ophthalmology*. 2021;128(5):801-804.

7:43–7:46 am

Pembrolizumab as First-Line Treatment for Non-Metastatic Merkel Cell Carcinoma of the Eyelid

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Introduction: Merkel cell carcinoma (MCC) is a rare, aggressive, neuroendocrine tumor bearing similarities to Merkel cells. Despite a lower incidence rate ranging from 0.1 to 1.6 cases per 100,000 people per year, 5-year survival rates can be as low as <50%, even for stage I disease.^{1,2}

Immune checkpoint inhibitors targeting PD-1 and PD-L1 have emerged as first-line forms of therapy due to improved survival, decreased toxicity, and longer response duration compared to chemotherapy.^{2,3} Pembrolizumab as a first-line monotherapy has primarily been studied in the context of advanced disease, where objective response rates hover at around 50%.^{4,5,6}

Methods: The authors present a case report of local Merkel cell carcinoma on the upper right eyelid in an 83-year-old female treated with an immune checkpoint inhibitor.

Results: An 83-year-old Caucasian female former smoker with an ophthalmologic history of pseudophakia and neovascular age-related macular degeneration treated with Anti-VEGF therapy presented to an optometrist clinic with a rapidly growing, well-circumscribed right upper eyelid mass (Figure 1). At presentation, the patient had a visual acuity of 20/50, with no apparent visual deficits from the mass.

Following oculoplastics consultation, the patient underwent MRI imaging (Figure 2), which revealed a hyperintense mass near the right lacrimal gland measuring 2 x 2.6 x 2.7 cm (AP x TV x CC). A biopsy confirmed the diagnosis of Merkel cell carcinoma. The patient opted for treatment with pembrolizumab, given the high morbidity associated with surgery. She underwent 9 cycles of pembrolizumab and demonstrated an exceptional response (Figure 3) before pausing treatment due to immune checkpoint inhibitor colitis. Eleven months following the end of her pembrolizumab treatment, the patient's tumor began to grow, prompting the initiation of treatment with avelumab, a PD-L1 inhibitor. She has demonstrated an excellent response to this treatment.

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Conclusions: Our case demonstrates the second reported case of non-metastatic MCC of the eyelid treated with pembrolizumab⁷ and the first instance of consecutive checkpoint inhibitor treatment without surgery. This case also serves to highlight that treatment with PD-1 and/or PD-L1 inhibitors, though efficacious, may be limited in their long-term use due to side effects. Although pembrolizumab was stopped, the patient demonstrated a near-complete response, and she continues to demonstrate an excellent response to avelumab. Overall, the high mortality of MCC necessitates novel treatment, especially in the periocular area, where surgery is associated with high morbidity. Despite limitations, our case suggests that checkpoint inhibitors may fill this gap in care.

Figure 1



Figure 2

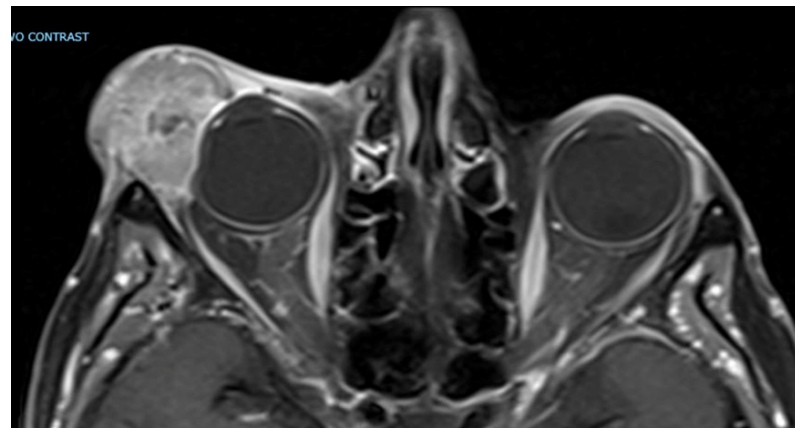
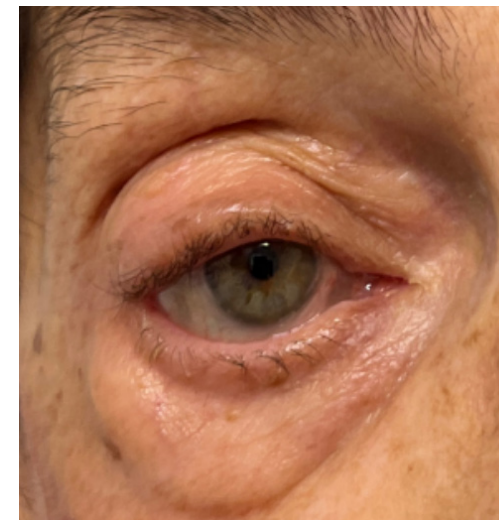


Figure 3



References

- Oliveira, Stella, et al. "Merkel Cell Carcinoma: Epidemiology, Clinical Features, Diagnosis and Treatment of a Rare Disease." *Anais Brasileiros de Dermatologia*, vol. 98, no. 3, 1 May 2023, pp. 277–286, <https://doi.org/10.1016/j.abd.2022.09.003>.
- Walsh NM. Merkel cell carcinoma of the eyelid and periocular region: A review. *Saudi J Ophthalmol*. 2022 Apr 18;35(3):186–192. doi: 10.4103/SJOPT.SJOPT_55_21. PMID: 35601863; PMCID: PMC9116095.
- M. Banlin, M. S. Goh, and J. J. Khong, "Contemporary Management of Malignant Eyelid Tumours: Surgical and Immunotherapeutic Advances," *Clinical & Experimental Ophthalmology* 54, no. 3 (2026): 320–340, <https://doi.org/10.1111/ceo.70062>.
- Mortier L, Villabona L, Lawrence B, Arance A, Butler MO, Beylot-Barry M, Saiag P, Samimi M, Ascierto PA, Spada F, De Pontville M, Maio M, Berrocal A, Espinosa E, Capdevila J, Levin M, Das D, Krepler C, Grebennik D, Chiarion-Sileni V. Pembrolizumab for the First-Line Treatment of Recurrent Locally Advanced or Metastatic Merkel Cell Carcinoma: Results from the Single-Arm, Open-Label, Phase III KEYNOTE-913 Study. *Am J Clin Dermatol*. 2024 Nov;25(6):987–996. doi: 10.1007/s40257-024-00885-w. Epub 2024 Oct 8. PMID: 39377880; PMCID: PMC11511690.
- Paul Nghiem et al. Durable Tumor Regression and Overall Survival in Patients With Advanced Merkel Cell Carcinoma Receiving Pembrolizumab as First-Line Therapy. *J Clin Oncol* 37, 693–702(2019). DOI:10.1200/JCO.18.01896.
- Nghiem, Paul T., et al. "PD-1 Blockade with Pembrolizumab in Advanced Merkel-Cell Carcinoma." *The New England Journal of Medicine*, vol. 374, no. 26, 30 June 2016, pp. 2542–2552, www.ncbi.nlm.nih.gov/pmc/articles/PMC4927341/, <https://doi.org/10.1056/NEJMoa1603702>.
- Zhan S, Nguyen M, Hollsten J. Immune checkpoint inhibition therapy as first-line treatment for localized eyelid Merkel cell carcinoma in a nonsurgical candidate. *Canadian Journal of Ophthalmology*. 2024;59(2):e183–e184. <https://doi.org/10.1016/j.jcjo.2023.10.019>

7:46–7:49 am

Novel Treatment of a Periorbital Epithelioid Hemangioma with Sirolimus

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Introduction: Epithelioid hemangioma (EH), also known as angiolymphoid hyperplasia with eosinophilia, is a rare vascular neoplasm which can arise at the site of damaged blood vessels, and while it often presents in the head and neck region, it rarely involves the orbit.^{1–4} EH is histologically benign but capable of aggressive local behavior. EH is typically a well-formed vascular nodule lined with epithelioid endothelial cells and an inflammatory infiltrate. Pathogenesis is attributed to a FOS or FOSB gene rearrangement, though cases have been found with other gene mutations.^{1,5,6} EH typically presents in the 4th decade as a slow growing nodule, occasionally with pain, bleeding, and pruritis.^{1,5} The rarity of EH is a barrier to studying novel treatment modalities, which are extrapolated from management of other vascular neoplasms, such as infantile hemangiomas and epithelioid hemangioendothelioma. The most common treatment modality is surgical excision, while medical therapies include beta blockers, steroids, and other immune suppressants.⁴ Even in the setting of prompt intervention, the rate of recurrence/treatment failure is high: 14% after surgical excision and 88% after systemic steroids.^{4,7}

Methods: Case report and literature review.

Results: A thirteen-year-old male with a history of asthma presented with a mildly tender nodule at the right lower lateral canthus for 6 months. He was initially discharged from the emergency department with a diagnosis of chalazion, but the lesion slowly enlarged and he returned and obtained a CT showing a cystic lesion and an MRI orbit with and without contrast showing a likely neoplasm with surrounding soft tissue inflammation. The patient reported progressive growth of the nodule with transient blurred vision. Incisional biopsy showed an epithelioid hemangioma. Further surgery for gross total resection was performed, however shortly afterwards he developed persistent bleeding from the lateral canthus and conjunctiva, and a recurrent lesion was noted on exam and MRI. A course of systemic steroids yielded no improvement. Oral propranolol was initiated after a discussion with the patient’s family, though was soon discontinued due to exacerbation of the patient’s asthma. The patient was then referred to oncology and started on systemic sirolimus. Two years after initiation, the nodule is no longer visible on exam and shows regression on MRI, and no recurrent symptoms or medication adverse events have been noted.

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Conclusions: This case highlights the novel use of sirolimus in EH and its efficacy in an otherwise refractory lesion. Sirolimus, also known as rapamycin, is an antiproliferative agent that acts as an inhibitor of mTOR, a key promotor of cell proliferation.⁸ Sirolimus likely leads to suppression of endothelial cell proliferation, and reduction of inflammatory cytokines. Sirolimus has been shown to induce tumor stability in epithelioid hemangioendothelioma, a malignant epithelioid vascular tumor, but there are no other published cases to our knowledge highlighting its use in EH.⁹ Our case demonstrates not only stability but involution of a recurrent EH lesion with long-term systemic sirolimus.

Figure 1

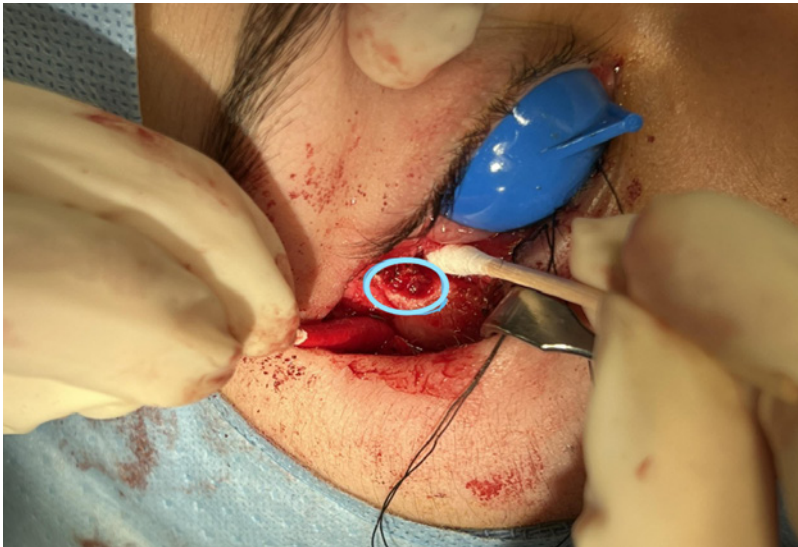
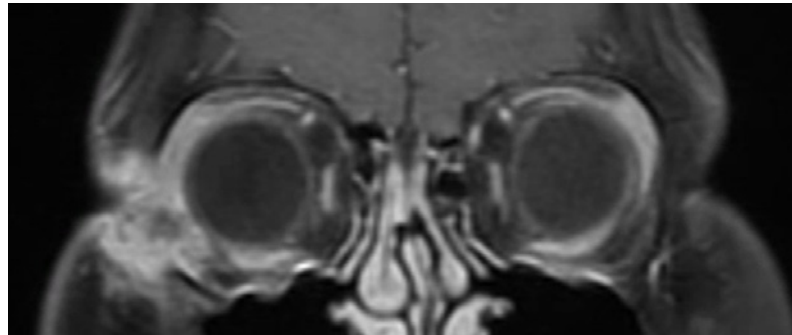


Figure 2



References

1. Luzar B, Ieremia E, Antonescu CR, Zhang L, Calonje E. Cutaneous intravascular epithelioid hemangioma. A clinicopathological and molecular study of 21 cases. *Mod Pathol*. Aug 2020;33(8):1527-1536. doi:10.1038/s41379-020-0505-4
2. Miličić B, Velnar T, Pregelj R, Limbaeck-Stokin C. Multiple epithelioid hemangiomas with orbital involvement. *Case Rep Pathol*. 2015;2015:629805. doi:10.1155/2015/629805
3. Brooks DR, Butnor KJ, Weinberg DA. Spontaneous orbital and periorcular hemorrhage in a patient with epithelioid hemangioma. *Ophthalmic Plast Reconstr Surg*. 2006;22(6):487-9. doi:10.1097/01.iop.0000244516.83893.de
4. Ahmed HS, Thrishulamurthy CJ, Venkatesh S, et al. Ophthalmic Manifestations of Angiolymphoid Hyperplasia with Eosinophilia: A Systematic Review and Pooled Analysis of 86 Cases. *Ophthalmic Plast Reconstr Surg*. 2025 Sep-Oct 01 2025;41(5):487-494. doi:10.1097/IOP.0000000000002880
5. Huang SC, Zhang L, Sung YS, et al. Frequent FOS Gene Rearrangements in Epithelioid Hemangioma: A Molecular Study of 58 Cases With Morphologic Reappraisal. *Am J Surg Pathol*. Oct 2015;39(10):1313-21. doi:10.1097/PAS.0000000000000469
6. Fetsch JF, Weiss SW. Observations concerning the pathogenesis of epithelioid hemangioma (angiolymphoid hyperplasia). *Mod Pathol*. Jul 1991;4(4):449-55.
7. Adler BL, Krausz AE, Minuti A, Silverberg JI, Lev-Tov H. Epidemiology and treatment of angiolymphoid hyperplasia with eosinophilia (ALHE): A systematic review. *J Am Acad Dermatol*. Mar 2016;74(3):506-12.e11. doi:10.1016/j.jaad.2015.10.011
8. Sehgal SN. Sirolimus: its discovery, biological properties, and mechanism of action. *Transplant Proc*. May 2003;35(3 Suppl):7S-14S. doi:10.1016/s0041-1345(03)00211-2
9. Stacchiotti S, Simeone N, Lo Vullo S, et al. Activity of sirolimus in patients with progressive epithelioid hemangioendothelioma: A case-series analysis within the Italian Rare Cancer Network. *Cancer*. Feb 15 2021;127(4):569-576. doi:10.1002/cncr.33247

7:49–7:52 am

Intraorbital Chlorpromazine for Refractory Persistent Socket Pain Following Enucleation: A Case Report

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Introduction: Persistent socket pain following enucleation is an uncommon but potentially debilitating condition with poorly defined pathophysiology and limited established treatment options. Pain may demonstrate overlapping inflammatory, structural, and neuropathic features, making management particularly challenging in refractory cases. We report a patient with chronic post-enucleation orbital pain requiring multiple reconstructive surgeries, extensive inflammatory workup, serial orbital injections of steroid and 5-FU, who ultimately achieved durable symptomatic relief with chlorpromazine-containing orbital injections.

Methods: A 44-year-old male with bilateral phthisical eyes secondary to congenital glaucoma underwent sequential bilateral enucleation for blind painful eyes, by an outside surgeon. Left-sided ocular pain resolved following surgery; however, the right orbit developed chronic, severe, and recurrent pain despite multiple interventions over a seven-year period.

Approximately one year after enucleation, the patient underwent right orbital implant removal with exploration and biopsy, which provided temporary relief. Three years later, he underwent right socket reconstruction with dermis fat grafting, again with only transient improvement. Recurrent episodes of severe right orbital pain continued despite multiple rounds of intraorbital corticosteroid and 5-fluorouracil (5-FU) injections. Evaluation of the right socket revealed conjunctival injection, but no implant exposure, erosion, or ulceration (Figure 1).

MRI revealed diffuse hyperintensity of the right orbital dermis fat graft with mild extraocular muscle enlargement concerning for chronic orbital inflammation (Figure 2). Extensive autoimmune and inflammatory laboratory evaluation was unremarkable. Subsequent anterior orbitotomy with biopsy demonstrated fibrous connective tissue with mild chronic inflammation without malignancy or granulomatous disease. Cultures were negative.

Intraorbital chlorpromazine (25 mg/mL × 1.0 mL) combined with 5-FU (50 mg/mL × 1.0 mL) was ultimately administered during orbitotomy in 2024, and later repeated as an office-based intraorbital injection for mild recurrent pain in 2025.

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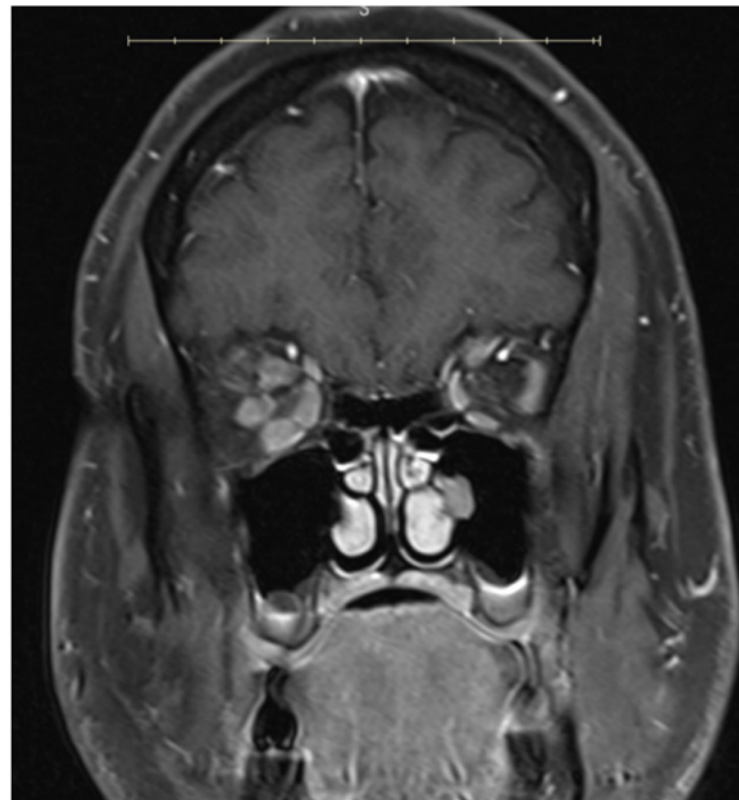
Results: Following the February 2025 intraorbital chlorpromazine/5-FU injection, the patient experienced complete resolution of right orbital pain sustained for approximately one year — the longest pain-free interval in his entire clinical course. When pain recurred again in March 2026, office-based retrobulbar chlorpromazine/5-FU injections reproduced comparable relief, without complications, tissue necrosis, conjunctival breakdown, or worsening socket contracture.

Conclusions: Persistent post-enucleation orbital pain may demonstrate overlapping inflammatory and neuropathic mechanisms and can remain refractory despite extensive reconstructive and anti-inflammatory management. In this patient, chlorpromazine-containing orbital injections provided the most durable and reproducible symptomatic relief during a prolonged and complex disease course. Chlorpromazine may exert analgesic effects through sensory denervation, and modulation of descending pain pathways via anti-adrenergic, anti-dopaminergic, and anti-serotonergic receptor activity. This case highlights the diagnostic complexity of persistent socket pain and suggests a role for chlorpromazine-based orbital therapy in carefully selected refractory cases.

Figure 1



Figure 2



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References

1. Hogeboom, C.S.E., Mourits, D.L., Ket, J.C.F., Tan, H.S., Hartong, D.T. and Moll, A.C. (2018), Persistent socket pain postenucleation and post evisceration: a systematic review. *Acta Ophthalmol*, 96: 661–672.
2. Fiore C, Lupidi G & Santoni G (1980): The effect of retrobulbar injection of chlorpromazine in the absolute glaucoma. *J Fr Ophtalmol*, 3: 397–399
3. Bastrikov NI (1989): [Symptomatic treatment of terminal painful glaucoma by the retrobulbar administration of aminazine]. *Vestn oftalmol*, 105:47–49
4. Al-faran MF & Al-omar OM (1990): Retrobulbar alcohol injection in blind painful eyes. *Ann Oph-thalmol*, 22: 460–462.
5. Eftekhari K, Shindler KS, Lee V, Dine K, Eckstein LA, Vagefi MR. Histologic Evidence of Orbital Inflammation from Retrobulbar Alcohol and Chlorpromazine Injection: A Clinicopathologic Study in Human & Rat Orbits. *Ophthalmic Plast Reconstr Surg*. 2016;32(4):302–304. doi:10.1097/IOP.0000000000000512
6. Abramoff MD, Ramos LP, Jansen GH, Mourits MP. Patients with persistent pain after enucleation studied by MRI dynamic color mapping and histopathology. *Invest Ophthalmol Vis Sci*. 2001;42(10):2188–2192.

7:52–7:55 am

A Rare Case Report of Orbital Nodular Fasciitis: Benign Imposter of the Orbit

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Introduction: Nodular Fasciitis (NF) is a master mimicker in pathology; a benign myofibroblastic proliferation whose rapid clinical evolution and concerning histological characteristics often strongly suggest highly aggressive sarcomas.¹⁻² This diagnostic ambiguity is amplified within the orbit, where NF is exceedingly rare, making an erroneous diagnosis particularly devastating due to the risk of overtreating surgical interventions. While the discovery of USP6 gene fusions provided a crucial diagnostic anchor, establishing USP6 Fluorescence In Situ Hybridization (FISH) as the primary confirmatory test, its reliability, as we demonstrate, is not absolute.¹⁻³ We present a critical case of periorbital NF where initial USP6 FISH was negative, yet subsequent next-generation sequencing (NGS) identified a novel USP6–PAFAH1B1 fusion. This case highlights the inherent diagnostic complexities of NF and mandates a nuanced, multi-modal approach for accurate differentiation from orbital sarcomas.

Methods: An 11-year-old boy with no past medical history presented with a palpable painless mass under the left eyebrow, which had enlarged over the past 6 months. His ultrasound revealed a 1.0 x 0.6 x 1.0 cm round hypoechoic lesion with a well-defined border in the left orbit (Figure 1A), suggesting the benign but incorrect diagnosis of an orbital dermoid.

Results: Ophthalmologic examination revealed a firm, irregular but mobile mass medial to the left zygomatic-frontal suture. Given the enlarging size and features, magnetic resonance imaging (MRI) with contrast was obtained, showing a 1.2 cm, enhancing mass in the preseptal plane, without bony invasion or post-septal extension (Figure 1B–C), contradicting dermoid diagnosis. The patient underwent left orbitotomy for excisional biopsy.

Intraoperatively, the lesion was unencapsulated, infiltrative, firm and rubbery with greyish discoloration. Histopathology revealed spindle cell proliferation arranged in short, irregular fascicles within a myxoid-to-collagenized stroma. Cells exhibited fine chromatin and pale, basophilic cytoplasm, consistent with nodular fasciitis (NF) (Figure 2A–B). Immunohistochemistry supported a myofibroblastic origin with strong smooth muscle actin (SMA) positivity (Figure 2C). This finding, common in NF, can also appear in certain sarcomas, maintaining a concerning differential diagnosis.

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Given the strong suspicion for NF, FISH for USP6 rearrangement was performed as the standard confirmatory test. Surprisingly, FISH was unequivocally negative, raising concerns for a false-negative finding or an alternative spindle-cell neoplasm with sarcoma potential, necessitating further investigation.

To resolve this diagnostic discordance, NGS was pursued, definitively identified a rare and previously unreported USP6–PAFAH1B1 fusion, confirming NF.

Conclusions: This critical case represents the second reported periorbital NF driven by a USP6–PAFAH1B1 fusion, challenging standard diagnostic pathways.³ It demonstrates that a negative USP6 FISH result does not definitively exclude nodular fasciitis, particularly when features strongly mimic aggressive orbital sarcomas. Given the devastating consequences of misdiagnosis in the orbital region, this case underscores the necessity for comprehensive genomic profiling, like NGS, to uncover rare or novel fusion partners when morphology suggests NF, but standard testing is unrevealing. Surgical excision remains diagnostic and curative, with low recurrence rates (1–2%), allowing for definitive management once identified.⁴ Our findings support a nuanced, multi-modal diagnostic approach to prevent overtreatment and ensure accurate, patient-centered care for this critical orbital lesion.

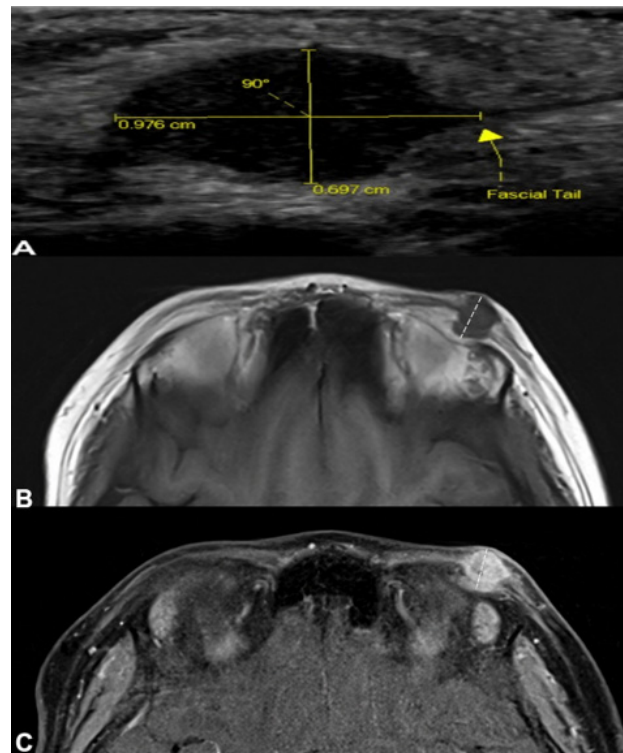


Figure 1A: Ultrasound depicting an anechoic mass.

Figure 1B: MRI of axial T1 pre-contrast demonstrating decreased T1 signal of the lesion.

Figure 1C: MRI of axial T1 post-contrast demonstrating a 1.2 cm avidly enhancing lesion.

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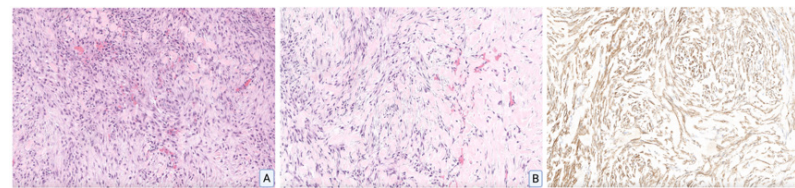


Figure 2A-B: Intermediate power views of hematoxylin-and-eosin-stained sections of spindle cell proliferation with irregular fascicles in myxoid-to-collagenized stroma. Figure 2C: Smooth muscle actin (SMA) stain demonstrates diffuse positivity.

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References

1. Font RL, Zimmerman LE. Nodular fasciitis of the eye and adnexa. Arch Ophthalmol. 1966;75:475–481.
2. Shields JA, Shields CL, Christian C, Eagle RC Jr. Orbital nodular fasciitis simulating a dermoid cyst in an 8-month-old child. Ophthalmic Plast Reconstr Surg. 2001;17(2):144–148.
3. Qiu Y, Peng R, Chen H, Zhuang H, He X, Zhang H. Atypical nodular fasciitis with a novel PAFAH1B1-USP6 fusion in a 22-month-old boy. Virchows Arch. 2021 Sep;479(3):623–629.
4. Hseu A, Watters K, Perez-Atayde A, Silvera VM, Rahbar R. Pediatric nodular fasciitis in the head and neck: evaluation and management. JAMA Otolaryngol-- Head Neck Surg. 2015;141(1):54–59

7:55–7:58 am

Off-Label Therapeutic Use of Intramuscular Nonavalent Human Papillomavirus Vaccine for Primary Conjunctival Squamous Cell Carcinoma with Orbital Involvement

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Introduction: Primary conjunctival squamous cell carcinoma (SCC) with orbital involvement is rare with no standardized treatment recommendations; however, it is typically managed aggressively with surgical excision, topical or injectable chemotherapy, and/or radiation. Immunotherapy is a new area of treatment currently being explored.^{1,2} The nonavalent Human Papillomavirus Vaccine (HPV) vaccine is approved for use in prevention of diseases including genital and mucosal cancers,⁴ has shown, in some case studies, a treatment effect in off-label use for cutaneous SCC⁵ as well as ocular surface neoplasia⁶ and ocular surface papillomas.⁷ However, there are no prior cases of the HPV vaccine treating conjunctival SCC with orbital involvement.

This report demonstrates a novel case of primary conjunctival SCC with orbital extension that was effectively treated with intramuscular injections (IM) of the HPV vaccine. Her history of multiple sclerosis made immunotherapy contraindicated due to the rare possibility of a potentially life-threatening flare. The tumor board recommended exenteration, but the patient declined the extensive surgery. She was offered off-label treatment based upon case reports in the dermatology and cornea/external disease literature. This case study demonstrates the vaccine's treatment potential as a safe and effective therapeutic alternative to radical surgery and immunotherapy.

Methods: This is a case report of a 61-year-old female patient who presented with two months of double vision and left eye irritation, found to have a 10x18mm papillary conjunctival lesion based in the inferior fornix and caruncle of the left eye with posterior extension into the orbit. A biopsy confirmed SCC. Refusing surgery, she was treated with five intramuscular injections of the HPV vaccine given every 4 to 6 weeks. The patient's lesion was evaluated and monitored with slit lamp examinations and computed tomography (CT) imaging.

Results: After one IM dose of the vaccine, the bulbar and forniceal conjunctival lesions visibly shrank; photographic documentation after 2 doses captures the overt reduction in tumor burden (Figure 1). After three doses, her double vision resolved and radiologic imaging findings confirmed clinical resolution of the orbital extension of the cancer (Figure 2). The ocular surface component continued to shrink and improve with subsequent doses of the vaccine. Interestingly, the patient's tissue tested negative for HPV subtypes 6, 11, 16, 18, 31, 33, 45, and 58.

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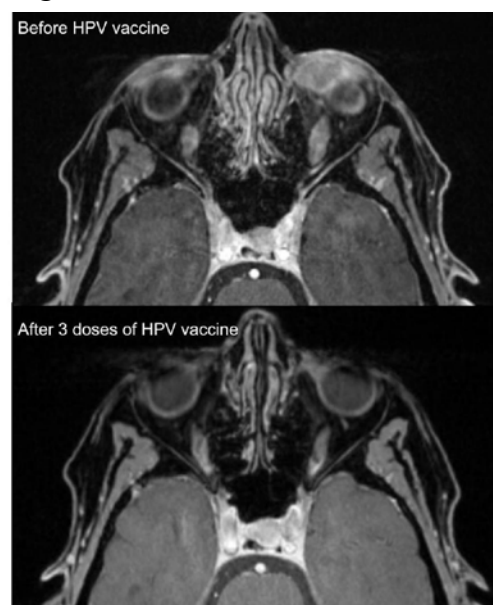
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Conclusions: The HPV vaccine may offer an effective, cost-efficient, and safe alternative for the management of conjunctival SCC with orbital involvement, particularly where current treatments are limited. While only currently available for prophylactic use in patients younger than 45 years, the HPV vaccine may have potential as a life-altering therapeutic option in cancer treatment. The patient will soon undergo map biopsies. Future studies are needed to evaluate the role of this vaccine for squamous neoplasia including HPV positivity and other factors to predict tumor response

Figure 1



Figure 2



References

1. Serbest Ceylanoglu K, Guneri Beser B, Singalavanija T, Juntipwong S, Worden FP, Demirci H. Targeted Therapy and Immunotherapy for Advanced Malignant Conjunctival Tumors: Systematic Review. *Ophthalmic Plast Reconstr Surg*. 2024 Jan-Feb 01;40(1):18-29. doi: 10.1097/IOP.0000000000002488.
2. Wolkow N, Lee NG, Emerick KS, Freitag SK, Kaufman HL, Miller DM, Chang HP, Stagner AM. Locally Advanced Conjunctival Squamous Cell Carcinoma not Responsive to Immune Checkpoint Inhibitor Therapy: 3 Cases and a Literature Review. *Ophthalmic Plast Reconstr Surg*. 2026 Jan 12. doi: 10.1097/IOP.0000000000003174.
3. GARDASIL®9 (Human Papillomavirus 9-valent Vaccine, Recombinant), Official Site. Gardasil9, 2025. <https://www.gardasil9.com/>. Accessed April 28, 2026.
4. U.S. Food and Drug Administration. GARDASIL 9. FDA-2025-D-125508. U.S. Food and Drug Administration; 2025. Accessed April 30, 2026. <https://www.fda.gov/vaccines-blood-biologics/vaccines/gardasil-9>.
5. Nichols AJ, Gonzalez A, Clark ES, Khan WN, Rosen AC, Guzman W, Rabinovitz H, Badiavas EV, Kirsner RS, Ioannides T. Combined Systemic and Intratumoral Administration of Human Papillomavirus Vaccine to Treat Multiple Cutaneous Basaloid Squamous Cell Carcinomas. *JAMA Dermatol*. 2018 Aug 1;154(8):927-930. doi: 10.1001/jamadermatol.2018.1748.
6. Zein M, De Arrigunaga S, Amer MM, Galor A, Nichols AJ, Ioannides T, Dubovy SR, Karp CL. Therapeutic Response to Treatment of a Papillomatous Ocular Surface Squamous Neoplasia With Intramuscular Human Papillomavirus Vaccine. *Cornea*. 2024 Aug 1;43(8):1049-1052. doi: 10.1097/ICO.0000000000003525. Epub 2024 Mar 7.
7. Sripawadkul W, AlBaiyyat G, Galor A, Wylegala A, Nichols AJ, Ioannides T, Karp CL. Resolution of a Presumed Conjunctival Papilloma After Therapeutic Treatment With the Human Papillomavirus Vaccine. *JAMA Ophthalmol*. 2022 Apr 1;140(4):434-435. doi: 10.1001/jamaophthalmol.2021.6334.



Moderators: Mark J. Lucarelli and Lilangi Ediriwickrema

8:03–8:09 am

Comprehensive In Silico Identification and Structural Modeling of Fusion Junction Neoantigens as Vaccine Targets in Adenoid Cystic Carcinoma

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Introduction: Adenoid cystic carcinoma (ACC) is an aggressive secretory gland malignancy lacking approved systemic therapies. The hallmark MYB-NFIB t(6;9) translocation, present in approximately 60% of ACC cases, generates a tumor-specific fusion protein whose junction sequence is absent from the normal human proteome. Preliminary studies have established the immunogenicity of select MYB-NFIB junction peptides.¹ This study aims to identify a tumor-exclusive neoantigen that could serve as a vaccine target for ACC treatment using a comprehensive, multi-platform computational evaluation encompassing major histocompatibility complex (MHC) class I binding, structural modeling, and self-tolerance discrimination across a broad human leukocyte antigen (HLA) panel.

Methods: A standard computational pipeline was employed for neoantigen prediction, as similarly described in RNA neoantigen vaccine clinical trials for cancers including pancreatic carcinoma.² Protein and transcript sequences were retrieved from UniProt and NCBI RefSeq for MYB (P10242; NM_005375.4), NFIB (O00712; NM_005596.3), and MYBL1 (P10243; UniProt). From the five MYB-NFIB and MYBL1-NFIB breakpoint variants modeled, all possible 8–11mer peptides spanning the fusion were computationally enumerated. Peptides were then filtered against wild-type MYB, MYBL1, and NFIB sequences, and cross-referenced against the human reference proteome (UniProt, UP000005640) to confirm that identified peptides were exclusive to the tumor. MHC-I binding affinity across 20 HLA alleles was predicted using NetMHCpan 4.1. Antigen processing was evaluated via Immune Epitope Database proteasomal cleavage and TAP transport algorithms. Peptide-MHC complex structures were subsequently modeled using AlphaFold2 Multimer and AlphaFold3. Immunogenicity was assessed using DeepImmuno and BigMHC, a deep-learning model incorporating explicit self-tolerance discrimination. (Figure 1)

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Results: The computational pipeline identified 36 candidate neoantigens (21 MYB-NFIB, 15 MYBL1-NFIB) with predicted MHC-I binding across 13 HLA alleles, including 18 strong binders (%Rank < 0.5%). The lead candidate, GEQDTLKNY (MYB exon 9 junction, HLA-B*44:03), achieved %Rank_EL of 0.01% (%Rank_EL < 2% is suggestive of strong binding) and %Rank_BA of 0.05% (scores of < 2 are suggestive of strong binding). (Figure 2) Notably, BigMHC assigned a high predicted eluted ligand probability (in other words high binding affinity) to the junction peptide (0.991) compared to the wild-type NFIB comparator (0.0006). (Table 1). BigMHC likewise assigned a substantially higher immunogenicity score to the tumor junction peptide than to wild-type NFIB (0.729 vs. 0.007). AlphaFold2 and AlphaFold3 predicted structurally plausible peptide-MHC complexes for the top neoantigen candidates (interface predicted template modeling score > 0.8), supporting compatibility with canonical MHC-I presentation. (Figure 3)

Conclusions: This multiplatform in silico study identified MYB-NFIB and MYBL1-NFIB fusion junctions as promising ACC tumor-exclusive neoantigen targets. The lead candidate, GEQDTLKNY, exhibits preferential presentation relative to its wild-type comparator, consistent with self-tolerance escape. These findings define a rationally prioritized set of tumor-specific vaccine candidates for future experimental testing in order to develop targeted ACC immunotherapy.

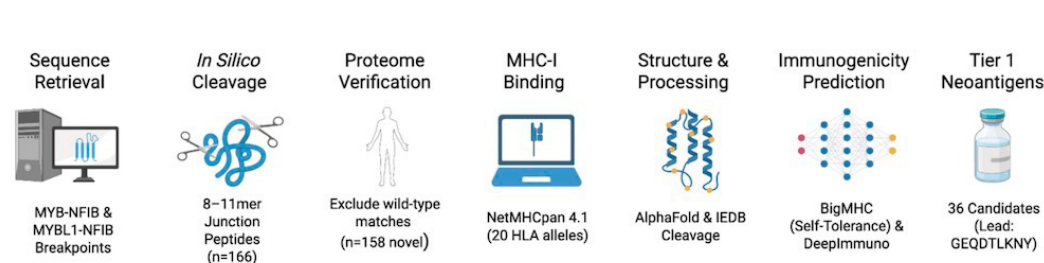


Figure 1. Schematic of the multi-platform computational pipeline for fusion junction neoantigen discovery. Breakpoint sequences from MYB-NFIB and MYBL1-NFIB fusions were used to enumerate 8–11mer junction-spanning peptides. Following proteome exclusivity filtering, candidates underwent MHC class I binding prediction (NetMHCpan 4.1) and antigen processing modeling (IEDB). High-affinity binders were structurally validated via AlphaFold2 and AlphaFold3. Finally, candidates were evaluated for immunogenicity and self-tolerance discrimination using DeepImmuno and BigMHC, yielding 36 high-confidence vaccine targets.

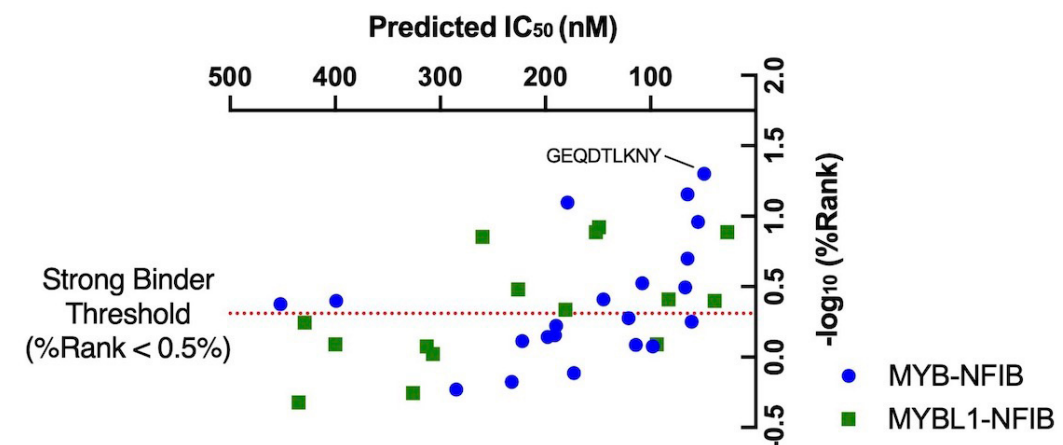


Figure 2. Integrated binding landscape of fusion-junction neoantigen candidates across MYB-NFIB and MYBL1-NFIB. Scatter plot showing predicted NetMHCpan binding affinity (IC₅₀, nM; x-axis, decreasing from left to right) versus $-\log_{10}(\%Rank)$ (y-axis; higher values indicate stronger binders) for candidate junction peptides. Blue circles indicate MYB-NFIB peptides and green squares indicate MYBL1-NFIB peptides. The horizontal dashed line marks the strong-binder threshold corresponding to %Rank < 0.5%. The annotated point GEQDTLKNY highlights the lead MYB exon 9 candidate on HLA-B*44:03, which combines low predicted IC₅₀ with strong percentile-rank performance.

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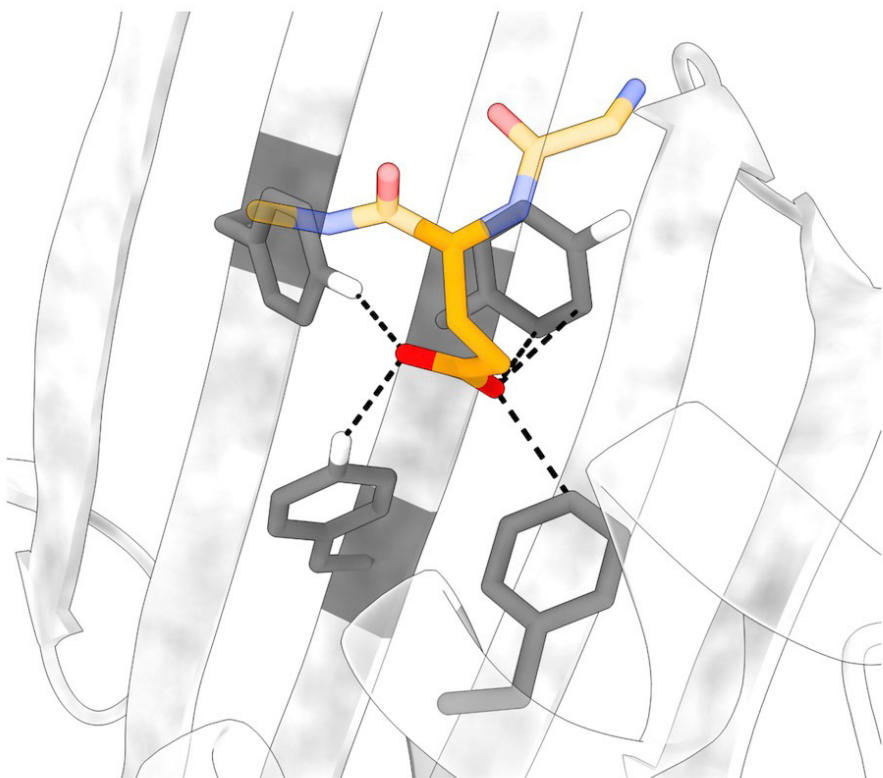


Figure 3. Structural basis for HLA-B*44:03 presentation of the MYB-NFIB fusion neoantigen, based on AlphaFold3-predicted structure. Detailed structural modeling of the peptide-MHC binding groove reveals that the MYB-derived N-terminal fusion residues supply a canonical anchor for HLA-B*44:03. The P2-Glutamate (orange) of the fusion peptide (GEQDTLKNY, N-terminus and peptide fragment GE shown) projects deeply into the MHC B-pocket. The side chain is highly stabilized through a dense hydrogen-bonding network and hydrophobic packing within an “aromatic cage” formed by native MHC Tyrosine and Phenylalanine residues (dark gray). This robust structural complementarity mechanistically supports the high predicted binding affinity (IC₅₀ 49 nM) of the junctional neoantigen.

References

1. Xi S, Bhatt M, Bhatt V, et al. RGT-61159 inhibits c-MYB synthesis and tumor growth in adenoid cystic carcinoma patient-derived xenograft models. *Cancer Res.* 2024;84(suppl 6):abstract 5940.

2. Rahimi SM, Nouri HR. Computational design and molecular characterization of a multi-epitope peptide vaccine targeting pancreatic cancer. *J Gen Engineering Biotech* 2026; 24(2):100670.

Peptide	HLA	Type	BigMHC_EL	BigMHC_IM	DeepImmuno
GEQDTLKNY	B*44:03	Junction	0.991	0.729	0.294
GEQDTLKNY	B*44:02	Junction	0.993	0.198	—
NELKGQDTL	B*40:01	Junction	0.354	0.327	—
AVLSQDTLK	A*11:01	Junction	0.144	0.160	—
LTVTQDTLK	A*68:01	Junction	0.032	0.252	—
FTQDTLKNYV	A*02:01	Junction	0.036	0.193	—
MSNTQDTLK	A*11:01	Junction	0.015	0.024	—
QDTLKNYVP	B*44:03	WT	0.0006	0.007	0.331
QDTLKNYVP	A*11:01	WT	0.00007	0.011	—

Table 1. BigMHC presentation and immunogenicity scores for fusion-junction and wild-type NFIB comparator peptides. BigMHC_EL = eluted ligand probability (model confidence that a peptide is naturally processed and presented); BigMHC_IM = predicted T-cell recognition probability. DeepImmuno column shows available scores; DeepImmuno does not model self-versus-nonsel context, producing similar scores for junction (0.294) and wild-type (0.331) on HLA-B*44:03. Wild-type NFIB peptides serve as self-tolerance comparators; the stark divergence in scores between junction and WT sequences supports predicted escape from central tolerance for the lead candidate GEQDTLKNY.

8:09–8:15 am

Does GLP-1 Receptor Agonist Use Decrease Risk of Facial Cutaneous Malignancy?

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are increasingly prescribed for type 2 diabetes (T2DM) and obesity, with emerging evidence suggesting benefits beyond glycemic control. Recent reviews and meta-analyses indicate potential cancer-protective effects, supported by pre-clinical data demonstrating mechanisms such as immune modulation and suppression of tumor-promoting inflammation. Observational studies have reported protective associations across various obesity-related malignancies, including colorectal, hepatocellular, prostate, and ovarian cancers. However, the relationship between GLP-1RA use and facial cutaneous malignancies has not been investigated. This study evaluates the association between GLP-1RA use and the incidence of facial skin cancer.

Methods: A retrospective cohort study was conducted using the All of Us Research Program Researcher Workbench. Adult patients with T2DM and/or obesity were identified and stratified by GLP-1RA exposure. The primary outcome was incidence of facial skin cancer. Multivariable logistic regression and Cox proportional hazards models were performed, adjusting for age, sex, BMI, race, ethnicity, and smoking history.

Results: Among 129,758 patients, 30.8% had both T2DM and obesity, 21.7% had T2DM alone, and 47.5% had obesity alone (Figure 1). Facial cancer occurred in 2,775 patients (2.1%), of whom 160 had prior GLP-1RA exposure. In multivariable logistic regression adjusting for age, sex, BMI, race, ethnicity, and smoking status, GLP-1RA use was associated with significantly reduced odds of facial skin cancer (OR=0.46, 95% CI 0.39–0.55, $p<0.001$). Increasing age was associated with higher odds (OR=1.04 per year, $p<0.0001$), while female sex was protective (OR=0.62, $p<0.001$). Cox proportional hazard showed consistent findings, with GLP-1RA exposure associated with reduced hazard of facial skin cancer (HR=0.38, 95% CI 0.319–0.440, $p<0.0001$). No differences were observed in age at diagnosis, cancer type, or cancer location between groups (Figure 2).

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Conclusions: GLP-1RA use was associated with a significantly reduced risk of facial skin cancer, with consistent findings across both logistic and time-to-event analyses. These results align with prior observational data suggesting potential cancer-protective effects of GLP-1RA. It is possible that GLP-1RA may decrease cancer risk by modulating key signaling pathways, reducing chronic inflammation, and inhibiting tumor proliferation. To our knowledge, this is the first study to examine the association between GLP-1RA use and facial skin cancer specifically, highlighting a novel and clinically relevant extension of the growing body of evidence supporting the oncologic implications of GLP-1RA-based therapies.

Figure 1

Total Cohort Characteristics		
Variable	Statistic	Total Population
Initial Diagnosis	N (%)	
T2DM and Obesity		40022 (30.8)
T2DM only		28147 (21.7)
Obesity only		61589 (47.5)
Age at diabetes diagnosis	N	68169
	Mean (SD)	54.3 (13.1)
	Min, Median, Max	2.0, 55.0, 99.0
Age at obesity diagnosis	N	101611
	Mean (SD)	48.4 (15.0)
	Min, Median, Max	1.0, 5.0, 100.0
BMI at Index	N	129758
	Mean (SD)	34.7 (6.1)
	Min, Median, Max	10.6, 33.9, 118.0
Race	N (%)	
Not reported		26085 (20.1)
White		64562 (49.7)
Black/African American		28296 (21.8)
American Indian		2035 (1.6)
Asian		1902 (1.5)
Middle Eastern or North African		538 (0.4)
Native Hawaiian or other Pacific Islander		166 (0.1)
More than one race		6174 (4.8)
Ethnicity	N (%)	
Not Reported		3673 (2.8)
Not Hispanic/Latino		100048 (76.8)
Hispanic/Latino		26037 (20.4)
Smoking	N (%)	
Not Reported		3391 (2.6)
No		72511 (55.8)
Yes		53856 (41.6)
Facial Cancer Diagnosis	N (%)	
No		126983 (97.9)
Yes		2775 (2.1)

(continued)

Figure 2

For Patients with Facial Cancer Comparison of GLP1 Exposure				
Variable	Statistic	No GLP1	GLP1	P-value*
Age at Facial Cancer Diagnosis	N	2615	160	
	Mean (SD)	68.9 (10.2)	68.3 (8.4)	
	Min, Median, Max	27.0, 70.0, 95.0	39.0, 69.0, 87.0	0.361
Facial Cancer Type	N (%)			0.081
Basal cell carcinoma (BCC)		1725 (66.0)	94 (58.7)	
Squamous cell carcinoma (SCC)		733 (28.0)	58 (36.3)	
Melanoma		157 (6.0)	8 (5.0)	
Facial Cancer Location	N (%)			0.198
Face (unspecified)		1152 (44.0)	80 (50.0)	
Nose		259 (9.9)	18 (11.2)	
Ear/periauricular		207 (7.9)	14 (8.7)	
Eyelid/periorcular		80 (3.1)	4 (2.5)	
Lip		198 (7.6)	15 (9.4)	
Multiple Locations		719 (27.5)	29 (18.1)	

*P-values for continuous variables based on Wilcoxon rank sum test.
P-values for categorical variables based on chi-square test.

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References

1. Valencia-Rincón E, Rai R, Chandra V, Wellberg EA. GLP-1 receptor agonists and cancer: current clinical evidence and translational opportunities for preclinical research. *Journal of Clinical Investigation*. 2025;135(21):e194743. doi:10.1172/JCI194743
2. Ateawi YA, Mahmood R, Wong HJ, et al. Glucagon-like peptide-1 receptor agonists and the risk of obesity-related cancers: a systematic review and meta-analysis. *Diabetes Research and Clinical Practice*. 2026;234:113158. doi:10.1016/j.diabres.2026.113158
3. Levy S, Attia A, Elshazli RM, et al. Differential Effects of GLP-1 Receptor Agonists on Cancer Risk in Obesity: A Nationwide Analysis of 1.1 Million Patients. *Cancers*. 2024;17(1):78. doi:10.3390/cancers17010078
4. Lucente D, Bellino S, La Salvia A. GLP-1 Receptor Agonists in Solid Tumour Therapy: Exploring Their Anticancer Potential and Underlying Molecular Pathways. *Genes*. 2025;16(11):1352. doi:10.3390/genes16111352

8:15–8:21 am

Advanced Conjunctival Squamous Cell Carcinoma that Failed Immunotherapy Treatment

Michael Kozlov¹, Sapna Syal², Roman Shinder^{2,3}

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Introduction: Immune checkpoint inhibitors (ICIs), including cemiplimab and pembrolizumab, have emerged as promising treatments for advanced cutaneous and ocular adnexal squamous cell carcinoma (SCC), with response rates up to 76.5% in locally advanced disease.¹⁻³ Traditional management of advanced conjunctival SCC with orbital invasion often requires exenteration or high-dose radiotherapy, which are associated with significant morbidity.

Although recent studies demonstrate favorable responses to ICIs in advanced conjunctival SCC, cases of treatment failure and disease progression remain poorly characterized.² This study describes a series of patients with advanced conjunctival SCC and orbital invasion who experienced progression despite ICI therapy, highlighting potential factors associated with treatment resistance.

Methods: This is a retrospective review from a single academic tertiary institution of patients with advanced conjunctival SCC who failed treatment with ICI from 2020 to 2025. Advanced disease was defined as having orbital invasion in whom surgical intervention would necessitate exenteration. All patients received detailed ophthalmic examination, orbital radiography, and PET scan for systemic workup, with diagnosis confirmed by histopathologic analysis. The palpebral conjunctiva was the primary site of disease in all patients. Patients either received cemiplimab 350mg every 3 weeks or pembrolizumab 200mg every 3 weeks. Response to therapy was assessed using the RECIST criteria. Treatment failure was defined as locoregional progression during therapy.

Results: Eight patients (mean age 42.9, range 33–61; 5 female; 5 African American) with advanced conjunctival SCC who failed ICI were identified. Six patients were smokers, and one patient was human immunodeficiency virus positive. All patients had best corrected visual acuity of 20/25 or better in the ipsilateral eye on presentation. All cases were T4N0M0 based on the AJCC 8th edition classification. All patients experienced disease progression while on therapy, with one patient developing distant metastases (Fig 1-3). Treatment with ICI was halted by cycle 4 and alternate therapies were considered. Of the seven patients with locoregional disease progression without metastatic disease, six patients underwent exenteration, while one patient deferred surgical intervention and elected for radiotherapy. The 6 patients who underwent exenteration are alive without evidence of disease. The patient undergoing radiotherapy is alive with stable disease. The patient with metastases passed away from his disease.

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Conclusions: Although ICI therapy offers patients with advanced conjunctival SCC the possibility of avoiding exenteration and high dose radiotherapy, and the downsides associated with these treatments, not all patients will show a treatment response to ICI. The current series describes eight patients who experienced disease progression while on ICI treatment, and eventually received radiotherapy, exenteration, or passed away from distant disease.

Primary tumor location may influence treatment response. All patients in this series had palpebral conjunctival involvement, whereas prior responsive cases involved bulbar conjunctiva. Increased UV exposure in the bulbar conjunctiva may lead to higher tumor mutation burden and improved ICI response.² Future larger studies are needed to better understand the variables that may be important in determining which patients may show a positive response to ICI therapy and which may be better served by alternative treatment options.

Figure 1

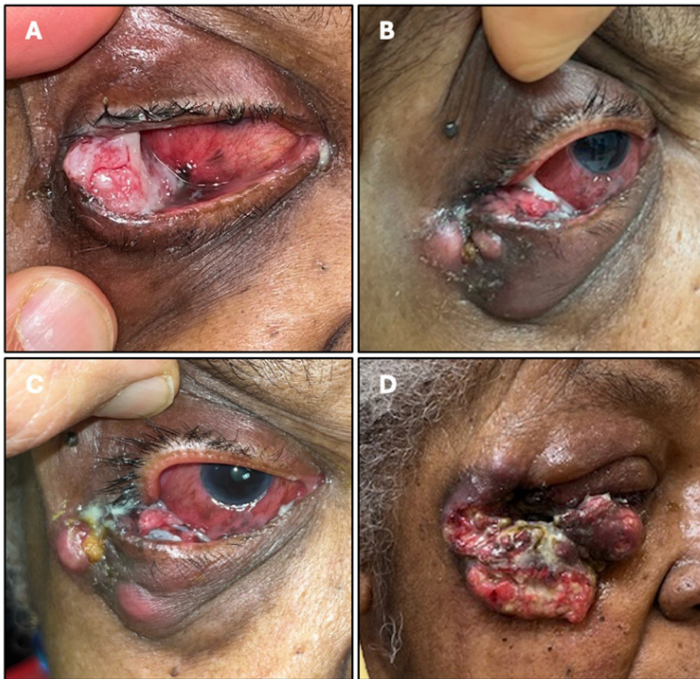


Figure 2

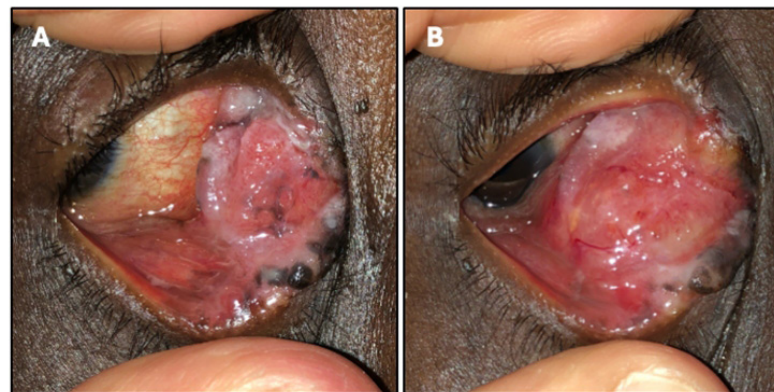
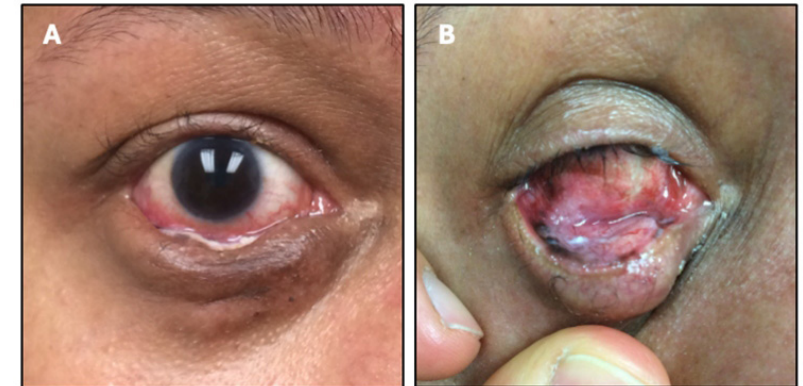


Figure 3



References

1. Gross ND, et al. Neoadjuvant cemiplimab for stage II to IV cutaneous squamous-cell carcinoma. *N Engl J Med*. 2022 Sep 12;387(17):1557-68.
2. Esmali B, et al. Immune checkpoint inhibitors with or without chemotherapy for orbital, conjunctival, and ocular adnexal squamous cell carcinoma. *Can J Ophthalmol*. 2025 Feb;60(1):e38-51.
3. Grob JJ, et al. Pembrolizumab monotherapy for recurrent or metastatic cutaneous squamous cell carcinoma: a single-arm phase II trial. *J Clin Oncol*. 2020 Sep 1;38(25):2916-25.

8:21–8:27 am

Incidence of Metastasis in Conjunctival Squamous Cell Carcinoma Requiring Orbital Exenteration: A Case Series

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Introduction: Reported rates of metastasis in Conjunctival squamous cell carcinoma (CSCC) vary widely (8–9% in mixed-stage series versus 29% with nearby lymph node spread and orbital extension). Most studies do not specifically report these rates in patients requiring exenteration, likely underestimating true metastatic rates in this population with possibly more advanced disease.

Methods: A cross-sectional cohort study of patients with histologically confirmed CSCC who underwent orbital exenteration at a single institution between 2022 and 2026 was conducted. Clinical data including demographics, immunosuppression history, tumor location, surgical margins, use of preoperative and/or postoperative imaging, adjuvant therapy, metastatic events and survival outcomes were collected. Metastasis was defined as histologically confirmed disease in regional lymph nodes or distant sites. The incidence of metastasis was compared with published rates using descriptive statistics

Results: Six patients were included (50% male, mean age 74.5 years). In three (50%) there intra-ocular involvement was noted histologically. Aggressive and rapidly growing behavior despite treatment was present in two patients (33.3%). Three (50%) developed metastatic disease. Sites of metastasis included ipsilateral submandibular lymph node, ipsilateral periparotid lymph node, thalamus and caudate head. All three patients with metastasis had positive orbital margins on initial resection and rapid regrowth before radiotherapy, leading to exenteration. Two of them were on long term immunosuppressive therapy. Histopathologic examination revealed a poorly differentiated squamous cell carcinoma in two patients (33.3%), both of them were among the metastatic group. Median time from diagnosis to metastasis detection was six months. Adjuvant radiation therapy was administered in three patients (50%). At a mean follow-up of 10.7 months (range 3.9–17.4), zero patients had died of disease.

Conclusions: In this case series, the metastasis rate for CSCC requiring orbital exenteration was 50%, considerably higher than previously reported. Positive orbital margins, poorly differentiated histology, rapidly aggressive behavior and immunosuppression may represent clinical scenarios where metastatic potential is higher.

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References

1. El-Hadad C, Rubin ML, Nagarajan P, et al. Prognostic factors for orbital exenteration, local recurrence, metastasis, and death from disease in conjunctival squamous cell carcinoma. *Ophthalmic Plast Reconstr Surg*. 2021;37(3):262-268.
2. Cruzado-Sanchez D, Tellez WA, Villarreal-Aguilar B, et al. Conjunctival squamous cell carcinoma: prognostic factors for the recurrence and metastasis and clinicopathological characteristics at an oncological hospital in Peru. *Br J Ophthalmol*. 2020;104(7):1010-1015.
3. Kaliki S, Wagh RD, Vempuluru VS, et al. Ocular surface squamous neoplasia with orbital tumor extension: risk factors and outcomes. *Eye (Lond)*. 2023;37(3):446-452

8:27–8:33 am

Limited Prognostic Value of Sentinel Lymph Node Biopsy in Periocular Malignant Melanoma Treated with Mohs Micrographic Surgery

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Introduction: Periocular malignant melanoma carries a risk of regional and distant metastasis that may not be fully addressed by local tumor control alone. Mohs micrographic surgery (MMS) is often the standard of care in this setting, as it provides an advantage in thin periorbital skin with complex underlying structures due to its ability to achieve precise margin control. However, MMS does not provide information regarding regional nodal involvement, which remains a key determinant of patient prognosis.

Sentinel lymph node biopsy (SLNB) is an established, minimally invasive staging technique in cutaneous melanoma that may identify occult nodal metastasis based on lymphatic drainage patterns. SLNB has been associated with improved staging and may influence recurrence risk and survival when combined with early disease management in broader melanoma populations [1,2]. However, its role in periocular malignant melanoma is not well defined due to limited data in this rare tumor type.

Conceptually, MMS and SLNB may work synergistically to achieve local tumor control and assess metastatic risk, providing both clinical and prognostic value. Thus, clarifying the utility of SLNB in this context is important for risk stratification, treatment planning, expectation setting, and shared decision-making with patients. This study aimed to evaluate the prognostic value of SLNB prior to MMS in the treatment of periocular malignant melanoma.

Methods: Adult patients with biopsy-proven periocular malignant melanoma were identified from a prospectively maintained MMS database (2005–2025). This retrospective cohort study stratified patients by SLNB status and result (positive vs. negative). Cox proportional hazards models were used to evaluate differences in disease-specific survival (DSS), defined as death attributable to melanoma, and disease-free survival (DFS), defined as local recurrence, regional nodal metastasis, distant metastasis, or death from any cause.

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Results: A total of 101 patients with malignant melanoma were identified, of whom 34 patients underwent SLNB. Among these, 28 (82.4%) had a negative SLNB, and 6 patients (17.6%) had a positive SLNB. DSS events occurred in 1 patient in the SLNB-negative group (3.6%) and 1 patient in the SLNB-positive group (16.7%) (HR, 4.24; 95% CI, 0.25–70.72; $p = 0.31$). DFS events occurred in 11 patients in the SLNB-negative group (39.3%) and 4 patients in the SLNB-positive group (66.7%) (HR, 1.60; 95% CI, 0.51–5.05; $p = 0.42$).

Conclusions: SLNB was not significantly associated with DFS or DSS in this cohort of patients with periocular malignant melanoma. These findings suggest that the role of SLNB as a prognostic indicator remains uncertain and should be interpreted cautiously in the context of clinical management and shared decision-making.

Figure 1

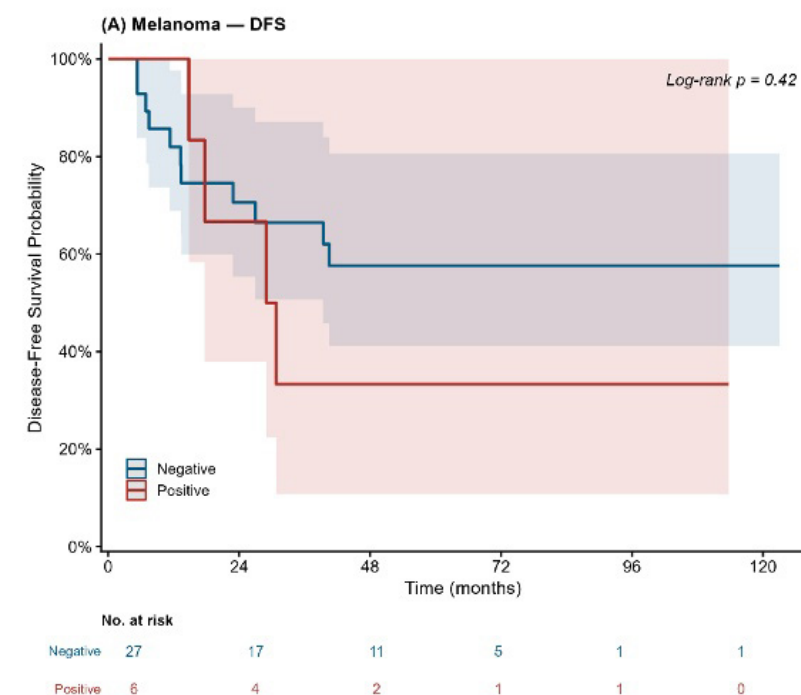
Table 1. Sentinel Lymph Node Biopsy Status and Survival Outcomes

Outcome	Model	Variable	n	Events n (%)	HR	95% CI	p-value
DSS	Unadjusted	SLNB Negative	28	1 (3.6%)	Ref	—	—
		SLNB Positive	6	1 (16.7%)	4.24	0.25–70.72	0.31
DFS	Unadjusted	SLNB Negative	28	11 (39.3%)	Ref	—	—
		SLNB Positive	6	4 (66.7%)	1.60	0.51–5.05	0.42

Abbreviations: DSS, disease-specific survival (cancer-specific death); DFS, disease-free survival (local recurrence, regional nodal metastasis, distant metastasis, or death); SLNB, sentinel lymph node biopsy; HR, hazard ratio; CI, confidence interval.

Figure 2

Figure 2. Kaplan-Meier Disease-Free Survival by Sentinel Lymph Node Biopsy Status in Periocular Malignant Melanoma



References

- Prieto, V.G., Sentinel Lymph Nodes in Cutaneous Melanoma. Clin Lab Med, 2017. 37(3): p. 417–430.
- Chen, J., et al., Prognostic role of sentinel lymph node biopsy for patients with cutaneous melanoma: A retrospective study of surveillance, epidemiology, and end-result population-based data. Oncotarget, 2016. 7(29): p. 45671–45677.



8:44–8:45 am

Association of Floppy Eyelid Syndrome with Increased 10-Year Incidence of Depression and Anxiety

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Introduction: Floppy eyelid syndrome (FES) has broad health implications beyond eyelid and ocular surface findings, and the persistent and often progressive nature can affect quality of life, relationship and mental health. We herein investigate the association of depression and anxiety with FES.

Methods: Using Epic Cosmos, an electronic health record database of 300M patients, FES patients (n=57084) with subsequent depression and anxiety within 10 years were compared to the general population (GP). Stratified odds ratios (OR) controlled for age, sex, race, ethnicity, obstructive sleep apnea (OSA), obesity, T2DM, HTN, alcohol, and tobacco use. Incidence was calculated. Two-proportion z-tests were conducted.

Results: FES patients had significantly elevated adjusted odds of incident depression (OR 1.92 [95%CI 1.90–1.93], $p<0.01$) and anxiety (1.65 [1.64–1.66], $p<0.01$). Ten-year incidence was 18.6% (FES) vs 6.7% (GP) for depression ($p<0.01$), and 28.9% vs 13.6% for anxiety ($p<0.01$). Elevated odds persisted after independent adjustment for race/ethnicity, age/sex, and all comorbidities. Within OSA patients, depression remained significant (1.17 [1.14–1.21], $p<0.01$), while anxiety was not (1.01 [0.98–1.04], $p=0.53$).

Conclusions: FES patients have nearly 3x higher odds of developing depression and anxiety within 10 years, independent of sleep apnea and metabolic comorbidities. Given that FES is frequently underdiagnosed and managed as a purely mechanical eyelid condition, characterizing its independent psychiatric risk has direct implications for screening and multidisciplinary care.

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Figure 1

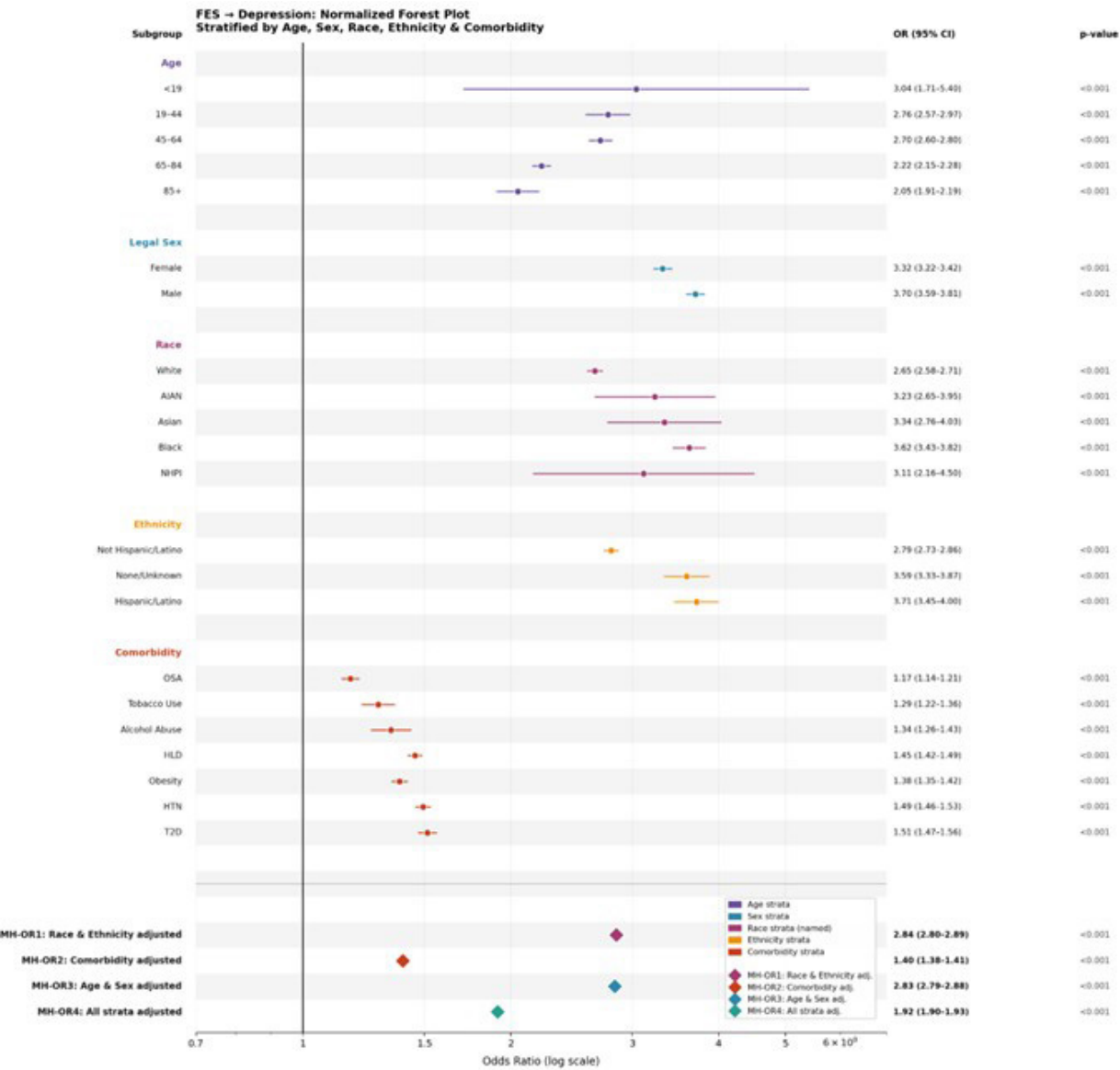
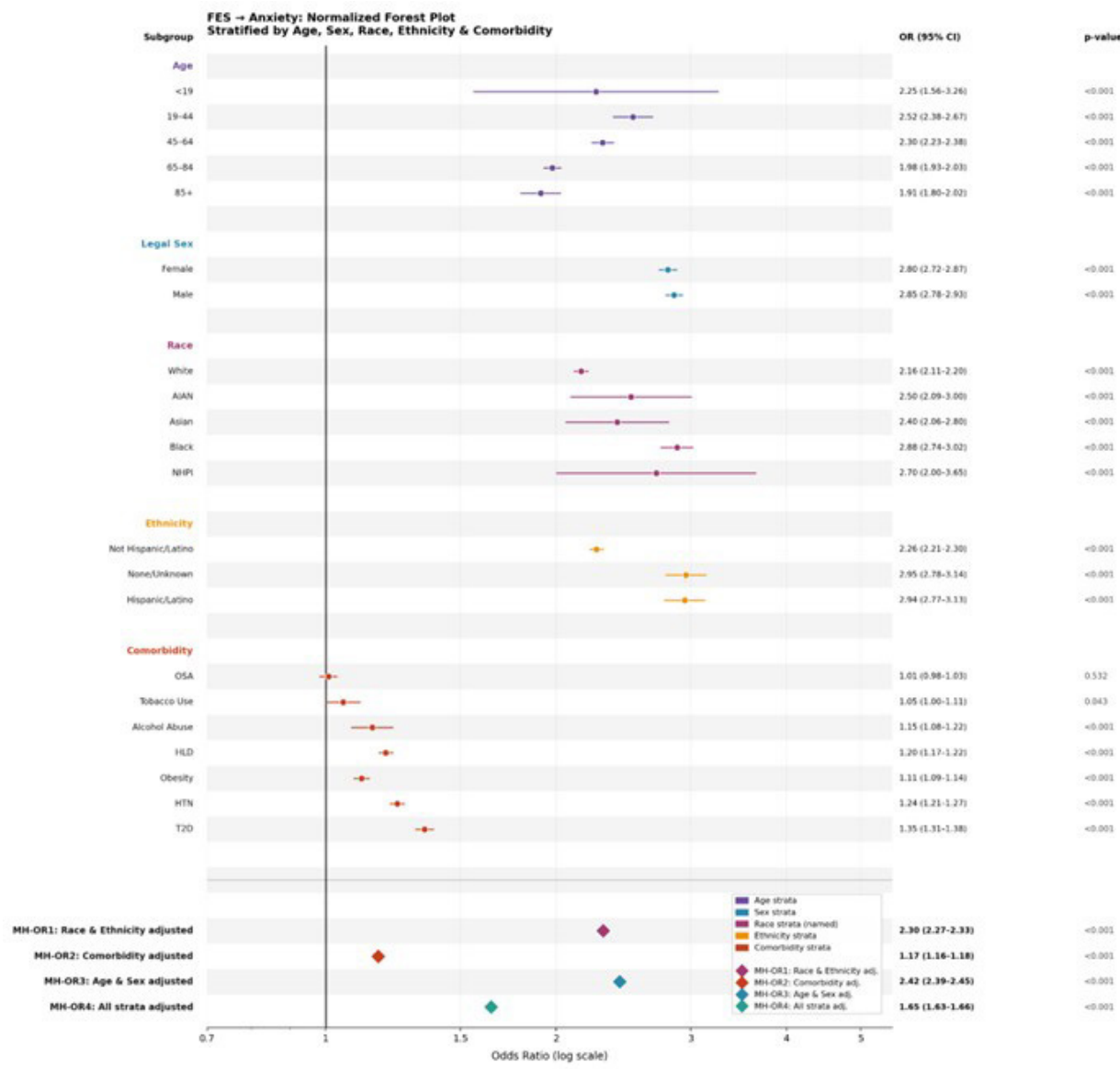


Figure 2



References

1. Scarabosio A, Surico PL, Patanè L, Tambasco D, Kahale F, Zeppieri M, Parodi PC, Coassin M, Di Zazzo A. The Overlooked Floppy Eyelid Syndrome: From Diagnosis to Medical and Surgical Management. *Diagnostics* (Basel). 2024 Aug 21;14(16):1828. doi: 10.3390/diagnostics14161828. PMID: 39202316; PMCID: PMC11353443.

2. Zhao AT, Shen CZ, Katowitz WR. Eyelid ptosis and dermatochalasis in obese patients with obstructive sleep apnoea: A large-scale propensity score-matched analysis. *Eye* (Lond). 2026 Feb;40(3):412-416. doi: 10.1038/s41433-025-04164-8. Epub 2025 Dec 19. PMID: 41419597; PMCID: PMC12881465.

8:45–8:46 am

Industry Payments for Three Oculoplastic-Relevant Drug Classes: An Eight-Year Analysis of CMS Open Payments

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Introduction: Industry payments to oculoplastic surgeons have been characterized cross-sectionally [1], but how industry investment in oculoplastic-relevant therapeutics evolves across product lifecycles, regulatory milestones, and corporate transactions has not been described. We analyzed eight years of CMS Open Payments data for three drug classes central to oculoplastic practice: teprotumumab (the first FDA-approved biologic for thyroid eye disease [2]), botulinum toxins, and ocular surface amniotic membrane biologics, and examined whether industry payment trajectories responded to corporate transactions.

Methods: We analyzed all non-research general payments reported to CMS Open Payments for program years 2017 through 2024 (93.7 million records). Payments were assigned to one of three product categories based on the drug or device names listed by reporting manufacturers, with cross-checks against the manufacturer name to handle corporate name changes during the study period (Horizon Therapeutics → Amgen, October 2023; TissueTech → BioTissue Holdings; Allergan → AbbVie). All dollar amounts were inflation-adjusted to December 2024 USD. Monthly payment trajectories were compared before and after key events using segmented regression [3]. To test whether the teprotumumab trajectory around Amgen's acquisition of Horizon was specific to teprotumumab rather than reflecting broader trends, we compared it against a control series of all other ophthalmology-recipient payments.

Results: The analytic dataset comprised 894,289 payment records totaling \$293.7 million. Teprotumumab payments grew at +3.5% per month from launch through September 2023 (95% CI: +2.5% to +4.5%, $p < 0.001$). Following Amgen's acquisition of Horizon Therapeutics, the trajectory reversed: post-event monthly slope of -7.9 percentage points (95% CI: -11.2 to -4.5, $p < 0.001$). The ophthalmology control series showed no significant slope change at the same event date (-1.4 pp/mo, $p = 0.35$), indicating the trajectory inflection was specific to teprotumumab. During the Horizon era (2020–2023), 69.7% of teprotumumab dollars went to ophthalmologists, with substantial shares to primary care/internal medicine (15.1%) and endocrinology (6.6%). Payment composition was distinctive: approximately 75% of teprotumumab dollars represented direct professional engagement (39.6% consulting, 35.0% speaker/education) versus only 14.9% food and beverage.

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In contrast, botulinum toxin payments were dominated by royalty and licensing income (55.2%), a structurally different payment pattern. Ocular surface amniotic membrane payments were nearly equally distributed between optometrists (45.8%) and ophthalmologists (47.3%) across the full eight-year window. Several product classes relevant to oculoplastics (hyaluronic acid fillers, energy-based devices, and most surgical implants) had negligible Open Payments coverage.

Conclusions: The teprotumumab payment inflection at the Amgen–Horizon acquisition, absent in ophthalmology payments overall, suggests that corporate transactions can meaningfully reshape industry–physician engagement around high-cost biologics within months of a deal closing. The three categories illustrate distinct industry payment archetypes. Teprotumumab represents a launch-engagement model, supported predominantly by consulting and speaker fees. Botulinum toxin represents a patent-royalty model, with license income to inventors dominating dollar volume. Amniotic membrane biologics represent a broad-outreach model, with payments distributed equally across ophthalmology and optometry. Two methodological constraints merit attention for future Open Payments research: manufacturer reporting practices changed materially during corporate transitions in our cohort, limiting longitudinal recipient-specialty analyses; and Open Payments reporting requirements exclude most cosmetic-only products, a gap relevant to oculoplastic practice.

References

1. Mechels KB, Tori K, Pangan H, Art L, Lee HBH. Industry Payments Among Oculofacial Plastic Surgeons: An Open Payments Database Analysis. *Ophthalmic Plast Reconstr Surg*. 2025, online ahead of print. doi: 10.1097/IOP.00000000000003161.
2. Douglas RS, Kahaly GJ, Patel A, *et al*. Teprotumumab for the treatment of active thyroid eye disease. *N Engl J Med*. 2020;382(4):341–352. doi:10.1056/NEJMod1910434.
3. Wagner AK, Soumerai SB, Zhang F, Ross–Degnan D. Segmented regression analysis of interrupted time series studies in medication use research. *J Clin Pharm Ther*. 2002;27(4):299–309. doi:10.1046/j.1365–2710.2002.00430.x



Moderators: Timothy McCulley and Liza Cohen

8:47–8:53 am

Validation of the Hawkeye Orbital Fracture Prioritization and Evaluation (HOPE) Algorithm for Orbital Fracture Triage

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Introduction: Although most orbital fractures do not result in urgent ocular pathology, many patients are transferred to tertiary care centers for emergent ophthalmologic evaluation, only to be discharged and scheduled for outpatient follow-up. This practice imposes unnecessary burdens on patients and contributes to increased healthcare utilization. The HOPE algorithm was developed to identify adult patients requiring urgent evaluation for appropriate triage. Prior to implementation, external validation is necessary to assess its diagnostic performance.

Methods: A retrospective review was conducted of patients with orbital fractures at referring hospitals who had telephone consultation requests initiated for urgent ophthalmologic evaluation prior to examination at the University of Iowa between September 2023 and April 2025. Clinical variables obtained from phone consultation and outside hospital records were used to retrospectively apply the HOPE triage algorithm. The HOPE algorithm provided transfer recommendations retrospectively for each patient (Figure 1). Accuracy of the algorithm was then determined by identifying patients with conditions requiring immediate ophthalmic assessment who were correctly and incorrectly triaged. The algorithmic interface is detailed in Figure 2.

Results: A total of 134 patients had telephone consultation requests initiated for urgent ophthalmologic evaluation during the study period, including 76 males and 58 females, with a mean age of 52.3 years (SD 19.8). After exclusion of children and patients without follow up examination, 123 patients with 124 eyes at risk due to orbital fracture remained. The HOPE algorithm advised the transfer of 22 patients (17.9%). Twelve patients had conditions that required urgent ophthalmic evaluation, 11 of which were correctly identified for transfer by the HOPE algorithm (91.7% sensitivity, 90.2% specificity). Urgent conditions included: orbital compartment syndrome that underwent canthotomy and cantholysis (5 eyes), retrobulbar hemorrhage without intervention (6 eyes), and chemical injury (1 eye). The

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patient who was not recommended for transfer sustained an orbital fracture involving the medial, inferior, and lateral walls following an explosion of a chemical container. This resulted in a grade 1 chemical injury that was copiously irrigated, and the patient was prescribed topical antibiotic, cycloplegic, and anti-inflammatory therapies.

Conclusions: The HOPE algorithm is an effective tool for the triage of patients with orbital fractures, correctly identifying most patients who require urgent ophthalmologic evaluation and possible intervention. In this cohort, its application demonstrated robust sensitivity and specificity. Notably, no patients in this cohort were confirmed to have extraocular muscle entrapment or an open globe injury, and only one patient with a moderate chemical injury would have been inappropriately triaged. While the algorithm will significantly reduce patient referrals for urgent evaluation in the ED, it may still miss some patients with urgent conditions. The use of the algorithm for identification of patients who may need intervention within a less immediate timeframe needs to be further studied. Given the frequency of orbital fracture referrals to ophthalmologists at tertiary care facilities, the implementation of this algorithm would improve resource utilization in the ED and assist triaging patients for evaluation in the clinic.

Figure 1

Category	Variables Recorded
Demographics	Date of consult, patient age, patient gender, and mechanism of injury
Subjective Exam Findings	Subjective change in vision and presence of diplopia
Objective Exam Findings	Presence of relative afferent pupillary defect, motility defect, subconjunctival hemorrhage, chemosis, eyelid laceration, corneal abrasion, hyphema, and eye injury
Radiographic Exam Findings	Location of fracture(s)
What is considered “Urgent”	Orbital compartment syndrome, open globe injury, significant corneal trauma, choroidal rupture, retinal detachment, and extraocular muscle entrapment

Figure 2

HawkeEYE Orbital Fracture Prioritization and Evaluation Algorithm (HOPE)

Count Fingers at 3 ft or better

No

Foreign body injury

No

Subconjunctival hemorrhage

No

Orbital floor fracture

No

Ophthalmology-detected Retrobulbar hemorrhage on CT

No

Ophthalmology-detected Extraocular Muscle Entrapment on CT

No

Results	Risk
The Logit Risk Score is	-39.21
The Probability is	9.36080858357868e-18
Does HOPE Suggest An Emergent Referral?	No

References

1. Sanchez PH, Shriver EM, Strampe MR, Diel RJ, Pham CM, Carter KD, Kemp PS, Field MG. Retrospective Optimization of the Hawkeye Orbital Fracture Prioritization and Evaluation Algorithms for Triaging Ophthalmic Care. Ophthalmol Sci. 2023 Dec 10;4(3):100447. doi: 10.1016/j.xops.2023.100447. PMID: 38284103; PMCID: PMC10810741.

8:53–8:59 am

Outcomes of Patients Undergoing Enucleation With and Without Postoperative Conformer Placement: A 12-Year Retrospective Chart Review

May Ameri, Vandana Venkatesh, George Villatoro, Michael Yen
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Introduction: Postoperative conformer placement following enucleation is widely considered standard practice to maintain fornix depth, preserve socket volume, and facilitate prosthetic rehabilitation. Despite its widespread use, there is limited evidence directly evaluating whether omission of a conformer adversely affects long-term socket outcomes. Existing literature largely assumes routine conformer placement and does not isolate outcomes in patients without conformers.

Socket contracture, symblepharon, and prosthesis intolerance are among the most clinically significant complications following enucleation, often necessitating secondary reconstructive procedures. Whether conformer omission increases the risk of these complications remains unclear. This study aims to evaluate postoperative outcomes in patients who did not receive a conformer and compare these findings to patients who did, with the hypothesis that non-conformer use does not typically result in increased socket morbidity.

Methods: This retrospective cohort study reviewed medical records of adult patients who underwent enucleation at a single academic institution between 2012 and 2024. Patients were divided into conformer and non-conformer groups based on postoperative management. Demographic data, surgical details, and postoperative outcomes including socket contracture, symblepharon, motility limitation, prosthesis use, need for secondary socket surgery, and clinic call frequency were collected. Comparative analyses were performed using descriptive statistics, with categorical variables expressed as proportions.

Results: Of 248 charts reviewed, 163 met inclusion criteria, defined as adult patients (≥ 18 years) who underwent enucleation at our institution between 2012 and 2024 with adequate documentation of operative details, conformer status, and postoperative follow-up sufficient to assess clinical outcomes. The mean age was 59.6 years, with 78 males and 87 females. The most common indication for enucleation was infection ($n=45$), followed by trauma and glaucoma ($n=25$ each). Porous implants comprised the majority (89%) of implants used. Forty-two patients (25.8%) received a conformer and 121 (74.2%) did not. Clinically evident socket contracture occurred in 7.1% of conformer patients versus 3.3% of non-conformer patients ($p=0.375$), while symblepharon was observed in 4.8% and 3.3%, respectively ($p=0.648$). Limited motility occurred in 7.1% of conformer patients compared to 3.3% of non-conformer patients ($p=0.375$). Secondary socket surgery was required in 7.1% of conformer patients and 8.3% of non-conformer patients ($p>0.99$). Lack of prosthesis

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use during post-operative visits was similar between groups (16.7% vs 14.0%, $p=0.65$). While the proportion of patients with at least one postoperative clinic call was similar (35.7% vs 35.5%, $p>0.99$), repeat calls (≥ 2) were more frequent in the conformer group (26.2% vs 16.5%), although this did not reach statistical significance ($p=0.177$).

Conclusions: Omission of a postoperative conformer following enucleation was not associated with increased rates of clinically meaningful socket contracture, symblepharon, motility limitation, prosthesis intolerance, or need for secondary socket surgery. These findings suggest that routine conformer placement may not be necessary in all patients and that selective use should be considered based on individual clinical factors. This has important implications for reducing unnecessary interventions and cost, as well as streamlining postoperative care for the anophthalmic socket.

References

1. Berkowitz S, Shinder R. Anophthalmic sockets: a retrospective review of 82 primary sockets. *J Clin Med*. 2024;14(21):7764.
2. Bajaj MS, Pushker N, Tejwani LK, Khurana S, Kashyap S. Clinical evaluation of 188 patients with contracted sockets. *J Clin Exp Ophthalmol*. 2013;4(2):203
3. Fante RG, Buckley RH, Dortzbach RK. Prosthetic rehabilitation using progressive conformers in anophthalmic socket syndrome. *Ophthal Plast Reconstr Surg*. 1990;6(3):181-187.

8:59–9:05 am

Optic Neuropexy With Interposition Fat Grafting to Facilitate Stereotactic Radiosurgery After Resection of Perioptic Tumors

Hyun Jun Kim¹, Leslie Nussbaum², Michael Lee², Ali Mokhtarzadeh², Andrew Harrison², Eric Nussbaum²

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Introduction: To evaluate the safety and utility of interpositional fat graft (optic neuropexy) following microsurgical resection of perioptic tumors to facilitate subsequent stereotactic radiosurgery (SRS).

Methods: A retrospective review was performed of 75 consecutive patients undergoing microsurgical resection of perioptic tumors by a single surgeon between approximately 2010–2024. Pathologies included meningioma (n=71, 95%), craniopharyngioma (n=3, 4%), and pituitary adenoma (n=1, 1%). All patients underwent anterior clinoidectomy, optic canal unroofing, and decompression of the optic apparatus. Following tumor resection, an autologous abdominal fat graft measuring approximately 10 × 10 mm was interposed between the optic nerve/chiasm and tumor resection bed. Primary outcomes included surgical complications, rate and timing of adjuvant SRS, change in fat graft volume on serial MRI, and visual and radiation-related outcomes, including radiation-associated optic neuropathy (RION), visual field changes, optic atrophy, and radiation retinopathy.

Results: Mean clinical follow-up was approximately 36 months (range, 6–120 months). No intraoperative or postoperative complications were attributable to fat graft placement (0%; 95% CI, approximately 0–5%). Postoperative MRI demonstrated graft visualization in more than 95% of cases, with expected partial resorption estimated at 20%–40% volume reduction within the first 3–6 months.

Approximately 24 patients (32%) underwent delayed SRS at a mean interval of 18 months postoperatively, most commonly for residual or progressive tumor or WHO grade II pathology. Typical SRS dosing ranged from 12–16 Gy in a single fraction or 25–30 Gy in fractionated regimens. The fat graft served as a reliable radiographic landmark in nearly all SRS cases. Over an average follow-up of 24 months in the SRS subgroup, no cases of radiation-associated optic neuropathy were identified. Formal neuro-ophthalmic follow-up was available in approximately 80% of patients, with stable or improved visual function observed in the majority.

Conclusions: Optic neuropexy using an interposition fat graft is a safe and effective adjunct in the management of perioptic tumors, particularly clinoidal and medial sphenoid wing meningiomas. This technique provides a reliable radiographic landmark that facilitates radiosurgical planning and may improve the safety of SRS delivery by maintaining separation between the optic apparatus and the tumor resection bed. No graft-related complications were observed in this series, and no cases of radiation-associated optic neuropathy occurred among patients who subsequently underwent SRS.

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References

1. Wang D jun, Xie Q, Gong Y, Mao Y, Wang Y, Cheng H xia, et al. Histopathological classification and location of consecutively operated meningiomas at a single institution in China from 2001 to 2010. *Chin Med J (Engl)*. 2013 Feb;126(3):488–93. PubMed PMID: 23422112.
2. Pham TN, Azemar N, Mathis T, Delattre G, Seraphim M, Quintyn JC, et al. Multivariable Normal Tissue Complication Probability Prediction of Early Grade Radiation-Induced Optic Neuropathy Using Visual Field Deficit in a Prospective Pencil Beam Scanning Proton Therapy Cohort. *Int J Radiat Oncol Biol Phys*. 2025 Nov 23;S0360-3016(25)06481-8. doi:10.1016/j.ijrobp.2025.11.007 PubMed PMID: 41290050.
3. Lee EJ, Chung HT, Kim JW, Kim DG, Paek SH. Single-Fraction Stereotactic Radiosurgery for Benign Perioptic Meningiomas: A Strategy for Long-Term Tumor Control and Radiation-Induced Optic Neuropathy Avoidance With a 10-Year Follow-up. *J Korean Med Sci*. 2026 Feb 5;41(7):e76. doi:10.3346/jkms.2026.41.e76 PubMed PMID: 41732044; PubMed Central PMCID: PMC12929000.
4. Lieber BA, Rodgers S, Kondziolka D, Sen C, Narayana A, Jafar JJ. Intraoperative fat placement in surgically refractory parasellar neoplasms to facilitate stereotactic radiosurgery. *Acta Neurochir (Wien)*. 2014 Oct;156(10):1947–51. doi:10.1007/s00701-014-2187-5 PubMed PMID: 25062907.
5. Diaz S, Starnoni D, Tuleasca C, Dunet V, Peters D, Messerer M, et al. Radiological Evolution of Fat Graft Used for Optic Neuropexy During Surgery for Parasellar Meningiomas. *Neurosurgery*. 2023 Jun 1;92(6):1208–15. doi:10.1227/neu.0000000000002351 PubMed PMID: 36700760; PubMed Central PMCID: PMC10150850.
6. Turner B, Schüller E, Chang S, Harsh G, Soltys S. Intracranial Autograft Fat Placement to Separate the Optic Chiasm from Tumor to Improve Stereotactic Radiotherapy Dosimetry. *World Neurosurgery*. 2021 Feb 1;146:80–4. doi:10.1016/j.wneu.2020.10.110

9:05–9:11 am

Reconstruction in Transorbital Skull Base Surgery: Evolution of Free Fat Graft Volume and Globe Symmetry Following Lateral Transorbital Approaches to the Middle Cranial Fossa

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Introduction: The lateral transorbital approach is a minimally invasive, endoscope-assisted approach to the middle cranial fossa. To preserve orbital volume following sphenoid osteotomy and tamponade dural closures, orbital free fat grafts may be used. Longitudinal data on postoperative fat graft volume changes and their relationship to globe position are limited in patients undergoing these procedures. This study evaluates fat graft atrophy and associated postoperative orbital dynamics over time in patients undergoing the lateral transorbital approach for HSWM versus other tumor pathologies, as understanding these trends can inform surgical planning and decisions regarding fat graft placement.

Methods: A retrospective consecutive case review was performed of patients who underwent combined multidisciplinary transorbital approaches with oculoplastic and neurological surgery at a single center (2016–2024). Patients were categorized into 2 groups: hyperostotic sphenoid wing meningiomas (HSWM) versus all other (non-HSWM) tumors. Globe position and fat graft volume were assessed by analyzing orbital or brain magnetic resonance imaging (MRI) at preoperative, first postoperative, 3–6 months postoperative, and most recent scans. Globe position was measured on T2 fat saturated axial scans at the level of the lens, based on the anterior distance between the interzygomatic line and anterior globe (Figure 1). Relative exophthalmos was calculated and compared across time points.

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Results: 39 patients were included: 6 HSWM (3 with fat graft, 3 without) and 33 other tumors (15 with fat graft, 18 without) (Figure 2). Overall, 46% of patients received fat grafts. Fat graft volumes decreased to 55% of their initial size by 3–6 months postoperative then plateaued (Figure 3). In the HSWM with fat graft group, average relative exophthalmos was $4.77 \pm 3.7\text{mm}$ preoperatively, $5.73 \pm 3.4\text{mm}$ at first postoperative, $3.03 \pm 4.5\text{mm}$ at 3–6 months, and $3.37 \pm 4.2\text{mm}$ at most recent scans. For HSWM without fat grafts, average relative exophthalmos was $1.67 \pm 1.9\text{mm}$ preoperatively, $1.77 \pm 1.4\text{mm}$ at first postoperative, $1.00 \pm 0.9\text{mm}$ at 3–6 months, and $0.57 \pm 0.9\text{mm}$ at most recent scans (Figure 4). For other tumors with grafts, average relative exophthalmos was $0.87 \pm 1.9\text{mm}$ preoperatively, $2.32 \pm 1.5\text{mm}$ at first postoperative, $1.09 \pm 1.9\text{mm}$ at 3–6 months, and $0.19 \pm 1.3\text{mm}$ at most recent scans. In other tumors without grafts, average relative exophthalmos was $1.31 \pm 2.0\text{mm}$ preoperatively, $2.46 \pm 2.5\text{mm}$ at first postoperative, $-0.04 \pm 1.1\text{mm}$ at 3–6 months, and $0.16 \pm 3.2\text{mm}$ at most recent scans (Figure 5).

Conclusions: Orbital fat grafts undergo early atrophy, losing 45% of their initial volume within 3–6 months of surgery before stabilizing. Changes in globe position for all groups generally paralleled that pattern, with relative exophthalmos decreasing and reaching a plateau after 3–6 months. All groups demonstrated an initial postoperative increase in relative exophthalmos, likely due to post-surgical inflammation, followed by improvement in globe symmetry over time. Using a 2mm threshold for clinically significant relative exophthalmos, persistent globe asymmetry was only observed in the HSWM with fat graft group. These findings highlight the importance of understanding fat graft atrophy and globe position changes to aid in surgical planning and optimize favorable aesthetic outcomes for patients undergoing transorbital neuroendoscopic surgery. Larger studies are needed to validate these trends.

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Figure 1

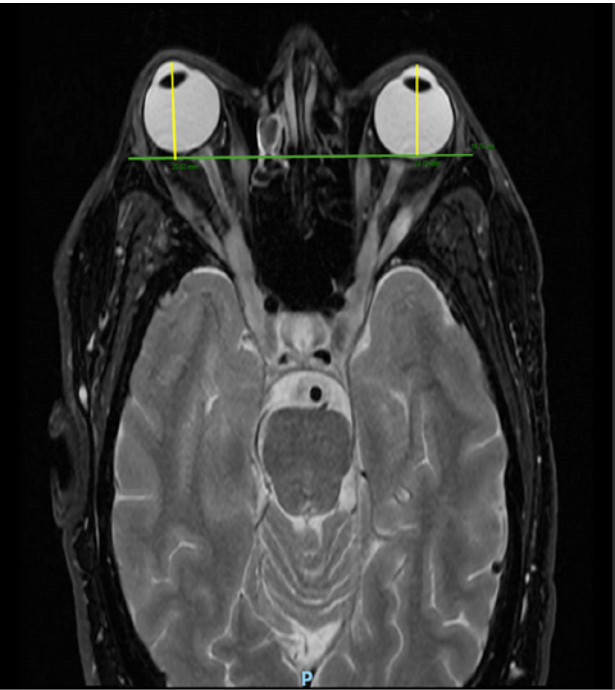


Figure 2

	Hyperostotic SWM	All other tumor pathologies
n	6	33
Mean age at surgery (years)	66.67 ± 10.46	50.42 ± 19.75
Female (%)	100	48.5
Caucasian (%)	66.7	60.6
Hispanic (%)	16.7	18.2
Fat graft reconstruction (#)	3 (50%)	15 (46%)
Surgery (%)	Subtotal Resection: 0 Gross Total Resection: 100 Biopsy: 0	Subtotal Resection: 27.3 Gross Total Resection: 51.5 Biopsy: 21.2
Pathologic diagnosis (%)	Meningioma: 100	Astrocytoma: 6 Craniopharyngioma: 3 Dermoid cyst: 3 Dysembryoplastic neuroepithelial tumor: 3 Encephalocele: 6 Epidermoid cyst: 3 Fibrous tumor: 3 Glioma: 6 Granular cell tumor: 3 Inflammation: 9 Meningioma: 15 Metastases: 12 Myofibroma: 3 Pituitary adenoma: 9 Schwannoma: 12 Spindle cell neoplasm: 3
Tumor location (%)	Sphenoid Wing: 100	Cavernous sinus: 27 Meckel's cave: 12 Cavernous sinus and Meckel's cave: 3 Infratemporal fossa: 3 Middle fossa: 21 Orbit: 15 Orbits and paracavernous sinus: 3 Paracavernous sinus: 12 Temporal lobe: 3

Figure 3

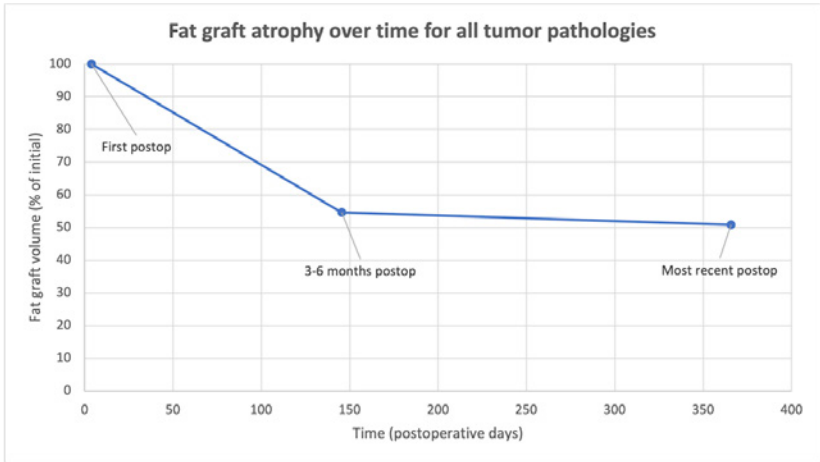


Figure 4

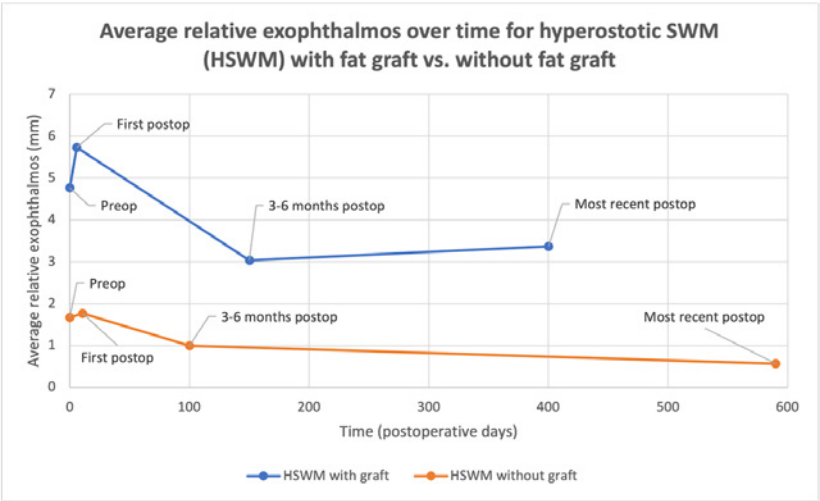
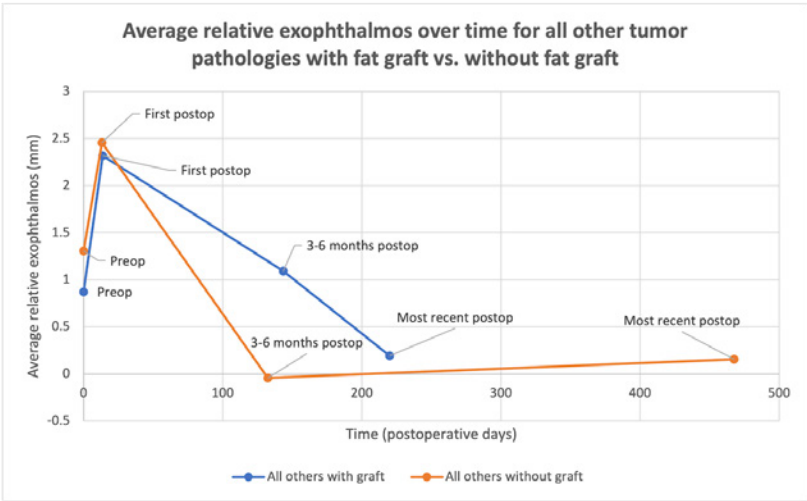


Figure 5





9:23–9:24 am

Rural Firearm-Related Ocular Injuries: Characterizing a High-Risk Population with Behavioral Disorders

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Introduction: Firearm-related ocular trauma can be devastating and visually threatening, yet its occurrence and outcomes in rural populations remain poorly characterized. Prior studies suggest that rural patients experience increased barriers in accessing care and psychiatric comorbidity is an additional risk factor for injuries by firearm. The aim of this study is to characterize the features of patients who sustained firearm-related ocular injuries and received care at a rural tertiary academic medical center. Understanding this population can help inform care pathways and guide targeted interventions.

Methods: Retrospective study of patients diagnosed with non-specific and ocular firearm injuries (2016–2024) presenting to a rural tertiary care center. Descriptive statistics were used to summarize demographic, geographic, ophthalmic, and psychiatric characteristics. Group comparisons used Mann-Whitney U and chi-square tests. The primary outcome was the proportion of firearm-related trauma admissions presenting to a rural tertiary care center that involved confirmed ocular injury. Demographic, geographic, and psychiatric data, follow-up adherence, and visual outcomes were also documented.

Results: Among 286 patients (median age 36.0, IQR 25.9–53.7; 252 [88.1%] male; 243 [85.0%] rural), 16 (5.6%) sustained confirmed ocular injuries (median age 37.9, IQR 29.6–47.9; 13 [81.2%] male; 14 [87.5%] rural). Patients with ocular injuries were significantly more likely to have sustained a self-inflicted injury (56.2% vs. 15.9%, $P < 0.001$). They were also significantly more likely to be diagnosed with PTSD/adjustment disorder (43.8% vs. 15.9%, $P = 0.012$), anxiety (68.8% vs. 25.6%, $P = 0.001$), and alcohol use disorder (43.8% vs. 17.8%, $P = 0.025$) and trended toward higher rates of subsequent firearm-related encounters (62.5% vs. 35.9%, $P = 0.062$). Despite 87.5% receiving inpatient ophthalmology consultation, only 50.0% pursued post-discharge follow-up, with non-returning patients living farther from the tertiary care center (42.4 vs. 35.1 miles). Among those presenting with no light perception, 50% sustained permanent vision loss at last follow-up.

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Conclusions: Firearm-related ocular injuries represent a small but clinically meaningful subset of firearm trauma in rural areas, disproportionately driven by self-inflicted injuries in patients with high psychiatric comorbidity. Patients lost to follow-up were concentrated in areas farther from the tertiary care center, highlighting geography as a barrier to longitudinal management. These findings underscore the need for integrated psychiatric and ophthalmic care and proactive outreach to reduce both repeat firearm injury and preventable vision loss in this vulnerable population.

References

1. Dowd B, Khan I, Boneva D, Mckenney M, Elkbulli A. Self-Inflicted Gun Violence Injuries Epidemic in the United States: A Closer Look at the Nation's Well-Being. *The American Surgeon™*. 2020;86(3):208-212. doi:10.1177/000313482008600329
2. Herrin BR, Gaither JR, Leventhal JM, Dodington J. Rural Versus Urban Hospitalizations for Firearm Injuries in Children and Adolescents. *Pediatrics*. 2018;142(2):e20173318. doi:10.1542/peds.2017-3318
3. Truong T, He CH, Poulsen DM, Parsikia A, Mbekeani JN. Firearm-associated ocular injuries: analysis of national trauma data. *Arq Bras Oftalmol*. 2021;84(1):58-66. doi:10.5935/0004-2749.20210055
4. Zwald ML. Emergency Department Visits for Firearm Injuries Before and During the COVID-19 Pandemic — United States, January 2019–December 2022. *MMWR Morb Mortal Wkly Rep*. 2023;72. doi:10.15585/mmwr.mm7213a2

9:24–9:25 am

Instagram vs. Reality: Quality and Consistency of Blepharoplasty Photos Posted by ASOPRS Surgeons

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Introduction: Several studies have shown that before-and-after photos in cosmetic surgery are often misrepresented on social media to favor postoperative results, frequently through enhancements in lighting, background, angle, and patient pose.^{1,2,3,4} This study evaluates the quality and consistency of before-and-after blepharoplasty photos posted to Instagram by ASOPRS-affiliated surgeons. Using imaging process and AI-based facial landmark analysis, it examines whether these images provide a transparent and accurate portrayal of surgical outcomes.

Methods: On March 20, 2025, Instagram was queried using the hashtag #ASOPRS, which yielded approximately 11,200 posts. The first 1,000 were screened for before-and-after images of upper, lower, or quad blepharoplasty by U.S.-based ASOPRS surgeons. Images were included if they displayed both views in a single composite. To reduce duplication bias, one image per account—the top-ranked post by Instagram’s default algorithm—was selected for analysis. Each image was evaluated for quality and consistency using objective metrics. Head tilt (a proxy for camera angle) and interpupillary distance (IPD, a proxy for camera distance or zoom) were calculated using the face_alignment model (Imperial College London) by referencing the coordinates of the medial canthi, as illustrated in Figures 1 and 2. Image brightness, contrast, and saturation were quantified using Python (v3.11; Python Software Foundation) with OpenCV (v4.9.0; Open Source Computer Vision Library) and NumPy (v1.26.4; NumPy Developers).

Results: Among the top 1,000 posts screened, 359 included before-and-after photographs. After applying inclusion and exclusion criteria, 29 unique U.S.-based ASOPRS accounts met eligibility, and the top-ranked image from each was included for analysis. Postoperative head tilt (mean Δ : $+1.7^\circ \pm 2.5^\circ$; $p = 0.02$) showed a small but statistically significant change, indicating subtle changes in camera angle. IPD also increased (mean Δ : $+21.0 \pm 34.7$ px; $p = 0.03$), suggesting closer or more zoomed-in framing in postoperative photos. The overall brightness (mean Δ [Post – Pre]: $+3.0 \pm 13.0$) tended to increase in post-op images, suggesting slightly improved lighting conditions, though the difference was not statistically significant ($p = 0.204$). Contrast (mean Δ : -0.18 ± 6.7 , $p = 0.88$) and saturation (mean Δ : -2.1 ± 16.8 , $p = 0.50$) remained relatively stable.

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Conclusions: Blepharoplasty before-and-after photos posted to Instagram by ASOPRS surgeons demonstrated overall consistency in lighting, with no statistically significant changes in brightness, contrast, or saturation. Although small but significant differences in head tilt and interpupillary distance were observed—indicating minor variations in camera angle and zoom—these differences were modest. In contrast to previous studies showing that cosmetic surgeons often enhance lighting in postoperative images, our findings did not find evidence of photographic manipulation to exaggerate outcomes by ASOPRS surgeons. This may reflect a culture of photographic integrity within the ASOPRS community. The primary limitation of this study was the cohort size that fulfilled inclusion criteria. Future studies evaluating a larger cohort of surgeons, a greater number of before-and-after images, and a broader range of procedures—including both cosmetic and functional surgeries—may support further generalizability to this concept that ASOPRS surgeons present surgical outcomes on social media in a transparent and reliable manner.

Figure 1



Figure 2



Figure 3

Metric Mean ± SD	PreOp	PostOp	Δ (PostOp – PreOp)	p-value
Camera Angle				
Eye Tilt (°)	1.02 ± 12.08	2.7 ± 13.38	1.68 ± 2.52	0.02
Zoom (IPD (px))	384.34 ± 159.38	405.32 ± 154.96	20.98 ± 34.67	0.03
Brightness	134.93 ± 19.28	137.96 ± 19.31	3.02 ± 12.97	0.20
Contrast	45.49 ± 9.54	45.32 ± 9.54	-0.18 ± 6.73	0.88
Saturation	87.35 ± 23.48	85.3 ± 19.37	-2.05 ± 16.81	0.50

PreOp = Preoperative; PostOp = Postoperative; SD = standard deviation; IPD = interpupillary distance; px = pixels.

References

1. ElAbd R, Alghanim K, Alnesef M, Alyouha S, Samargandi OA. Aesthetic surgery before-and-after photography bias on Instagram. *Aesthetic Plastic Surgery*. 2023 Oct;47(5):2144-9.
2. Vaca EE, Perez MM, Lamano JB, Turin SY, Moradian S, Fagien S, Schierle C. Photographic misrepresentation on instagram after facial cosmetic surgery: is increased photography bias associated with greater user engagement?. *Aesthetic Surgery Journal*. 2021 Nov 1;41(11):NP1778-85.
3. Eskandari S, Mehta M, Sethna A, Chou DW. Quality and Consistency of Rhinoplasty Photos on Social Media: Prevalence of Potentially Misleading Before-and-After Images. *Facial Plastic Surgery & Aesthetic Medicine*. 2025 Mar 1;27(2):176-82.
4. Maamari RN, Farhood Z, Holds JB, Couch SM. Quantitative analysis of preoperative and postoperative photographs posted on social media by oculoplastic surgeons. *Ophthalmic Plastic & Reconstructive Surgery*. 2022 Nov 1;38(6):571-6



Moderators: Sophie D. Liao and Suzanne K. Freitag

9:26–9:32 am

Declining Inflation-Adjusted Medicare Reimbursements in Oculofacial Surgery

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Introduction: Medicare reimbursements have undergone substantial changes over time, with increasing concern regarding declining physician payments after adjustment for inflation. Prior studies in ophthalmic and oculofacial surgery have demonstrated reductions in reimbursement, with implications for practice sustainability and access to care.^{1,2} This study evaluates long-term trends in inflation-adjusted Medicare reimbursements across commonly performed oculofacial procedures.

Methods: This study utilized the Centers for Medicare & Medicaid Services (CMS) Physician Fee Schedule Look-Up Tool to identify reimbursements for selected oculofacial CPT/HCPCS codes in 2000, 2010, 2020, and 2026 using a fixed New York locality that is the practice location of the senior author (RS, Brooklyn; MAC Locality 80302/1320202). Facility and nonfacility (office-based) reimbursement rates were recorded and adjusted to 2026 U.S. dollars using the Consumer Price Index. Inflation-adjusted percent change and compound annual growth rate (CAGR) were calculated for the intervals 2000–2010, 2010–2020, 2020–2026, and 2000–2026. CPT codes with missing CMS data for specific years were excluded from interval-specific analyses. All analyses were performed in Microsoft Excel (Microsoft Corp., Redmond, WA).

Results: Across all analyzed procedures, inflation-adjusted reimbursements declined in both facility and nonfacility settings from 2000–2026 (Figure 1). Early intervals (2000–2010 and 2010–2020) demonstrated modest or mixed changes, while the 2020–2026 interval showed consistent and pronounced declines across all procedures (Figure 2). Increases in reimbursement rates were rare and seldom exceeded CAGR >1% (punctoplasty, NLD probing, canalicular irrigation [facility 2000–2010]; intralesional injection [nonfacility 2000–2010]). All available reimbursement rates are shown in Table 1.

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Between 2000–2026, the largest declines in facility reimbursements were seen for CPT 67810 (biopsy of eyelid, \$171.19 to \$63.18, -63.1%), CPT 68510 (lacrimal gland biopsy, \$650.10 to \$268.47, -58.7%), and CPT 67917 (ectropion repair, extensive, \$1079.26 to \$452.82, -58.0%). Between 2000–2026, the largest changes in nonfacility reimbursements were seen for CPT 67825 (treatment of trichiasis via electrolysis, cryotherapy, etc., \$479.06 to \$157.49, -67.1%), CPT 68810 (nasolacrimal duct probing, \$554.97 to \$187.44, -66.2%), and CPT 68440 (punctoplasty, \$363.86 to \$123.80, -66.0%).

Declines in reimbursement were especially notable between 2020–2026. The largest declines in facility reimbursement in this time period included CPT 67810 (biopsy of eyelid, \$107.34 to \$63.18, -41.1%), CPT 11900 (intralesional injection, \$46.76 to \$27.58, -41.0%), and CPT 68510 (lacrimal gland biopsy, \$442.45 to \$268.47, -39.3%). The largest declines in nonfacility reimbursement from 2020–2026 included CPT 68815 (nasolacrimal duct probing with stent, \$600.69 to \$437.31, -27.1%), CPT 37609 (temporal artery biopsy, \$214.84 to \$169.14, -21.3%), and CPT 67912 (upper eyelid weight, \$1403.17 to \$1052.82, -25.0%).

Mean change in CAGR did not vary significantly by surgical setting across all procedures from 2000–2026 (facility = -2.27%, nonfacility = -2.21%).

Conclusions: Inflation-adjusted Medicare reimbursement for oculofacial procedures has declined substantially over the recent decades, with evidence of accelerating reductions in recent years. These findings raise concerns regarding the long-term financial sustainability of oculofacial practice and may have implications for access to care and procedural utilization.

Figure 1

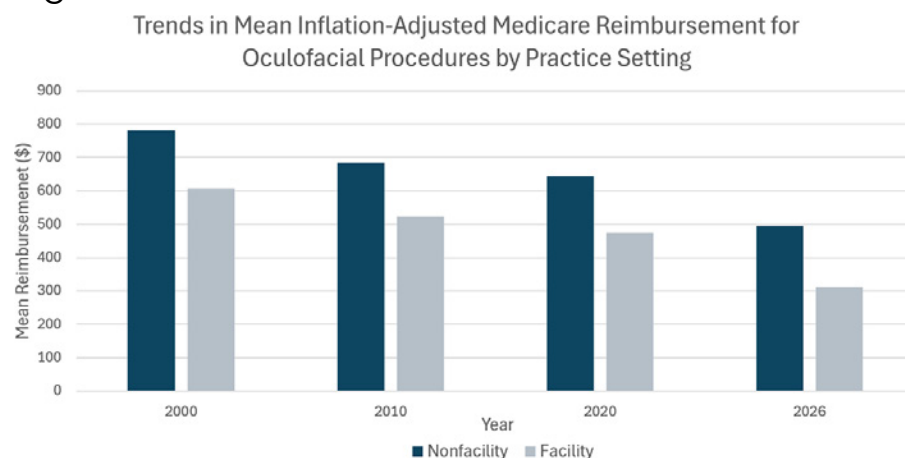


Figure 2

Compound Annual Growth Rate (CAGR) of Inflation-Adjusted Medicare Reimbursement for Oculofacial Procedures

CPT Code	Description	2000-2010 facility CAGR (%)	2000-2010 nonfacility CAGR (%)	2010-2020 facility CAGR (%)	2010-2020 nonfacility CAGR (%)	2020-2026 facility CAGR (%)	2020-2026 nonfacility CAGR (%)	2000-2026 facility CAGR (%)	2000-2026 nonfacility CAGR (%)	CAGR (%)
11440	lid exc <5cm	0.66	-1.05	-0.27	0.07	-5.44	-4.28	-1.14	-1.38	-8
11900	intralesional inj ex steroid	-1.07	1.01	-1.01	-0.98	-8.42	-3.98	-2.79	-0.92	-7
15260	FTSG <20sq cm	-0.55	0.46	-0.86	-0.63	-7.06	-4.57	-2.21	-1.14	-6
15823	UL bleph excess skin	-1.81	-1.82	-2.10	-1.79	-6.53	-3.98	-3.03	-2.31	-5
21390	Floor Fx repair w implant	-2.94	NA	-0.26	NA	-6.72	NA	-2.81	-2.81	-4
37609	TAB	-1.52	-1.13	-0.21	-0.25	-6.53	-4.71	-2.21	-1.63	-3
64612	facial Botox	-0.75	-2.36	-2.80	-2.65	-6.11	-3.91	-2.80	-2.83	-2
65093	evisc	-2.72	NA	0.23	NA	-4.96	NA	-2.13	-2.13	-1
65105	enuc	-1.51	NA	0.07	NA	-5.42	NA	-1.83	-1.83	0
67400	ant orbitotomy w Bx	-1.87	NA	0.01	NA	-5.64	NA	-2.04	-2.04	1
67414	ant orbitotomy decompression	0.75	NA	0.29	NA	-6.24	NA	-1.08	-1.08	2
67445	lat orbitotomy decompression	-0.45	NA	-0.13	NA	-6.28	NA	-1.71	-1.71	3
67800	chal I&D single	0.10	-6.92	-0.64	-0.32	-7.13	-4.16	-1.90	-3.79	
67810	lid Bx	-1.41	0.01	-3.20	-2.51	-8.45	-4.47	-3.76	-2.01	
67825	trichiasis electrolysis, cryo etc	-0.63	-8.05	-0.53	-0.19	-6.33	-4.15	-1.94	-4.19	
67900	brow lift	-1.40	-0.40	-0.58	-0.41	-7.02	-4.16	-2.42	-1.29	
67901	sling w banked fascia	-2.70	-0.63	-0.39	0.50	-6.86	-4.18	-2.80	-1.03	
67904	ptosis external levator	-1.93	-1.50	-0.52	-0.41	-6.98	-4.28	-2.58	-1.73	
67908	CMMR	-2.97	-2.65	-0.64	-0.07	-6.52	-3.48	-2.92	-1.86	
67911	lid retraction repair	-0.87	NA	-0.50	NA	-6.98	NA	-2.17	-2.17	
67912	UL weight	NA	NA	-0.53	-0.34	-6.66	-4.67	NA	NA	
67917	ectrop extensive	-3.37	-2.29	-0.98	0.01	-6.88	-4.23	-3.29	-1.87	
67924	entrop extensive	-3.40	-1.85	-0.43	0.43	-6.87	-4.28	-3.09	-1.55	
68440	punctoplasty	3.16	-7.20	-0.38	-0.84	-5.89	-4.03	-0.35	-4.06	
68510	LG Bx	-3.08	-3.15	-0.71	-0.44	-7.99	-4.65	-3.34	-2.47	
68700	canaliculoplasty	0.43	NA	-0.59	NA	-6.89	NA	-1.69	-1.69	
68720	DCR	-2.23	NA	-0.16	NA	-6.12	NA	-2.36	-2.36	
68810	NLD probing	1.93	-3.60	-4.48	-4.48	-6.38	-4.24	-2.51	-4.09	
68815	NLD probing w stent	-0.18	-0.55	-2.01	-1.77	-6.65	-5.15	-2.41	-2.10	
68840	canalic irrig	2.91	-7.73	-0.38	-0.13	-6.00	-3.95	-0.47	-4.00	

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Figure 3

CPT Code	Description	2000 Facility	2000 Nonfacility	2010 Facility	2010 Nonfacility	2020 Facility	2020 Nonfacility	2026 Facility	2026 Nonfacility
11440	lid exc <.5cm	154.26	239.65	164.72	215.62	160.25	217.10	114.56	166.98
11900	intralesional inj ex steroid	57.63	84.63	51.75	93.61	46.76	84.85	27.58	66.50
15260	FTSG <20sq cm	1512.93	1579.15	1431.90	1653.73	1313.69	1552.17	846.80	1172.06
15823	UL bleph excess skin	1242.28	1354.69	1034.94	1127.73	836.61	941.51	557.89	737.79
21390	Floor Fx repair w implant	1740.47	1740.47	1291.82	NA	1258.87	NA	829.41	829.41
37609	TAB	402.98	578.98	345.81	516.72	338.47	504.09	225.69	377.40
64612	facial Botox	270.59	356.84	251.04	281.04	188.90	214.84	129.42	169.14
65093	evisc	1342.99	1342.99	1019.00	NA	1042.41	NA	767.98	767.98
65105	enuc	1591.34	1591.34	1366.34	NA	1376.11	NA	985.14	985.14
67400	ant orbitotomy w Bx	1807.91	1807.91	1496.91	NA	1498.77	NA	1057.65	1057.65
67414	ant orbitotomy decompression	1920.00	1920.00	2068.16	NA	2129.45	NA	1447.07	1447.07
67445	lat orbitotomy decompression	2372.92	2372.92	2268.12	NA	2238.45	NA	1516.98	1516.98
67800	chal I&D single	164.51	414.58	166.17	202.46	155.80	196.11	99.99	152.01
67810	lid Bx	171.19	361.12	148.59	361.35	107.34	280.14	63.18	212.90
67825	trichiasis electrolysis, cryo etc.	207.20	479.06	194.46	207.01	184.35	203.12	124.53	157.49
67900	brow lift	944.77	1074.60	820.58	1031.95	774.16	990.55	500.31	767.58
67901	sling w banked fascia	1214.09	1214.09	923.79	1139.34	888.54	1197.14	580.23	926.53
67904	ptosis external levator	1157.98	1366.21	953.01	1174.85	904.93	1127.95	586.11	867.68
67908	CMMR	937.75	1038.82	693.34	794.49	650.12	788.68	433.77	637.50
67911	lid retraction repair	974.67	974.67	893.06	NA	849.49	NA	550.38	550.38
67912	UL weight	NA	NA	786.69	1451.49	745.69	1403.17	493.25	1052.82
67917	ectrop extensive	1079.26	1192.53	766.05	946.04	694.39	946.66	452.82	730.41
67924	entrop extensive	1023.46	1141.09	724.12	946.65	693.83	988.62	452.59	760.37
68440	punctoplasty	115.55	363.86	157.72	172.36	151.88	158.50	105.53	123.80
68510	LG Bx	650.10	1006.46	475.28	730.59	442.45	699.15	268.47	525.42
68700	canalicuplasty	929.20	929.20	970.32	NA	914.53	NA	595.78	595.78
68720	DCR	1511.61	1511.61	1206.83	NA	1188.18	NA	813.33	813.33
68810	NLD probing	251.77	554.97	304.90	384.44	192.89	243.12	129.85	187.44
68815	NLD probing w stent	420.70	758.76	413.16	718.00	337.38	600.69	223.25	437.31
68840	canalic irrig	136.80	451.33	182.24	201.78	175.43	199.16	121.01	156.35

References

1. Devlin AM, McCormack G. Physician responses to Medicare reimbursement rates. *J Health Econ.* 2023;92:102816. doi:10.1016/j.jhealeco.2023.102816
2. Jaber J, Siddiqui T, Onyeka R, et al. Centers for Medicare & Medicaid Services Reimbursement Declines for Chalazion Incision and Drainage. *Ophthalmic Plast Reconstr Surg.* Published online February 16, 2026. doi:10.1097/IOP.0000000000003094

9:32–9:38 am

Cost Analysis of Outpatient Ophthalmic Plastic Surgical Procedures

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Introduction: As healthcare costs increase in the United States,¹ analysis of care at outpatient centers including hospital outpatient departments (HOPDs) and ambulatory surgical center (ASCs) has been scrutinized, particularly in ophthalmology where over 95% of procedures are performed in the outpatient setting.² While outpatient facilities represent lower cost alternatives to traditional inpatient operating rooms,³ formal metrics to evaluate financial efficiency and cost effectiveness remain poorly defined. As governmental payors propose alterations to facility reimbursement,⁴ the need for such metrics increases to better evaluate utilization of HOPDs and ASCs as a strategy to minimize cost while expanding patient access. In this study we examined a novel framework to assess the financial feasibility of conducting Ophthalmic Plastic and Reconstructive Surgery (OPRS) procedures in the outpatient setting by using a time-based metric that considers institutional expenditures relative to facility reimbursement.

Methods: Our model incorporates operational and personnel costs of ASCs and HOPDs, direct and indirect costs associated with individual procedures, and Centers of Medicare Services (CMS) facility reimbursement (Figure 1). Using this framework, the output is the maximum total intraoperative time to maintain financial neutrality, a unified time-based metric based on expenditure versus reimbursement. Total costs for each procedure were determined using a combination of masked procedural costs, defined operational frameworks,⁵ and publicly available data. These inputs were used to calculate the maximum intraoperative time for common OPRS procedures identified using 2024 CMS National Summary Data.

Results: Unilateral OPRS procedures analyzed included: external levator repair (67904), blepharoptosis repair (frontalis technique; 67901), conjunctivo-tarso-muller's muscle-levator resection (67908), brow ptosis repair (67900), canthoplasty (67950), ectropion repair (67917), entropion repair (67924), excision and repair of eyelid (67966), enucleation (65105), evisceration (65093), orbital blow out fracture repair (21390), orbital decompression (67445), and orbitotomy (67400). Maximum intraoperative time to maintain financial neutrality for ASCs ranged from 86.4 (orbital blow out fracture repair with nylon foil implant) to 4.5 (enucleation with porous integrated implant) minutes and was driven by CMS facility reimbursement and direct material cost per procedure (Table 1). For HOPDs, maximum intraoperative times were higher for all procedures and ranged from 186.7 (orbital blow out fracture repair with nylon foil implant) to 73.7 (blepharoptosis repair, frontalis technique) minutes (Table 1).

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Conclusions: Overall, outpatient facilities are well-positioned to offer common OPRS procedures. ASCs, however, face greater financial pressures due to lower CMS facility reimbursement and billing policy restrictions. This is particularly relevant for procedures that may necessitate high-cost implants, such as evisceration and fracture repair where low maximum intraoperative times are necessary to maintain financial neutrality in the ASC setting when higher-cost implants are used. Prior work has shown that common OPRS procedures including blepharoplasty⁶ and dacryocystorhinostomy⁷ are cost-effective and have a positive impact on patient quality of life, underscoring the importance of increasing patient access to OPRS procedures. ASCs represents an important strategy to increase patient access to care while reducing healthcare costs, but our findings also highlight the need for ongoing advocacy in CMS reimbursement and billing structure to maintain institutional financial efficiency and viability.

Figure 1

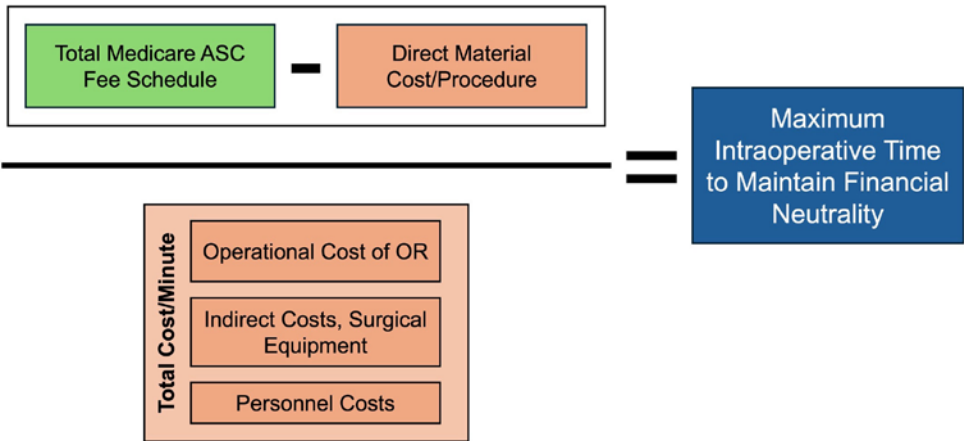


Figure 2

Procedure Description (Unilateral)	CPT Code	Implant	Maximum Intraoperative Time, ASC (minutes)	Maximum Intraoperative Time, HOPD (minutes)
Repair of blepharoptosis; (larso) levator resection or advancement, external approach	67904		30.7	75.2
Repair of blepharoptosis; frontalis muscle technique with suture or other material (eg, banked fascia)	67901		29.2	73.7
Repair of blepharoptosis; conjunctivo-tarso-muller's muscle-levator resection (eg, fasanella-servat type)	67908		29.6	74.1
Repair of brow ptosis (supraciliary, mid-forehead or coronal approach)	67900		29.9	74.4
Canthoplasty (reconstruction of canthus)	67950		29.9	74.4
Repair of ectropion; extensive (eg, tarsal strip operations)	67917		29.9	74.4
Repair of entropion; extensive (eg, tarsal strip or capsulopalpebral fascia repairs operation)	67924		30.1	74.6
Excision and repair of eyelid, involving lid margin, tarsus, conjunctiva, canthus, or full thickness, may include preparation for skin graft or pedicle flap with adjacent tissue transfer or rearrangement; over one-fourth of lid margin	67966		29.9	74.4
Enucleation of eye with implant, muscles attached to implant	65105	Porous integrated implant	4.5	80.2
		Acrylic sphere	46.5	122.2
Evisceration of ocular contents with implant	65093	Porous integrated implant	4.9	80.6
		Acrylic sphere	46.9	122.6
Open treatment of orbital floor blowout fracture; periorbital approach, with alloplastic or other implant	21390	Porous polyethylene titanium implant	48.2	148.5
		Nylon foil implant	86.4	186.7
Orbitotomy with bone flap or window, lateral approach (eg, kroenlein); with removal of bone for decompression	67445		44.3	120.1
Orbitotomy without bone flap (frontal or transconjunctival approach); for exploration, with or without biopsy	67400		50.1	125.8

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References

1. Sisko AM, Keehan SP, Poisal JA, et al. National Health Expenditure Projections, 2018–27: Economic And Demographic Trends Drive Spending And Enrollment Growth. *Health Aff (Millwood)*. 2019;38(3):491–501. doi:10.1377/hlthaff.2018.05499
2. Hollingsworth JM, Birkmeyer JD, Ye Z, Miller DC. Specialty-specific trends in the prevalence and distribution of outpatient surgery: implications for payment and delivery system reforms. *Surg Innov*. 2014;21(6):560–565. doi:10.1177/1553350613520515
3. Osias E, Cale M, Singh P, Rootman D “Cost-Effectiveness Analysis of Posterior Blepharoptosis, Ectropion, and Entropion Surgeries Performed in an Operating Room versus an Office Procedure Room,” ASOPRS Fall Meeting, Chicago, IL, September 2022
4. Calendar Year 2026 Hospital Outpatient Prospective Payment System (OPPS) and Ambulatory Surgical Center Proposed Rule (CMS-1834-P) | CMS. Accessed September 14, 2025. <https://www.cms.gov/newsroom/fact-sheets/calendar-year-2026-hospital-outpatient-prospective-payment-system-opps-and-ambulatory-surgical>
5. Childers CP, Maggard-Gibbons M. Understanding Costs of Care in the Operating Room. Accessed September 15, 2025. <https://jamanetwork.com/journals/jamasurgery/fullarticle/2673385>
6. Lee TC, Fung SE, Hu JQ, et al. Is Blepharoplasty Cost-effective? Utility Analysis of Dermatochalasis and Cost-effectiveness Analysis of Upper Eyelid Blepharoplasty. *Ophthalm Plast Reconstr Surg*. 2024;40(5):552–559. doi:10.1097/IOP.0000000000002649
7. Hu JQ, Men CJ, Afshari NA, Liu CY, Korn BS, Kikkawa DO. Cost-effectiveness analysis of endoscopic dacryocystorhinostomy using Markov modelling. *Can J Ophthalmol J Can Ophtalmol*. 2024;59(3):e233–e238. doi:10.1016/j.jcjo.2023.03.005

9:38–9:44 am

Prospective Evaluation of Sublingual Anesthesia for Oculoplastics Procedures

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Introduction: Patient comfort for ASC and in-office oculoplastics procedures is a critical factor in a positive surgical experience. We evaluated sublingual midazolam, ketamine and ondansetron for safety and efficacy in oculoplastic procedures.

Methods: 150 sequential ASC oculoplastics procedures (excluding posterior orbit, dacryocystorhinostomy, and patient request) were prospectively evaluated for patient comfort, need for additional anesthesia, Post anesthesia care unit (PACU) duration, intraoperative complications, surgeon and anesthesia provider preference, and intra- and post-operative patient satisfaction. Each melt consisted of 3 mg of midazolam, 25 mg of ketamine HCl, and 2 mg of ondansetron. Dosing was age-based (persons up to 65 years of age received two pills; 1.5 melts for patients between 65 to 70, one melt for patients between 70 to 80, and 0.5 melt for patients greater than 80) and was increased by 0.5–1 melt for increased anxiety and/or a significant history of pain medication use, illicit drug or alcohol use. The goal of administration was 30 min prior to local anesthetic injection.

Results: In all patients, no supplemental intravenous anesthesia was required on any procedure. No intraoperative complications were observed. 96% of patients were satisfied with their operative comfort after injection, and had little recollection at their first postoperative day interview. PACU time was not prolonged. The anesthesia providers were satisfied with patient anesthesia, comfort and responsiveness in all cases. Postoperatively, all surgeons were satisfied with patient comfort during the procedures. Additionally, they observed improved cooperation for levator advancement procedures compared to intravenous propofol.

Conclusions: Sublingual conscious sedation using midazolam, ketamine and ondansetron provides adequate anesthesia for the majority of oculoplastic surgical procedures. The benefits of sublingual anesthesia may negate then need for intravenous sedation in many oculoplastic procedures. Midazolam, ketamine and ondansetron melt may offer improved patient cooperation in levator advancement procedures.

References

1. Conger JR, Manipud N, Elhaloiti I, et al. Oral Sedation Anesthesia Protocol for In-Office Oculoplastic Surgery. *Ophthalmic Plast Reconstr Surg* 2024;40: 254-259.
2. Conscious Sedation Efficacy of the MKO Melt (Midazolam, Ketamine, Ondansetron). *ClinicalTrials.gov* ID NCT03653520
3. Jeffries M, Wade E, Mayo M, Eisele V, Janecki J. Conscious sedation efficacy of the novel medication, MKO melt (midazolam, ketamine, ondansetron), during cataract surgery. Poster presented at: AAO 2018 annual meeting; October, 26–30, 2018; Chicago.

9:44–9:50 am

Safety of Low-Level Disinfection for Reusable Instruments in Postoperative Eyelid Suture Removal: A Narrative Review and a Cost Savings Analysis of this Protocol

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Introduction: The use of sterile instruments in skin suture removal after surgery is variable. The authors explore the literature for rates of surgical site infection (SSI) in surgical cases using surgical clean versus sterile technique for minor cutaneous surgical procedures and/or postoperative intact suture removal. The cost benefits of a multiuse disinfection approach for disposable suture removal instruments are compared to one-time use disposable instruments and autoclaved sterile instruments.

Methods: A literature review using the PubMed search engine from 1965 to the present with the terms (“surgery” OR “procedures”) AND (“sterile” OR “nonsterile” OR “clean technique” OR “aseptic”) as keywords populated 2988 results. Meta-analyses, randomized controlled trials, reviews, and systematic reviews were included, from which 17 studies directly comparing sterile versus non-sterile or clean techniques were identified and included (Figure 1). Additionally, a targeted web search was performed to identify existing guidelines using query terms: (“sterile technique” OR “aseptic technique”) guidelines. The cost to run an autoclave was obtained using ZMS Health Bio’s breakdown of processing and sterilizing instruments for an outpatient/clinical setting. The cost of monthly maintenance, water, and electricity per cycle of instrument sterilization for an individual oculoplastic or plastic surgery clinic was compared to the cost of single-use, disposable instruments.

A cost savings analysis on UCI Health surgical records of oculoplastics procedures performed from November 2024 to November 2025, combined with the cost of surgical instruments, running an autoclave, and reimbursement rates based on CMS data was used to further extrapolate additional savings from a multi-use disinfection protocol with alcohol prep pads for an average of 20 daily uses prior to disposal. These estimates were then projected to CMS national average numbers of oculoplastic surgical procedures to create a cost savings comparison between reusable suture removal instruments, single-use disposable suture removal instruments, and a multi-use low-level disinfection protocol with alcohol prep pads.

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Results: 17 articles met the inclusion criteria (Table 1). In studies comparing infection rates between sterile and non-sterile instruments, there was not a statistically significant increase in infection rates. Thus, there was no increased risk of infection in using clean techniques to remove sutures in post-operative patients with intact skin. An institutional cost savings analysis demonstrated the oculofacial plastics division at UCI Health could reduce costs by approximately \$14,450 annually (Table 2) by integrating low-level disinfection and cleaning of disposable suture removal instruments. Projecting these cost savings to national CMS oculoplastic surgical procedure totals found that using the multi-use low-level disinfection protocol could save \$5.8 million annually (Table 3) in national healthcare costs and reduce healthcare-associated waste.

Conclusions: According to the available literature, multi-use low-level disinfection and cleaning protocol for instruments involved in eyelid suture removal is safe. By switching from sterile to clean protocols for suture removal, significant reductions in economic and material waste are possible for oculofacial surgery.

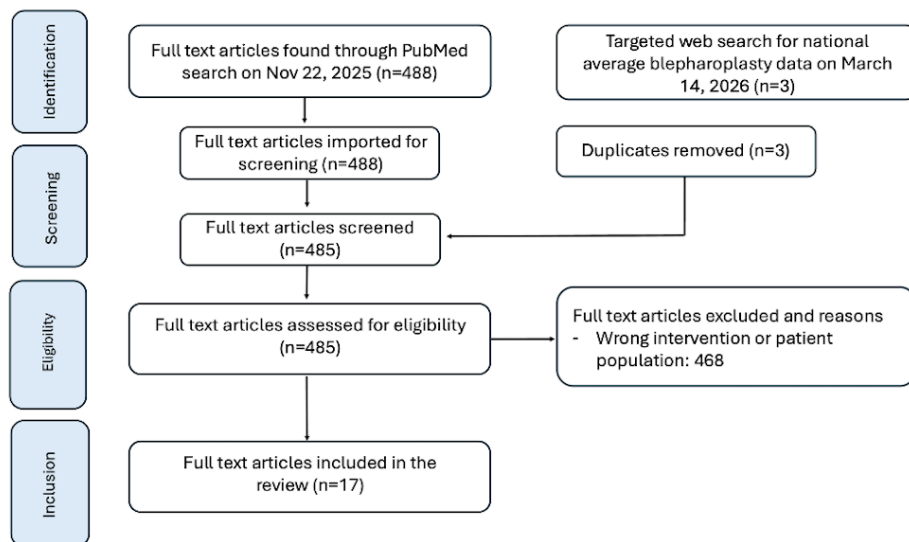


Figure 1: PRISMA Flowchart depicting the study selection workflow.

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Article Authors	Study Design	Procedure	Study Setting	Sterility Compared	Infection Rate (Total %)	Sterile-Infection Rate (%)	Non-sterile Infection Rate (%)	Statistical Significance (p<0.05)
Rutala & Weber (CDC, 2023)	Guideline	Disinfection & sterilization	Healthcare	N/A	N/A	N/A	N/A	N/A
Coccolin i et al. (2024)	Guideline	Trauma surgery	Hospital	N/A	N/A	N/A	N/A	N/A
Goldman & Tetsworth (2023)	Guideline	Major extremity trauma	Hospital	N/A	N/A	N/A	N/A	N/A
WHO (2013)	Guideline	Wound care	Global healthcare	N/A	N/A	N/A	N/A	N/A
Worrell (1989)	Prospective Study	Skin laceration repair	Outpatient	Yes	30.20%	45.50%	14.30%	Not significant
Heal et al. (2015)	RCT (non-inferiority)	Minor surgery	Outpatient	Yes	9.00%	9.30%	8.70%	Not significant
Chiu et al. (2006)	Prospective comparative	Wisdom tooth surgery	Dental	Yes	1.50%	2.20%	0.70%	Not significant
Perelma n et al. (2004)	RCT	Laceration repair	Emergency Department	Yes	5.30%	6.10%	4.40%	Not significant
Xia et al. (2011)	RCT (pilot)	Mohs surgery repair	Dermatology	Yes	5.00%	6.70%	3.30%	Not significant
Brewer et al. (2016)	Systematic review & meta-analysis	Cutaneous & dental procedures	Outpatient	Yes	2.10%	2.00%	2.10%	Not significant
Wang & Shinder (2023)	Retrospective study	Oculoplastic procedures	Outpatient	Yes	0.00064 %	0.06400 %	0.06400 %	Not significant
Singer & Clark (1999)	Narrative review	Wound healing	N/A	N/A	N/A	N/A	N/A	N/A
Mahsoui et al. (2024)	Systematic review	Minor procedures	Multiple	Yes	N/A	N/A	N/A	N/A
Rutala et al. (2023)	Narrative review	Disinfection/antiseptics	Hospital	N/A	N/A	N/A	N/A	N/A
Rowan et al. (2023)	Review	Medical device sterilization	Hospital	N/A	N/A	N/A	N/A	N/A
Purssell et al. (2024)	Systematic review & meta-analysis	Wound care	Emergency Department	Yes	N/A	N/A	N/A	N/A
Tan et al. (2023)	Systematic review & meta-analysis	ED wound repair	Emergency Department	Yes	5.20%	5.69%	4.71%	Not significant

Table 1: This table compares all the studies evaluated in the article on study type, study location, sterility comparison, infection rate, and statistical significance.

University of California Irvine Cost Savings Analysis							
Item	Unit Cost	Procedure Totals	Uses / Year	Autoclave Cost	Cost / Procedure	Annual Net Cost	Annual Savings
Disposable Jewelers	\$5	3,042	3,042	N/A	\$5.00	\$15,210	-
Reusable Jewelers	\$100	3,042	3,042	\$2.00	\$2.44	\$7,417	+\$7,793
Multi-use Low-level Disinfection Protocol	\$5	3,042	152	N/A	\$0.25	\$760	+\$14,450

Table 2: Cost Savings Analysis using total number of procedures completed at University of California Irvine from November 2024 until November 2025 along with industry standard costs of jewelers forceps and autoclave usage.

National Cost Savings Estimates based on CMS data							
Item	Unit Cost	Procedure Totals	Uses / Year	Autoclave Cost	Cost / Procedure	Annual Net Cost	Annual Savings
Disposable jewelers	\$5	1,168,243	1,168,243	N/A	\$5.00	\$5,841,215	-
Autoclaved jewelers	\$100	1,168,243	1,168,243	\$2.00	\$2.44	\$2,850,513	+\$2,990,702
Multi-use Low-level Disinfection Protocol	\$5	1,168,243	58,412	N/A	\$0.25	\$14,603	+\$5,826,612

Table 3: Cost Savings Analysis using national averages from CMS 2019 data and average cost of jewelers forceps and autoclave usage.

9:50–9:56 am

Ophthalmology Residents' Perceptions of Oculoplastics Fellowship: A National Survey

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Introduction: Prior studies have characterized the competitiveness of oculoplastic surgery fellowship matching and the evolving demographics of oculoplastics fellows, but residents' perceptions of oculoplastics as a career remain underexplored. In recent years, the number of resident applicants to oculoplastics fellowships has declined. This study examines the factors influencing ophthalmology residents' decisions to pursue oculoplastic fellowship.

Methods: A cross-sectional survey was administered to ophthalmology residents at ACGME-accredited U.S. programs from March to April 2026. Residents were asked about program characteristics, demographics, oculoplastics exposure, and perceptions of fellowship application using Likert-scale questions. Responses were anonymous, voluntary, and aggregated using descriptive statistics and non-parametric analysis. This study was approved by the Baylor College of Medicine Institutional Review Board.

Results: 129 residents completed the survey with 49.6% (n=64) male respondents, 49.6% (n=64) female respondents, and 0.8% (n=1) listed as other. 17.8% (n=23) planned to apply for oculoplastics fellowship, 64.3% (n=83) did not, and 17.8% (n=23) were undecided. Among all respondents, likelihood of matching was rated highest in the top two importance categories (64.8%), followed by geographic availability of fellowships (60.5%) and call schedule (58.1%). However, all factors asked received a median of 4 (on a scale of 1–5 importance) suggesting a broad array of variables impact decision-making. Aggregating themes in the free-text responses reported other factors such as early application timeline before adequate surgical exposure, competitiveness driven by personal connections and early planning over merit, and loss of intraocular surgery as important for applying. Most residents reported sufficient clinical exposure to oculoplastics (73.6% agree/strongly agree, n=95), though fewer felt they had sufficient faculty support (53.5%, n=69). Compared to non-applicants, prospective applicants placed significantly greater importance on faculty support ($p<0.001$) and ASOPRS accreditation status ($p=0.003$) when selecting fellowship programs to apply to. Notably, 83.8% of respondents identified the loss of intraocular surgery as a deterrent to applying.

Conclusions: Residents' decision-making is shaped by both structural factors — particularly match competitiveness and geographic availability — and institutional factors such as faculty mentorship. While systemic barriers can be difficult to modify, fellowship leadership can influence recruitment by fostering faculty involvement with residents who are exploring oculoplastics as a career.

9:56–10:02 am

Beyond the Chatbot: A 24/7 Agentic AI Assistant Across the Oculoplastic Surgeon's Workflow

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Introduction: We describe a single-surgeon deployment of a persistent agentic AI assistant across the breadth of an academic oculoplastic surgeon's workflow.

Beyond clinical and surgical duties, the increasing requirements for documentation and regulatory obligations in academic oculoplastic surgery have outpaced the time available to perform them. Generative artificial intelligence (AI) chatbots have been increasingly integrated into clinical and administrative practice; such tools address isolated tasks but operate as single-turn interactions, lack durable context across sessions, and cannot act in the surgeon's local computing environment.

A newer class of AI system, termed an agent, combines a large language model with persistent memory, multi-tool orchestration, the ability to invoke local and cloud resources and the ability to create bespoke applications. The same agent that organizes clinical photographs can draft an operative report, assemble a regulatory submission, and retain context across all prior tasks.

Methods: An agentic AI assistant was deployed by a single surgeon over 4 months at a tertiary academic oculoplastics practice. The agentic AI assistant (Claude Code, Anthropic) ran on a local Apple-silicon workstation (Mac Mini) with file-based persistent memory and multi-tool orchestration across local and cloud resources. Protected-health-information (PHI) workflows executed entirely on the surgeon's encrypted device using local optical character recognition; non-PHI workflows used a hybrid local-cloud configuration.

Six application domains were deployed: clinical-photograph organization; natural-language patient-photograph retrieval; ACGME and international fellowship documentation; literature and research knowledge-vault construction; scientific presentation drafting; and a daily executive brief integrating calendar, email, and security events.

Results: Photograph organization processed 774,960 clinical images spanning a 22-year period into per-patient-per-visit folders in 52.7 hours of compute, versus an estimated 6,458 hours of manual sorting (a 122× speedup; approximately 3.2 work-years of medical-assistant labor avoided; estimated labor-cost savings \$192,000). Patient-photograph retrieval shifted from manual folder navigation to natural-language query, with median retrieval time of approximately 60 seconds. An ACGME non-standard-training annual reassessment package was assembled with automatic cross-document consistency (titles, dates, signatures, named program directors) with every claim traceable to source guidelines. A topic-organized research vault provided cross-referenced retrieval with

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verbatim source citations, eliminating hallucination risk and supporting auditable manuscript drafting. Scientific presentations and daily executive briefs were generated consistently using the agent's recall of recurring contacts and projects.

Conclusions: A persistent agentic AI assistant with cross-session memory and multi-tool orchestration enables a single academic oculoplastic surgeon to maintain breadth across clinical, regulatory, educational, and academic domains beyond what isolated chatbot interactions support. On-device execution of PHI workflows is feasible and HIPAA-compatible. Adoption depends less on model selection than on workflow design and durable memory architecture.

Figure 1

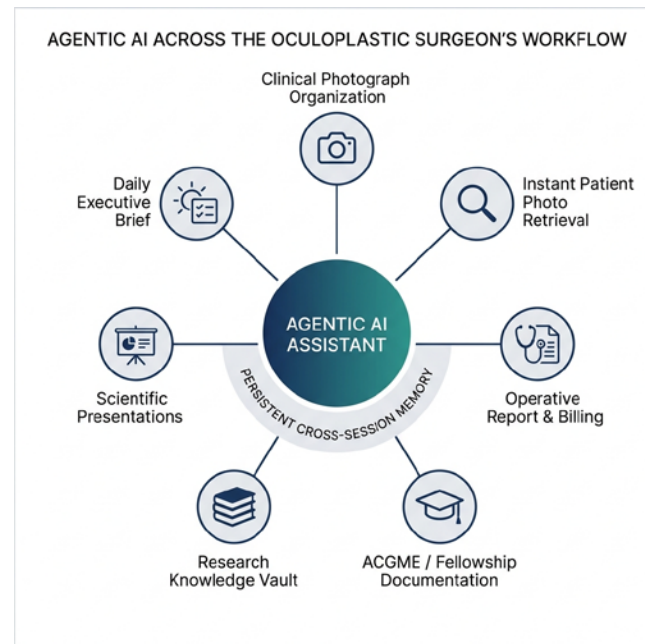


Figure 2

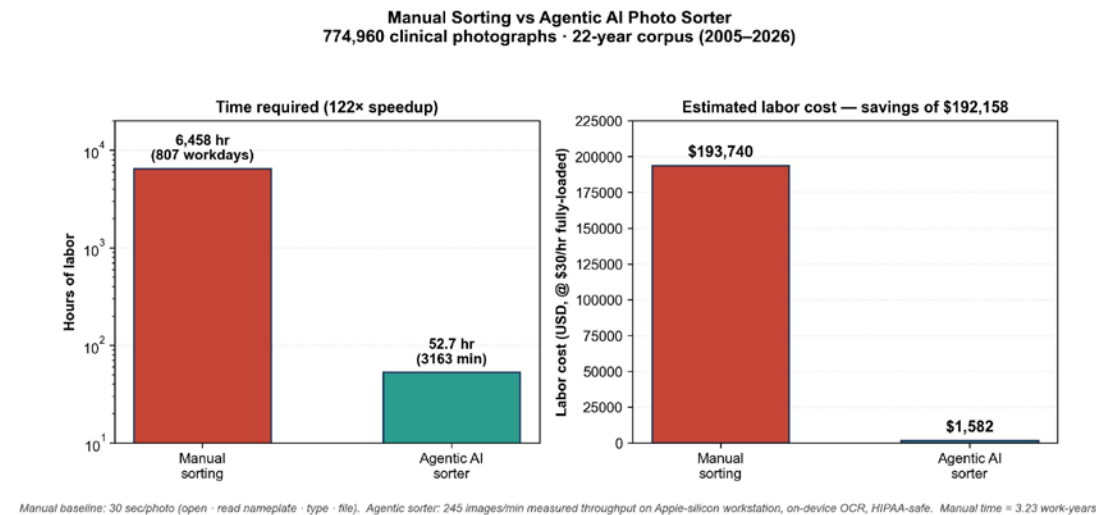
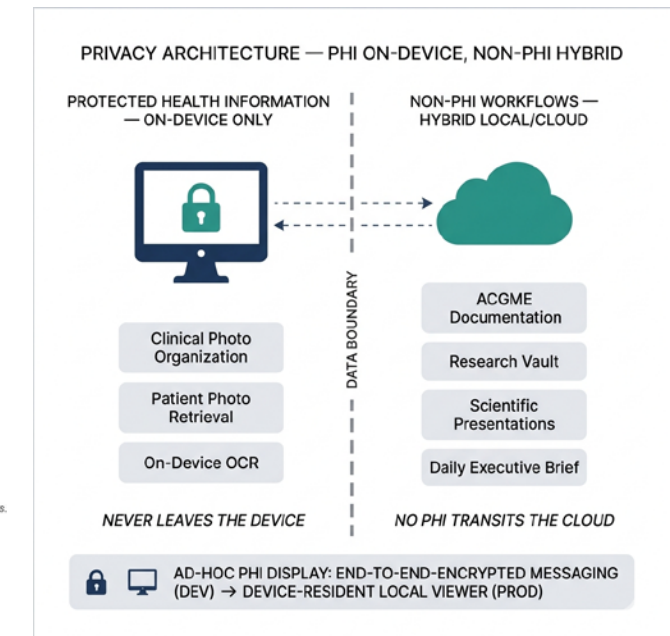


Figure 3



References

1. Singhal K, Azizi S, Tu T, et al. Large language models encode clinical knowledge. *Nature*. 2023;620(7972):172–180.
2. Lee P, Bubeck S, Petro J. Benefits, Limits, and Risks of GPT-4 as an AI Chatbot for Medicine. *N Engl J Med*. 2023;388(13):1233–1239.
3. Tu T, Palepu A, Schaeckermann M, et al. Towards Conversational Diagnostic AI. *Nature*. 2024;625(7995):416–424.
4. Topol EJ. As artificial intelligence goes multimodal, medical applications multiply. *Science*. 2023;381(6663):eadk6139.



Moderators: John Holds and Natalie Hoesly

10:45–10:51 am

Extended Endoscopic Brow Lift: A Comprehensive Technique for Upper Facial Rejuvenation

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Introduction: The standard endoscopic brow lift is a well-established procedure for aesthetic upper facial rejuvenation, typically involving subperiosteal dissection of the frontal bone, release of the superior orbital rim, and superior fixation.^{1-6,11-13} However, this approach has notable limitations in consistently achieving optimal lateral brow elevation, aesthetic contour, and long-term longevity.^{2,4,7,13} This stems from inadequate release of the lateral retaining ligaments and midfacial attachments.¹² To address these limitations, we describe our experience with an extended endoscopic brow lift technique where the subperiosteal dissection is carried inferiorly below the lateral orbital rim and incorporating dissection past the medial the zygomatic arch to include midfacial release. Combined with robust lateral temporal fixation, this extended release provides improved brow and temple position, contour, and longevity compared to the standard endoscopic technique.

Methods: A retrospective review was conducted on 1417 patients who underwent either a standard endoscopic brow lift or the extended technique between January 2012 and January 2026. Brow position and contour were evaluated using standardized preoperative and postoperative photographs at intervals of 1 week, 6 weeks, and 3 months. (Figure 1) Objective aesthetic outcomes were assessed utilizing the Global Aesthetic Improvement Scale (GAIS).¹⁰ Standardized preoperative and postoperative photographs were blindly graded by a panel consisting of three American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) fellowship-trained surgeons. The incidence of complications including brow malposition, contour deformities, patient satisfaction, and the need for surgical revision were noted. Statistical analysis was performed using independent t-tests for continuous variables and chi-square tests for categorical variables, with significance set at $p < 0.05$.

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Results: A total of 1292 patients were included in the study (667 standard, 750 extended). Patients in the extended endoscopic brow lift cohort demonstrated a statistically significant higher GAIS scores and patient satisfaction ($p < 0.05$), and lower revision rates. The incidence of brow malposition, contour deformities were similar between groups. Complication rates were low between both groups.

Conclusions: The extended endoscopic brow lift offers extended benefits beyond the standard endoscopic browlift technique. By extending the subperiosteal dissection to beyond the medial one-third of the zygomatic arch, surgeons can achieve a critical midfacial release, essentially releasing the retaining ligaments of the upper half of the face. (Figure 2) This results in maximized lateral brow position, improved aesthetic contour, and greater longevity of surgical outcomes, providing for comprehensive upper facial rejuvenation.

It is particularly advantageous for patients presenting with pronounced lateral brow ptosis, heavy temporal hooding, or concurrent upper midfacial descent—a demographic where the standard approach often yields suboptimal or transient results. Furthermore, this approach has a synergistic benefit with deep plane facelifting that mobilizes midfacial volume and skin towards the temple. By providing a more thorough mobilization of the brow, temple and midface, this technique offers a predictable, robust, and comprehensive upper facial rejuvenation.

Figure 1



Figure 2



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References

1. Biggs, Thomas M. "Endoscopic brow lift: a retrospective review of 628 consecutive cases over 5 years." *Plastic and reconstructive surgery* 113.7 (2004): 2219.
2. Cho, Min-Jeong, Jourdan A. Carboy, and Rod J. Rohrich. "Complications in brow lifts: a systemic review of surgical and nonsurgical brow rejuvenations." *Plastic and Reconstructive Surgery-Global Open* 6.10 (2018): e1943.
3. Cohen, Brian D., Alyssa J. Reiffel, and Henry M. Spinelli. "Browpexy through the upper lid (BUL): a new technique of lifting the brow with a standard blepharoplasty incision." *Aesthetic Surgery Journal* 31.2 (2011): 163-169.
4. Jones, Barry M., and Rajiv Grover. "Endoscopic Brow Lift: A Personal Review of 538 Patients and Comparison of Fixation Techniques." *Plastic and reconstructive surgery* 113.4 (2004): 1242-1250.
5. Graham, Darrell W., et al. "Brow lift in facial rejuvenation: a systematic literature review of open versus endoscopic techniques." *Plastic and reconstructive surgery* 128.4 (2011): 335e-341e.
6. Iblher, Niklas, et al. "Morphometric long-term evaluation and comparison of brow position and shape after endoscopic forehead lift and transpalpebral browpexy." *Plastic and Reconstructive Surgery* 130.6 (2012): 830e-840e.
7. Isse, Nicanor G. "Endoscopic forehead lift: Evolution and update." *Clinics in plastic surgery* 22.4 (1995): 661-673.
8. Knize, David M. "Anatomic concepts for brow lift procedures." *Plastic and reconstructive surgery* 124.6 (2009): 2118-2126.
9. Paul, Malcolm D. "The evolution of the brow lift in aesthetic plastic surgery." *Plastic and reconstructive surgery* 108.5 (2001): 1409-1422.
10. Narins RS, Brandt F, Leyden J, Lorenc ZP, Rubin M, Smith S. A randomized, double-blind, multicenter comparison of the efficacy and tolerability of Restylane versus Zyplast for the correction of nasolabial folds. *Dermatol Surg.* 2003 Jun;29(6):588-95. doi: 10.1046/j.1524-4725.2003.29150.x. PMID: 12786700.
11. Niamtu III, Joseph. "Endoscopic brow and forehead lift: a case for new technology." *Journal of oral and maxillofacial surgery* 64.7 (2006): 1129-1132.
12. Rohrich, Rod J., and Min-Jeong Cho. "Endoscopic temporal brow lift: surgical indications, technique, and 10-year outcome analysis." *Plastic and Reconstructive Surgery* 144.6 (2019): 1305-1310.
13. Şibar, Serhat, Asiye Uğraş Dikmen, and Ayhan Işık Erdal. "Long-term stability in endoscopic brow lift: a systematic review and meta-analysis of the literature." *Aesthetic Surgery Journal* 45.3 (2025): 232-240.

10:51–10:57 am

SMAS Flap Mobility in Deep-Plane Face Lifting

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Introduction: Deep-plane face lifting is a complex and nuanced endeavor. Numerous factors can affect the final outcome, including plane of dissection, degree of surgical release, vector of suspension, amount of skin resection, volumization, and adjunctive treatments including concomitant energy-based treatments^{1,2}. Rather than “fighting with the face”, modern facelifting encourages the surgeon to listen to the tissue to determine the optimum vector of suspension³. The purpose of this study is measure the angle at which the composite SMAS flap has the optimum mobility, and determine to what extent surgical dissection affects the mobility of this flap.

Methods: 25 consecutive patients who underwent deep-plane face lift by the author from January to June of 2025 were analyzed. Surgical technique was as follows:

1. A standard facelift incision was created in the skin. Limited (1–2cm) subcutaneous dissection was performed and the subSMAS plane was entered with monopolar cautery 2–3cm anterior to the cutaneous incision in a “W” fashion.
2. SubSMAS dissection was carried out with monopolar cautery and blunt/sharp dissection as necessary in two stages. In the first stage, the traditional Jacono “extended deep-plane release”⁴ was performed to release the face anteriorly past the zygomaticocutaneous, masseteric, and cervical retaining ligaments (Figure 1, yellow). SMAS flap mobility was measured.
3. A further extended dissection was then continued until the subSMAS plane was released to the nasolabial fold, modiolus, and lateral border of the submandibular triangle of the neck (Figure 1, blue). SMAS flap mobility was again measured.
4. The mobility of the SMAS flap was determined by measuring the displacement (*mm*) of the tip of the SMAS entry point from its starting point at 45°, 50°, 60°, 70°, and 80°. The angle at which the SMAS flap was observed to have its *maximal* displacement was noted, along with the magnitude of the displacement at that angle. The key fixation suture for the SMAS was then placed to the deep temporal fascia at this angle with 2–0 PDS. The remainder of the fixation, skin tailoring, and suturing was completed as per standard procedure. The right side of the face was fixated and sutured after the neck lift, but prior to the left side of the face.

Results: 25 consecutive patients were included in the study. Mean age was 67 years (range 39–78 years); 2 patients were male. Concomitant procedures included blepharoplasty (84%), brow lift (76%), fat transfer (82%), and laser resurfacing of the skin (52%).
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Mean follow-up for the treatment group was 6.2 months (range 3 – 13 months). No patients reported alopecia, wound infection, skin necrosis, or permanent sensory or motor nerve deficit. One patient (4%) reported temporary buccal branch dysfunction with lagophthalmos, which resolved spontaneously at 3 months postoperatively. One patient (4%) had wound dehiscence at a temporal brow lift incision site which was resutured with no adverse effects.

Average vector of SMAS fixation was 75.5°, with an average of 24.5mm maximum displacement; average vector of SMAS fixation was 76.3° on the right and 74.6° on the left hemiface (*ns*). Maximal dissection to the nasolabial fold and modiolus yielded roughly 5mm more displacement of the SMAS flap ($p<0.00001$) (Figure 2). There was no difference between optimal vector or displacement of the SMAS flap between the right or left sides ($p>0.05$).

Table 1. Descriptive statistics of SMAS flap mobility.

SMAS Flap Mobility						
	SMAS displacement after “Jacono” release (mm)	SMAS displacement after maximal release (mm)	<i>p</i>	SMAS displacement (maximal displacement right hemiface)	SMAS displacement (maximal release left hemiface)	<i>p</i>
45°	13	18.1	<0.0001	18.6	17.6	<i>ns</i>
50°	14.1	19.5	<0.0001	20.0	19.0	<i>ns</i>
60°	15.6	21.4	<0.0001	22.1	20.7	<i>ns</i>
70°	16.6	22.8	<0.0001	23.7	21.9	<i>ns</i>
80°	16.8	23.6	<0.0001	24.6	22.7	<i>ns</i>

Conclusions: Maximal subSMAS release to the nasolabial fold, modiolus, and lateral angle of the submandibular triangle yields roughly 5mm increased SMAS flap displacement. Optimal vector of fixation for maximal SMAS flap mobility is roughly 75°, which is significantly more vertical than the vector of the zygomaticus major muscle.

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References

1. Stuzin JM, Baker TJ, Gordon HL BT. Extended SMAS dissection as an approach to midface rejuvenation. *Clin Plast Surg*. 1995;22(2):295-311.

2. Marten TJ. High SMAS Facelift: Combined Single Flap Lifting of the Jawline, Cheek, and Midface. *Clin Plast Surg*. 2008;35(4):569-603. doi:10.1016/j.cps.2008.04.002

3. Talei B, Gould D, Ziai H. Vectorial Analysis of Deep Plane Face and Neck Lift. *Aesthet Surg J*. 2024;44(10):1015-1022. doi:10.1093/asj/sjae102

4. Jacono A, Bryant LM. Extended Deep Plane Facelift: Incorporating Facial Retaining Ligament Release and Composite Flap Shifts to Maximize Midface, Jawline and Neck Rejuvenation. *Clin Plast Surg*. 2018;45(4):527-554. doi:10.1016/j.cps.2018.06.007

Figure 1. “Jacono” extended subSMAS dissection⁴ compared to maximal release subSMAS dissection.

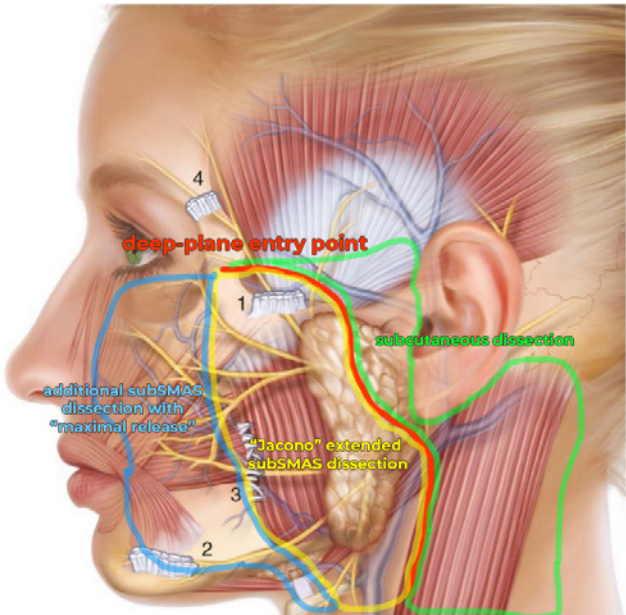


Figure 2. SMAS flap mobility (mm of displacement) by extent of dissection and angle of the elevation vector.

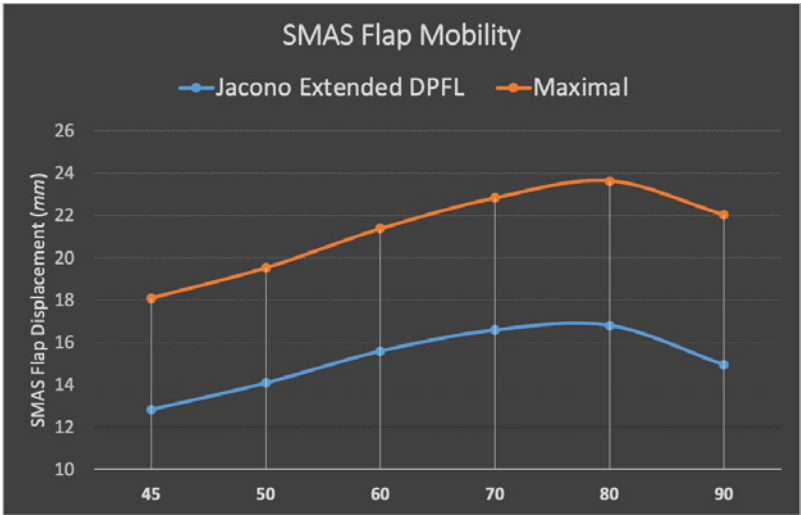


Figure 2. SMAS flap mobility (mm of displacement) by extent of dissection and angle of the elevation vector.

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Figure 3. Representative pre- and post-operative month 9 photos of a 62-year-old woman who underwent endoscopic brow lift, upper/lower blepharoplasty, fat transfer, laser resurfacing, deep neck lift, and deep-plane face lift.



Figure 4. Representative pre- and post-operative month 3 photos of a 72-year-old woman who underwent ptosis repair, fat transfer, deep neck lift, and deep-plane face lift.



Figure 5. Representative pre- and post-operative month 6 photos of a 55-year-old woman who underwent bilateral upper/lower blepharoplasty, deep neck lift, and deep-plane face lift.



10:57–11:03 am

Skin-Sparing Deep Plane Lower Eyelid Blepharoplasty and Midface Lift: Safety and Durability Outcomes of a Large Series of Patients in Brazil and California

Daniel Azzam¹, Emily Tom¹, Roberto Limongi², Jeremiah Tao¹

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Introduction: The deep plane facelift has gained significant attention in facial surgery for its purportedly more durable and natural results compared to skin-only or more superficial techniques. Common variations of lower blepharoplasty emphasize fat repositioning—often via a transconjunctival approach—and skin resection using the skin pinch technique. While effective, these approaches are associated with lower eyelid retraction rates of 15%–20% and may have limited durability.^{1–4} Here, we describe a deep plane trans-eyelid midface lift technique, highlighting its conceptual parallels to deep plane facelifting. We evaluate outcomes in terms of aesthetic results, durability, and safety.

Methods: This study represents a large, consecutive retrospective series spanning 15 years, including patients who underwent deep plane trans-eyelid midface lift for aesthetic concerns (midface descent and tear trough hollowing). Procedures were performed by the senior authors at two centers (RML, Goiânia, Brazil; JT, California, USA). Outcomes assessed included aesthetic measures (eyelid–cheek contour and skin rhytid improvement) and functional results (complications requiring revision, including retraction), with a minimum follow-up of 12 months.

Surgical Technique (*video and figures in presentation*): A subciliary lower eyelid incision was made, followed by release of the arcus marginalis and orbitomalar ligament to mobilize the midface. Prolapsed orbital fat was redraped into preperiosteal dissection pockets, and lateral canthal anchoring was performed in patients with eyelid laxity. A composite deep plane flap of all tissues from skin to periosteum was then developed, with the supero-temporal edge of orbicularis secured to the lateral orbital rim periosteum and temporalis fascia, thereby elevating the eyelid and cheek as a single unit. Some redundant skin from the underlying muscle flap is resected past the lateral canthus; minimal or no skin excision in the subciliary zone.

Results: A total of 983 patients were included (Table 1), with 69% female and a mean age of 71.4 ± 9.4 years. Representative pre- and postoperative results are shown in Figure 2. The procedure yielded favorable aesthetic and functional outcomes with low complication rates. The overall revision rate was 7.3%, most commonly for minor issues such as lateral scar/web revision, trichiasis, cysts, or granulomas (4.4%) (Table 2). Revision for lower eyelid retraction was rare (0.55%) and usually included a single suture lateral
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tarsconjunctival suspension flap. Repeat surgery for cosmetic indications occurred in 2% of cases, typically for additional lateral fat pad resection or, less commonly, flap tightening. Improvements were consistently observed in tear trough deformity, lower eyelid position, midface descent, and skin elasticity.

Conclusions: Skin-sparing deep plane lower eyelid blepharoplasty and midface lift was safe and durable with favorable aesthetic outcomes in this large series. Postoperative retraction rates were lower than those typically reported for traditional skin-pinch blepharoplasty. By elevating and suspending a composite midface flap from skin to periosteum, this technique shares key mechanistic principles with deep plane facelifting and may similarly enhance aesthetic results, safety, and durability in the lower eyelid and midface.

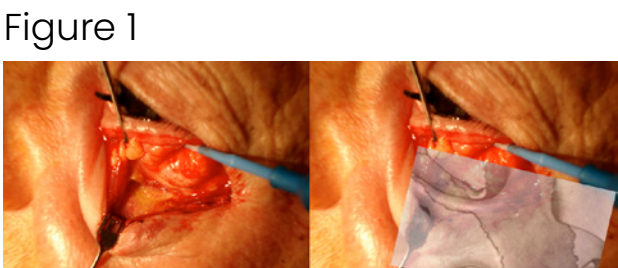


Figure 3

Table 1. Patient Demographics	
Patient Characteristics	N (%) or Mean ± S.D.
Age	71.4 ± 9.4
Men	302 (30.7%)
Women	681 (69.3%)
Total	983

S.D. standard deviation

Figure 4

Table 2. Outcomes of Skin-sparing Deep Plane Lower Eyelid Blepharoplasty and Midface Lift	
Complication	Revision Rate (%)
Lateral scar/web, cysts, granulomas, trichiasis	43 (4.4%)
Lower eyelid retraction	6 (0.6%)
Wound dehiscence	3 (0.3%)
Cosmetic revisions: additional lateral fat pad resection or flap tightening	20 (2.0%)
Total	72 (7.3%)

References

1. Kim KH, Baek JS, Lee S, et al. Causes and Surgical Outcomes of Lower Eyelid Retraction. Korean J Ophthalmol. 2017;31(4):290–298. doi:10.3341/kjo.2016.0059
2. Edgerton MT. Causes and prevention of lower lid ectropion following blepharoplasty. Plast Reconstr Surg. 1972;49(4):367–373. doi:10.1097/00006534-197204000-00001
3. McGraw BL, Adamson PA. Postblepharoplasty ectropion. Prevention and management. Arch Otolaryngol Head Neck Surg. 1991;117(8):852–856. doi:10.1001/archotol.1991.01870200046006
4. Pak J, Putterman AM. Revisional eyelid surgery: treatment of severe postblepharoplasty lower eyelid retraction. Facial Plast Surg Clin North Am. 2005;13(4):561–569, vi–vii. doi:10.1016/j.fsc.2005.06.002

11:03–11:09 am

Is Bony Fixation Really Necessary in the Endoscopic Brow Lift Procedure?

Armin Avdic^{1,2}, Devin Hill³, Wesley Brundridge^{3,4}, David Holck^{1,4}

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Introduction: Brow ptosis contributes to both functional and aesthetic concerns, including upper eyelid hooding, restricted superior visual fields, chronic frontalis overactivation, and an overall fatigued appearance. Multiple surgical techniques exist for brow elevation, each with inherent trade-offs related to scar visibility, magnitude of lift, and durability. Endoscopic brow lift has gained popularity due to its minimally invasive approach and concealed incisions; however, its long-term efficacy and the need for central bony fixation remain debated. Several bony fixation methods have been attempted including cortical bone tunnels, percutaneous and subcutaneous screws, as well as other resorbable fixation devices in attempt to maintain brow position, despite associated drawbacks such as increased operative time, cost, and potential complications. This study evaluates the magnitude and long-term durability of brow elevation achieved through endoscopic brow lift performed without bony fixation, emphasizing the role of extensive subperiosteal dissection and ligament release.

Methods: A retrospective chart review was conducted on 285 patients who underwent endoscopic brow lift without bony fixation by a single surgeon between December 2016 and December 2024. Of these, 275 patients (550 brows) had standardized preoperative and postoperative photographs suitable for objective analysis. A longitudinal cohort of 103 patients with follow-up exceeding 12 months was further evaluated for long-term outcomes. Brow position was measured at the lateral canthus, mid-pupil, and medial canthus relative to the horizontal mid-pupillary line using ImageJ software. Surgical technique involved wide subperiosteal dissection extending to the arcus marginalis, lateral orbital rim, and zygomatic prominence, with release of the conjoint tendon and temporal fixation via sutures. Additionally, patients with deep glabellar and procerus lines underwent corrugator and procerus myotomy with Takahashi forceps. Statistical analysis was performed using paired and independent t-tests, with significance set at $p < 0.05$.

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Results: Significant brow elevation was achieved at all measured landmarks and maintained across all follow-up intervals. Postoperatively, at approximately 3 months, mean elevation measured 4.55 mm at the lateral canthus, 4.84 mm at the mid-pupil, and 4.13 mm at the medial canthus (all $p < 0.001$). These results remained stable at 1 year, with no statistically significant decline compared to earlier postoperative measurements. Extended follow-up (up to 84 months) demonstrated sustained or even increased brow height in some regions, particularly at the medial canthus. Overall, 98.6% of brows demonstrated improvement. There were no major complications; one facial nerve weakness resolved within one month. Patient satisfaction remained high, with reported improvements in visual field, forehead rhytids, and overall aesthetic appearance.

Conclusions: Endoscopic brow lift without bony fixation is a safe, effective, and durable technique for correcting brow ptosis. The findings suggest that extensive subperiosteal dissection and comprehensive periosteal release are sufficient to achieve and maintain brow elevation, eliminating the need for fixation devices. This approach reduces operative complexity, cost, and device-related complications while delivering consistent, long-lasting results. These data challenge the conventional reliance on central bony fixation and support a paradigm shift toward wide subperiosteal release as the primary mechanism for durable brow repositioning. Continued long-term follow-up will further validate these findings.

Figure 1



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References

1. Mokhtarzadeh A, Massry GG, Bitrian E, Harrison AR. Quantitative efficacy of external and internal browpexy performed in conjunction with blepharoplasty. *Orbit* 2017;36:102–109.
2. McCord CD, Doxanas MT. Browplasty and browpexy: An adjunct to blepharoplasty. *Plast Reconstr Surg* 1990;86:248–254.
3. Paul MD. The evolution of the brow lift in aesthetic plastic surgery. *Plast Reconstr Surg* 2001;108:1409–1424.
4. Vasconez LO, Core GB, Gamboa-Bobadilla M, et al. Endoscopic techniques in coronal brow lifting. *Plast Reconstr Surg* 1994;94:788–793.
5. Holck DE, Ng JD, Wiseman JB, Foster JA. The endoscopic browlift for forehead rejuvenation. *Semin Ophthalmol* 1998;13:149–157.
6. Core GB, Vasconez LO, Graham HD 3rd. Endoscopic browlift. *Clin Plast Surg* 1995;22:619–631.
7. Chiu ES, Baker DC. Endoscopic brow lift: a retrospective review of 628 consecutive cases over 5 years. *Plast Reconstr Surg* 2003;112:628–635.
8. Jones BM, Lo SJ. The impact of endoscopic brow lift on eyebrow morphology, aesthetics, and longevity: objective and subjective measurements over a 5-year period. *Plast Reconstr Surg* 2013;132:226e–238e.
9. Perez PB, Gunter AE, Moody MP, et al. Investigating long-term brow stabilization by Endotine-assisted endoscopic brow lift with concomitant upper lid blepharoplasty. *Ann Otol Rhinol Laryngol* 2021;130:1139–1147.
10. Adetayo OA, Wong WW, Motakef S, et al. Endoscopic brow lift fixation with MiTek suture anchors: a 9-year experience of a new “ideal” technique. *Plast Surg (Oakv)* 2019;27:100–106.
11. Chasan PE, Kupfer DM. Direct K-wire fixation technique during endoscopic brow lift. *Aesthetic Plast Surg* 1998;22:338–340.
12. Marchac D, Ascherman J, Arnaud E. Fibrin glue fixation in forehead endoscopy: evaluation of our experience with 206 cases. *Plast Reconstr Surg* 1997;100:704–712.
13. Servat JJ, Black EH. A comparison of surgical outcomes with the use of 2 different biodegradable multipoint fixation devices for endoscopic forehead elevation. *Ophthalmic Plast Reconstr Surg* 2012;28:401–404.
14. Troilius C. Subperiosteal brow lifts without fixation. *Plast Reconstr Surg* 2004;114:1595–1603.
15. Hashemi H, Khabazkhoob M, Emamian MH, et al. White-to-white corneal diameter distribution in an adult population. *J Curr Ophthalmol* 2015;27:21–24.
16. Sibar S, Dikmen AU, Erdal AI. Long-term stability in endoscopic brow lift: A systematic review and meta-analysis of the literature. *Aesthet Surg J* 2025;45:232–240.



11:21–11:22 am

Impact of GLP-1 Receptor Agonist Use on Ptosis, Dermatochalasis, and Eyelid Surgery Risk Compared to Alternative Weight Loss Drugs: A Propensity Score-Matched Analysis

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Introduction: Blepharoptosis and dermatochalasis are prevalent acquired conditions linked to aging, obesity, and metabolic dysfunction, and frequently require surgical correction via ptosis repair or blepharoplasty. Obesity drives periocular connective tissue laxity through chronic low-grade inflammation, oxidative stress, and adipokine-mediated elastolysis of the levator aponeurosis and periorbital support structures. GLP-1 receptor agonists (GLP-1 RAs) have become first-line agents for obesity and type 2 diabetes management, exerting anti-inflammatory and antifibrotic effects through NF-kappaB and TGF-beta pathway modulation in addition to their metabolic actions. Emerging evidence links metabolic dysregulation to eyelid pathology, but no large-scale study has evaluated GLP-1 RA use and oculoplastic outcomes. We sought to determine whether GLP-1 RA use is associated with lower risk of developing ptosis or dermatochalasis and undergoing blepharoplasty or ptosis repair in a propensity-matched national cohort, and whether these associations vary by degree of BMI difference between cohorts.

Methods: This retrospective cohort study utilized a federated database aggregating deidentified electronic health records from 68 U.S. healthcare organizations. Adults aged 18 years or older with BMI 30 kg/m² or greater prescribed a GLP-1 RA (tirzepatide, exenatide, liraglutide, semaglutide, or dulaglutide) with at least two prescriptions 6 months apart were compared with adults using alternative weight-loss (AWL) agents (orlistat, phentermine, topiramate, bupropion, or naltrexone) with equivalent documentation. Patients with congenital ptosis, eyelid retraction, or prior oculoplastic procedures were excluded. The primary outcomes were incident dermatochalasis (ICD-10: H02.83), ptosis (H02.3), blepharoplasty (CPT 15820–15823), and ptosis repair (CPT 67901–67908) at 1, 3, and 5 years. Cohorts were balanced using 1:1 propensity score matching (PSM) on age, sex, race, comorbidities, and medication use. A secondary analysis stratified matched cohorts by BMI difference (delta BMI 5, 10, and 15 kg/m²) to assess whether outcome associations persisted across weight differential strata.

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Results: After 1:1 PSM, 424,209 patients were retained in each cohort. GLP-1 RA use was associated with significantly lower 5-year risk of dermatochalasis (RR 0.69; 95% CI 0.627–0.759; $P<0.0001$), ptosis (RR 0.538; 95% CI 0.481–0.603; $P<0.0001$), blepharoplasty (RR 0.509; 95% CI 0.393–0.659; $P<0.0001$), and ptosis repair (RR 0.614; 95% CI 0.437–0.861; $P=0.004$). In the BMI-stratified secondary analysis, protective associations for dermatochalasis and ptosis were consistent across delta BMI strata of 5, 10, and 15 kg/m² (ptosis 5-year RR range: 0.45–0.47, all $P<0.001$; dermatochalasis 5-year RR range: 0.68–0.70; all $P<0.001$). Blepharoplasty and ptosis repair risk were also significantly lower across all BMI strata (blepharoplasty 5-year RR range: 0.37–0.56, all $P<0.05$; ptosis repair 5-year RR range: 0.32–0.47, all $P<0.001$).

Conclusions: GLP-1 RA therapy is associated with significantly lower rates of periocular eyelid pathology and oculoplastic surgical intervention compared with AWL agents across a large propensity-matched national cohort. These protective associations persist across BMI difference strata, suggesting a class-specific benefit beyond weight reduction alone. Prospective studies are needed to clarify mechanistic pathways and determine whether GLP-1 RA use can delay or prevent functionally significant eyelid disease.

References

1. Paik JS et al. PLOS ONE. 2015;10(7):e0131427.
2. Moon SS et al. Endocrine. 2015;48(2):504–510.
3. Nagi KS et al. Ophthalmology. 2011;118(6):1205–1210.
4. Ridha Z et al. Aesthet Surg J. 2024;44(11):Np809–Np818.
5. Shi Q et al. Lancet. 2022;399(10321):259–269.



HENRY I. BAYLIS COSMETIC SURGERY AWARD LECTURE

Moderator: Wendy W. Lee

Thursday, October 8

11:25–11:49 am

The Quest for “Beauty” – At What Risk and At What Price?

John J. Martin



Moderators: Seanna Grob and Bryan Winn

1:01–1:07 pm

Deep Learning for Detection of Orbital Pathology on MRI

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Introduction: To develop and validate a deep learning model that leverages bilateral orbital anatomy on MRI to automatically detect orbital pathology, with potential application as a screening and triage tool.

Methods: Orbital MRIs from 285 patients at Sheba Medical Center were analyzed, including 201 with pathological orbits (152 biopsy-proven, 49 radiologist-confirmed) and 84 with normal orbits. Four MRI sequences were evaluated: axial T1, sagittal T1, axial T1 with contrast, and axial T2. An automated deep learning pipeline segmented orbital structures and classified each orbit as normal or pathological by detecting asymmetry between the two orbits of the same patient. A held-out validation set of 41 patients was reserved prior to model development. Performance was assessed using area under the ROC curve (AUC).

Results: The development set comprised 244 patients (181 with orbital pathology). The most common diagnoses were idiopathic orbital inflammation (n=35), lymphoma (n=34), cavernous venous malformation (n=27), and lymphatic venous malformation (n=12), with the remainder comprising metastases, meningioma, and other rare pathologies. The multimodal model combining all four sequences achieved an AUC of 0.91 on internal cross-validation. Among individual sequences, axial T1 with contrast performed best (AUC 0.91), followed by axial T1 (AUC 0.87). At 90% specificity, overall sensitivity was 77% on internal cross-validation, with per-diagnosis sensitivity highest for lymphatic venous malformation (92%) and cavernous venous malformation (81%), followed by idiopathic orbital inflammation (74%) and lymphoma (74%). On the held-out validation set, the multimodal ensemble achieved an AUC of 0.88. Among individual sequences on the holdout set, axial T1 performed best (AUC 0.83), followed by axial T2 (AUC 0.79), axial T1 with contrast (AUC 0.73), and sagittal T1 (AUC 0.71).

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Conclusions: A deep learning model leveraging orbital symmetry can effectively detect orbital pathology on MRI across a wide range of diagnoses, with an AUC of 0.88 on independent held-out validation. This approach may serve as a screening tool to prioritize cases requiring specialist review.

Figure 1

Results - ensemble on holdout

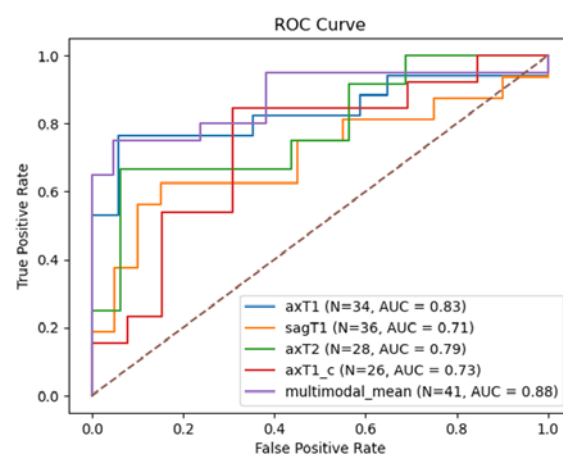
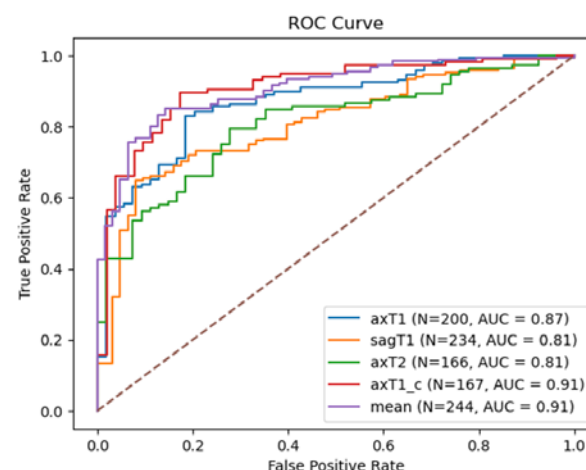


Figure 2

Results – multimodal leave-10-out ensemble CV



References

1. Ben Simon GJ, Greenberg G, Landau-Prat D eds. Atlas of Orbital Imaging, Springer publications, 2022
2. Waisberg E, Ong J, Kamran SA, Masalkhi M, Paladugu P, Zaman N, Lee AG, Tavakkoli A. Generative artificial intelligence in ophthalmology. *Surv Ophthalmol*. 2025 Jan-Feb;70(1):1-11. doi: 10.1016/j.survophthal.2024.04.009. Epub 2024 May 16. PMID: 38762072.
3. Belden CJ, Zinreich SJ. Orbital imaging techniques. *Semin Ultrasound CT MR*. 1997 Dec;18(6):413-22. doi: 10.1016/s0887-2171(97)90003-2. PMID: 9416658.
4. Levanon E, Greenberg G, Lustig-Barzelay Y, Landau-Prat D, Ben Simon GJ. Orbital masses: a review of CT imaging characteristics. *Front Ophthalmol (Lausanne)*. 2025 Nov 14;5:1685141. doi: 10.3389/fopht.2025.1685141. PMID: 41323232; PMCID: PMC12660082.
5. Ben Simon GJ, Annunziata CC, Fink J, Villablanca P, McCann JD, Goldberg RA. Rethinking orbital imaging establishing guidelines for interpreting orbital imaging studies and evaluating their predictive value in patients with orbital tumors. *Ophthalmology*. 2005 Dec;112(12):2196-207. doi: 10.1016/j.opht.2005.09.013. PMID: 16325712.

1:07–1:13 pm

Toward Oculoplastic Foundation Models: A Multi-Million Image External-Eye Dataset and Anatomical Evaluation Framework

George R. Nahass¹, Michelle Fleishaker², Sanjay Ganesh², Sasha Hubschman¹, Chad A. Purnell³, Sathya Ravi⁴, Pete Setabutr¹, Ann Q. Tran¹
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Introduction: Artificial intelligence (AI) in oculoplastic surgery has seen a large growth in recent years. However, most current models are trained for narrow supervised tasks and depend on small, labeled datasets (1, 2). Foundation models offer a different approach: these models are pretrained on large image collections with no labels to learn general-purpose representations adaptable to downstream clinical tasks (3). In medical imaging, this strategy is important because high-quality labels are expensive, task-specific, and often unavailable at scale (4).

We performed this study to determine whether publicly available unlabeled facial image datasets could be repurposed to build foundation models of the external eye for application in oculoplastic surgery.

Methods: This was an experimental dataset-construction and artificial intelligence study using publicly available facial image datasets. Images from fourteen open-source facial image datasets were processed through duplicate removal, face detection, landmark-based alignment, periocular visibility filtering, brow-and-eye cropping, unilateral eye splitting, and resolution standardization. The main corpus contained 4,352,692 external-eye images. Fixed subsets of 10,000, 100,000, and 1,000,000 images were used for self-supervised pretraining, with separate open-source, high-resolution open-source, and clinical datasets reserved for evaluation (Table 1).

Self-supervised models were trained under a fixed-compute protocol using three self-supervised training paradigms. The primary outcome was whether pretrained representations preserved clinically relevant periocular anatomy, assessed by their ability to predict periorbital landmarks using lightweight regression probes trained on frozen embeddings. The structure of the embedding space was analyzed as an additional measure of representation quality and domain transfer.

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Results: The final created dataset included 4,352,692 standardized unilateral external-eye crops, a high-native-resolution evaluation subset of 134,969 images. An external clinical evaluation set of 35,082 images from our institution's craniofacial center was used as well (Table 1). Self-supervised pretraining converged across dataset scales and initialization settings (Figure 1). Embedding geometry became less isotropic on higher-resolution open-source and clinical images than on source-matched images, indicating incomplete domain transfer. However, degradation varied by training objective, with some objectives preserving broader, better-distributed embedding spaces across evaluation datasets (Figure 2).

Frozen landmark probes showed that learned spatial features preserved recoverable periocular anatomy (~5 pixels of error). Landmark localization improved directionally with increasing pretraining dataset size, supporting the value of scaling external-eye pretraining data. Random initialization outperformed ImageNet initialization suggesting natural-image pretraining may not always be optimal for fine-grained periocular anatomy. All self-supervised training methods evaluated outperformed baselines. Within-dataset probing achieved low pixel-level localization error for iris, eyelid, scleral, and canthal landmarks (Figure 3), while cross-dataset qualitative evaluation showed failure cases commonly involved canthal and eyelid localization errors (Figure 4).

Conclusions: Publicly available facial image datasets can be repurposed into a large standardized external-eye image resource for periocular artificial intelligence research. The resulting corpus provides a scalable foundation for self-supervised representation learning and anatomical evaluation of external-eye features. Despite variation across objective, initialization, dataset scale, and evaluation domain, almost all models successfully learned features related to periocular anatomy after pretraining on a dataset with no labels. Future work should validate these models using clinically labeled external-eye datasets.

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Dataset	N	Use Case	Source	Label Status	Pretraining?	Evaluation?
Main external-eye corpus	4352692	Unlabeled master corpus	Open-source face datasets	Unlabeled	TRUE	FALSE
Pretrain-10K	10000	SSL pretraining subset	Main external-eye corpus			
Pretrain-100K	100000					
Pretrain-1M	1000000					
Source-Holdout	421730	Source-matched geometry evaluation	Open-source face datasets			
Open-HR	134969	High-resolution open-source geometry evaluation				
Clinic-CF	35082	Clinical domain-shift geometry evaluation				
Landmark-Celeb	3610	Within-dataset and transfer probe source	Open-source periocular annotations	9 landmark coordinates	FALSE	TRUE
Landmark-CFD	1596		Open-source periocular annotations			

Table 1: External-eye dataset resources used for self-supervised pretraining and downstream evaluation. The benchmark is built around a large unlabeled corpus of 4,352,692 standardized unilateral external-eye crops derived from open-source face datasets. Fixed subsets of 10K, 100K, and 1M images are used for self-supervised pretraining. Separate held-out open-source, high-resolution open-source, and clinical datasets are used for evaluation only. Landmark-Celeb and Landmark-CFD provide nine-point periocular landmark annotations for within-dataset and cross-dataset anatomical probing.

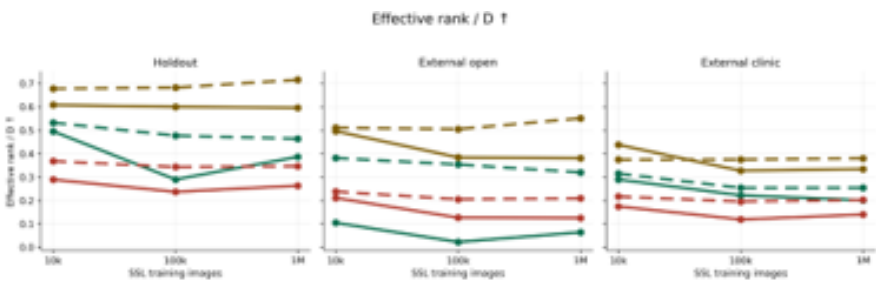


Figure 2: Effective rank normalized by embedding dimension across source-matched, open-source, and clinical evaluation sets. Higher effective rank / D indicates a more isotropic and better-distributed embedding space. Results are shown across dataset scale, initialization, and self-supervised objective family for the held-out source distribution, a higher-resolution open-source evaluation set, and an external clinical image repository. LeJEPa consistently produces the most isotropic embeddings in this benchmark, although representation geometry varies across initialization and evaluation domain.

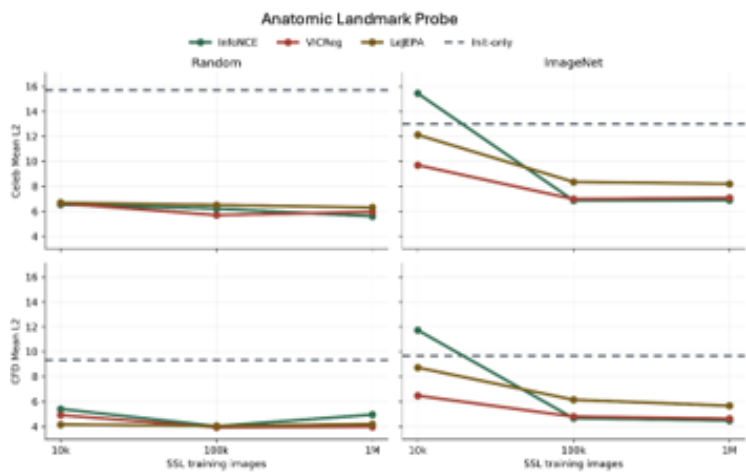


Figure 3. Accuracy of periocular landmark localization from frozen pretrained external-eye representations. A lightweight landmark regressor was trained on frozen embeddings and evaluated on held-out test images from the same dataset. Lower mean L2 error indicates better preservation of clinically relevant periocular anatomy, including iris and canthal structure



Figure 4: Qualitative examples of cross-dataset periocular landmark prediction. Examples illustrate landmark predictions on CFD images using probes trained on Celeb-derived embeddings. Accurate predictions show preserved external-eye anatomy across datasets, whereas failure cases highlight the difficulty of transferring canthal and eyelid localization under domain shift.

Dataset	N	Use Case	Source	Label Status	Pretraining?	Evaluation?
Main external-eye corpus	4352692	Unlabeled master corpus	Open-source face datasets	Unlabeled	TRUE	FALSE
Pretrain-10K	10000	SSL pretraining subset	Main external-eye corpus			
Pretrain-100K	100000					
Pretrain-1M	1000000					
Source-Holdout	421730	Source-matched geometry evaluation	Open-source face datasets			
Open-HR	134969	High-resolution open-source geometry evaluation				
Clinic-CF	35082	Clinical domain-shift geometry evaluation		Clinical repository		
Landmark-Celeb	3610	Within-dataset and transfer probe source	Open-source periocular annotations	9 landmark coordinates	FALSE	TRUE
Landmark-CFD	1596		Open-source periocular annotations			

Table 1: External-eye dataset resources used for self-supervised pretraining and downstream evaluation. The benchmark is built around a large unlabeled corpus of 4,352,692 standardized unilateral external-eye crops derived from open-source face datasets. Fixed subsets of 10K, 100K, and 1M images are used for self-supervised pretraining. Separate held-out open-source, high-resolution open-source, and clinical datasets are used for evaluation only. Landmark-Celeb and Landmark-CFD provide nine-point periocular landmark annotations for within-dataset and cross-dataset anatomical probing.

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References

1. Meer, Elana, et al. "Artificial Intelligence in Oculoplastics: A Review." *Ophthalmic Plastic & Reconstructive Surgery* 41.4 (2025): 372-387.
2. Cai, Yilu, et al. "Application of artificial intelligence in oculoplastics." *Clinics in dermatology* 42.3 (2024): 259-267.
3. Bommasani, Rishi, et al. "On the opportunities and risks of foundation models." *arXiv preprint arXiv:2108.07258* (2021).
4. Khan, Wasif, et al. "A comprehensive survey of foundation models in medicine." *IEEE Reviews in Biomedical Engineering* (2025).
5. Babenko, Boris, et al. "A deep learning model for novel systemic biomarkers in photographs of the external eye: a retrospective study." *The Lancet Digital Health* 5.5 (2023): e257-e264.
6. Babenko, Boris, et al. "Detection of signs of disease in external photographs of the eyes via deep learning." *Nature biomedical engineering* 6.12 (2022): 1370-1383.

1:13–1:19 pm

Normative Volumes of Orbital Structures from AI-enabled CT Analysis

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Introduction: Quantitative reference ranges for orbital structures^{1–5} provide an objective baseline for evaluating abnormal anatomy in orbital disorders such as thyroid eye disease, serving as a reference to guide clinical assessment and longitudinal monitoring of treatment response⁶. Prior studies have characterized orbital structures through linear measurements such as muscle diameters and cross-sectional areas, as well as through 3D volumetric measurements derived from manual segmentation. More recently, deep-learning-based pipelines have been introduced to address the labor-intensive nature of manual work, enabling standardized analysis of orbital structures⁷.

In this study, an automated deep learning pipeline is implemented to streamline the segmentation of orbital structures using computed tomography (CT) scans. Normative volumetric baselines were derived from a curated cohort, comprising CT scans from patients without identifiable orbital pathology, drawn from a large institutional imaging repository. Volumetric distributions of the globe, optic nerve, orbital fat, and rectus muscle are reported separately for each orbit.

Methods: This retrospective cross-sectional study included patients who underwent head CT. Orbital segmentation was performed using nnUNet⁸ trained on pseudo-labels from multi-atlas label fusion method⁹. All output segmentations were subjected to visual quality assurance. Representative segmentation outputs are illustrated in Figure 1. The primary outcome measures were computed from CT scans using voxel counting and physical volume conversion via affine transforms. Mean and standard deviation were calculated for each structure, with median and interquartile range (25th–75th percentile) reported as reference intervals.

Results: Following quality assurance, 60 orbits from 30 patients were included in the analysis. The normative bilateral volumetric reference intervals (reported in mm³) for each orbital structure, reported as mean ± standard deviation (median; 25th–75th percentile), were as follows: globe, 19028.8 ± 1850.7 mm³ (18890.5; 18100.0–19796.8 mm³); optic nerve, 1765.7 ± 370.0 mm³ (1820.4; 1555.2–1955.1 mm³); orbital fat, 27624.2 ± 4105.64 mm³ (27747.0; 25541.1–30269.5 mm³); and recti muscles, 8703.8 ± 1975.9 mm³ (8362.0; 7390.4–9941.9 mm³). Detailed volumetric data for individual orbits (OD, OS) are presented in the Table (Figure 2).

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Conclusions: This study provides quantitative normative data on the volumetric ranges of key orbital structures derived from an automated deep learning pipeline on CT imaging. These normative values can serve as an objective basis for further studies investigating anatomical alterations in various orbital diseases

Figure 1

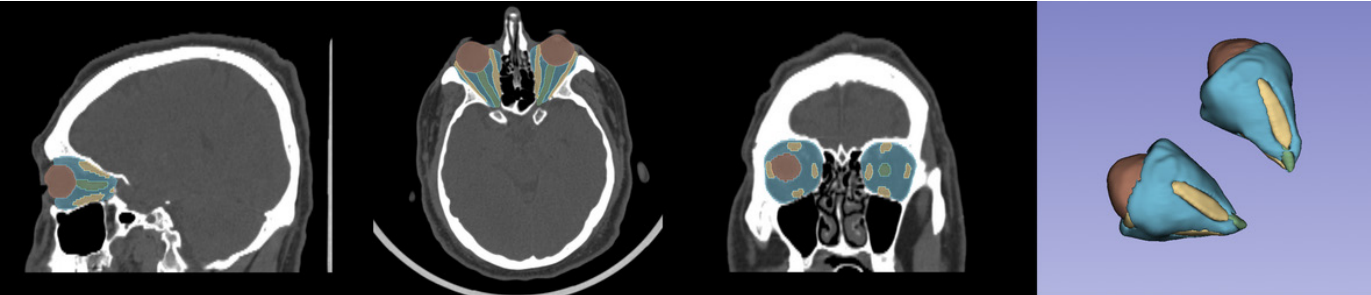


Figure 1. Representative segmentation case of orbital structures on CT. Sagittal, axial, and coronal views and 3D reconstruction showing the globe (brown), optic nerve (green), orbital fat (cyan), and rectus muscles (yellow).

Figure 2

Table 1. Volumetric Statistics for Individual Orbital Structures (mm³)

Structure	Group	Mean	SD	Median	IQR [25th–75th]
Globe	Right (OD)	9526.3	933.4	9460.1	9057.6 – 9986.7
	Left (OS)	9502.6	936.4	9512.2	8994.9 – 9836.0
Optic Nerve	Right (OD)	875.7	189.1	896.9	765.0 – 997.2
	Left (OS)	889.9	189.2	906.2	764.7 – 976.8
Orbital Fat	Right (OD)	13850.9	2170.3	13822.9	12612.4 – 15559.0
	Left (OS)	13773.3	1959.4	13924.1	12528.6 – 14965.7
Recti Muscle	Right (OD)	4365.2	1004.6	4234.5	3776.5 – 5062.4
	Left (OS)	4338.6	982.8	4166.8	3629.8 – 4966.0

References

1. Ozgen A, Ariyurek M. Normative measurements of orbital structures using CT. *AJR Am J Roentgenol*. 1998;170(4):1093-1096. doi:10.2214/ajr.170.4.9530066
2. Tian S, Nishida Y, Isberg B, Lennerstrand G. MRI measurements of normal extraocular muscles and other orbital structures. *Graefes Arch Clin Exp Ophthalmol*. 2000;238(5):393-404. doi:10.1007/s004170050370
3. Forbes G, Gehring DG, Gorman CA, Brennan MD, Jackson IT. Volume measurements of normal orbital structures by computed tomographic analysis. *AJR Am J Roentgenol*. 1985;145(1):149-154. doi:10.2214/ajr.145.1.149
4. Regensburg NI, Kok PH, Zonneveld FW, et al. A new and validated CT-based method for the calculation of orbital soft tissue volumes. *Invest Ophthalmol Vis Sci*. 2008;49(5):1758-1762. doi:10.1167/iovs.07-1030
5. Regensburg NI, Wiersinga WM, van Velthoven ME, et al. Age and gender-specific reference values of orbital fat and muscle volumes in Caucasians. *Br J Ophthalmol*. 2011;95(12):1660-1663. doi:10.1136/bjo.2009.161372
6. Reshef ER, Marsiglia M, Bouhadjer K, et al. Reduction in Extraocular Muscle Cross-sectional Area and Correlation With Extraocular Motility and Diplopia Following Teprotumumab for Thyroid Eye Disease. *Ophthalmic Plast Reconstr Surg*. 2023;39(5):433-439. doi:10.1097/IOP.0000000000002337

1:19–1:25 pm

“Vibe Coding” with AI to Improve Oculofacial Practice Efficiency

Brett Kotlus

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Introduction: The integration of artificial intelligence into clinical practice management represents a transformative opportunity for oculofacial surgeons. Despite growing availability of AI development tools, adoption in practice settings remains limited, partly due to the perceived technical barrier of software development. “Vibe coding”—a term describing the use of large language model (LLM)-based AI tools to build functional software through natural language prompts rather than traditional programming—lowers this barrier substantially, enabling clinicians without formal coding expertise to create custom, practice-specific solutions.

Our practice identified two high-burden administrative and patient care domains amenable to AI-assisted solutions: postoperative patient recovery guidance and the management of high-volume incoming patient email inquiries. Both areas were consuming disproportionate staff time and introducing variability in the quality and timeliness of patient communication. This quality improvement initiative describes the development, implementation, and early outcomes of two AI-built tools to address these inefficiencies in an oculofacial plastic surgery practice.

Methods: This is a quality improvement / practice report from a single aesthetic oculofacial surgery practice. Two AI-assisted tools were developed and deployed using vibe coding methodology, in which the physician authored software applications through iterative natural language prompting of a commercial LLM-based coding assistant, with no formal programming background.

Tool 1 — Patient Recovery Application: A mobile-accessible recovery application was designed to deliver structured, procedure-specific postoperative instructions, task checklists, wound care guidance, and return-precaution criteria to patients following cosmetic oculofacial surgery. Content was authored by the physician and structured through AI-assisted development. Application usage analytics, patient engagement rates, and qualitative patient and staff feedback were collected following deployment.

Tool 2 — AI Email Response Agent: An AI-powered agent was built and integrated into the practice inbox to triage and draft responses to common categories of incoming patient email inquiries including appointment requests, postoperative questions, and general informational queries. Staff reviewed and approved all AI-generated drafts before sending. Outcome measures included staff time-to-response estimates, volume of emails handled with AI assistance, and qualitative staff feedback on workflow integration.

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Qualitative feedback was gathered informally from patients and staff via structured interviews and direct observation. Time-savings estimates were derived from staff-reported pre- and post-implementation task duration comparisons.

Results: The patient recovery application adoption was documented through application download and active usage statistics, with the majority of surgical patients accessing the platform at least once during their postoperative period. Staff reported a meaningful reduction in routine postoperative phone inquiries following deployment, attributing this to improved patient self-sufficiency via the application's structured guidance content. Patient qualitative feedback was consistently positive, with users highlighting accessibility of information and reduced anxiety regarding postoperative expectations.

The AI email response agent was successfully integrated into the practice communication workflow. A substantial proportion of incoming patient emails were identified as suitable for AI-assisted draft responses, reducing staff time devoted to composing replies. Staff-reported time savings per email response were significant and cumulative given daily email volume. Qualitative feedback from staff indicated improved workflow efficiency and reduced cognitive load associated with repetitive correspondence. No adverse patient communication events were identified during the reporting period.

Both tools were developed by the physician author using vibe coding techniques without engagement of external software developers, underscoring the accessibility of this approach for busy oculofacial practices.

Conclusions: Vibe coding with commercially available AI tools enables oculofacial plastic surgeons to build custom, practice-specific software solutions without formal programming expertise. The development and deployment of an AI-powered patient recovery application and an email response agent resulted in measurable improvements in staff efficiency, time savings in patient communication workflows, and favorable qualitative outcomes among both patients and staff. These tools demonstrate the feasibility and practical value of physician-led AI development in oculofacial practice management. As AI coding tools continue to advance, the barrier to custom practice innovation will continue to fall, and early-adopter experience in our subspecialty can guide broader implementation frameworks.

References

1. Lee P, Goldberg C, Kohane I. The AI Revolution in Medicine: GPT-4 and Beyond. Pearson; 2023.
2. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. *Nat Med*. 2019;25(1):44-56.
3. Esteva A, Kuprel B, Novoa RA, et al. Dermatologist-level classification of skin cancer with deep neural networks. *Nature*. 2017;542(7639):115-118.
4. Ting DSW, Pasquale LR, Peng L, et al. Artificial intelligence and deep learning in ophthalmology. *Br J Ophthalmol*. 2019;103(2):167-175.

1:25–1:31 pm

Retrieval-Augmented Large Language Models Versus an Oculoplastic Surgeon for Perioperative Patient Questions: Accuracy, Safety, and Readability

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Introduction: Perioperative patient messaging through electronic health portals has rapidly increased in oculoplastic practice, adding substantially to physician inbox burden and contributing to clinician burnout. Many of these messages involve common but potentially time-sensitive postoperative concerns that may directly impact patient outcomes. At the same time, patients are increasingly seeking medical guidance online, where information is often inaccurate, unverified, or poorly tailored to subspecialty care.

General large language models (LLMs) trained on broad medical corpora can generate fluent and empathetic responses but remain prone to confident inaccuracies, particularly when addressing subspecialty-specific content outside their training distribution. Notably, prior studies have shown that ChatGPT-generated responses were often preferred over physician responses for quality and empathy on public forums despite containing factual errors.¹⁻³

We evaluated three contemporary LLMs across four retrieval conditions using perioperative patient messages from a single academic oculoplastic practice. Responses were compared against the surgeon-authored replies received by patients, with accuracy, safety, and readability evaluated for each model and condition.

Methods: This single-center benchmarking study evaluated 50 consecutive de-identified perioperative patient messages from a single academic oculoplastic practice, representing 40 distinct procedures and paired with the surgeon-authored patient response.

Each question was answered by three LLMs—OpenAI GPT-4o, Cohere Command R+, and Anthropic Claude Opus 4.7—under four retrieval conditions: Base, FAQ only, StatPearls only, and FAQ plus StatPearls. Three blinded graders scored responses for accuracy and safety on a five-point scale. Readability was assessed using Flesch-Kincaid grade level (Figure 1).

Primary outcomes were accuracy, safety, and readability. Statistical analysis included mixed-effects models with random intercepts by question, paired Wilcoxon tests with false discovery rate correction, and Friedman tests across model families.

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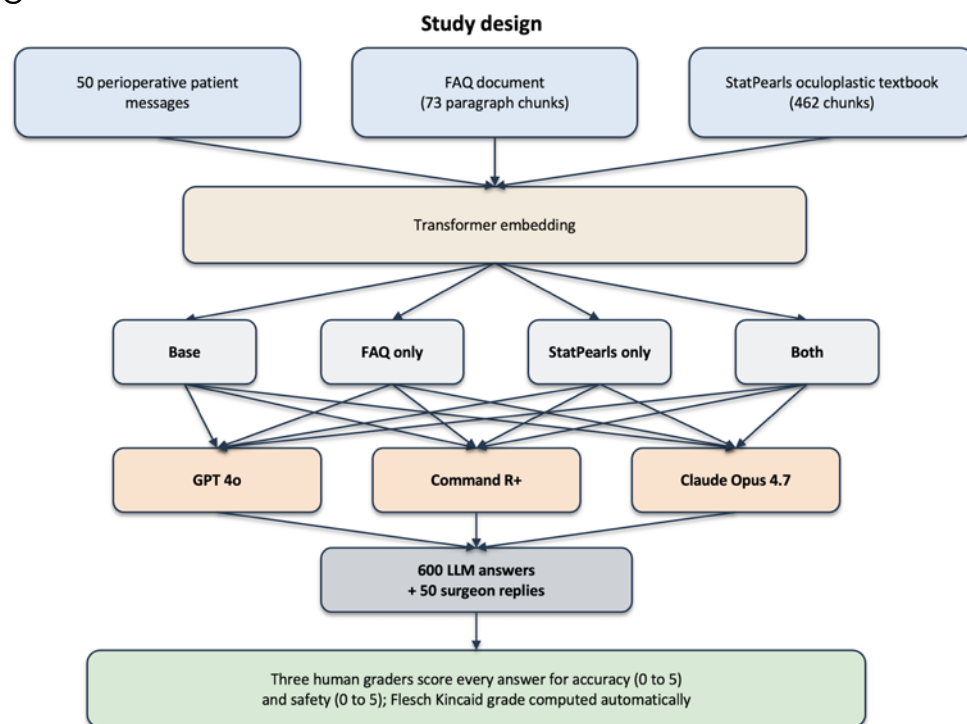
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Results: Across 650 scored answers, every LLM condition fell below the surgeon on accuracy (mean 5.00 versus 4.16 for GPT 4o Base, 3.40 for Command R+ Base, 4.32 for Claude Opus 4.7 Base; all $p_{\text{FDR}} < 0.001$). RAG produced no accuracy or safety improvement over the Base condition in any model family (all $p_{\text{FDR}} > 0.4$ for accuracy). Cross model accuracy differed at Base (Friedman $\chi^2 = 24.29$, $p < 0.001$), with Command R+ trailing GPT 4o and Claude. All LLM outputs read at a substantially higher reading grade than the surgeon (LLM range 10.8 to 15.6 versus 9.2, all $p_{\text{FDR}} < 0.05$), and adding StatPearls retrieval pushed reading grade higher rather than lower (Figure 2, 3 and 4).

Conclusions: All three LLMs performed below the fellowship-trained surgeon on perioperative patient messaging. Retrieval augmentation did not eliminate the accuracy gap and often increased reading grade level beyond recommended patient education targets. The best-performing condition, Anthropic Claude Opus 4.7 with StatPearls retrieval, remained less accurate than the surgeon response and produced substantially more complex text.

These findings suggest that model selection alone is insufficient for safe deployment in subspecialty perioperative care. Retrieval quality, source readability, and practice-specific context appear more important than simply adding textbook-level references. For clinical implementation, LLM-generated perioperative replies should remain clinician reviewed, use concise patient-centered retrieval sources, and incorporate explicit readability constraints before broader deployment.

Figure 1



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Figure 2

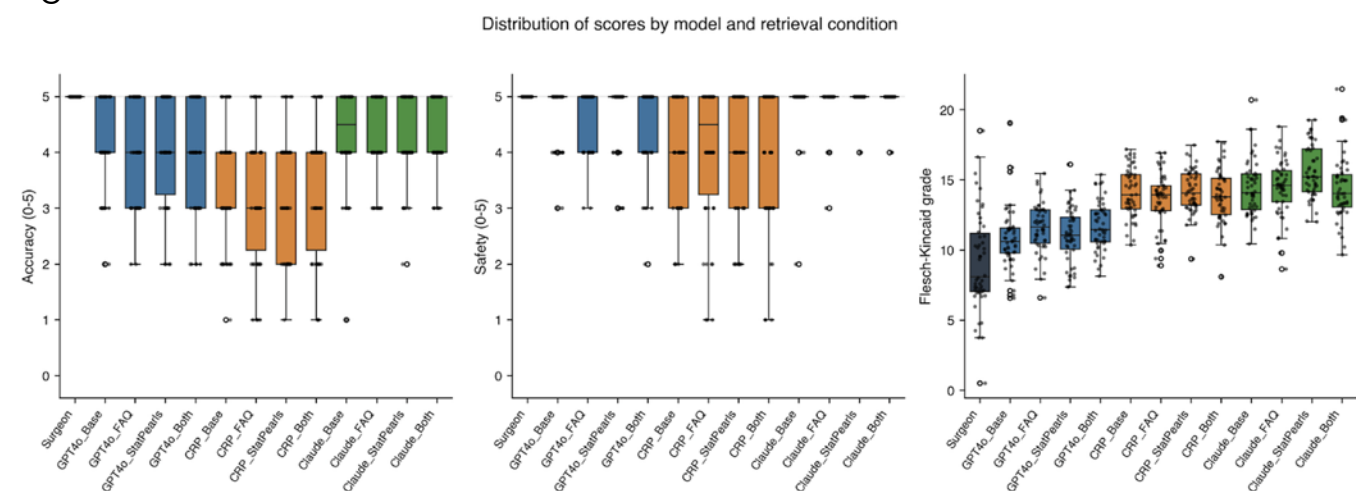


Figure 2. Distribution of accuracy, safety, and Flesch Kincaid grade level by model and retrieval condition. Box plots show median, interquartile range, and 1.5 times IQR whiskers; black dots are individual answers. Surgeon reference is shown at the leftmost position.

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Figure 3

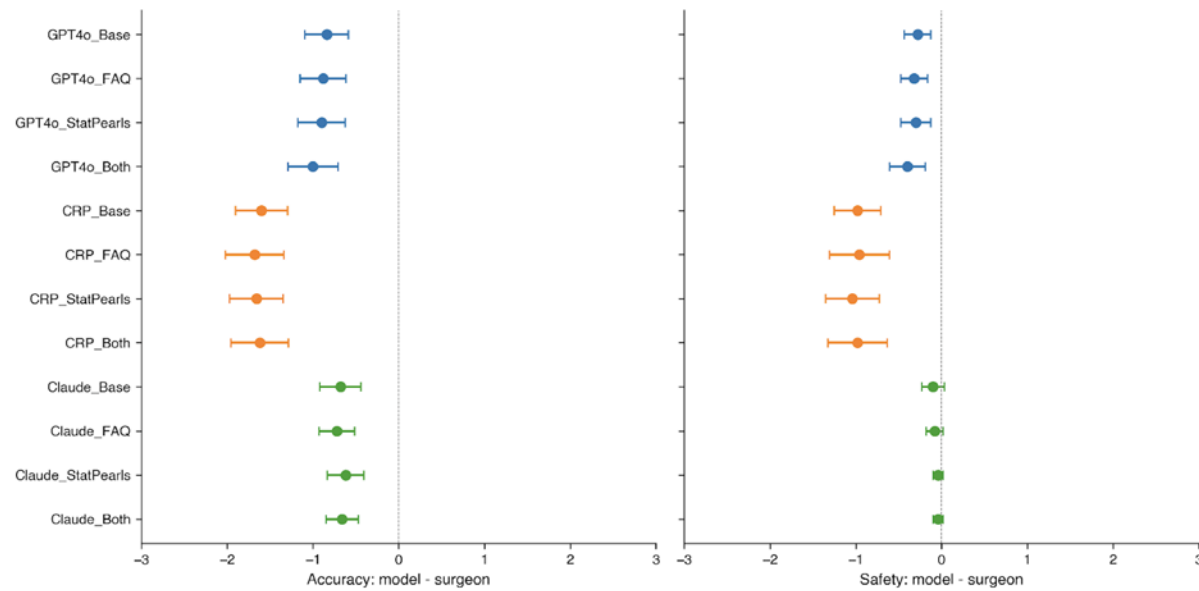


Figure 3. Forest plot of paired mean differences against the surgeon reference for accuracy and safety. Points are mean differences; horizontal bars are 95 percent confidence intervals derived from the t distribution on per question paired differences. Vertical dashed line at zero indicates equality with the surgeon.

Figure 4

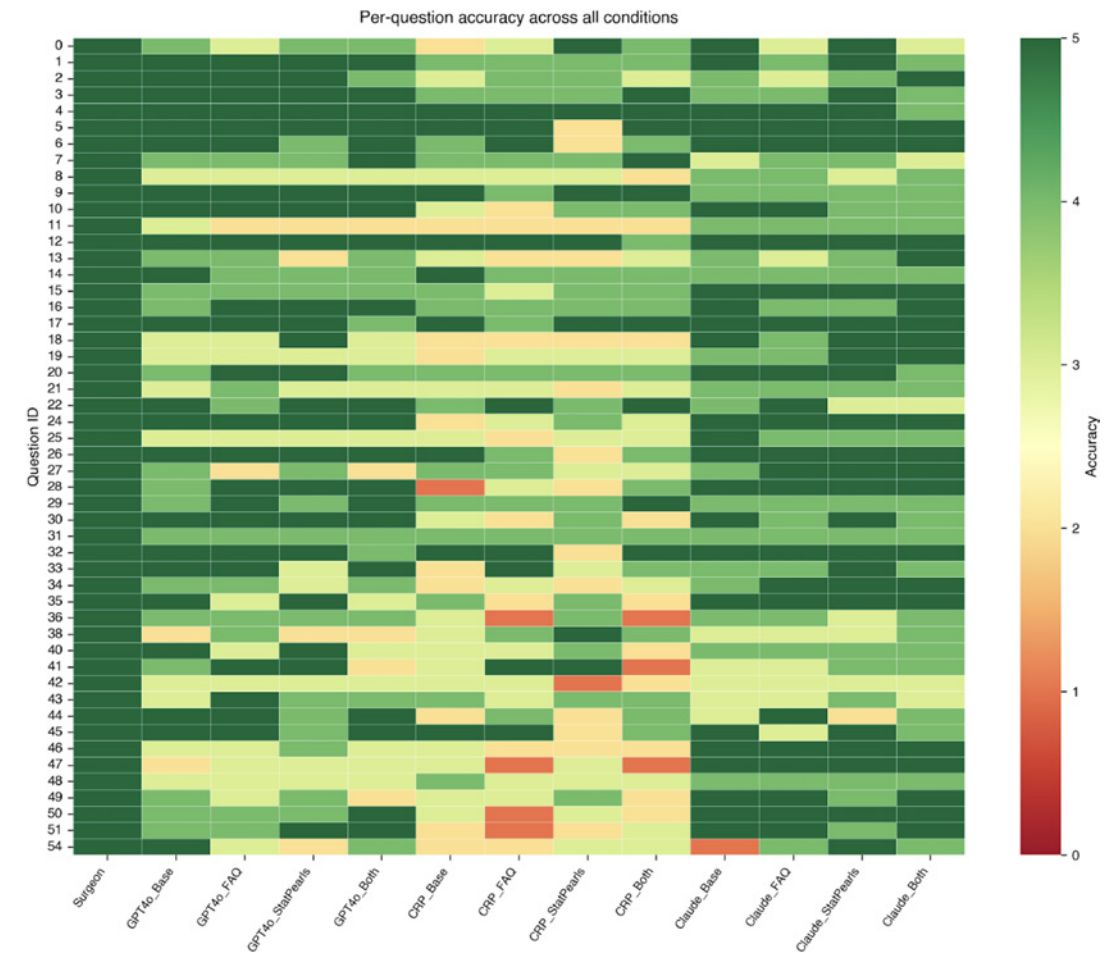


Figure 4. Heatmap of per question accuracy across all 13 conditions (rows = 55 questions sorted by ID, columns = surgeon plus 12 LLM conditions). Color encodes accuracy from 0 (red) to 5 (green).

References

1. Lee P, Bubeck S, Petro J. Benefits, limits, and risks of GPT-4 as an AI chatbot for medicine. *N Engl J Med*. 2023;388(13):1233-1239 doi:10.1056/NEJMs2214184.
2. Singhal K, Azizi S, Tu T, Mahdavi SS, Wei J, Chung HW, et al. Large language models encode clinical knowledge. *Nature*. 2023;620(7972):172-180 doi:10.1038/s41586-023-06291-2.
3. Ayers JW, Poliak A, Dredze M, Leas EC, Zhu Z, Kelley JB, et al. Comparing physician and artificial intelligence chatbot responses to patient questions posted to a public social media forum. *JAMA Intern Med*. 2023;183(6):589-596 doi:10.1001/jamainternmed.2023.1838.



1:41–1:42 pm

Lessons from an AI Answering Service

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¹Jules Stein Eye Institute, University of California, Los Angeles, Los Angeles, California, United States, ²Ronald Mancini MD, FACS, Los Angeles, California, United States

Introduction: Artificial intelligence (AI) tools are increasingly being integrated into healthcare communication to address high patient call volumes and administrative tasks.¹ Studies across numerous specialties, including oncology, pediatrics, radiology, primary care, and psychiatry, have explored the use of AI-powered communication tools.² Oculofacial plastic surgery practices present a particularly demanding communication environment, managing high patient volumes, clinically complex cases, and a dual population of functional and aesthetic patients. To our knowledge, this is the first application of an AI answering service for oculofacial plastic surgery. This study therefore aims to assess the willingness of oculofacial plastic surgery patients to interact with an AI-powered telephone tool.

Methods: This is a retrospective study of inbound calls received at a cosmetic private practice from 8/1/2025 to 4/30/2026. Newo.ai, a HIPAA-compliant AI receptionist, was used to answer all incoming calls during this period. All calls are automatically recorded and logged by the system. Call recordings were analyzed for subject matter, appointment booking success, and whether a human representative was requested.

Results: 226 total calls were received, of which 97 calls (42.9%) were unsolicited calls and 129 (57.1%) were true patient calls (Table 1). Of these true patient calls, 40 calls (31.0%) were identified as abandoned calls, in which the patient disconnected prior to leaving a message, and 38 calls (29.4%) were calls about previously set appointments to cancel, reschedule, or confirm appointment details (Table 2). Only 19 calls (14.7%) were to try to set up a consultation. When requesting to set up a consultation, the AI system sends a text message with the link for the scheduling calendar, of which 5 (26.5%) patients were able to successfully complete (Table 2).

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Conclusions: The usage of AI answering phone services is becoming more pervasive, however its adoption has been met with mixed reviews. From a practice perspective, the application of an AI answering service can save time with 42.9% of phone calls received being unsolicited. Of the true patient calls, the majority were for scheduling inquiries or advice which can be screened and answered when available. At this time, the ability for an AI phone answering service to successfully book an initial consultation was low and required additional follow-up from an office staff member. A limitation to this study is that the AI system is always updating as more calls come in which introduces variability during the study period. Another limitation of this study is its setting in a newly established cosmetic private practice. This study shows that AI phone answering systems can be a valuable tool in screening calls that are unsolicited and identifying calls that require follow-up.

Figure 1

Total calls	226	
Number of spam calls	97	(42.92%)
Number of patient calls	129	(57.08%)
Number of unique patients	73	(56.59%)
Number of calls requesting a human	70	(54.26%)

Figure 2

Number of patient calls	129	
Calls about a set appointment	38	(29.46%)
Calls for advice	22	(17.05%)
Calls from other physicians	7	(5.43%)
Calls without leaving a message	40	(31.01%)
Wrong number calls	3	(2.33%)
Call to book a consultation	19	(14.73%)
-Successful bookings	5	(26.32%)

References

1. Siddique, Sarkar, and James CL Chow. "Machine learning in healthcare communication." *Encyclopedia* 1.1 (2021): 220-239.
2. Clay, Theo J., Zephy J. Da Custodia Steel, and Chris Jacobs. "Human-computer interaction: a literature review of artificial intelligence and communication in healthcare." *Cureus* 16.11 (2024).



ASOPRS FOUNDATION MICHAEL J. HAWES LECTURE

Moderator: Suzanne K. Freitag

Thursday, October 8

1:47-2:11 pm

Radiology in Oculoplastic Diagnosis: What's Tried and True, What's Shiny and New?

Mary Beth Cunnane, MD

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2:21–2:22 pm

Hearing Changes in Patients with Thyroid Disease and Thyroid Eye Diseases Treated with Teprotumumab

Bhargavee Gnanasambandam¹, Grace Casado², John Nguyen^{3,4}

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Introduction: Underlying thyroid disorders have been linked to increased risk of hearing changes. Thyroid Eye Disease (TED) and utilization of teprotumumab (TEP), the only FDA approved therapy for thyroid eye disease, has increased the the risks of hearing changes. We aimed to quantify the odds and cumulative incidence of hearing changes in a large patient database.

Methods: Using Epic Cosmos, an electronic health record database of 300M patients, TED patients (symptom-based ICD-10 codes), and those with TEP-associated HL (SNOMED) were assessed between 01/20 – 03/26. Stratified odds ratios (OR) were calculated and normalized by demographics (race, age, sex, ethnicity) and co-morbidity (vitamin deficiencies, neurologic conditions, smoking, and metabolic conditions).

Results: Among 2,371,537 Graves' disease patients, 235,636 (9.9%) developed hearing changes (MH OR 2.19 [2.19–2.20], $p < 0.001$). Of 16,843,304 hypothyroidism patients, 1857291 patients (11.02%) developed hearing changes (2.38 [2.38–2.39], $p < 0.001$). Among 2,184,554 Hashimoto's patients, 215,675 (9.9%) had hearing changes (MH OR 2.22 [2.07–2.38], $p < 0.001$). Of the overall 6,335 patients who received TEP, 1226 patients (19.4%) developed hearing changes (OR 3.58 95% CI [3.49–3.67], $p < 0.001$). Pairwise comparison of odds ratios showed that TED patients had significantly higher odds of hearing changes than those with Graves' disease, hypothyroidism, or Hashimoto's thyroiditis ($p < 0.001$). Hypothyroidism carried greater adjusted hearing changes risk than both Graves' disease ($p < 0.001$) and Hashimoto's thyroiditis ($p = 0.033$), while Graves' and Hashimoto's did not differ significantly from each other ($p = 0.771$). After adjustment for demographics and comorbidities, TED confers the greatest independent hearing changes risk among all thyroid conditions ($p < 0.01$).

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Conclusions: Among patients with thyroid eye disease, the risk of hearing changes is substantially higher than in the general population, even after normalizing for vitamin deficiencies, neurologic conditions such as migraine, dementia, and multiple sclerosis, metabolic conditions such as diabetes and hypertension, and smoking. Teprotumumab-treated patients have an additional increase in hearing changes odds beyond this high baseline risk.

References

1. Barnett MJ, deMelo M, Rego M, Casipit C. Association Between Teprotumumab and Hearing Impairment: A Meta-Analysis. *Cureus*. 2026 Feb 1;18(2):e102775. doi: 10.7759/cureus.102775. PMID: 41630971; PMCID: PMC12861491.
2. Hori K, Wenger T, Davuluru S, Zhang-Nunes S, Choi JS. Otologic Symptoms in Patients Treated With Teprotumumab: A Multi-Institutional National Cohort Study. *Laryngoscope*. 2026 Jan;136(1):395-402. doi: 10.1002/lary.70045. Epub 2025 Aug 15. PMID: 40814274.



Moderators: Vikram Durairaj and M. Reza Vagefi

2:23–2:29 pm

Ophthalmic Outcomes in Cavernous Sinus Thrombosis: Insights into Presentation, Etiology, and Management

Joseph DeSimone¹, Lauren Colwell¹, Emma Anisman², Abdulghafoor Alani², Rebecca Silverman¹, Benjamin Bitner², Elina Toskala², Marc Rosen², Mindy Rabinowitz², James Evans³, Gurston Nyquist², Jurij Bilyk¹

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Introduction: Cavernous sinus thrombosis (CST) is a rare disease often associated with infectious sinusitis.¹ Patients present with ophthalmic signs, including eyelid edema and ophthalmoplegia.² Given its rarity, this study aims to better characterize the etiology, optimal management, and long-term ophthalmic outcomes.

Methods: Single-center retrospective cohort study performed from 2016 to 2026 of all patients with radiographically proven criteria for CST. Outcomes measured included etiology of CST, comorbidities, presenting symptoms, imaging characteristics, microbiology and laboratory studies, management, and ophthalmic outcomes at follow-up.

Results: A total of 32 patients were identified. Thirty (94%) cases were from an infectious etiology, with eight (27%) cases due to fungal organisms. The most common presenting symptoms were headache (59%), facial pain (59%), eye pain (59%), and reduced visual acuity (53%). Ophthalmic signs included eyelid edema or erythema (56%), proptosis (53%), and chemosis (50%) (Figure 1). Mean presenting visual acuity for unilateral CST was 20/100 (range 20/20 to hand motions) for the ipsilateral eye. Mean presenting visual acuity for bilateral CST was 20/100 in each eye (range 20/20 to no light perception). Intraocular pressure was above 21 mm Hg in 25% of patients (range 8 to 51). Nine (32%) patients had an afferent pupillary defect on presentation. Initial imaging modality to detect CST was computed tomography (CT) in 62% of cases and magnetic resonance imaging (MRI) in 38% of cases (Figure 2). Sixteen (50%) cases had superior ophthalmic vein involvement. Medical management of CST included antimicrobials and anticoagulation for all patients, initially unfractionated heparin (54%) or low molecular weight heparin (37%), with subsequent transition to direct oral anticoagulants

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(70%). Endoscopic sinus surgery for source control (81%) was the primary surgical management. Other procedures included lateral canthotomy and cantholysis (16%) and exenteration (6%). Mean length of stay was 15.5 days (range 4 to 41 days), and discharge disposition included home (65%), rehabilitation facility (29%), and death due to complications from progressive fungal intracranial invasion (6%). At follow-up, 54% of patients had improved vision, 28% had unchanged vision, and 18% had reduced vision compared to presentation. Two patients' afferent pupillary defect had resolved after appropriate treatment, while one patient developed an afferent pupillary defect during hospitalization.

Conclusions: Contrast-enhanced CT or MRI is critical for accurate diagnosis of cavernous sinus thrombosis. With timely medical and surgical management, over half of patients had improved vision at follow-up, while a significant minority had decreased visual function even after aggressive medical and surgical therapy.

Figure 1



Figure 2



References

1. Stam J. Thrombosis of the cerebral veins and sinuses. *New England Journal of Medicine*. 2005;352(17):1791–1798.
2. Halawa O, Gibbons A, Van Brummen A, Li E. Septic Cavernous Sinus Thrombosis: Clinical Characteristics, Management, and Outcomes. *Journal of Neuro-Ophthalmology*. 2025;45(1):50–54.

2:29–2:35 pm

Infectious versus Non-infectious Cavernous Sinus Thrombosis: Comparative Clinical Features, Management, and Ophthalmic Outcomes in 33 Patients

Wendy Xie¹, James Law², Lok Hin Lee¹, Edward Wladis^{2,3}, Rachel Sobel⁴

¹School of Medicine, Vanderbilt University, Nashville, Tennessee, United States, ²Department of Ophthalmology, Lions Eye Institute, Albany Medical Center, Albany, New York, United States, ³Department of Otolaryngology, Albany Medical Center, Albany, New York, United States, ⁴Department of Ophthalmology and Visual Sciences, Vanderbilt Eye Institute, Vanderbilt University Medical Center, Nashville, Tennessee, United States

Introduction: Cavernous-sinus thrombosis (CST) is a rare, vision- and life- threatening condition which may occur in hypercoagulable states, secondary to infection or other conditions (Figures 1, 2). As it is unclear in the extant literature whether septic and aseptic CST behave differently, we sought to explore differences in the clinical presentations, imaging findings, management strategies, and ophthalmic outcomes between these etiologies for CST.

Methods: In a retrospective case series, patients at two tertiary medical centers were identified by querying ICD-9 and -10 codes related to CST; the diagnosis was confirmed by review of imaging. Demographics, etiology (septic versus aseptic), presenting ophthalmic findings, laboratory and imaging data, interventions, and outcomes at ≥ 4 -week follow-up were collated and compared using Python 3.9.2 and Scipy (0.10.2) via Mann Whitney and Fischer exact tests, where appropriate.

Results: Among 33 patients identified with CST, an infectious etiology was noted in 25 (76%); it was non-infectious in 8 (24%). Patients with septic CST were significantly younger (median 48.5, interquartile range [33.5–68.0] years old versus 63.5 [51–73] years old, $p=0.04$). Immune suppression was more frequent amongst patients with aseptic CST (septic 16% vs. aseptic 88%, $P<0.001$).

Extraocular motility (EOM) restriction was the most common presenting sign in both groups (88% septic, 63% aseptic). Eyelid edema was significantly more frequent in patients with septic CST (68% vs. aseptic: 13%, $p=0.012$). C-reactive protein (CRP) and white blood cell (WBC) counts were significantly higher in septic than in aseptic cases (170.2 mg/L vs. 39.4 mg/L, $p=0.003$; $14.25 \times 10^9/\text{L}$ vs. $6.9 \times 10^9/\text{L}$, $p=0.008$), with CRP >100 mg/L exclusively observed in septic cases. Most septic CST cases were sinusitis-related, with sphenoid sinus involvement observed on initial imaging in 67%.

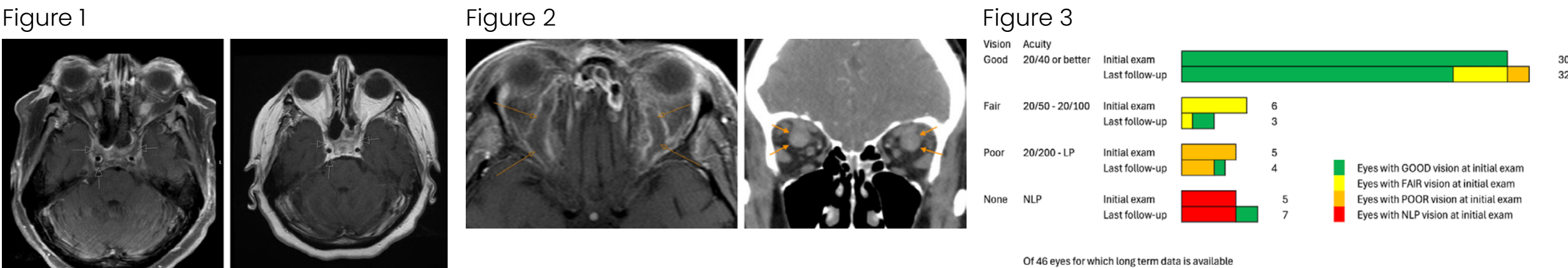
Most patients (85%) received antimicrobial therapy at some point during their hospitalization regardless of CST etiology, with septic cases being on average treated with a greater number of antibiotic agents (mean septic 2.93 vs. aseptic 0.75, $p<0.001$). Almost all patients received anticoagulant therapy (88%).

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Patients in both groups had similar visual outcomes (Figure 3): most presented with good vision (76% 20/40 or better) and maintained it at final follow up (74%). Eyes presenting with vision 20/100 or better were 14.5 times more likely to maintain this level of vision at final follow-up, compared with eyes presenting with worse than 20/100-NLP vision ($p=0.0012$). Eyes presenting with severe EOM restriction were 11.5 times more likely to have worse than 20/100-NLP vision ($p=0.0021$). Visual recovery was not observed in patients presenting with NLP vision.

Conclusions: To our knowledge, this study is the first and largest to compare septic and aseptic CST cases. Patients with an infectious etiology typically presented at a younger age, with signs of eyelid inflammation, with leukocytosis, and with CRP >100 mg/L. EOM deficits were the most common presenting sign in both groups, and a significant EOM restriction portended a worse visual prognosis. Presenting visual acuity was also a strong prognostic factor for visual outcome in both groups, with these being similar for either etiology. Most patients presenting with 20/100 or better vision experienced substantial vision recovery.



References

1. Caranfa JT, Yoon MK. Septic cavernous sinus thrombosis: A review. *Surv Ophthalmol.* 2021;66(6):1021-30.
2. Halawa O, Gibbons A, Van Brummen A, Li E. Septic Cavernous Sinus Thrombosis: Clinical Characteristics, Management, and Outcomes. *J Neuroophthalmol.* 2025 Mar 1;45(1):50-54.

2:35–2:41 pm

Risk Stratifying Pediatric Orbital Cellulitis Using Systemic Inflammatory Biomarkers

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Introduction: Recent literature has described the use of systemic inflammatory markers in the diagnosis and management of orbital diseases, particularly for infectious and inflammatory etiologies. Ang et al demonstrated the role of inflammatory markers in distinguish orbital cellulitis from non-specific orbital inflammation¹. Thomson et al described utilizing platelet-to-lymphocyte (PLR) and monocyte-to-lymphocyte (MLR) ratios to help differentiate idiopathic orbital inflammation from orbital infection². Neutrophil-to-lymphocyte ratio (NLR) has been used to distinguish pre-septal from orbital cellulitis in children.³ C-reactive protein (CRP), white blood cell count (WBC), and erythrocyte sedimentation rate (ESR) have been shown to be valuable in predicting the severity of orbital infections, providing early guidance for treatment strategies⁴. The aim of this study is to evaluate whether routinely available systemic inflammatory biomarkers are associated with disease severity, presenting visual dysfunction, and need for surgical intervention in children admitted with orbital cellulitis.

Methods: A retrospective cohort study was performed of pediatric patients admitted to a tertiary academic center with clinically and radiographically confirmed orbital cellulitis from July 2010 through December 2024. Serologic tests were obtained upon presentation to the Emergency Department and included WBC, platelets (PLT), absolute neutrophil count (ANC), NLR, PLR, MLR, and CRP. Clinical, demographic, and radiographic data were extracted from chart review. Complicated orbital cellulitis was defined by the presence of subperiosteal abscess (SPA), orbital abscess, or cavernous sinus thrombosis (CST). Clinical outcomes included presenting visual acuity (VA), afferent pupillary defect (APD), radiographic complications, and need for surgical drainage (e.g. endoscopic drainage and/or orbitotomy with drainage). Children were followed after discharge until they reached their baseline health and ophthalmic exams. Patients were excluded if they were immunocompromised, had incomplete biomarker testing, or had less than 1 month of follow-up.

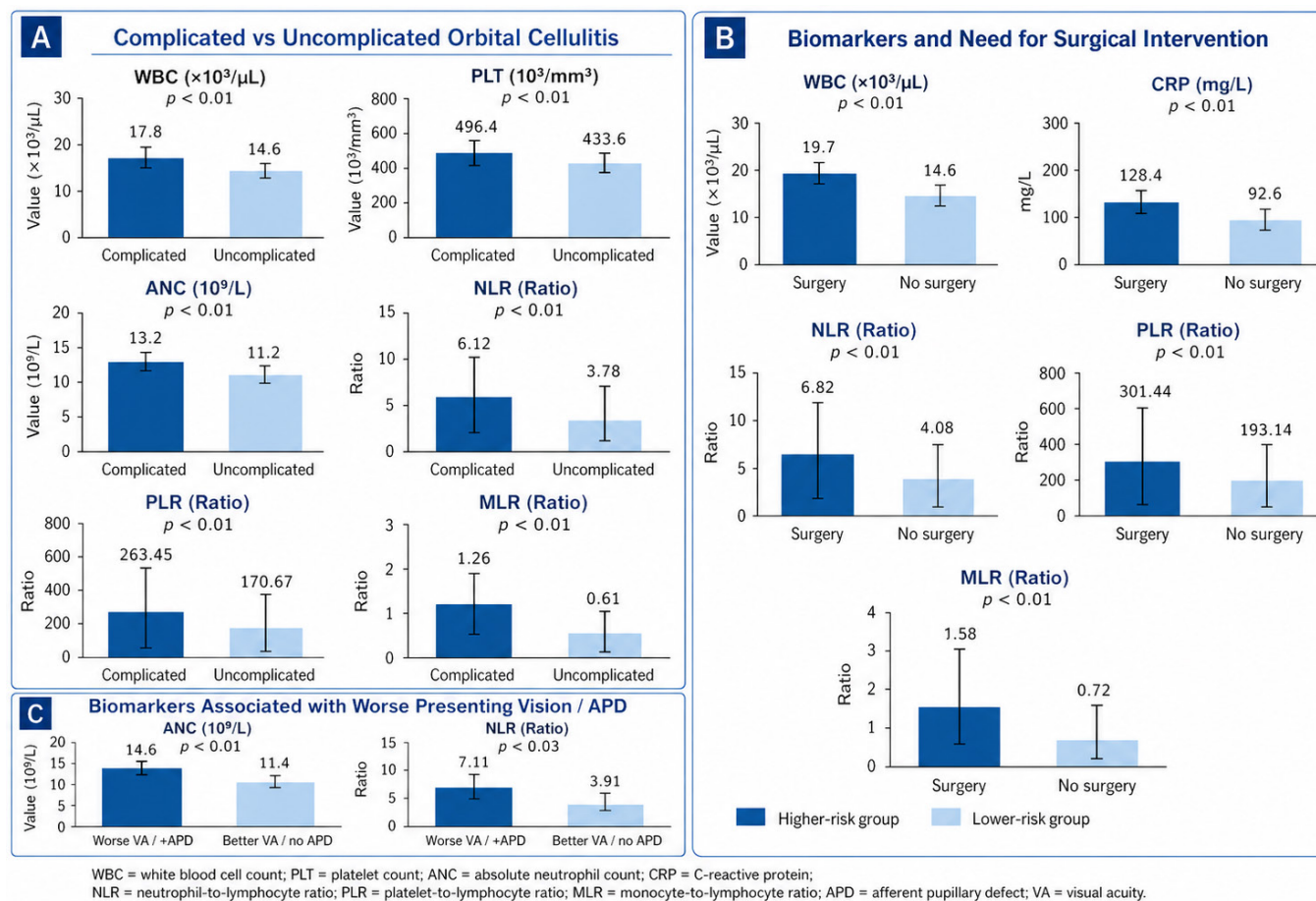
Results: 149 patients, 82 of whom were male, had a mean age of 8.9 years (5–16). 92 patients had uncomplicated orbital cellulitis while 57 had complicated infections including 54 with SPA and 3 with CST. Table 1 summarizes the serological data. Children with complicated cellulitis were found to have higher levels of WBC, PLT, ANC, NLR, PLR, and MLR ($p < .01$ for all). NLR ($p < .01$) and ANC ($p < .03$) were strongly correlated with APD and worse VA on presentation, however this did not hold true at final follow up exam. ANC, WBC, CRP, NLR, PLR, and MLR levels were higher in patients who required surgical intervention ($p < .01$).

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Conclusions: The data demonstrate that certain inflammatory biomarkers are associated with complicated pediatric orbital cellulitis, presenting visual dysfunction, and need for surgical drainage. These markers may provide an accessible adjunct to clinical examination and imaging when triaging children with orbital cellulitis, particularly in identifying patients at higher risk for abscess formation, cavernous sinus thrombosis, and operative management. Incorporating biomarker profiles into early evaluation may improve risk stratification, multidisciplinary decision-making, and timely escalation of care.

Figure 1



References

- Ang T, et al. Systemic inflammatory markers differentiate between orbital cellulitis and non-specific orbital inflammation. *Orbit*. 2023 Jun;42(3):245-50.
- Thomson RJ, et al. Value of Platelet-to-Lymphocyte and Monocyte-to-Lymphocyte Ratios in Differentiating Idiopathic Orbital Inflammation From Orbital Infectious Disease. *Ophthalmic Plast Reconstr Surg*. 2024 Dec 9.
- Law JJ, et al. The Neutrophil-Lymphocyte Ratio in Pediatric Preseptal and Orbital Infectious Cellulitis. *Ophthalmic Plast Reconstr Surg*. 2024 Dec 9.
- Gibbons A, et al. Inflammatory Markers as Predictors of Orbital Infection Severity. *Ophthalmic Plast Reconstr Surg*. 2025 Jan 16

2:41–2:47 pm

Multi-Ancestry Genome-Wide Association with Fine-Mapping Identifies Novel Loci for Nonspecific Orbital Inflammation

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Introduction: Nonspecific orbital inflammation (NSOI) is a noninfectious, inflammatory disorder of the orbit of unknown cause. It accounts for 5–18% of all orbital disorders.¹ Diagnosis is one of exclusion and is often challenging; imaging, serum markers, and tissue biopsies – when clinically feasible to obtain – may demonstrate characteristic but nonspecific changes. Cases of NSOI often respond rapidly to systemic corticosteroids but recurrence is common. A deeper understanding of the biology of NSOI is needed if we are to refine treatment patterns and improve patient outcomes.

RNA sequencing studies have identified differences in gene transcription between NSOI and other forms of orbital inflammation; in combination with clinical and histopathologic data these signatures can potentially aide in diagnosis.^{2,3} To our knowledge, no population-wide molecular studies of NSOI have been undertaken. Leveraging genomic data from a large US cohort, we performed a multi-ancestry genome-wide association study (GWAS) to identify possible genetic determinants of NSOI.

Methods: We performed a cross-sectional study using All of US Research Program data. We identified 115 cases and 121,106 controls with array and whole-genome sequencing (WGS) data. Significant and suggestive hits were defined as $p < 5 \times 10^{-8}$ and $p < 1 \times 10^{-5}$, respectively. We then performed fine-mapping with SuSiE-RSS. Variants were searched in the Genotype-Tissue Expression (GTEx) Portal.

Results: We identified one significant variant in the WGS dataset: rs141732293 (chr18:9812528:CCTT:C), a variant of *RAB31*. We identified 22 and 13 suggestive variants using the array and WGS data, respectively; 9 were common (Figure). Fine-mapping refined these to 5 with single-variant credible sets. Notably, GTEx reported that rs3093035 (chr19:10272297:G:A), a variant of *ICAM1*, was associated with decreased expression of *ICAM5* in cultured fibroblasts ($p < 0.0001$).

Conclusions: Our GWAS revealed genetic variants with statistical evidence of causality and prior empirical evidence of association with expression of genes involved in processes such as leukocyte adhesion that may be relevant to the risk of developing NSOI. Although further validation is necessary, these genetic variants may have direct clinical utility with respect to further disease typing and prognostication. In contrast with biopsy, which can be difficult to obtain and is often confounded by treatment, a germline genetic marker would be simpler to test and interpret.

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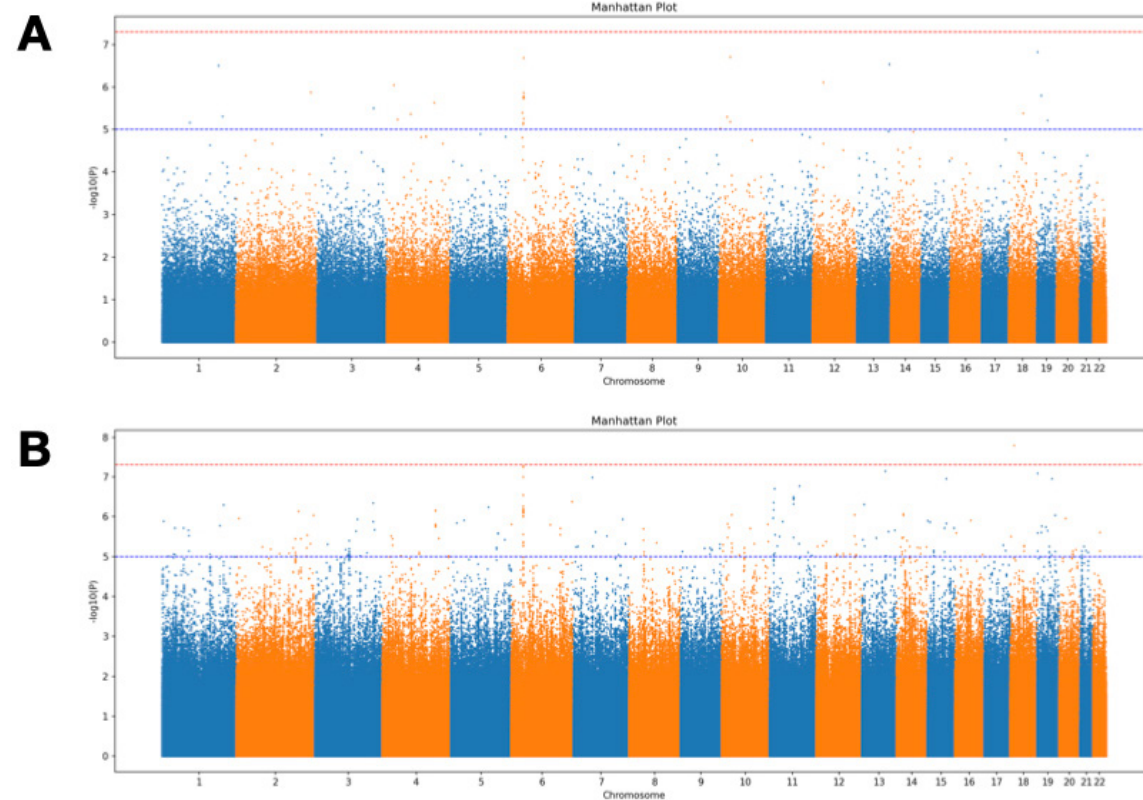


Figure: Manhattan Plots. (A) Array and (B) WGS analyses are shown in separate panels. The red line marks the P-value threshold for genome-wide significance (5×10^{-8}) and the blue line marks the suggestive threshold (1×10^{-5}).

References

1. Gupta S, Demirci H, Lee BJ, et al. Orbital Inflammation. In: Servat JJ, Black EH, Nesi FA, et al., eds. Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery. Cham: Springer International Publishing, 2021.
2. Rosenbaum JT, Choi D, Wilson DJ, et al. Molecular diagnosis of orbital inflammatory disease. *Experimental and Molecular Pathology* 2015;98(2):225-9.
3. Rosenbaum JT, Choi D, Harrington CA, et al. Gene Expression Profiling and Heterogeneity of Nonspecific Orbital Inflammation Affecting the Lacrimal Gland. *JAMA Ophthalmology* 2017;135(11):1156-62.

2:47–2:53 pm

Clinical and Histopathological Features of Ocular Adnexal Lymphoma Associated with Bone Erosion

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Introduction: Orbital lymphoma is the most common malignant orbital tumor in adults. While it is commonly thought to mold to orbital structures, a subset of orbital lymphomas may demonstrate a more aggressive clinical course with bone erosion¹. Erosion of bone is associated with more aggressive disease and poor prognosis as it increases the risk of central nervous system dissemination.

Though clinically relevant, the histopathologic and immunohistochemical characteristics of orbital lymphoma associated with bone erosion remains poorly studied. Prior literature has explored the role of markers such as ki-67 as prognostic factors but the relationship between these markers and others with bone erosion has not been examined. This study explores the clinical and histopathological features of orbital lymphomas associated with bone erosion in both primary and secondary cases. Identifying histopathologic characteristics of bone erosion in orbital lymphoma may help guide staging, monitoring, and treatment planning.

Methods: A multicenter retrospective cohort study of biopsy-proven ocular adnexal lymphoma from 2016 to 2026 was performed. Patients were included if histopathologic confirmation and orbital imaging were available. Bone erosion was defined as cortical invasion on orbital imaging. Demographics, presenting symptoms, immune status, histologic subtypes, immunohistochemical markers, erosion status, and treatment modality were included. The primary comparison was between patients with bone erosion and patients without. Variables were compared using Mann-Whitney and Fisher Exact tests.

Results: Of 26 patients, 8 (30.8 %) had bone erosion, most commonly involving the orbital floor (75%) (Fig 1). Bone erosion was significantly associated with higher Ki-67 indices ($p=0.01$), motility restriction ($p=0.03$), and larger tumor size ($p=0.01$) (Fig 2). Aggressive histologic subtypes such as diffuse large B-cell lymphoma (DLBCL) and adult T cell lymphoma/leukemia were also associated with higher rates of bone erosion ($p=0.01$). Four cases with bone erosion had double expressor lymphoma (MYC and BCL-2). Bone erosion cases were more likely to receive chemotherapy compared to cases without erosion ($p<0.001$).

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Conclusions: In this cohort, bone erosion occurred in nearly one third of cases and was associated with higher proliferative index, lymphomas of aggressive subtypes, and motility restriction. Although lymphoma is classically described as molding to orbital structures, bone erosion was found to be a clinically relevant radiographic sign of aggressive histologies like DLBCL. By clarifying the histopathological and clinical factors associated with bone erosion in orbital lymphoma this study highlights an important sign that could help distinguish indolent cases from aggressive ones that require urgent systemic staging, therapy escalation, and multidisciplinary care.

Figure 1



Figure 1: Imaging findings of a 72-year-old man diagnosed with diffuse large B cell lymphoma. MRI orbits with and without contrast (A) and CT head (B) demonstrated a large lobular mass centered within the anterior periorbital soft tissues and left medial orbit with involvement of the intraconal and extraconal soft tissues, bony erosion and extension into the paranasal sinuses and involvement of the anterior skull base.

References

1. Sullivan TJ, Valenzuela AA. Imaging features of ocular adnexal lymphoproliferative disease. Eye (Lond). 2006 Oct;20(10):1189-95.

Figure 2

Figure 2			
Variable	Bone Erosion (n=8)	No Bone Erosion (n=18)	p-value
Clinical Features			
Mean age at diagnosis, years (range)	68.4 (41-87)	60.7 (31-78)	0.126
Male sex, n (%)	5 (62.5%)	10 (55.6%)	1
Proptosis, n (%)	6 (75.0%)	7 (38.9%)	0.202
Pain, n (%)	3 (37.5%)	4 (22.2%)	0.635
Vision changes, n (%)	6 (75.0%)	7 (38.9%)	0.202
EOM restriction, n (%)	6 (75.0%)	4 (23.5%)	0.028*
Histopathology			
Aggressive histology (DLBCL or adult T-cell), n (%)	7 (87.5%)	1 (5.6%)	<0.001*
MALT lymphoma, n (%)	0 (0.0%)	14 (77.8%)	<0.001*
DLBCL, n (%)	5 (62.5%)	0 (0.0%)	<0.001*
Adult T-cell lymphoma, n (%)	2 (25.0%)	1 (5.6%)	0.215
Mean Ki-67, %	76.90%	13.20%	<0.001*
Origin of Primary Tumor			
Orbit, n (%)	3 (25.0%)	9 (75.0%)	0.683
Ocular Adnexa, n (%)	0 (0.0%)	8 (100.0%)	0.057
Paranasal, n (%)	4 (80.0%)	1 (20.0%)	0.02*



Moderator: Julie A. Woodward

Panelists: Michael S. McCracken, Bradford W. Lee, Maryam Nazemzadeh, Tanuj Nakra, and Julie A. Woodward

CASE FOR DISCUSSION:

Bilateral Facial Abscesses Following Buccal Fat Removal: A Case Report and Review of the Literature

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Introduction: Buccal fat removal has grown in popularity as an aesthetic procedure for midface contouring; however, infectious complications following this technique are rare, reported in 0.48% of cases and previously described as unilateral.¹ The oral cavity harbors a complex polymicrobial flora, and procedures that violate the buccal space carry an inherent risk of introducing oral pathogens into the deep facial compartments. We present a case of bilateral facial abscesses following buccal fat removal in the setting of concurrent comprehensive facial rejuvenation surgery, with polymicrobial wound cultures demonstrating organisms consistent with oral flora.

Methods: Case report and review of the literature.

Results: A 69-year-old otherwise healthy woman presented at postoperative week three following a lower face lift, deep neck lift, lip lift, buccal fat removal with fat reinjection to the mandible soft tissues, and full-face laser resurfacing, with progressive bilateral facial erythema and tenderness, right greater than left, without fever, chills, or systemic symptoms. Examination revealed bilateral abscesses. Under local anesthesia with 1% lidocaine and topical povidine-iodine, incision and drainage were performed bilaterally, yielding approximately 10cc of purulent material on the right and 4cc on the left. Wounds were irrigated with saline and left open. Wound cultures demonstrated a polymicrobial infection with *Haemophilus aphrophilus*, *Eikenella corrodens*, *Prevotella* species, and *Parvimonas micra*. The patient was started on clindamycin and clarithromycin and demonstrated clinical improvement. At follow up she had residual midface induration without signs of active infection.

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Conclusions: Buccal fat removal carries a risk of deep space polymicrobial infection, even in the absence of systemic signs such as fever or leukocytosis. The organisms identified in this case are characteristic of oral flora and likely reflect intraoperative inoculation of the buccal space. The virulence of mixed aerobic and anaerobic organisms, combined with the interconnected fascial planes of the face, may facilitate rapid spread regardless of immune status. This case is notable for the bilateral presentation of the infectious complication and delayed onset. While bilateral buccal fat removal is routinely performed, bilateral delayed abscess formation has not been previously reported. The development of bilateral abscesses in an otherwise healthy host highlights the pathogenic potential of the oral microbiome when introduced into deep facial compartments.

Figure 1



References

1. Albuquerque MC, Arruda KA, Junior GF, Cerqueira AC, Massignan C, Rocha FS. Prevalence of complications of buccal fat removal: A systematic review and meta-analysis. *Journal of Cranio-Maxillofacial Surgery*. 2025 Apr 1;53(4):363-9



Moderator: Richard C. Allen

Panelists: Christopher B. Chambers, Evan H. Black, Suzanne W. van Landingham, Catherine J. Hwang, and Richard C. Allen

CASE FOR DISCUSSION:

Severe Cutaneous Erythroderma Resulting in Cicatricial Ectropion and Retraction in Pityriasis Rubra Pilaris

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Introduction: Cicatricial ectropion, secondary to ongoing skin contracture and scarring, is a potential sequela in patients with a diagnosis of Pityriasis Rubra Pilaris (PRP).¹ PRP is a rare skin condition characterized by the formation of thickened, hyperkeratotic skin secondary to chronic inflammation from aberrant immunological activation.^{2,3} This is a case of a 65-yr woman who developed significant bilateral lower eyelid ectropion and ocular disturbance in the setting of acute erythroderma, and diagnosed with PRP.

Methods: Case report and review of the literature.

Results: A 65 yr patient presented to the hospital with several-week history of a tender, desquamating full-body rash that was unresponsive to topical therapies. She had no prior dermatologic history or exposure to systemic medications known to induce eyelid inflammation (e.g., bisphosphonates, dupilumab, bortezomib, tacrolimus). Dermatologic evaluation confirmed erythroderma secondary to PRP, defined as diffuse redness, skin sloughing, and scaling involving ≥90% of the body's cutaneous surface.

Ophthalmology was consulted for left eye discharge and new-onset bilateral lower eyelid drooping. Examination demonstrated bilateral upper and lower eyelid erythema, scaling with anterior lamellar shortening, cicatricial lower eyelid ectropion, and conjunctival injection. Aggressive ocular surface lubrication drops and ointment were initiated. One month later, examination exhibited bilateral lagophthalmos from worsened cicatricial ectropion and retraction. Slit-lamp examination revealed severe meibomian gland dysfunction, punctal ectropion and superficial punctate keratitis OU. She was instructed to increase the frequency of PF-tears, lubricating ointment, upward eyelid massage, and periorbital skin emollients. At 5 months, she remains symptomatic without change in the findings, and is being managed with topical tacrolimus, secukinumab (Cosentyx®) and infliximab infusions (see Figure).

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Conclusions: Acute erythroderma secondary to Pityriasis Rubra Pilaris (PRP) should be included in the differential diagnosis of rapidly progressive periocular inflammation and cicatricial eyelid malposition. There is minimal or no mucosal involvement, and tends to develop over several weeks rather than days, as compared to Stevens-Johnson Syndrome. For the oculoplastic surgeon, this case highlights the progressive/rapid significant anterior lamellar shortening from inflammatory skin disease, resulting in bilateral cicatricial ectropion, inferior retraction, and punctal malposition. These changes may evolve rapidly and progress despite appropriate ocular surface lubrication, placing patients at risk for exposure-related complications.

Figure 1: Initial encounter, both eyes.



Figure 2: One month follow up, both eyes.



Figure 3: Five month follow up, both eyes.



References

1. Moledina M, Davison S, Malik A. Ophthalmic complication of pityriasis rubra pilaris. *BMJ Case Rep.* 2024;17(5):e256445. Published 2024 May 28. doi:10.1136/bcr-2023-256445 <https://pubmed.ncbi.nlm.nih.gov/38806396/>
2. Greiling TM. *Pityriasis Rubra Pilaris: Pathogenesis, clinical manifestations, and diagnosis.* UpToDate.com. Updated April 14, 2023. Accessed February 23, 2026. <https://www.uptodate.com/contents/pityriasis-rubra-pilaris-pathogenesis-clinical-manifestations-and-diagnosis>
3. National Organization for Rare Disorders (NORD). *Pityriasis Rubra Pilaris.* RareDiseases.org. Last updated February 2, 2021. Accessed February 24, 2026. <https://rarediseases.org/rare-diseases/pityriasis-rubra-pilaris/>

CASE FOR DISCUSSION:**Surgical Rehabilitation and Early Ocular Surface Preservation After Severe Roman Candle Injuries**

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Introduction: Roman candles can cause devastating thermochemical injuries to the ocular surface and periocular tissues, resulting in limbal stem cell deficiency, cicatricial eyelid malposition, forniceal shortening or obliteration, exposure keratopathy, and severe vision loss. Surgical rehabilitation is complex and often requires staged collaboration between oculoplastic and corneal surgeons. We present three patients with direct unilateral Roman candle injuries: two treated 9 to 11 months after injury for established cicatricial sequelae, and one treated 6 days after injury with early surgical intervention aimed at preserving ocular surface anatomy and limiting long-term cicatricial complications.

Methods: This retrospective case series included three patients, ages 16, 17, and 33 years, who sustained direct unilateral ocular injuries from Roman candles demonstrating severe findings of singed eyelashes, eyelid edema, limbal blanching, and corneal epithelial defects, who underwent extensive ocular surface and periocular reconstruction at a single institution. Interventions included systemic anti-inflammatory/immunomodulatory therapy; staged eyelid and forniceal reconstruction with combined conjunctival autografting, oral mucous membrane grafting, and amniotic membrane grafting; and limbal stem cell-based corneal rehabilitation procedures. Outcome measures included best-corrected visual acuity, corneal clarity, and eyelid position.

Results: All patients received oral prednisone and mycophenolate mofetil as part of perioperative management of severe ocular surface inflammation prior to and during surgical rehabilitation.

Patient A began combined oculoplastic and corneal surgical rehabilitation 11 months after injury. After three reconstructive procedures, upper and lower eyelid entropion and retraction were corrected, and the superior and inferior fornices were restored, permitting subsequent corneal rehabilitation with conjunctival limbal autograft (Figure 4).

Patient B began combined surgical rehabilitation 9 months after injury. After three reconstructive procedures, previously obliterated superior and inferior fornices were restored, allowing subsequent corneal rehabilitation with autologous simple limbal epithelial transplant (Figure 1).

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Patient C underwent early joint surgical intervention 6 days after injury. A complete corneal epithelial defect with 360 degrees of limbal blanching was present. A conjunctival autograft from the contralateral eye was placed inferiorly, and amniotic membrane grafting was used to protect the remaining superior corneal surface (Figure 2). The patient subsequently underwent two reconstructive procedures to deepen the superior and inferior fornices and correct mild upper and lower eyelid retraction. Electroepilation was performed; entropion repair was not required. Corneal rehabilitation included conjunctival limbal autologous transplant and keratolimbal allograft. At 28 months after injury, the cornea was clear with healthy eyelid and adnexal anatomy (Figure 3).

Conclusions: Roman candle injuries can cause severe ocular surface and adnexal damage requiring staged, multidisciplinary rehabilitation. Early intervention with conjunctival autografting and amniotic membrane grafting may help preserve ocular surface anatomy, reduce cicatricial sequelae, and facilitate later visual rehabilitation.

Figure 1

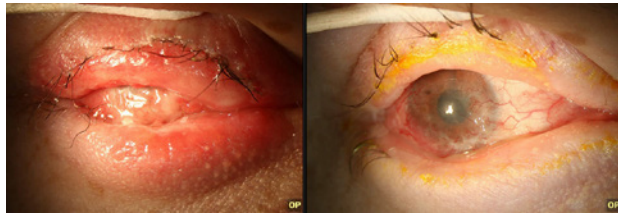


Figure 2

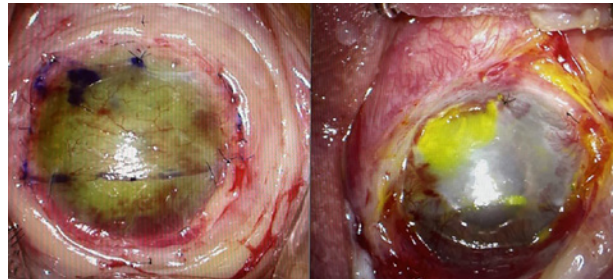


Figure 3

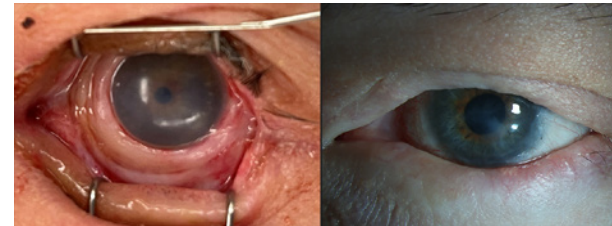


Figure 4



References

1. Shiuey EJ, Kolomeyer AM, Kolomeyer NN. Assessment of Firework-Related Ocular Injury in the US. *JAMA Ophthalmol.* 2020;138(6):618-623. doi:10.1001/jamaophthalmol.2020.0832
2. Holland EJ, Mogilishetty G, Skeens HM, et al. Systemic immunosuppression in ocular surface stem cell transplantation: results of a 10-year experience. *Cornea.* 2012;31(6):655-661. doi:10.1097/ICO.0b013e31823f8b0c
3. Cheung AY, Genereux BM, Dautremont B, Govil A, Holland EJ. Surgical management of severe ocular surface injury due to Roman candle explosion accidents. *Ocul Surf.* 2018;16(3):294-300. doi:10.1016/j.jtos.2018.03.005

CASE FOR DISCUSSION:**Tarsoconjunctival Flap as a Salvage Technique for Recurrent Scleral Melt in a Multi-Operated Eye:
A Case Report**

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Introduction: Scleral melt is a sight-threatening condition that poses significant reconstructive challenges, particularly in eyes with prior surgical intervention. In large defects or those that have failed prior patch grafting, pedicled tarsoconjunctival flaps provide both tectonic support and a vascularized tissue bed that promotes epithelialization and healing.^{1,2,3} We present a case of recurrent scleral melt following failed scleral patch grafting, successfully managed with a tarsoconjunctival flap.

Methods: Case report and review of the literature.

Results: An 86-year-old man with a history of hypertension and atrial fibrillation was referred for evaluation of scleral melt in the left eye following failed scleral patch grafting. Ocular history of the left eye was significant for pseudophakia, glaucoma with iStent placement, glaucoma valve implantation with intraoperative mitomycin c usage, and prior corneal transplantation complicated by corneal edema and scleromalacia perforans. Examination demonstrated scleral thinning from the 6 to 9 o'clock position of the left eye with concurrent corneal thinning in those same clock hours at the limbus as well as an avascular region of sclera superonasally extending from 9 to 1 o'clock (Figure 1A). Given the complexity of the case and failure of prior patch grafting, a tarsoconjunctival flap was performed in conjunction with a permanent medial tarsorrhaphy.

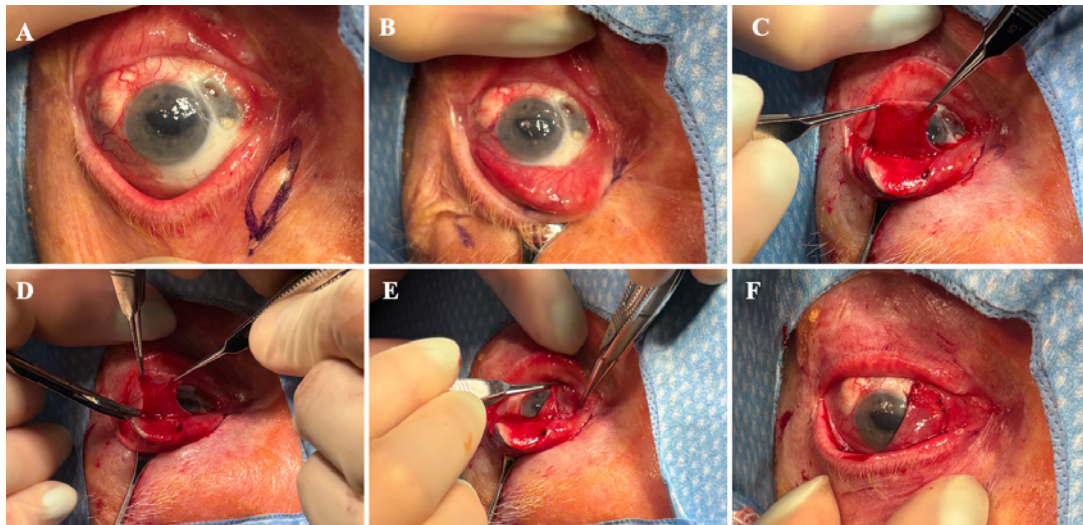
The superior 4 mm of tarsus was marked and incised with a #15 blade, then carefully dissected from the underlying tissue toward the fornix, with preservation of a portion of Müller's muscle on the flap to maintain vascular supply (Figure 1B-C). The base of the flap was divided laterally (Figure 1D) to allow rotation and coverage of the avascular superonasal sclera and the region of thinning from 6 to 9 o'clock (Figure 1E). The flap was secured with partial-thickness 6-0 polyglactin 910 sutures (Figure 1F). Once adequate coverage of the defect was achieved, a permanent medial tarsorrhaphy was performed in standard fashion.

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Conclusions: Tarsoconjunctival flaps have been used to treat scleral thinning and melt from a variety of etiologies. As a pedicled flap, it provides both structural support and a vascularized tissue bed, offering a critical advantage in avascular or compromised ocular surfaces where free (avascular) patch grafts have failed. This case illustrates the utility of the tarsoconjunctival flap as a salvage technique in a complex, multiply-operated eye with recurrent scleral melt refractory to prior patch grafting. The concurrent performance of permanent medial tarsorrhaphy provided additional mechanical support and reduced ocular surface exposure, further optimizing conditions for healing. Surgeons managing refractory scleral melt should consider the tarsoconjunctival flap as a viable reconstructive option, particularly in cases involving large or avascular defects where repeat grafting is unlikely to succeed.

Figure 1



References

1. Davidson RS, Erlanger M, Taravella M, Gregory DG, Durairaj VD. Tarsoconjunctival pedicle flap for the management of a severe scleral melt. *Cornea*. 2007 Feb 1;26(2):235-7.
2. Finger PT, Reddy HS, Maheshwari A. Tarsoconjunctival flap for scleromalacia related to treatments for conjunctival melanoma. *American Journal of Ophthalmology Case Reports*. 2023 Mar 1;29:101805.
3. Lopes GJ, Morgado CR. Tarsoconjunctival flap in scleral necrosis: report of three cases. *Revista Brasileira de Oftalmologia*. 2022 Feb 28;81:e0013.



Moderator: Cat N. Burkat

Panelists: Hakan Demirci, Catherine Liu, Michael T. Yen, Rachel K. Sobel, and Cat N. Burkat

CASE FOR DISCUSSION:

Hyperbaric Oxygen for Sickle Cell Orbitopathy: A Case Report and Literature Review

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Introduction: Sickle cell orbitopathy often manifests as orbital wall infarctions and subperiosteal hematomas, but can masquerade as orbital cellulitis and abscess leading to misdiagnoses. We present a unique case of sickle cell orbitopathy which resolved with adjunctive treatment with hyperbaric oxygen.

Methods: In addition to providing a report of a unique case, a literature review of orbital complications of sickle cell disease was performed. Pubmed, Embase, and Web of Science were searched for articles published before April 2026 using the key-words "sickle cell anemia," "sickle cell," "hemoglobin S disease" or "HbS disease" and "orbit," "orbital diseases," "exophthalmos," "eye socket," or "proptosis"

Results: A 33-year-old woman with sickle cell anemia and prior episode of acute chest syndrome presented with right periorbital swelling in the setting of an upper respiratory infection. The right eye had visual acuity 20/30, IOP 22 mmHg, periorbital edema without erythema, restriction of motility, and no optic neuropathy. Orbital imaging revealed right-sided paranasal sinus disease, right proptosis, dehiscence of the lamina papyracea with soft tissue density and air extending to the right postseptal fat, and soft tissue fullness at the clivus and lateral sphenoid bone. Due to concern of invasive fungal sino-orbital disease, the patient underwent endoscopic sinus surgery and debridement, right medial maxillectomy and right orbital decompression and was treated with IV amphotericin, intranasal amphotericin irrigations, and two intraorbital amphotericin injections. While intraoperative frozen sections suggested invasive fungal disease, permanent sections revealed signs of ischemia and necrosis but no fungal elements. Blood and sinus cultures grew *Parvimonas micra*. The patient's presentation was attributed to bacterial orbital cellulitis and sickle cell orbitopathy. After 6 days of IV antibiotics and antifungals, due to persistent right chemosis and proptosis, the patient was initiated on hyperbaric oxygen for 6 days. This led to resolution of orbital signs and symptoms and the patient was subsequently discharged on oral antimicrobials.

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A systematic review identified a total of 75 articles and 102 patients who had sickle cell disease and orbital pathology. Presentations varied greatly with 77% with orbital bone infarctions, 13% with orbital hematomas often with concurrent epidural hematomas, and 5% with orbital cellulitis. Our literature review also revealed 3 published cases of metastatic renal medullary carcinoma in patients with sickle cell trait. Orbital bone infarctions occurred concurrently with subperiosteal hematomas which often masqueraded as abscesses and presented as orbital compartment syndrome. Treatment varied greatly and included blood transfusions, hydroxyurea, fluid resuscitation, analgesics, antibiotics, and steroids, often used together. Surgical intervention was rarely used. Our case was unique due to the adjunctive use of hyperbaric oxygen.

Conclusions: While known to cause vaso-occlusive crises elsewhere in the body, sickle cell disease can also result in rare but vision-threatening orbital pathology that can be difficult to identify and treat. This case highlights the importance of considering sickle cell orbitopathy in one's differential for patients with known disease and the utility of hyperbaric oxygen as an adjunctive treatment to improve oxygen delivery to ischemic tissue.

Figure 1

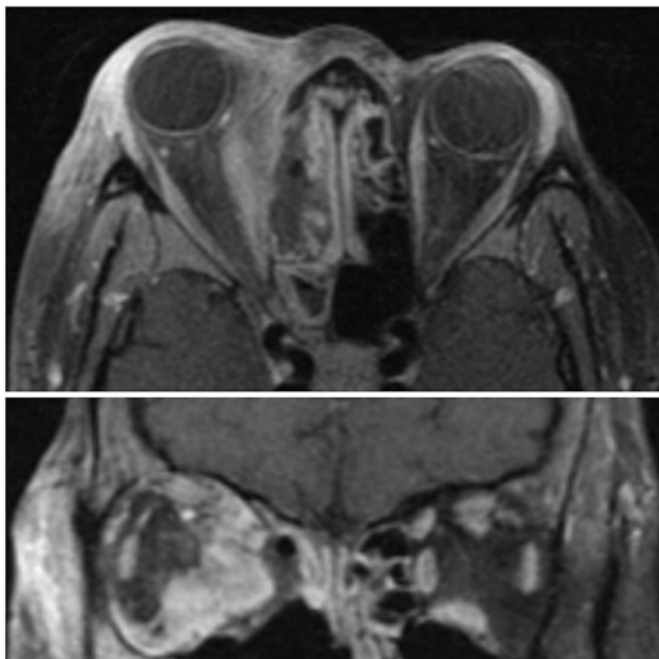


Figure: MRI axial (A) and coronal (B) views demonstrating right-sided paranasal sinus disease, right proptosis, fat stranding and enhancement of the right orbit

CASE FOR DISCUSSION:**Suture and Shield-Assisted Globe Protraction to Guide Orbital Reconstruction in Sphenoid Dysplasia: A Technical Case Report**

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Introduction: Sphenoid wing dysplasia in Neurofibromatosis type 1 can result in pulsatile proptosis due to orbital wall defects and meningoencephalocele. Surgical goals include reduction of intracranial contents, and restoration of orbital boundaries and volume.¹ Precise volume restoration is essential, as it determines globe projection and facial symmetry, yet remains challenging when bony landmarks are distorted.² We describe a new technique using suture-assisted globe protraction to place the globe and periorbita into a desired projection, thereby guiding implant contouring for predictable reconstructive outcomes.

Methods: A 25-year-old woman presented with pulsatile proptosis secondary to sphenoid wing dysplasia. Exophthalmometry measured 22 mm (right) and 19 mm (left) (Figure 1). She underwent craniotomy with mesh reconstruction but developed marked enophthalmos postoperatively with increased orbital volume on CT (Figure 2).

Revision frontotemporal craniotomy was performed jointly by neurosurgery and oculofacial plastic surgery. Mesh was removed, and a hemi-conical polyethylene-coated titanium implant was fashioned to reconstruct the bony defect.³ Despite its positioning apposing periorbita, enophthalmos persisted, reflecting excessive orbital volume. Further implant constriction was deferred due to the risk of orbital neurovascular impingement.

To safely establish desired globe and periorbita projection, four rectus muscle bridle sutures were placed and passed through a fenestrated eye shield on the orbital rim. Traction was applied using slip knots until globe projection matched the contralateral side (Figure 3). Intraoperative CT was obtained to assess implant support. The implant was then contoured to closely support the periorbita in this protracted state. Repeat CT demonstrated apposition without gaps (Figure 4). Globe projection remained symmetric with sutures released.

Postoperative assessments included visual acuity, motility, sensation, pulsations, and exophthalmometry.

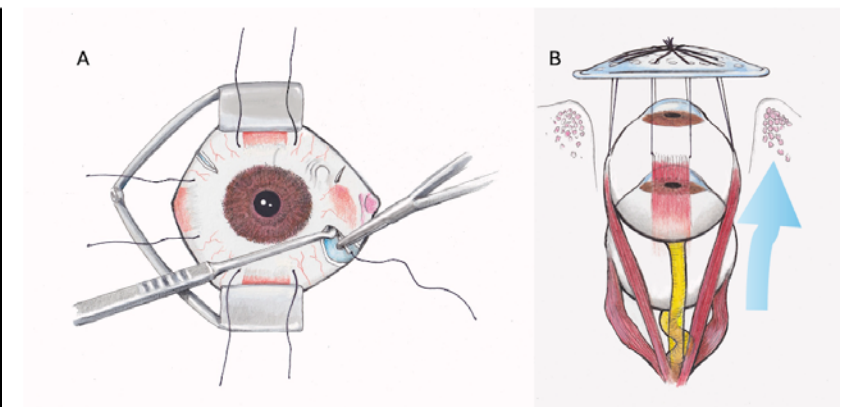
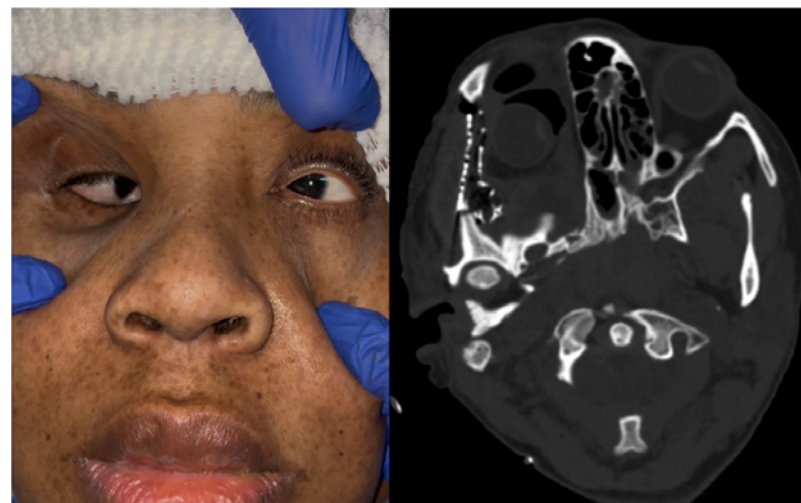
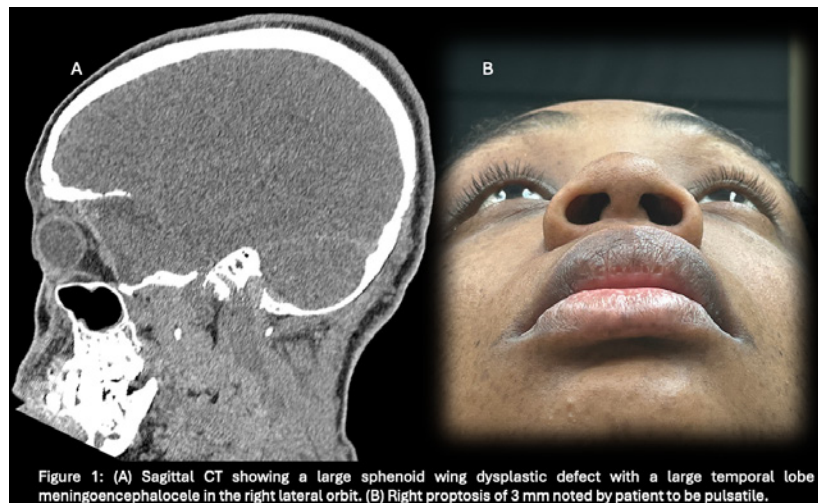
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Results: Initial failure to correct enophthalmos resulted from retracted tissues impeding proper implant fitting. Suture-assisted protraction restored physiologic globe position, enabling implant contouring based support of the periorbita. This maneuver also protracts the orbital apex periorbita guiding re-creation of the superior orbital fissure (Figure 5). Intraoperative imaging confirmed improved implant–periorbita congruence and SOF sizing.⁴

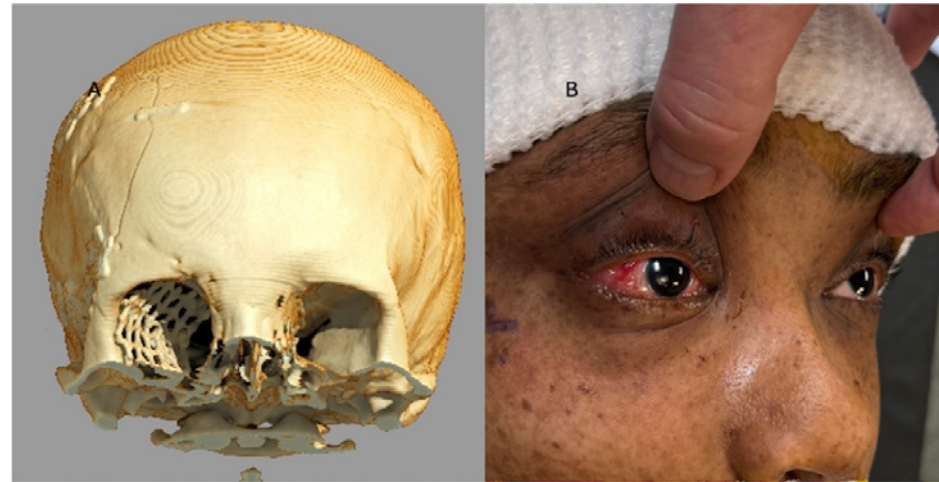
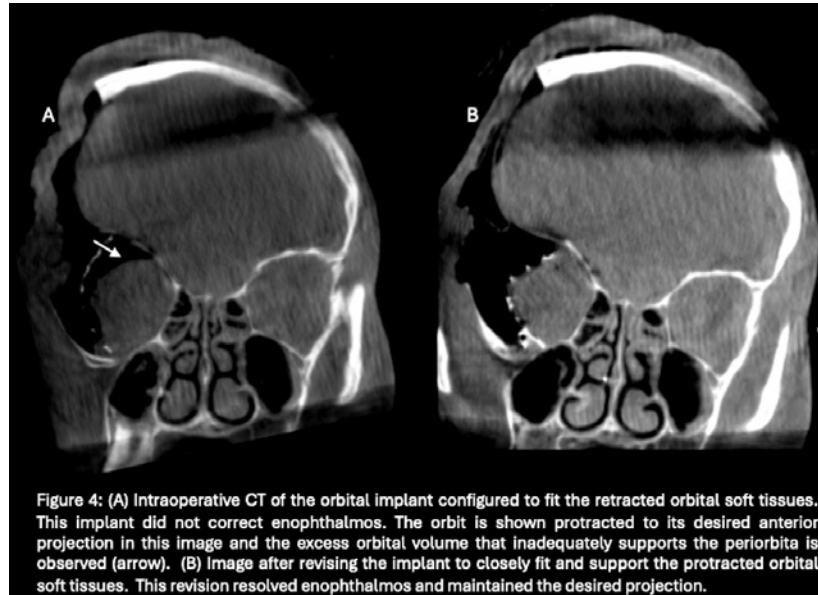
At 3 months, vision remained at baseline, ductions were full, facial sensation was intact and exophthalmometry measured 18 mm bilaterally.

Conclusions: Suture-assisted globe protraction maintained with a fenestrated eye shield is an effective adjunct in complex orbital reconstruction when bony landmarks are unreliable. By prioritizing desired soft-tissue projection, this technique allows implant shaping to reflect true orbital volume requirements, improving control over results and minimizing risk. This approach may be adaptable to other orbital reconstructions performed via craniotomy.



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References

1. Friedrich RE, Nuding MA. Sphenoid wing dysplasia in neurofibromatosis type 1: clinical features and surgical management. *J Craniomaxillofac Surg.* 2016;44(5):563–570.
2. Ploder O, et al. Evaluation of computer-based area and volume measurement from coronal computed tomography scans in isolated orbital floor fractures. *J Oral Maxillofac Surg.* 2002;60(11):1267–1272.
3. Niddam J, et al. Treatment of sphenoid dysplasia with a titanium-reinforced porous polyethylene implant in orbitofrontal neurofibroma: report of three cases. *J Craniomaxillofac Surg.* 2014;42(8):1937–1941.
4. Coroleucă R, et al. Laser Scanning Morphometric Measurements of Main Orbital Communications in Dry Human Skulls. *Diagnostics (Basel).* 2024;14(19):2168.

CASE FOR DISCUSSION:**Presumed ANCA–Negative ANCA–Associated Vasculitis Presenting as Vision–Threatening Recurrent Orbital Apex Fluid Collections**

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Introduction: ANCA-associated vasculitides (AAV) are rare autoimmune small-vessel vasculitides with ocular or orbital involvement in up to 78% of granulomatosis with polyangiitis (GPA) cases.¹ Orbital apex involvement poses particular risk of irreversible vision loss via optic nerve compression or ischemia.² We report a case of ANCA-negative AAV presenting as recurrent, vision-threatening necrotic orbital apex fluid collections, ultimately diagnosed after four surgical interventions.

Methods: Retrospective single-institution case report with IRB exemption.

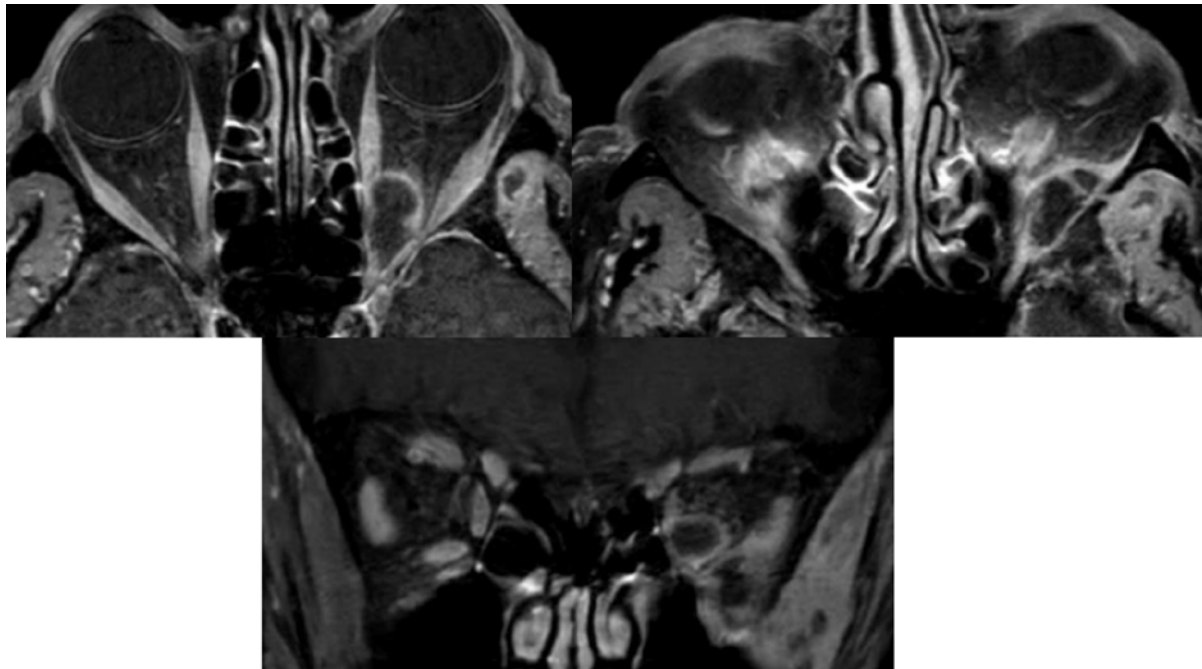
Results: A 77-year-old man with a history of ulcerative colitis and giant cell arteritis on high-dose steroids presented with acute left-sided vision loss, ophthalmoplegia, orbital pain, and headaches. His vision was hand motion in the left eye with extraocular muscle (EOM) limitations and mild left proptosis. Magnetic resonance imaging (MRI) demonstrated an enhancing, lobulated mass with bony erosion concerning for a cystic mass or an orbital abscess at the left orbital apex. The patient underwent expedited oncology work-up, was started on intravenous, broad-spectrum antibiotics, and had an urgent orbitotomy with biopsy and cultures. Intraoperatively, two pockets of yellow, turbid fluid were identified with erosive orbital bone changes. Cultures were ultimately negative for aerobic, anaerobic, and fungal organisms and his oncology work-up was unrevealing. Histopathology demonstrated a lymphoplasmacytic inflammatory infiltrate and focal necrotic debris without identifiable organisms. He improved on oral antibiotics and steroids but recurred two weeks later with orbital pain and vision loss while tapering steroids. Over the following months, he underwent three additional orbitotomies for recurrent left orbital apex fluid collections involving approaches to endoscopically decompress the orbit apex and a pre-auricular approach to the infratemporal fossa to access the involved left temporalis muscle. During the fourth case, it was discovered that the lateral orbital wall had been eroded through to form a connection between the inferomedial orbit and infratemporal fossa leading to a fluid collection within the temporalis. Cultures remained negative or grew low-virulence organisms, PCR-based microbiologic studies were unrevealing, and repeat pathology demonstrated non-specific inflammatory infiltrates and fibrosis +/- small foci of necrosis without clear evidence of infection. Systemic serologic evaluations were negative for sarcoidosis, IgG4-related disease, and (continued)

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antineutrophil cytoplasmic antibodies (ANCA). However, more viable tissue was acquired with the fourth intervention demonstrating dense fibrosis, a mixed inflammatory infiltrate of predominantly histocytes and plasma cells, with few admixed granulocytes and foci suggesting of chronic vasculitis. These findings raised the possibility of a fibrosing autoimmune-related orbital pseudotumor and in the orbit favored a diagnosis of ANCA-negative ANCA-associated vasculitis. The patient was subsequently treated with rituximab with improvement in his vision to 20/30, no dyschromatopsia, and improvement in EOM limitations and proptosis sustained at his 4-month follow-up.

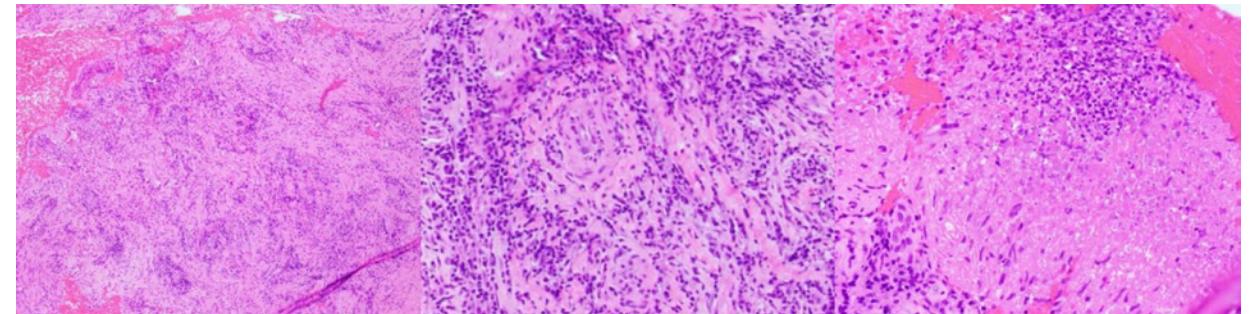
Conclusions: ANCA immunofluorescence can be negative in up to 30% of ANCA-associated vasculitides limited to the orbit. This is a unique case of vision-threatening, recurrent fluid collections in the orbital apex with bony erosive changes that proved to be a challenging diagnosis. Oculoplastic surgeons should maintain suspicion for vasculitic disease in patients with recurrent orbital inflammation, destructive bony changes, and non-diagnostic cultures and involve Rheumatology early to guide management.

Figure 1. MRI (T1 post-contrast, axial and coronal) demonstrating heterogeneous enhancement of a cystic lesion on the left lateral orbital wall with involvement of the left temporalis muscle, erosive changes of the lateral orbital wall and sphenoid, and an enhancing mass at the orbital apex with internal cystic component producing apex narrowing.



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Figure 2. Histopathology. A, Dense fibrosis with mixed histiocytic and plasmacytic infiltrate and admixed granulocytes. B, Focus of chronic small-vessel vasculitis. C, Focal necrosis with palisaded histiocytes.



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References

1. Abu-Yaghi N, et al. Ocular and orbital manifestations of GPA: a systematic review. *Front Ophthalmol*. 2023;3:1242547.
2. Nguyen ML, et al. Acute vision loss as the initial manifestation of GPA involving the orbital apex. *Diagnostics*. 2022;12:1540.
3. Rosenbaum JT, et al. Clinical and imaging features predictive of orbital GPA and risk of systemic involvement. *JAMA Ophthalmol*. 2014;132:1412–1418.
4. Najem K, et al. The diagnosis of GPA when serology and biopsies are negative. *Laryngoscope Investig Otolaryngol*. 2024;9:e12006.
5. Grayson PC, et al. 2021 ACR/Vasculitis Foundation guideline for management of ANCA-associated vasculitis. *Arthritis Rheumatol*. 2021;73:1366–1383.
6. Hijazi N, et al. ANCA-negative ANCA-associated vasculitis: pitfalls of the ‘vasculitis screen.’ *BMJ Case Rep*. 2024;17:e257781.

CASE FOR DISCUSSION:**Medication-Induced Orbital Osteonecrosis and its Reconstruction with a Customized 3D-Printed Poly-Ether-Ether-Ketone (PEEK) Thermoplastic Implant**

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Introduction: The purpose of this case discussion is to describe surgical management of a complex orbital floor and inferior orbital rim defect in a patient with medication-related osteonecrosis using a patient-specific polyetheretherketone (PEEK) implant.

Methods: Case report

Results: A 64-year-old woman with a past medical history of metastatic breast cancer, type-2 diabetes, and medication-related osteonecrosis of the jaw (MRONJ) was referred with right hypoglobus, right lower eyelid ectropion, maxillary osteomyelitis, and inferior orbital rim hardware exposure. Following ten years of bisphosphonate therapy for hypercalcemia of malignancy, she developed MRONJ requiring total maxillectomy and a left scapular tip osteocutaneous free flap for the resulting midfacial defect. Pathologic specimens demonstrated filamentous colonies consistent with *Actinomyces*. The patient subsequently developed hardware exposure with lower eyelid retraction and ectropion refractory to fat transposition and canthoplasty, requiring marginal mandibulectomy and paramedian forehead flap that was complicated by hardware infection and lateral orbital rim bony exposure. The patient ultimately underwent a multidisciplinary procedure involving debridement of infected bone and necrotic soft tissue, placement of a custom 3D-printed PEEK implant, repair of lower eyelid retraction and ectropion, and closure with a radial forearm free flap.

Postoperative computed tomography confirmed optimal implant positioning. At most recent follow-up, the patient demonstrated restoration of lower eyelid position, resolution of hypoglobus, and improved orbital contour with an excellent functional and aesthetic outcome.

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Conclusions: Medication-related osteonecrosis is highly associated with *Actinomyces* colonization in patients undergoing bisphosphonate therapy and can produce complex orbital defects posing reconstructive challenges. Patient-specific PEEK implants offer a precise, biocompatible solution for orbital reconstruction in patients with irregular bony anatomy from osteonecrosis. This case demonstrates successful reconstruction despite multiple recurrences of hardware exposure and free-flap revision. A multidisciplinary approach is essential for achieving optimal outcomes in these complex cases.

Figure 1

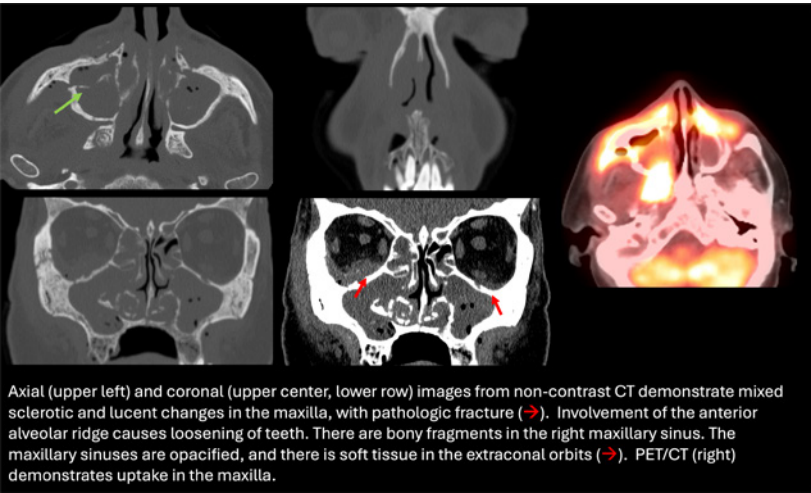


Figure 2



Figure 3



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Figure 4

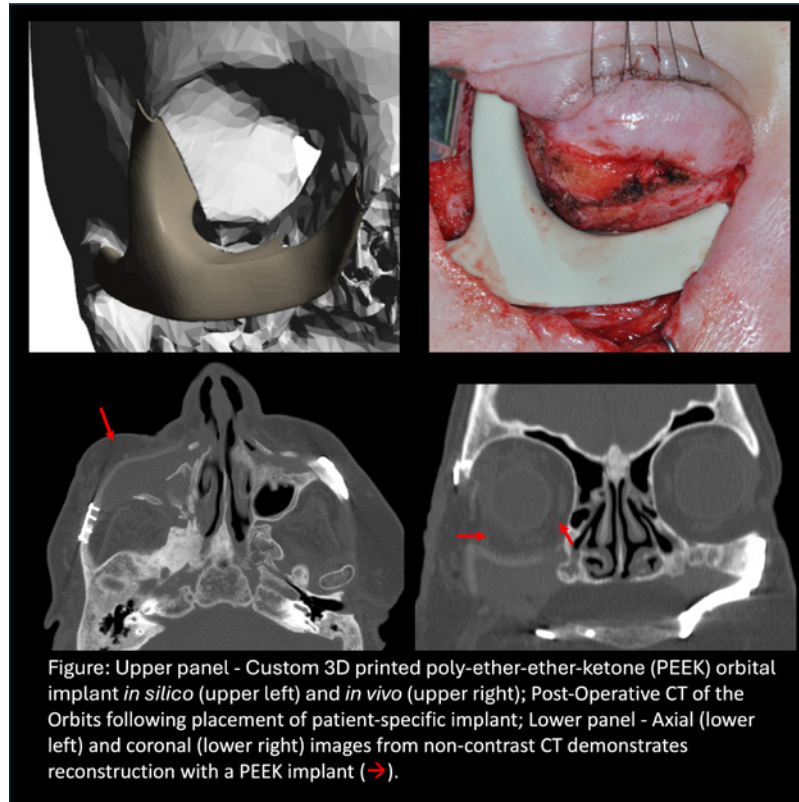


Figure 5



Figure: Clinical photographs taken before (left) and 3-months after (right) orbital reconstruction with a custom PEEK thermoplastic implant for hardware exposure in the setting of medication-induced osteonecrosis of the orbit.

References

1. Marx RE, Sawatari Y, Fortin M, Broumand V. Bisphosphonate-induced exposed bone (osteonecrosis/osteopetrosis) of the jaws: risk factors, recognition, prevention, and treatment. *J Oral Maxillofac Surg*. Nov 2005;63(11):1567-75. doi:10.1016/j.joms.2005.07.010
2. Brody A, Scheich B, Dobo-Nagy C. Targeted histological evaluation shows high incidence of actinomyces infection in medication-related osteonecrosis of the jaws. *Sci Rep*. Mar 1 2022;12(1):3406. doi:10.1038/s41598-022-07375-1

CASE FOR DISCUSSION:**Globe-Sparing Management of Pediatric Orbital and Lacrimal Sac Mucormycosis via Surgical Debridement and Intra-orbital Catheter-Administration of Amphotericin**

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Introduction: Rhino-orbital mucormycosis is a rapidly progressive, angioinvasive fungal infection with high morbidity and mortality, particularly in immunocompromised patients. Orbital involvement has historically prompted consideration of exenteration. However, the role of exenteration is less clear particularly when infection is disseminated or if visual function remains intact.

We report a case of a 6-year-old male who presented with disseminated mucormycosis involving the nasolacrimal system, medial canthus, cheek, and inferomedial orbital tissues secondary to immunosuppression from B-cell acute lymphoblastic leukemia. Despite extensive periocular and orbital involvement, the absence of clinical orbital signs and excellent visual acuity prompted an attempt at globe preservation using aggressive debridement and catheter-directed intra-orbital amphotericin delivery in lieu of exenteration.

Methods: Case report.

Results: A 6-year-old boy with B-cell acute lymphoblastic leukemia and disseminated mucormycosis was transferred to a tertiary care facility with concerns for mucormycosis of the left orbit.

Visual acuity was 20/20 with full motility, normal pupils, full color vision, and no clinical orbital signs, despite progressive necrosis of the left medial canthus and cheek and fistulization formation (Figure 1A). There were multiple skin lesions of the left hip and right anterior and posterolateral shoulder, confirming the diagnosis of disseminated mucormycosis.

Complete blood counts revealed white blood cell count of $1.0 \times 10^9/\text{liter}$ (reference $4.2\text{--}10.2 \times 10^9/\text{liter}$), hemoglobin of 8.8 grams/deciliter (reference 11.4–14.1 grams/deciliter), and platelets of $69 \times 10^9/\text{liter}$ (reference $212\text{--}480 \times 10^9/\text{liter}$).

MRI face/orbit/neck demonstrated soft tissue thickening and edema over the left periorbital space with enhancement extending into the left orbit, to the apex, and involving the medial rectus muscle. There was also non-enhancement of the left lacrimal sac consistent with soft tissue necrosis (Figure 2A/2B).

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The patient was initiated on systemic antifungals. Urgent surgical interventions by the otolaryngology/oculoplastic services were performed. The otolaryngology team completed resections of the left inferior and middle turbinate, medial maxillary wall, a left total ethmoidectomy, left sphenoidotomy, and focal debridement of necrotic tissue around the left lacrimal sac.

The oculoplastics service performed left dacryocystectomy with additional debridement of necrotic tissue in the lower eyelid, cheek, and medial orbital tissues. In addition, orbitotomy was performed by the oculoplastics team with placement of a 7-French catheter into the inferomedial orbit. The patient was treated with five days of catheter-directed liposomal amphotericin B flushes (1 mL of 4 mg/mL) at bedside (Figure 1B).

Throughout hospitalization, visual acuity remained 20/20 with full motility, normal pupillary responses, and no evidence of clinical worsening of the disease. Catheter-directed amphotericin flushes were well tolerated without procedure-related complications. Repeat MRI demonstrated stable postoperative inflammatory changes without intracranial extension or progression of orbital disease (Figure 2C/2D). Exenteration was deferred (Figure 1C).

At 3-month follow-up, vision remained 20/20 without orbital signs. Post-surgical sequelae included mild medial cicatricial lower eyelid ectropion with punctal ectropion and <1 mm left eye lagophthalmos without evidence of exposure keratopathy (Figure 1D).

Conclusions: In carefully selected patients with orbital and peri-orbital mucormycosis, management with systemic antifungal therapy, targeted surgical debridement, and catheter-directed intra-orbital amphotericin may result in adequate infection control while preserving the globe, deferring orbital exenteration.

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Figure 1

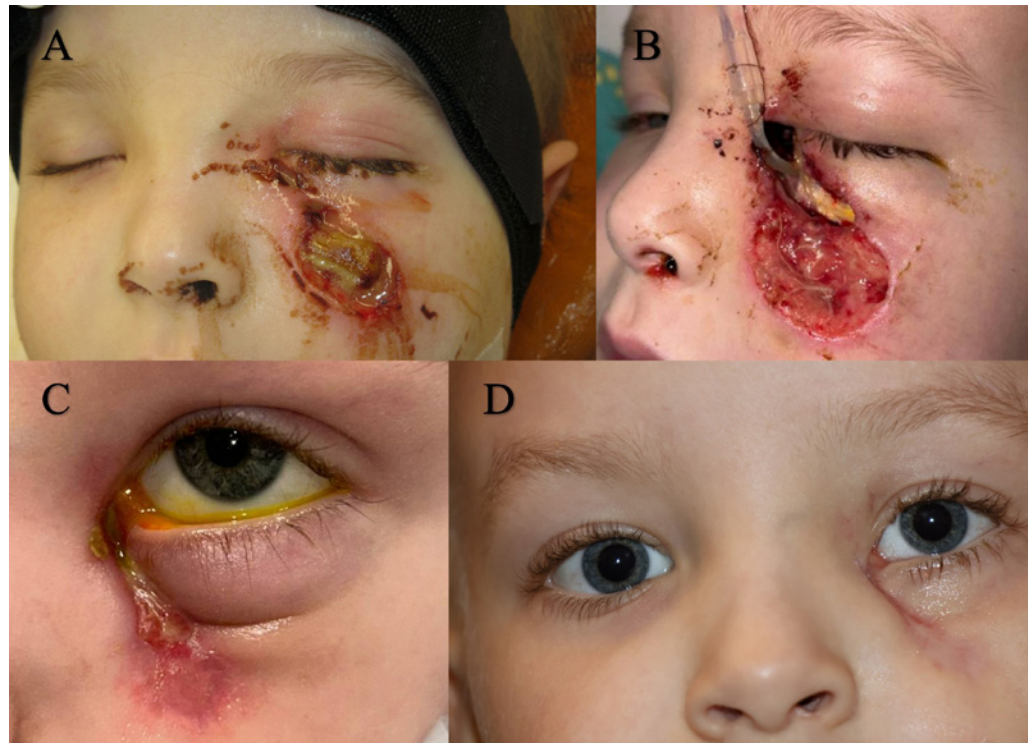


Figure 1 | Clinical images of the patient (A) pre-operative assessment, (B) post-operative assessment with orbital catheter, (C) two-three weeks post-orbital catheter removal, and (D) three months post-operative assessment.

Figure 2

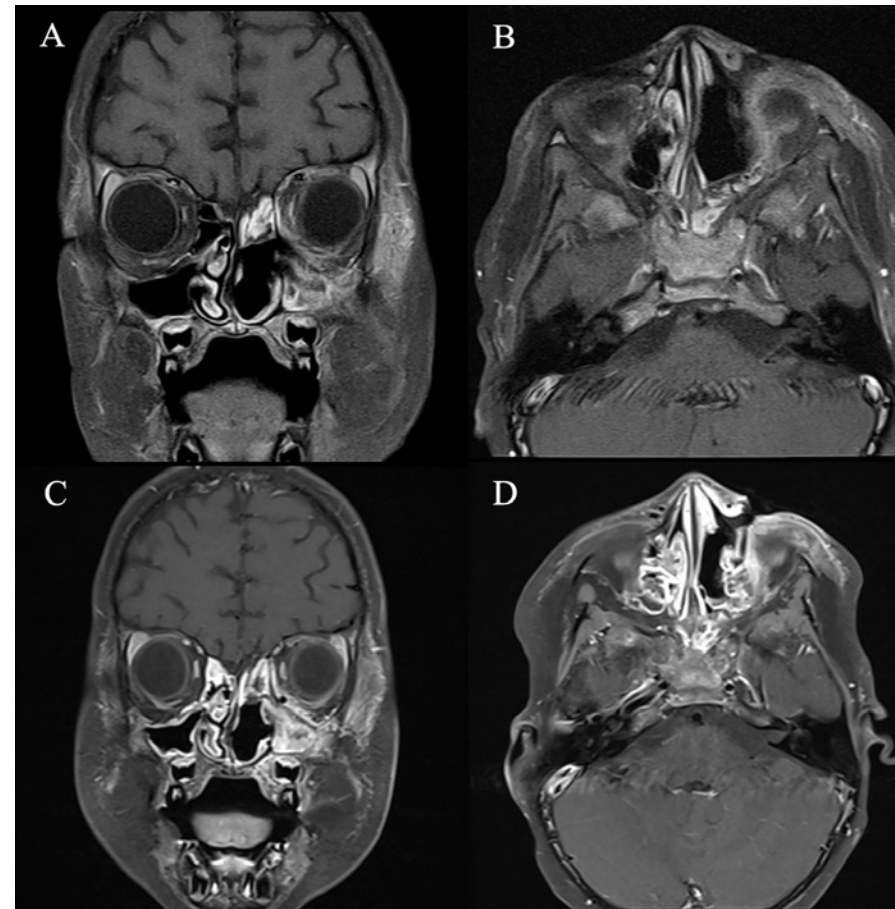


Figure 2 | MRI orbits with and without contrast prior to oculoplastics debridement (A) coronal and (B) axial cuts showing region of non-enhancing tissue extending from the premaxillary skin on the left, through the inferomedial lower eyelid, to the medial canthus/nasolacrimal duct; and post-operatively (C) coronal and (D) axial cuts showing postsurgical changes of left lacrimal sac resection, infraorbital soft tissue debridement and left inferomedial orbital drain placement.

References

1. Hirabayashi KE, Kalin-Hajdu E, Brodie FL, Kersten RC, Russell MS, Vagefi MR. Retrobulbar injection of amphotericin B for orbital mucormycosis. *Ophthalmic Plastic and Reconstructive Surgery*. 2017;33(4):e94–e97.
2. Safi M, Ang MJ, Patel P, Silkiss RZ. Rhino-orbital-cerebral mucormycosis and orbital exenteration. *Ophthalmic Plastic and Reconstructive Surgery*. 2020;36(4):e85–e90.
3. Yohai RA, Bullock JD, Aziz AA, Markert RJ. Survival factors in rhino-orbital-cerebral mucormycosis. *Survey of Ophthalmology*. 1994;39(1):3–22.
4. Hargrove RN, Wesley RE, Klippenstein KA, Fleming JC, Haik BG. Indications for orbital exenteration in mucormycosis. *Ophthalmic Plastic and Reconstructive Surgery*. 2006;22(4):286–291.

CASE FOR DISCUSSION:**A Case of Orbital Injury from High Pressure Water-Based Paint Gun**

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Introduction: High-pressure paint gun injuries to the orbit are rare occupational accidents that can cause devastating complications despite a deceptively benign external appearance. These injuries occur when paint is forcefully injected into orbital tissues at pressures exceeding 3,000 PSI. Tissue damage involves mechanical trauma, chemical irritation, inflammatory reaction to retained material, and potential infection. Retained paint can incite chronic foreign body reactions mimicking infectious or idiopathic orbital inflammation. We present a case highlighting diagnostic and management challenges of orbital water-based paint injury with delayed complications requiring surgical intervention. We also present, for the first time, color-based histology slides of the case.

Methods: Case report of a 43-year-old male with no prior ocular history who sustained right orbital injury from commercial high-pressure water-based paint gun (3,300 PSI) in July 2025. Evaluation included comprehensive ophthalmologic examination, intraocular pressure measurement, and orbital computed tomography. The treatment course was documented over 5 months, including three emergency visits, admission, and one surgical intervention. Specimens underwent histopathologic examination with hematoxylin-eosin staining, special stains, and immunohistochemical analysis.

Results: Initial presentation revealed decreased visual acuity (20/200), elevated intraocular pressure (31 mmHg), significant lid edema, temporal chemosis, and traumatic iritis. Computed tomography demonstrated an inferolateral orbital wall fracture, preseptal and postseptal hyperdense material with air, and an intact globe. Initial management included irrigation, broad-spectrum antibiotics, tetanus prophylaxis, topical corticosteroids, and pressure-lowering medications. The patient developed recurrent inflammation at one month (postseptal cellulitis) and 2.5 months (chemosis, ptosis, restricted motility, diplopia). Imaging showed persistent intra and extraconal material with inflammation. Surgical debulking was performed. Histopathology demonstrated fibrovascular tissue with birefringent foreign material, chronic inflammation, and macrophage response. No organisms or lymphoma identified.

Conclusions: High-pressure orbital paint injuries require high suspicion for extensive deep tissue involvement despite minimal external findings. Retained paint incites chronic foreign body reactions requiring prolonged follow-up and symptom-guided surgical intervention. Initial management should include aggressive irrigation, broad-spectrum antibiotics, systemic corticosteroids, and ophthalmologic consultation. Imaging is essential to assess for open globe injury, compartment syndrome, and material extent. Surgical debridement may be necessary for persistent inflammation or refractory symptoms. Clinicians should obtain detailed
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information about paint composition to guide treatment decisions for a possible fire hazard in the emergency room from oil-based paint. These injuries may mimic infectious or idiopathic orbital inflammation, with definitive diagnosis requiring histopathologic confirmation. Early recognition and comprehensive multidisciplinary management are critical for optimal outcomes.

Figure 1

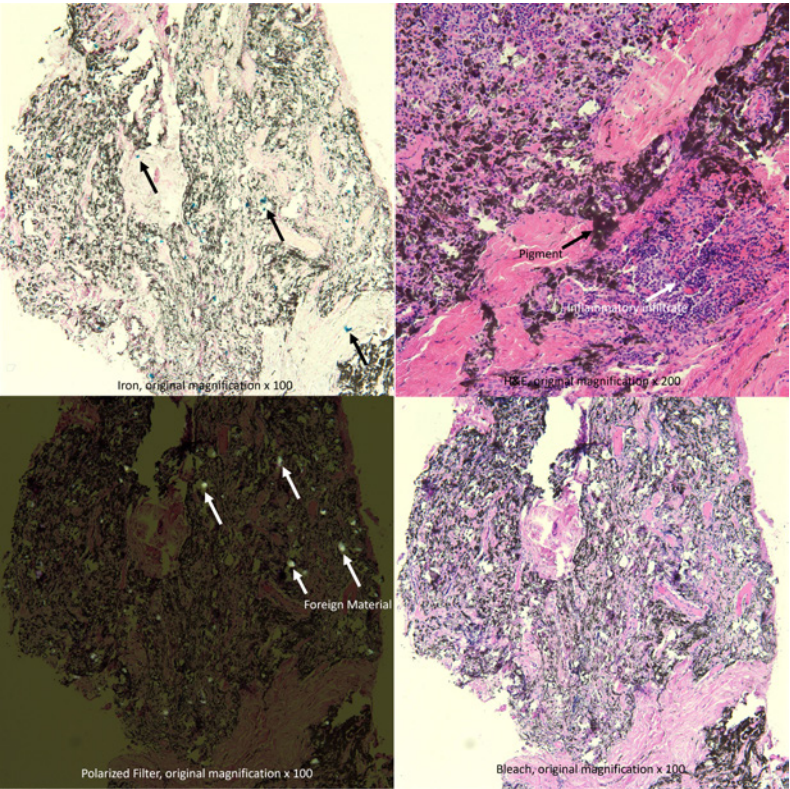


Figure 2

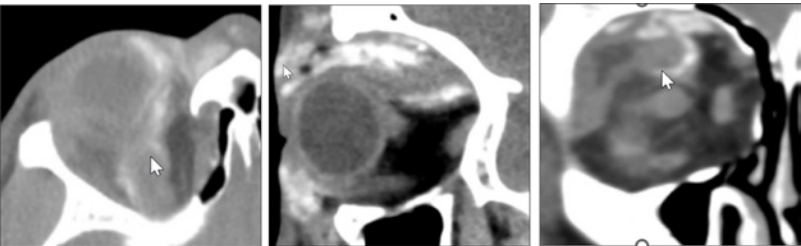


Figure 3



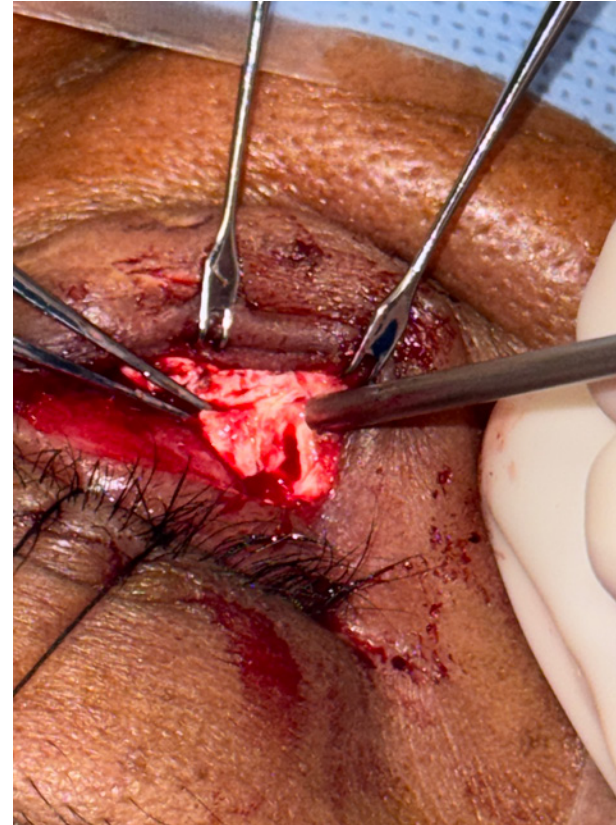
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Figure 4



Figure 5



References

1. Wang W, Elsherif S, Abdulhalim A, et al. An uncommon case of high-pressure paint gun injury to the orbit with multimodality evaluation and literature review. *Emerg Radiol.* 2023;30:235-238.
2. Fialkov JA, Freiberg A. High pressure injection injuries: an overview. *J Emerg Med.* 1991;9:367-371.
3. Holds JB, Patrinely JR, Zimmerman PL, Anderson RL. Hydraulic orbital injection injuries. *Ophthalmology.* 1993;100:1475-1482.
4. Yip CC, Tan DT, Balakrishnan V, Choo CT. High-pressure paint gun injury to the orbit and ocular adnexa. *Int Ophthalmol.* 1998;22:335-339.
5. Kelpin JP, Fahrenkopf MP, Van Pelt AE. Treatment of an uncommon high-pressure orbital injection injury. *J Craniofac Surg.* 2018;29:1829-1831.
6. Kubal WS. Imaging of orbital trauma. *Radiographics.* 2008;28:1729-1739.
7. Obidi O, Aboaba O, Makanjuola M, Nwachukwu S. Microbial evaluation and deterioration of paints and paint-products. *J Environ Biol.* 2009;30:835.



Moderators: James Chelnis and Ashley Campbell

7:31–7:34 am

Immune Checkpoint Inhibitor–Induced Myasthenia Gravis Presenting with Ophthalmic Manifestations Following Durvalumab for Muscle–Invasive Bladder Cancer

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Introduction: Immune check point inhibitor (ICI)–induced myasthenia gravis (MG) is a rare but serious immune–related adverse event occurring in fewer than 1% of patients, with a reported mortality rate of approximately 30%—significantly higher than idiopathic autoimmune MG.¹ Ptosis is the most common presenting symptom, reported in approximately 80% of cases, and progression from ocular findings to myasthenic crisis can occur within days. Overlap syndrome of concurrent myocarditis, myositis, and MG occurs in fewer than 1% of patients with ICI–MG, but carries in–hospital mortality rates of 40–60%.² We present a case of durvalumab–associated MG with prominent ophthalmic manifestations and bulbar signs in a patient undergoing treatment for muscle–invasive bladder cancer (MIBC).

Methods: case report

Results: A 57–year–old male with MIBC status post four cycles of neoadjuvant gemcitabine/cisplatin/durvalumab and radical cystectomy presented to the oculoplastics clinic with worsening diplopia and bilateral ptosis. He reported mild right ptosis since childhood, now acutely worsened, with several episodes of dysphagia and head drop requiring manual support. On exam, he had globally reduced extraocular motility bilaterally, near–complete right ptosis (margin–reflex distance –1.0 mm), and inability to sustain upgaze. With ice pack testing the right ptosis improved slightly from MRD1 from –1 to +0.5 mm. Acetylcholine receptor (AChR) binding antibody was markedly elevated to 201 nmol/L and AChR blocking antibody to 73%.

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He was classified as Grade 3 ICI-induced MG and admitted for urgent workup for overlap syndrome. Chest computed tomography (CT) showed no mediastinal mass. Troponin, creatine kinase, aldolase, electrocardiogram, and transthoracic echocardiogram were all normal. The patient showed minimal response to intravenous (IV) methylprednisolone 1 mg/kg, prompting initiation of intravenous immunoglobulin (IVIG) (2 g/kg daily for three days), after which ptosis, diplopia, neck weakness, and dyspnea on exertion significantly improved. He was discharged on prednisone 1 mg/kg with pyridostigmine 60 mg three times daily. Durvalumab was permanently discontinued.

Outpatient, prednisone was tapered 10–20 mg/week with three additional weekly IVIG infusions at 1 g/kg. At six week follow up, neck weakness and ptosis were improved with rest, though he continued to fatigue with talking. Extraocular motility was generally improved; however, right adduction remained significantly limited and had regressed after completing IVIG, prompting additional infusions.

Conclusions: ICI-induced MG may present initially with isolated ophthalmic findings and progress to include bulbar signs requiring emergent inpatient management. This patient showed minimal response to corticosteroids alone but significant improvement with IVIG. ICIs have become standard of care for numerous malignancies, and as their use continues to expand, oculoplastic surgeons should maintain a high index of suspicion for ICI-induced MG and facilitate urgent multidisciplinary evaluation when indicated.³

References

1. Makarios D, Horwood K, Coward JIG. Myasthenia gravis: An emerging toxicity of immune checkpoint inhibitors. *Eur J Cancer*. 2017;82:128–136. doi:10.1016/j.ejca.2017.05.041
2. Sánchez-Camacho A, Torres-Zurita A, Gallego-López L, et al. Management of immune-related myocarditis, myositis and myasthenia gravis (MMM) overlap syndrome: a single institution case series and literature review. *Frontiers in Immunology*. 2025;16:1597259.
3. Powles T, Catto JWF, Galsky MD, et al. Perioperative durvalumab with neoadjuvant chemotherapy in operable bladder cancer. *New England Journal of Medicine*. 2024;391(19):1773–1786.

7:34–7:37 am

A Novel Hypoglossal–Orbicularis Synkinesis

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Introduction: We describe a novel hypoglossal–orbicularis synkinesis and provide an anatomical hypothesis.

Methods: Case Report

Results: A 41-year-old patient developed bothersome twitching of the left lower eyelid. Over two weeks, she noticed increasing left lower eyelid twitching synchronous with forward projection of the tongue. She denied any antecedent head trauma, surgery, dental work, or facial nerve palsy. She had started semaglutide two months prior for Insulin resistance and had a longstanding nocturnal seizure disorder which did not require treatment. On examination, we confirmed contraction of the left pretarsal orbicularis in association with projection of the tongue; other movements of the jaw or face did not provoke contractions. Her ophthalmic examination was normal as was her cranial nerve function. MRI of the brain was normal with no evidence of demyelination. MRA demonstrated contact between the intradural V4 segment of the left vertebral artery and origin of the left posterior-inferior cerebellar artery with the left hypoglossal nerve.

The orbicularis oculi is a sphincter muscle which enables closure of the eye and is innervated by the zygomatic and temporal motor branches of the facial nerve. Involuntary contractions of the orbicularis muscle may be seen in benign essential blepharospasm, hemifacial spasm, and aberrant regeneration of the facial nerve following facial nerve palsy. Marin-Amat Syndrome is a rare syndrome in which involuntary orbicularis contraction occurs with movement of the jaw, and is thought to originate from aberrant connections between the trigeminal and facial nerves following facial palsy or trauma. (1)

To the best of our knowledge, our patient's hypoglossal–orbicularis synkinesis has not been previously described. Orbicularis contractions occurred exclusively with forward tongue projection mediated by intrinsic muscles of the tongue which are innervated by the hypoglossal nerve. (2) We hypothesize that denervation of the hypoglossal nerve may have caused aberrant regeneration of hypoglossal nerve fibers which terminate in the tongue. Here, terminal branches of the chorda tympani, a branch of the facial nerve, provide sensory and parasympathetic innervation to the anterior tongue and salivary glands. (3) Retrograde growth of aberrant hypoglossal axons within the chorda tympani may have terminated within the zygomatic or temporal motor branches of the facial nerve to cause synkinetic contraction of the orbicularis muscle with activation of the hypoglossal nerve. Intriguingly, the radiologic finding of vascular contact with the hypoglossal nerve could be a potential cause for hypoglossal denervation. Her symptoms

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abated at six months of follow up and no treatment was offered, though botulinum toxin injections to the orbicularis muscle could be considered for symptomatic cases.

Conclusions: A novel synkinesis between the hypoglossal nerve and orbicularis muscle is described. We hypothesize that chronic vascular compression of the hypoglossal nerve led to aberrant regeneration of hypoglossal fibers through the chorda tympani branch of the facial nerve to reach the orbicularis muscle.

References

1. Rana P, Wadia RS. The Marin Amat Syndrome: an unusual facial synkinesia. *Journal of Neurology, Neurosurgery, and Psychiatry*. 1985; 48:939-941.
2. SY, Naqvi IA. Neuroanatomy, Cranial Nerve 12 (Hypoglossal) [Updated 2022 Nov 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532869/>
3. Dulak D, Naqvi IA. Neuroanatomy, Cranial Nerve 7 (Facial)(Archived) [Updated 2023 Jul 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK526119/>

7:37–7:40 am

The Emergence of *Corynebacterium Bovis* in Lower Blepharoplasty Infections

Frank Mei¹, Linus Amarikwa², Sonia Anchouche¹, Tatiana Rosenblatt¹, Angela Oh¹, Javier Moreno-Alemán¹, Joshua Miller³, Robert Goldberg¹, Rao Chundury², Ronald Mancini¹

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Introduction: *Corynebacterium bovis* (*C. bovis*) is a well-known causative agent of bovine mastitis; however, reports of human infections are rare.^{1,2} Unlike in cattle, *C. bovis* is not part of the normal human flora and therefore should not be disregarded as a contaminant when isolated in human specimens. There are only 21 cases of *C. bovis* reported in the literature thus far. Following the first reported case of *C. bovis* preseptal cellulitis and abscess after lower blepharoplasty in 2025, two additional cases were identified at separate institutions, prompting this multi-center case series.³ Herein, we present a series of patients across the United States with *C. bovis* infection following lower blepharoplasty.

Methods: This is a retrospective case series of three patients at three academic institutions across the United States. Demographics, clinical presentation, culture results, antibiotic susceptibilities, and outcomes were reviewed.

Results: Three patients presented with *C. bovis* infection following lower blepharoplasty, each treated by different surgeons in Texas, Nebraska, and California. All 3 patients were female. The average age at time of surgery was 80 years old (Table 1). None of the patients had exposure to cattle or were immunosuppressed. The average time of presentation with infection was 4.33 weeks after surgery. All 3 patients had cellulitis with abscess formation (Figure 1). *C. bovis* was isolated from incision and drainage of abscesses in all 3 patients. 2 of 3 patients who had culture susceptibilities, both cultures of *C. bovis* were intermediately resistant to penicillin (Table 2). On average, it took 4.33 weeks from onset of infection to reach infection resolution. All patients had complete recovery (Figure 1).

Conclusions: *C. bovis* is an emerging pathogen that can cause delayed cellulitis with abscess formation following lower lid blepharoplasty. *C. bovis* can occur in patients without exposure to cattle and does not appear to be geographically restricted. It is typically resistant to penicillin but responds well when recognized and treated with appropriate antibiotics. Its propensity for abscess formation can be mistaken for a granulomatous inflammation. Although mycobacteria are the typical causative pathogen in delayed infections with abscess formation, *C. bovis* should be considered as part of the differential in post-lower lid blepharoplasty infections.⁴

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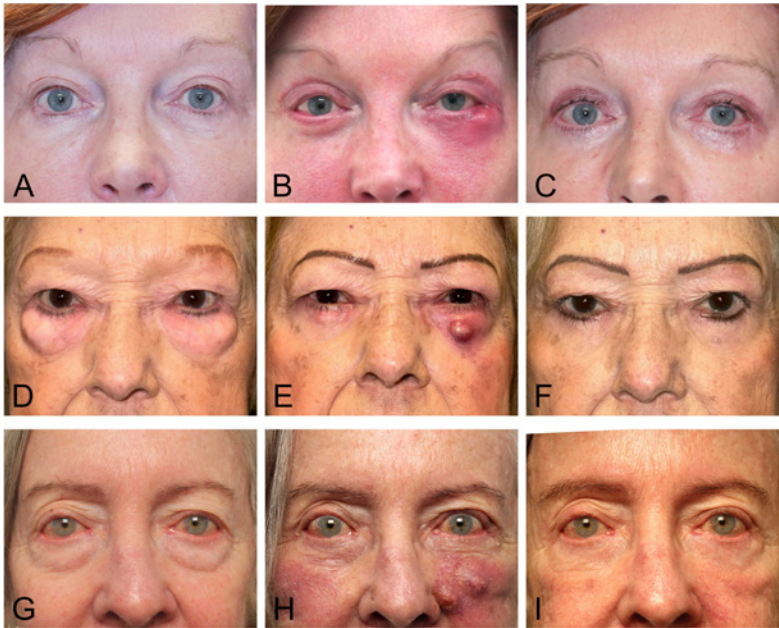
Figure 1

Case	Age	Sex	Immunocompromized	Exposure to cattle	Procedure	Onset of infection from surgery (Weeks)	Time to resolution of infection from surgery (Weeks)
1	75	Female	No	No	Bilateral upper eyelid and lower eyelid blepharoplasty	4	10
2	81	Female	No	No	Bilateral lower eyelid ectropion repair with blepharoplasty and bilateral midface lift	7	10
3	84	Female	No	No	Bilateral canthoplasty with bilateral lower eyelid blepharoplasty and fat transfer	2	6

Figure 2

Case	Antibiotic course	Suspectibility	
1	6 days of oral clindamycin 150 mg TID 14 days of oral clindamycin 300 mg TID with 875/125 mg of oral amoxicillin/clavulanate BID 7 days of oral trimethoprim-sulfamethoxazole 800/160 mg BID	Ceftriaxone Meropenem Vancocycin Linezolid Trimethoprim-Sulfamethoxazole Penicillin Clindamycin	Sensitive Sensitive Sensitive Sensitive Sensitive Intermediate Resistant
2	7 days of 875/125mg amoxicillin/clavulanate BID 2 days of cephalexin 500mg qid 14 days of 875/125mg amoxicillin/clavulanate BID	None reported	
3	7 days of cephalexin 500mg qid 8 days of doxycycline 100mg BID 17 days of trimethoprim-sulfamethoxazole 800-160mg BID	Doxycycline Gentamycin Vancomycin Penicillin	Sensitive Sensitive Sensitive Intermediate

Figure 3



References

1. Vale JA, Scott GW. *Corynebacterium bovis* as a cause of human disease. *Lancet*. 1977;2(8040):682-684. doi:10.1016/s0140-6736(77)90495-0.

2. Cheleuitte-Nieves C, Gulvik CA, McQuiston JR, et al. Genotypic differences between strains of the opportunistic pathogen *Corynebacterium bovis* isolated from humans, cows, and rodents. *PLoS One*. 2018;13(12):e0209231. doi:10.1371/journal.pone.0209231.

3. Ingrassia PR, Parikh P, Dallalzadeh L, Mancini R. A Case of *Corynebacterium Bovis* positive surgical site infection post-blepharoplasty. *Orbit*. 2026;45(1):176-180. doi:10.1080/01676830.2025.2570758.

4. Zhan S, Hoang A, Escaravage GK, Jr., Oester AE, Jr. Preventing Postoperative Atypical Mycobacterial Infection. *Ophthalmic Plast Reconstr Surg*. 2019;35(3):235-237. doi:10.1097/IOP.0000000000001212.

7:40–7:43 am

Corynebacterium Bovis Eyelid Abscess Following Blepharoplasty: A Rare Zoonotic Complication Linked to Manure Exposure

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Introduction: Blepharoplasty is among the most performed oculoplastic procedures, with a low postoperative infection rate of 0.2–0.4%. When infections do occur, they are typically caused by common skin flora such as *Staphylococcus* and *Streptococcus* species. However, atypical organisms have been increasingly recognized as causes of delayed postoperative eyelid infections.

Corynebacterium bovis is a Gram-positive rod primarily associated with bovine mastitis and rarely implicated in human disease. Fewer than 30 ocular and adnexal infections have been documented, predominantly presenting as keratitis, conjunctivitis, and chalazia. Only two prior cases of *C. bovis* infection following blepharoplasty have been reported. We present the third such case, uniquely characterized by bilateral sequential involvement and a direct link to fertilizer exposure.

Methods: Case report with literature review.

Results: A 73-year-old woman with bilateral dermatochalasis underwent uncomplicated bilateral upper blepharoplasty. Around postoperative day 9, an erythematous raised lesion developed on the medial right upper eyelid, initially managed as a suture granuloma with topical erythromycin ointment and oral doxycycline (Figure 1A–B). Sutures were removed on post-operative day 11. About one month post-op, a large, tender, fluctuant abscess developed on the left upper lid (Figure 1C–D). Excisional biopsy of the right upper eyelid and incision and drainage of the left eyelid abscess was performed with significant expression of bloody purulent material. Cultures grew *C. bovis*. Histopathology demonstrated granulomatous inflammation with multinucleated giant cells positive for CD68. The patient was treated with oral amoxicillin-clavulanate twice daily for 10 days and polysporin ophthalmic ointment twice daily for 14 days. At follow-up about three weeks later, there was no evidence of active infection in either eye, with mild medial upper eyelid scarring noted, (Figure 2). The patient was a gardener and admitted to cow manure exposure during the post-operative period. Vision and intraocular pressure remained stable throughout post-operative course.

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Conclusions: We report third documented case of *C. bovis* infection following blepharoplasty. Prior post-blepharoplasty cases have been limited to unilateral abscess formation, with one report noting possible farm exposure and the other lacking a clear environmental source. Our case demonstrates bilateral, sequential abscess formation, suggestive of sustained environmental exposure during the postoperative period. These findings underscore the importance of obtaining a detailed environmental exposure history in patients with atypical postoperative infections. Targeted counseling on avoidance of high-risk exposures during wound healing may reduce preventable complications and improve outcomes.

Figure 1

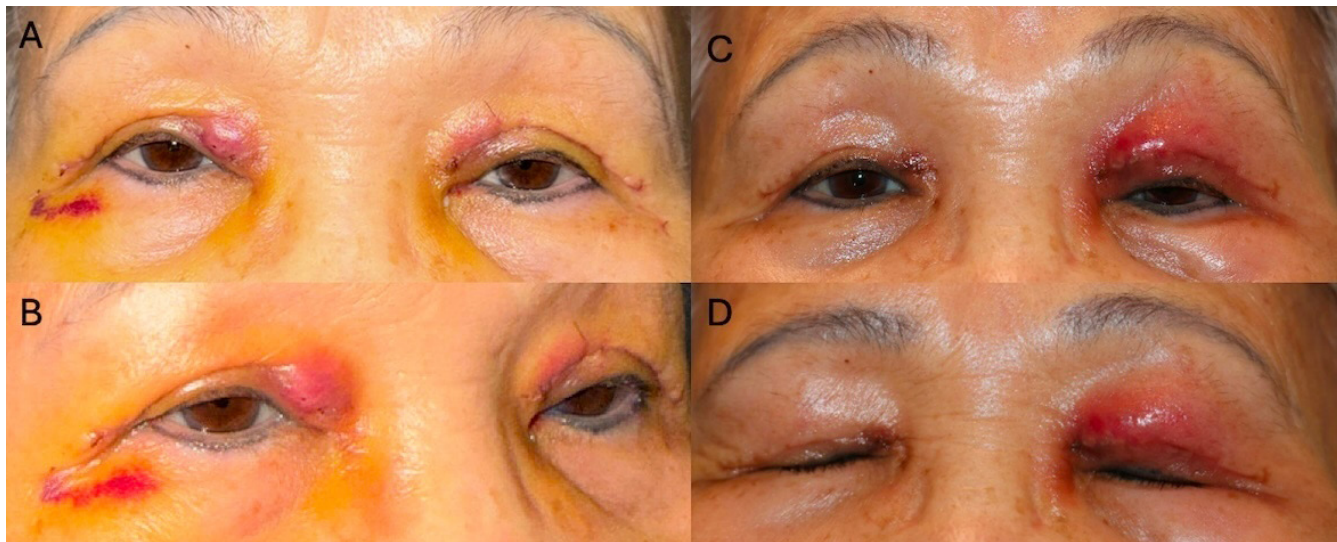
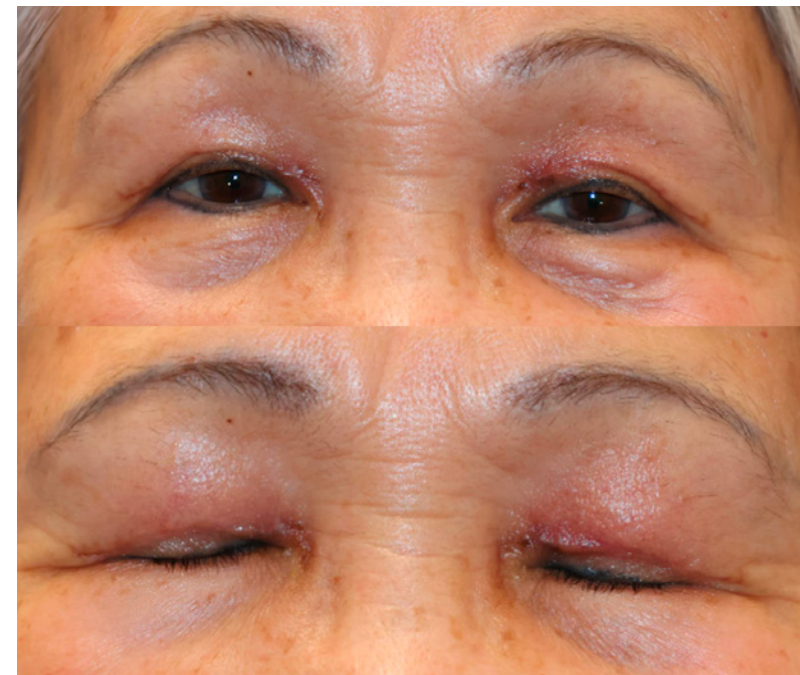


Figure 2



References

1. Carter SR, Stewart JM, Khan J, et al. Infection after blepharoplasty with and without carbon dioxide laser resurfacing. *Ophthalmology*. 2003;110(7):1430-1432. doi:10.1016/S0161-6420(03)00447-0
2. Ferneini EM, Halepas S, Aronin SI. Antibiotic Prophylaxis in Blepharoplasty: Review of the Current Literature. *Journal of Oral and Maxillofacial Surgery*. 2017;75(7):1477-1481. doi:10.1016/j.joms.2017.01.025
3. Whipple KM, Lim LH, Korn BS, Kikkawa DO. Blepharoplasty Complications. *Clinics in Plastic Surgery*. 2013;40(1):213-224. doi:10.1016/j.cps.2012.07.002
4. Klapper S, Patrinely J. Management of Cosmetic Eyelid Surgery Complications. *Seminars in Plastic Surgery*. 2007;21(1):080-093. doi:10.1055/s-2007-967753
5. Vale JA, Scott GW. CORYNEBACTERIUM BOVIS AS A CAUSE OF HUMAN DISEASE. *The Lancet*. 1977;310(8040):682-684. doi:10.1016/S0140-6736(77)90495-0
6. Ingraffia PR, Parikh P, Dallalzadeh L, Mancini R. A Case of Corynebacterium Bovis positive surgical site infection post-blepharoplasty. *Orbit*. 2026;45(1):176-180. doi:10.1080/01676830.2025.2570758

7:43–7:46 am

Trabecular Architecture and Myxoid Stroma within an Orbital Plasma Cell Neoplasm

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Introduction: Orbital involvement by plasma cell neoplasia is rare, accounting for fewer than 1% of orbital lesions, and most frequently occurs as a manifestation of systemic multiple myeloma¹. Plasma cell tumors typically demonstrate a diffuse sheet-like proliferation of cells with characteristic cytomorphologic and immunophenotypic features². Trabecular architecture and myxoid stromal change are exceedingly rare in plasma cell neoplasms. We describe an orbital plasma cell neoplasm displaying both atypical features, a morphologic combination not previously documented at this site.

Methods: Case report

Results: A 74-year-old man with treated multiple myeloma presented with a 3-month history of an enlarging, intermittently painful left upper eyelid mass. Examination revealed a firm, immobile mass at the superonasal orbital rim (Figure 1A) with mild upgaze limitation, but no proptosis, periorbital sensory deficit, or head and neck lymphadenopathy. The remainder of the ophthalmic examination was unremarkable. Computed tomography demonstrated a well-defined, slightly lobulated, enhancing mass centered on the left trochlea, alongside multiple lytic calvarial lesions (Figure 1B–D). The firm mass was excised intact through a medial upper lid skin-crease incision (Figure 1E&F).

Histopathological examination revealed a multinodular soft-tissue neoplasm composed of atypical plasma cells partly arranged in a trabecular pattern with prominent myxoid stromal change (Figure 2). Immunohistochemistry showed tumor positivity with CD138, CD56, and cyclin D1 antibodies, weak CD79a expression (Figure 3A–D) and negative staining with CD20, CD3, and AE1/AE3. There was light chain restriction with cytoplasmic kappa positivity (Figure 3E&F). These findings confirmed an extramedullary deposit of plasma cell myeloma. The postoperative course was uncomplicated, and the patient was referred for continued oncological management.

Conclusions: This case represents the first reported orbital plasma cell neoplasm exhibiting both trabecular architecture and abundant myxoid stromal change. Trabecular architecture has been described in only one prior plasma cell neoplasm in the periorbital area, involving the conjunctiva³, and myxoid change in only a single plasmacytoma⁴. These features may divert diagnostic consideration away from plasma cell pathology: a trabecular pattern toward local or metastatic carcinoma^{5–9}, and myxoid stromal change toward myxoid epithelial or primary myxoid soft-tissue tumors^{4,10}. Careful morphologic assessment and appropriate immunophenotypic (continued)

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studies are therefore essential to exclude these alternative diagnoses. This unusual morphologic combination expands the recognized histologic spectrum of orbital plasma cell neoplasia, and recognition of this histologic pattern is essential to avoid misclassification, particularly in small biopsies, where cellular material may be limited and architectural features disrupted.

Figure 1

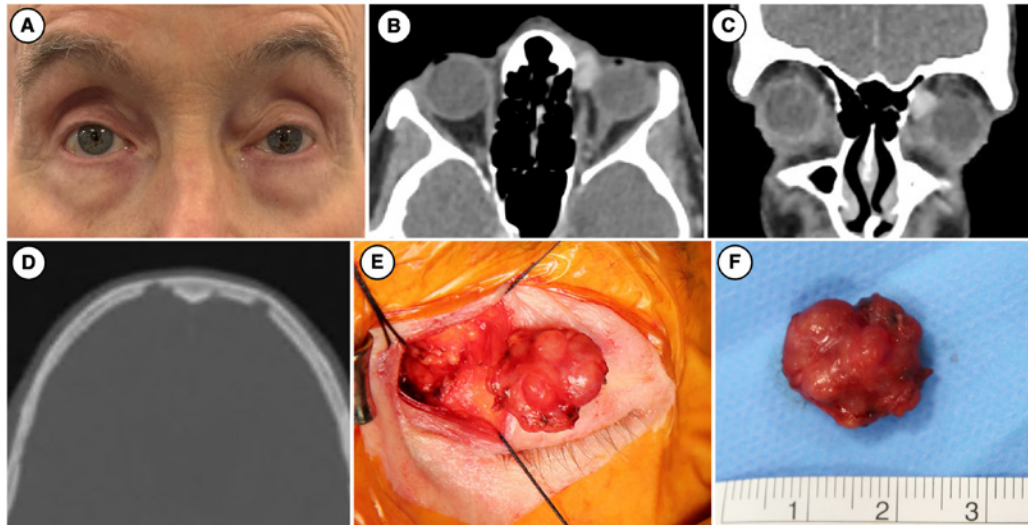


Figure 2

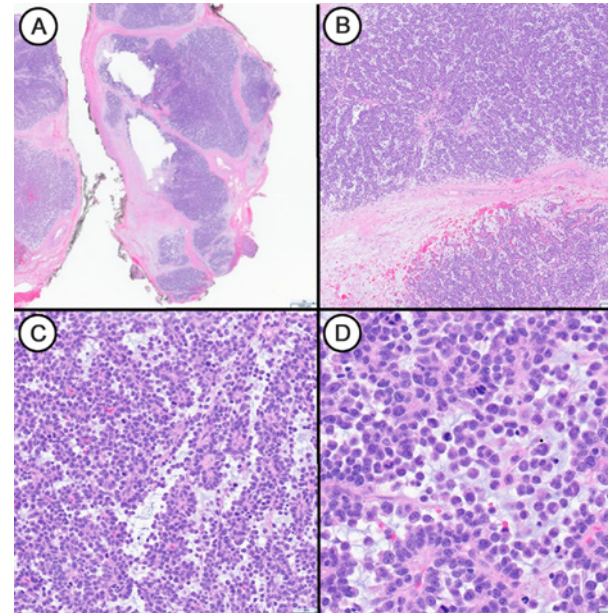
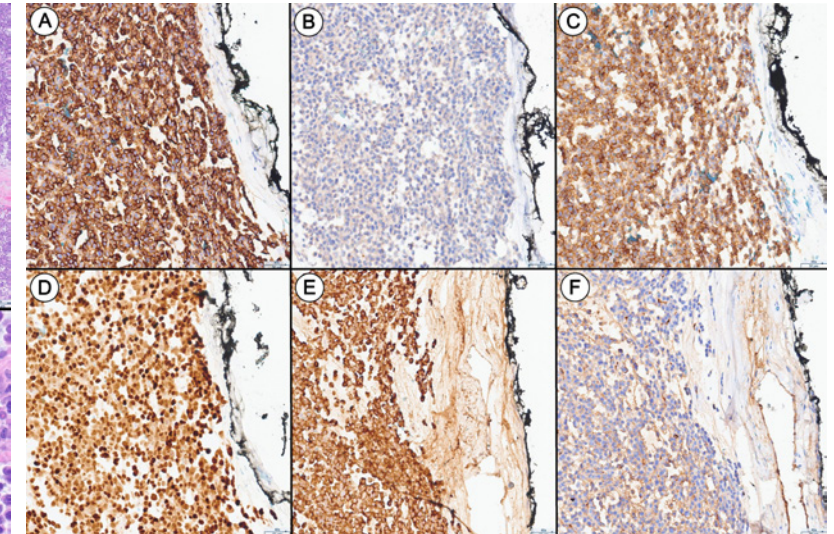


Figure 3



References

- Permaisuari N, Anggraini N, Mahyuddin M, et al. A case series of aggressive orbital plasmacytomas. *Ocul Oncol Pathol*. 2022;8(4-6):197–202.
- Ashraf MJ, Azarpira N, Khademi B, et al. Extramedullary plasmacytoma of the nasal cavity report of three cases with review of the literature. *Iran Red Crescent Med J*. 2013;15(4):363–366.
- Marangoni D, Gouigoux S, Zacchi A, Tognetto D. An unusual primary conjunctival plasmacytoma. *Digit J Ophthalmol*. [serial online] 2024;30. Available at: <https://djo.harvard.edu/index.php/djo/article/view/652>. Accessed April 30, 2026.
- Lara-Torres CO, Gómez-Plata E, Ortiz-Hidalgo C. Small-cell plasmacytoma with prominent myxoid stroma mimicking a soft-tissue neoplasm. *Int J Surg Pathol*. 2009;17(5):398–400.
- Messina G, Fucile MA, Kupper M, et al. Multiple myeloma presenting as breast metastasis: diagnostic challenges and case analysis. *Am J Case Rep*. 2025;26:e945853.
- Saglietti C, Piana S, La Rosa S, Bongiovanni M. Hyalinizing trabecular tumour of the thyroid: fine-needle aspiration cytological diagnosis and correlation with histology. *J Clin Pathol*. 2017;70(8):641–647.
- Sessa A, Mulé S, Brustia R, et al. Macrotrabecular-massive hepatocellular carcinoma: light and shadow in current knowledge. *J Hepatocell Carcinoma*. 2022;9:661–670.
- Talerman A, Okagaki T. Ultrastructural features of primary trabecular carcinoid tumor of the ovary. *Int J Gynecol Pathol*. 1985;4:153–160.
- Denisov EV, Skryabin NA, Gerashchenko TS, et al. Clinically relevant morphological structures in breast cancer represent transcriptionally distinct tumor cell populations with varied degrees of epithelial-mesenchymal transition and CD44⁺CD24[−] stemness. *Oncotarget*. 2017;8(37):61163–61180.
- Tse CC, Chan JK, Yuen RW, Ng CS. Malignant lymphoma with myxoid stroma: a new pattern in need of recognition. *Histopathology*. 1991;18(1):31–35.

7:46–7:49 am

Orbital Myxoid Pleomorphic Liposarcoma: A Newly Characterized Malignancy with Evolving Treatment Strategies

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Introduction: Myxoid pleomorphic liposarcoma (MPLPS) is a recently defined liposarcoma characterized by myxoid and pleomorphic features with a molecular profile distinct from other liposarcomas. MPLPS represents approximately 0.1% of liposarcomas and is exceedingly rare in the orbit. MPLPS has predilection for children and young adults and an association with Li Fraumeni syndrome. Based on the few previously reported cases, MPLPS is a highly aggressive neoplasm with an estimated 25% survival rate at 3–4 years.^{1–4}

Given its rarity, optimal management of MPLPS is not known. We present two patients with orbital MPLPS and review current literature to highlight diagnostic advances, management challenges, and treatment strategies for this neoplasm.

Methods: Retrospective case series of two patients with orbital MPLPS and a focused literature review.

Results: Case 1. 19-year-old Caucasian female presented with rapidly progressive proptosis and diplopia (Figure 1). Magnetic resonance imaging (MRI) revealed a 23.6x28.3x29.3 mm heterogeneously enhancing intraconal orbital mass (Figure 2). Biopsy showed a high-grade neoplasm with morphologic features overlapping pleomorphic and myxoid liposarcomas (Figure 3). Immunohistochemical studies showed p53 and p16 overexpression with RB1 loss. Molecular genetic studies for *MDM2* amplification and *DDIT3* rearrangement were negative. Systemic workup showed no extra-orbital involvement. The combined findings were diagnostic of MPLPS (pT2 AJCC 8th ed, Orbital Sarcoma). Genetic testing for cancer predisposition syndromes was advised but not completed. The patient underwent neoadjuvant proton beam radiation followed by lid-sparing orbital exenteration with skull base resection and free flap reconstruction. Three months after surgery, imaging revealed lesions of the left precentral gyrus and right parietal lobe consistent with necrotic metastases. Biopsy is planned to direct further management.

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Case 2. 14-year-old African female presented with progressive proptosis and headaches with MRI revealing an orbital mass. Biopsy confirmed MPLPS. Genetic studies identified a germline *TP53* mutation consistent with Li-Fraumeni syndrome. The patient underwent debulking (95% resection) followed by adjuvant multi-agent chemotherapy and external beam radiation therapy. She developed recurrence 7 months later, requiring resection and ultimately orbital exenteration. Four years later, she developed local recurrence, post-radiation nasal sarcoma, and distant metastasis to the breast requiring chemotherapy. She was tolerating chemotherapy well after 2 months.

Literature review revealed a single case of previously published orbital MPLPS in a 12-year-old female treated with orbitotomy with surgical excision and neoadjuvant chemotherapy.⁵ Unfortunately, 2 months after surgery, the tumor progressed and the patient died from chemotherapy related complications. A focused review of all orbital liposarcomas suggested that MPLPS may have been previously diagnosed as “myxoid liposarcoma” and “pleomorphic liposarcoma” – molecularly, clinically, and biologically distinct neoplasms.^{6,7}

Conclusions: Orbital MPLPS is a rare, newly characterized malignancy without standardized treatment guidelines. These cases emphasize the importance of integrated morphologic and molecular genetic diagnosis, multidisciplinary evaluation, and individualized treatment approaches. Complete surgical resection remains the cornerstone of treatment when possible, alongside adjunctive chemotherapy and radiation. Recurrence and metastasis must be monitored closely. Given the association with germline *TP53* alterations, testing for Li-Fraumeni syndrome should be considered, particularly young patients. Awareness of this malignancy is needed to inform future management guidelines.

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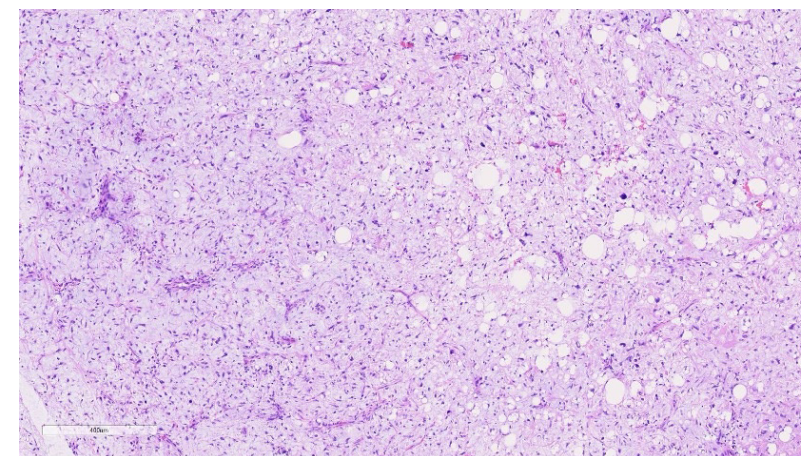
Figure 1



Figure 2



Figure 3



References

1. Blay JY, Toulmonde M, Valentin T, et al. Clinical presentation, management and outcome of 11,132 patients with liposarcoma: a population-based study from the NETSARC+ registry. *Lancet Reg Health Eur*. 2025;41:100940. doi:10.1016/j.lanepe.2024.100940
2. Fadaei S, Cordier F, Ferdinande L, Van Dorpe J, Creytens D. Myxoid pleomorphic liposarcoma. *Histol Histopathol*. 2024;39(9):1101-1108. doi:10.14670/HH-18-724
3. Dermawan JK, Hwang S, Wexler L, et al. Myxoid pleomorphic liposarcoma is distinguished from other liposarcomas by widespread loss of heterozygosity and significantly worse overall survival: a genomic and clinicopathologic study. *Mod Pathol*. 2022;35(11):1587-1597. doi:10.1038/s41379-022-01047-7
4. Creytens D, Folpe AL, Koelsche C, et al. Myxoid pleomorphic liposarcoma: a clinicopathologic, immunohistochemical, molecular genetic, and epigenetic study of 12 cases suggesting a possible relationship with conventional pleomorphic liposarcoma. *Mod Pathol*. 2021;34(11):2043-2052. doi:10.1038/s41379-021-00827-8
5. Tan GZL, Yong MH, Tiu LA, Dolendo M, Mok Y. Myxoid pleomorphic liposarcoma of the orbit: intratumoural genetic similarities and heterogeneity. *Pathology*. 2024 Feb;56(1):138-141. doi: 10.1016/j.pathol.2023.06.005. Epub 2023 Aug 19. PMID: 37657991.
6. Peck T, Gervasio KA, Zhang PJL, et al. Atypical Lipomatous Tumor/Well-Differentiated Liposarcoma with Myxoid Stroma in a Hereditary Retinoblastoma Survivor. *Ocul Oncol Pathol*. 2020;6(2):79-86. doi:10.1159/000501523
7. Madge SN, Tumuluri K, Strianese D, et al. Primary orbital liposarcoma. *Ophthalmology*. 2010;117(3):606-614. doi:10.1016/j.opththa.2009.08.017

7:49–7:52 am

Mucocutaneous Lesions Associated to the Use of Teprotumumab

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Introduction: Thyroid eye disease (TED) is a debilitating autoimmune disorder associated with thyroid dysfunction. Activation of autoantibodies against thyroid-stimulating hormone receptors (TSHR) and overexpression of insulin growth factor 1 receptor (IGF-1R) in orbital tissue lead to activation and proliferation of orbital fibroblasts. This results in glycosaminoglycan deposition, tissue swelling and remodeling, and enlargement of extraocular muscles.^{1–3} Teprotumumab, a monoclonal antibody that binds to IGF-1R, is the first Food and Drug Administration (FDA)-approved therapy for TED.^{2–4} While the literature has extensively documented Teprotumumab's side effects, such as muscle spasms, hyperglycemia, and hearing loss,^{5,6} mucocutaneous abnormalities—on the other hand—are rare and have only reported in a handful of patients.^{7,8}

Methods: The authors present a case report of a patient who developed new mucocutaneous lesions in the setting of Teprotumumab use for the treatment of TED.

Results: A forty-six-year-old patient with recent diagnosis of TED presented to our clinic with worsening diplopia, upper eyelid edema, and extraocular movement restriction. The patient was started on Teprotumumab infusions after an appropriate work-up, with significant improvement in TED symptoms. While receiving infusion treatment, the patient developed multiple painful oral mucosa ulcers involving the tongue, gums, and palate (Figure 1), which significantly impaired his oral intake. Additionally, he developed an erythematous rash affecting upper and lower extremities (Figures 2, 3). These lesions improved two months after treatment was completed. Six months later, the patient presented with recurrence of TED symptoms. At this time, a decision was made to proceed with a second cycle of Teprotumumab. Mucocutaneous ulcers recurred and remained present during the second cycle of infusions. Extensive work-up ruled out any systemic cause of aphthous stomatitis. Aphthous eruption related to Teprotumumab remains the most likely cause.

Conclusions: The authors present a novel case of a patient who developed mucocutaneous lesions associated with the use of Teprotumumab. These findings highlight the need to evaluate potential mucocutaneous side effects in patients undergoing treatment with Teprotumumab for TED, as such lesions can cause significant morbidity and negatively impact quality of life.

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Figure 1



Figure 2



Figure 3



References

1. Weiler DL. Thyroid eye disease: a review. *Clin Exp Optom*. 2017;100(1):20-25.
2. Hoang TD, Stocker DJ, Chou EL, Burch HB. Update on Clinical Management of Graves Disease and Thyroid Eye Disease. *Endocrinol Metab Clin North Am*.
3. Smith TJ, Janssen JAMJL. Insulin-like growth factor-I receptor and thyroid-associated ophthalmopathy. *Endocr Rev*. 2018;40(1):236-267.
4. Couch SM. Teprotumumab (Tepezza) for Thyroid Eye Disease. *Mo Med*. 2022;119(1):36-41.
5. Huang J, Su A, Yang J, Zhuang W, Li Z. Postmarketing Safety Concerns of Teprotumumab: A Real-World Pharmacovigilance Assessment. *Journal of Clinical Endocrinology and Metabolism*. 2025;110(1):159-165.
6. Mukit FA, Manley A, Patel AB, et al. Side Effects and Adverse Events After Treatment With Teprotumumab for Thyroid Eye Disease: A Retrospective Observational Case Series. *Cureus*. Published online April 19, 2024.
7. He LR, Villatoro GA, Yen MT. Persistent Palmar Rash Associated with Teprotumumab Treatment. *Ophthalmic Plast Reconstr Surg*. 2025
8. Dallalzadeh LO, Ting M, Topilow N, et al. Teprotumumab-related Cutaneous Hypersensitivity Reactions. *Ophthalmic Plast Reconstr Surg*. 2023;39(6):E208-E210.

7:52–7:55 am

Orbital Melanoma Arising within a Cellular Blue Nevus: An Atypical Clinical Presentation Highlighting the Role of Immunohistochemical and Molecular Diagnostics

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Introduction: Orbital melanoma is a rare but serious malignancy that require prompt management. Due to its rarity, diagnosis and evidence-based management remain challenging. Past literatures typically described the case presentation in their 40s, predominantly male, presenting with rapid proptosis and eyelid swelling.^{1,2,3} Surgery has traditionally been the mainstay of treatment.^{1,2,4} We present a case report of a young female who presented dissimilarly to the most cases in the literature.

Methods: Case report.

Results: A 29-year-old female was referred to the oculoplastics service for progressive left eyelid swelling and lacrimal gland enlargement since 2023, along with hypoglobus and proptosis. On examination, areas of deep slate gray pigmentation were noted (A) inferonasally and (B) in the inferior fornix (Figure 1). There was no associated dermal pigmentation. Past ocular history included strabismus surgery at ages 5 and 18, and a diagnosis of hypoplastic optic nerve OS with amblyopia.

On MRI (Figure 2), a mass was noted in the lacrimal gland fossa that was (A) hypo to iso intense on T2 and (B and C) T1 with (D) moderate contrast enhancement. Notably, (E and F) there was diffuse stranding within the orbit that was T1 isointense with and contrast enhancing.

The lesion was excised via a lateral orbitotomy approach. In addition to the pigmented lacrimal gland lesion, abnormal pigmentation was noted throughout the orbital soft tissues. Three map biopsies were taken from areas that were non-contiguous with the tumour itself. On H and E (Figure 3), a background of (A) blue nevus was identified; however (B) within the center of the lacrimal gland lesion, there was a region with epithelioid cells with prominent nucleoli, cytological atypia and pigment. (C) Immunohistochemistry for BAP1 demonstrates its retention in the blue nevus component, and its loss in the central melanoma component. The areas of BAP1 loss also had 6p gain on molecular analysis utilising genome-wide methylation analysis tool. All three biopsies taken from elsewhere throughout the orbit were consistent with cellular blue nevus with no areas of melanoma. Additional molecular analysis identified a mutation in GNAQ.

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The histopathologic differential diagnosis included atypical cellular blue nevus, melanoma arising in a cellular blue nevus, and melanoma mimicking a cellular blue nevus. Given the 6p gain and BAP1 loss within the most atypical portion of the tumour, melanoma arising within a cellular blue nevus was favored. Staging work up did not reveal distant metastatic disease. Given the uncertainty regarding the margins of resection and diffuse abnormalities noted on MRI, adjuvant proton beam radiotherapy was offered.

Conclusions: This case illustrates an unusual presentation of orbital melanoma progressing in a more insidious fashion than has previously been described in the literature and highlights the value in immunohistochemical and molecular diagnostics in more precisely narrowing the pathological differential. The incidence of orbital +/- ocular melanocytosis in the absence of dermal pigmentation is unknown but is an important association for clinicians to be aware of. The rarity of this tumour makes evidence-based decision making with respect to adjuvant treatment challenging.

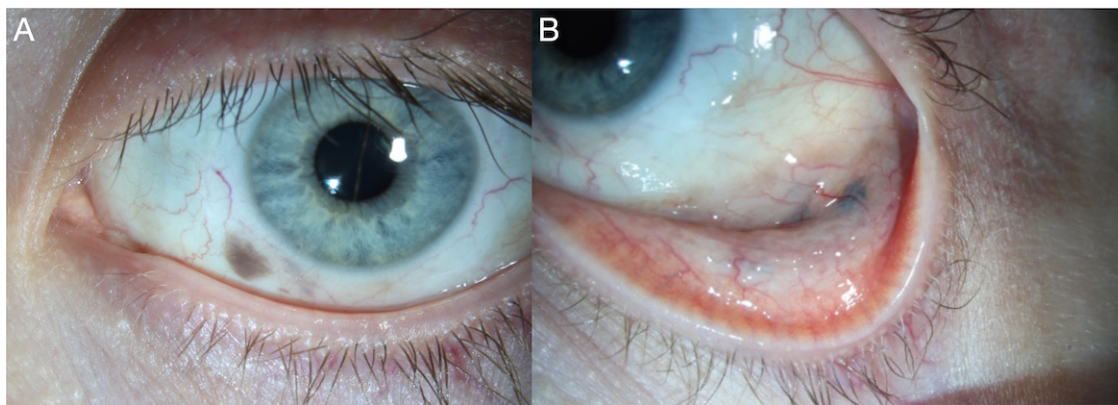


Figure 1. (A) Inferonasal scleral and (B) inferotemporal forniceal regions of deep slate grey pigmentation visible on slit lamp and external examination

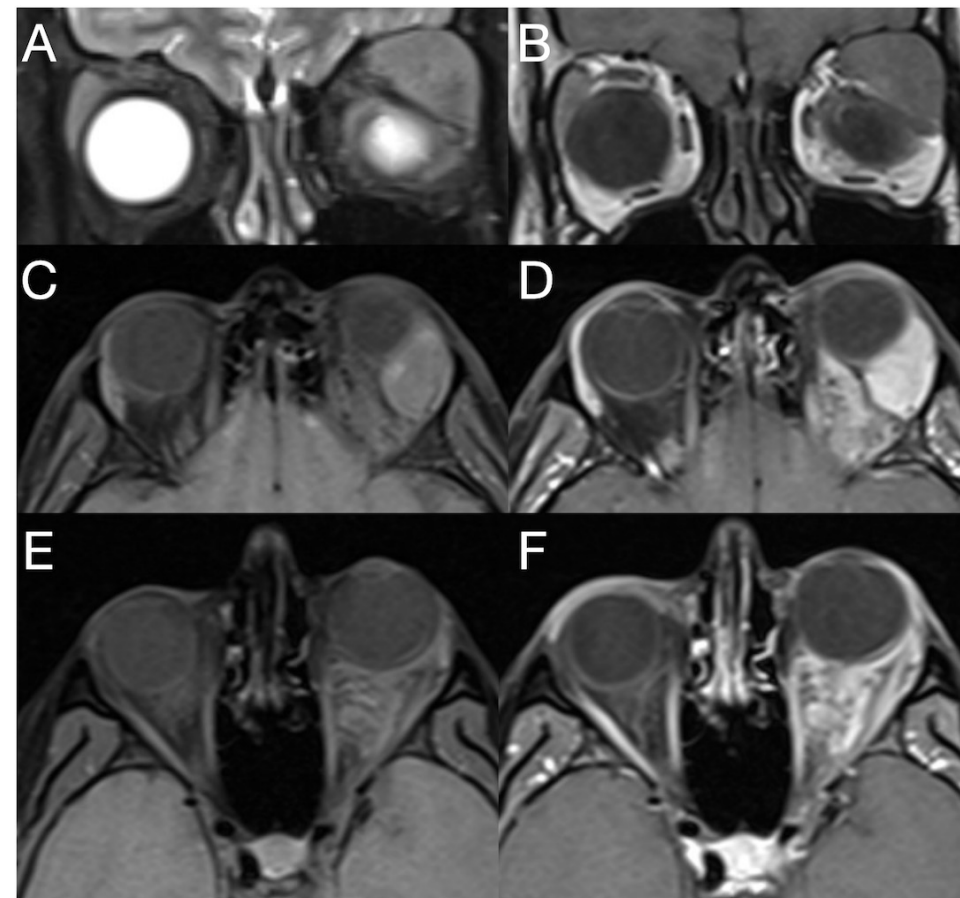


Figure 2. Pre-operative MRI demonstrating a lesion involving the left lacrimal gland with resulting indentation of the globe. The mass is (A) hypo to iso intense on T2 and (B and C) T1, with (D) diffuse homogeneous contrast enhancement. (E) Throughout the entire left orbit there is abnormal T1 iso-intense signal and this tissue (F) similarly demonstrates contrast enhancement, albeit to a slightly less avid extent compared to the lacrimal gland tumor

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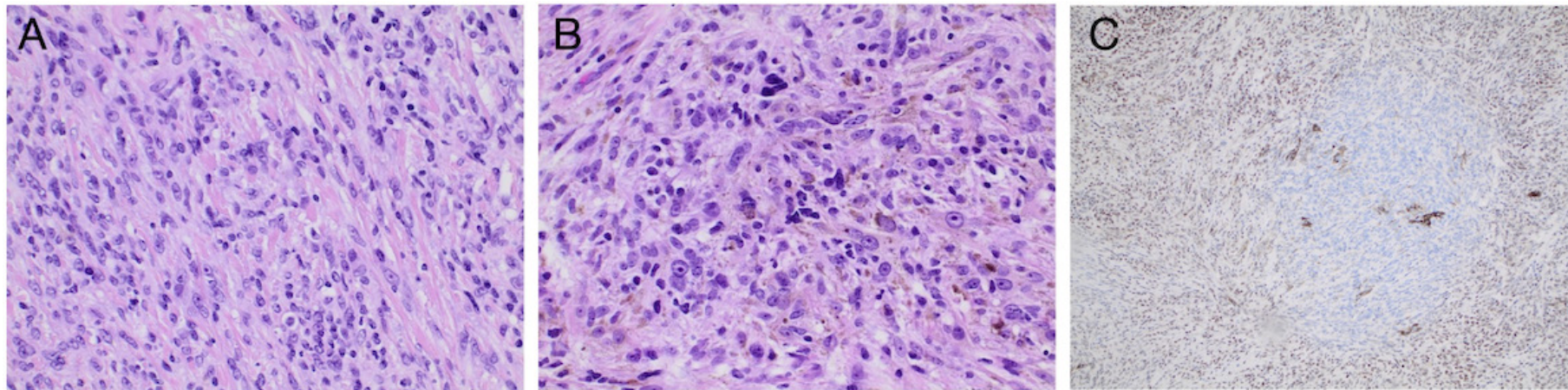


Figure 3. (A) At 400x magnification the background blue nevus component is appreciated. (B) Within the core of the lacrimal gland tumor there is a region with epithelioid cells with prominent nucleoli, cytological atypia and pigment. (C) Immunohistochemistry for BAP1 demonstrates its retention in the blue nevus component, and its loss in the central melanoma component. The areas of BAP1 loss also had 6p gain on molecular analysis utilising Infinium Methylation EPIC BeadChip.

References

1. Adetunji MO, McGeehan B, Lee V, Maguire MG, Briceño CA. Primary orbital melanoma: A report of a case and comprehensive review of the literature. *Orbit*. 2021;40(6):461-469. doi:10.1080/01676830.2020.1818265
2. Figueira E, Rajak S, McKelvie P, et al. Primary orbital melanoma: a case series and literature review. *Orbit*. 2018;37(5):352-357. doi:10.1080/01676830.2017.1423354
3. Rose AM, Luthert PJ, Jayasena CN, Verity DH, Rose GE. Primary Orbital Melanoma: Presentation, Treatment, and Long-term Outcomes for 13 Patients. *Front Oncol*. 2017;7:316. Published 2017 Dec 18. doi:10.3389/fonc.2017.00316
4. Furdova A, Chynoransky M, Krajcova P. Orbital melanoma. *Bratisl Lek Listy*. 2011;112(8):466-468.

7:55–7:58 am

Periorbital Mucinosis Successfully Managed with GLP-1 Agonist: A Case Report

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Introduction: We describe the clinical presentation, histologic findings, and management of a patient with isolated periorbital mucinosis.

Methods: A 56-year-old female with a past medical history significant for rheumatoid arthritis, scleroderma, Raynaud's disease, and an "undifferentiated connective tissue disorder" presented with a 3-year history of bilateral periorbital edema (Figure 1). She had previously been evaluated by outside ophthalmology, rheumatology, and allergy/immunology and had been resistant to prior management, including high-dose steroids. Additional laboratory studies, imaging, and excisional biopsy were performed.

Results: Lyme titers, SS-A/SS-B, C-1 Esterase, TSH, Thyroglobulin antibody, Myeloperoxidase antibody, Proteinase 3 antibody, and renal function studies were all within normal ranges. ACE (84; 9–67) and IgG 4 (145; 1–123) levels were mildly elevated. Magnetic resonance imaging demonstrated diffuse increased T2 signal in the preseptal space consistent with extensive edema. Excisional biopsy showed colloidal iron staining positive for mucin, consistent with a diagnosis of periorbital mucinosis (Figures 2 and 3). She had minimal improvement in her clinical findings following rheumatologic management, including a prolonged course of oral corticosteroids. A comprehensive genetic evaluation was unremarkable, and after a slow taper off of oral corticosteroids, IVIG therapy was administered with only modest clinical improvement. A glucagon-like peptide-1 (GLP-1) agonist was subsequently given with near complete resolution of her eyelid findings (Figure 4).

Conclusions: Cutaneous mucinoses are conditions characterized by the abnormal accumulation of glycosaminoglycans (mucin) in the epidermis, dermis, or hair follicles¹. Mucin deposition can either be focal or diffuse and may be either the primary histopathologic feature of disease or a secondary deposition associated with thyroid dysfunction, lupus erythematosus, scleroderma, and dermatomyositis^{2,3}. Recently, GLP-1 agonists have been used beyond the scope of type 2 diabetes and obesity. Given their ability to inhibit pro-inflammatory cytokines, GLP-1 agonists have shown promising results in limited cases for both cutaneous diseases, including psoriasis and hidradenitis suppurativa, and in rheumatologic disorders such as systemic lupus erythematosus⁴⁻⁷. In this case of a patient with localized periorbital mucinosis likely related to an underlying connective tissue disorder, the use of GLP-1 agonists led to

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significant improvement in her recalcitrant periorbital findings, suggesting an anti-inflammatory effect that may be more efficacious than high-dose oral steroids and IVIG infusions in patients with periorbital dermatologic or rheumatologic disease.

Figure 1



Figure 2

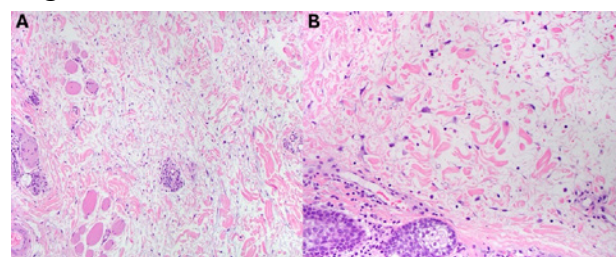


Figure 3

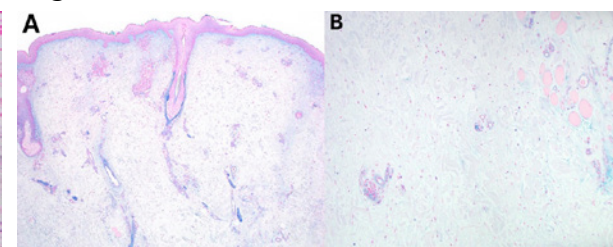
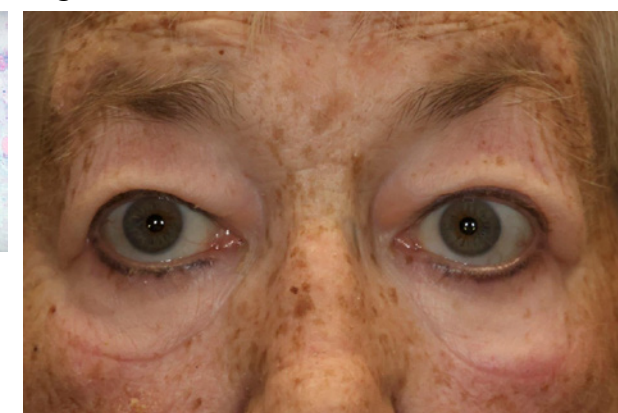


Figure 4



References

1. Rongioletti F, Rebora A. Cutaneous mucinoses: microscopic criteria for diagnosis. *Am J Dermatopathol*. 2001 Jun;23(3):257-67.
2. McDermott AL, Biswas C, Morgan K, Kay NJ. Focal mucinosis: clinical and histological features of an unusual condition. *J Laryngol Otol*. 2003 May;117(5):408-9.
3. Fernandez-Flores A, Saeb-Lima M. Mucin as a diagnostic clue in dermatopathology. *J Cutan Pathol*. 2016 Nov;43(11):1005-1016.
4. Haberman RH, Rice AL, Chen K, Scher U, Thib S, Scher JU, Eder L. Glucagon-Like Peptide-1 Receptor Agonist Therapy Is Associated With Improvement in Psoriatic Arthritis-Related and Metabolic Outcomes: A Retrospective Analysis of Two Cohorts. *Arthritis Rheumatol*. 2026 Apr 6.
5. Krajewski PK, Zlotowska A, Szepietowski JC. The Therapeutic Potential of GLP-1 Receptor Agonists in the Management of Hidradenitis Suppurativa: A Systematic Review of Anti-Inflammatory and Metabolic Effects. *J Clin Med*. 2024 Oct 22;13(21):6292.
6. Al-Badri MR, Azar ST. Effect of glucagon-like peptide-1 receptor agonists in patients with psoriasis. *Ther Adv Endocrinol Metab*. 2014 Apr;5(2):34-8.
7. Bilgin E, Venerito V, Bogdanos DP. Glucagon-Like Peptide-1 (GLP-1) receptor agonists in rheumatology: A review of current evidence and future directions. *Autoimmun Rev*. 2025 Aug 29;24(9):103864.



Moderators: Bobby S. Korn and Jonathan E. Lu

8:03–8:08 am

Periocular Disease Progression and Reconstructive Patterns in Parry–Romberg Syndrome

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Introduction: Parry–Romberg syndrome (PRS) is a rare progressive disease characterized by hemifacial and soft tissue atrophy, typically occurring in the first two decades of life with a reported female predominance.¹ Ocular and periocular involvement has been reported in nearly half of all individuals with PRS, most commonly as fat atrophy, enophthalmos, ptosis, and lagophthalmos.^{2,3}

Operative intervention for ocular and periocular-involving PRS is typically performed after disease stabilization. However, given the progressive nature of PRS, individuals may require multiple surgical procedures or revisions prior to definite stabilization.⁴ Despite recognition of its reconstructive burden, understanding of the periocular disease spectrum and surgical trajectory remains limited. The objective of this study is to better characterize presentations of periocular disease and reconstructive management patterns to inform clinical practice.

Methods: A single-institution retrospective cohort study was conducted of 38 individuals with diagnosed PRS who sought care at a plastic and reconstructive surgery clinic from June 2014 to December 2020. Demographic, periocular, and procedural data were collected including clinical manifestations, timing and type of surgical interventions, revision history, and post-operative complications. Institutional review board exemption was obtained.

Results: Thirty-eight patients were identified; 74% (n=28) were female and 61% (n=23) had left-sided disease. The cohort was predominantly White (n=31, 81%), with Asian (n=5, 13%), Black (n=1, 3%), and mixed-race (n=1, 3%) patients represented. The median age at symptom onset was 7 years [IQR 5–13]. Two patients were lost to follow-up.

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Periocular signs were identified in 83% (n=30) throughout their disease course and in 56% (n=20) at initial presentation. Manifestations included periocular fat loss (n=16, 44%), enophthalmos (n=12, 33%), ptosis (n=8, 22%), brow ptosis (n=7, 19%), dry eye (n=6, 17%), lagophthalmos (n=4, 11%), and exposure keratopathy (n=4, 11%). Uveitis (n=2, 6%) and brow/lash alopecia (n=2, 6%) were less commonly observed. Initial recognition was most often by non-ophthalmic providers, particularly plastic and reconstructive surgeons (n=24, 67%). Oculoplastics providers also noted lower retraction, ectropion and lateral canthal dystopia.

All 36 patients underwent surgical intervention at a median age of 13.95 [IQR 9.03-29.87] years, with a median symptom onset-to-surgery interval of 4.79 [IQR 2.27-13.46] years. The most frequent procedures were free flap facial reconstruction (n=33, 92%) and canthopexy/canthoplasty (n=13, 36%). Patients underwent a median of 4 [IQR 3-5] procedures, with all patients requiring revisions at a median of 6.22 [IQR 4.8-7.3] months from initial surgery. Recurrences of lower eyelid retraction and lateral canthal dystopia were the most common indications for revision lower eyelid surgery, contributed by the mechanical weight and bulk of the facial flap. Postoperative complications occurred in 39% (n=14), with ocular complications in the form of corneal abrasions in 6% (n=2) of total patients. Placement of an inferior orbital rim resulted in worsened relative enophthalmos and was removed in 2 patients.

Conclusions: PRS is associated with a high rate of periocular involvement in this surgically engaged cohort, suggesting a greater burden than previously reported in the literature. Individuals with PRS experience a substantial reconstructive burden, characterized by multiple procedures and early interventions. More robust techniques for elevating and fixating the lower eyelid should be considered due to large facial flaps and severe cicatricial components. These findings support routine, early integration of oculoplastic surgeons into multidisciplinary PRS care to optimize periocular outcomes.

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Figure 1

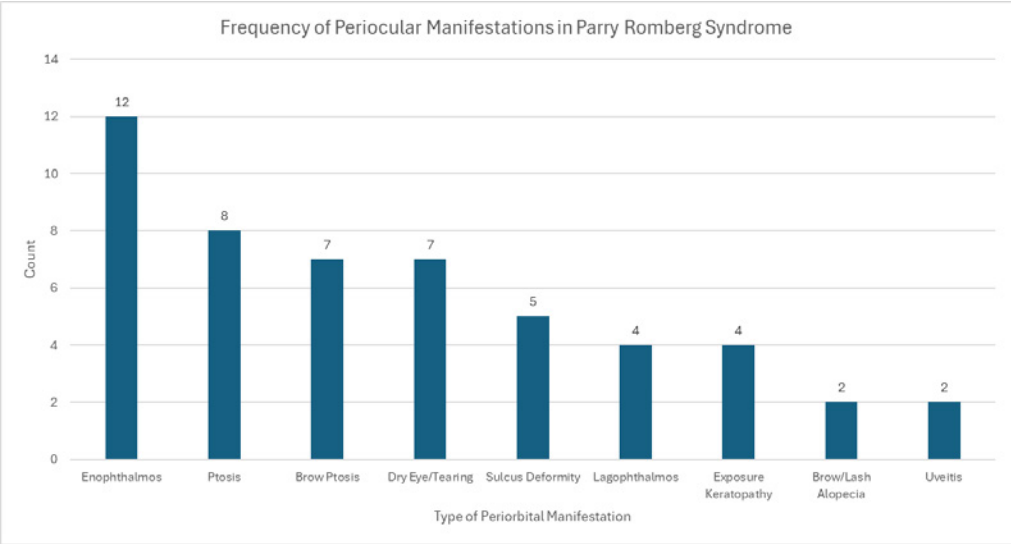


Figure 2

Demographics	
Demographic Categories	N (%)
Sex	
Female	29 (76.3%)
Male	9 (23.7%)
Race	
White	31 (81.6%)
Asian	5 (13.2%)
Black/African American	1 (2.6%)
Mixed	1 (2.6%)
Ethnicity	
Hispanic	2 (5.3%)
Non-Hispanic	36 (94.7%)
Age of Onset	
0–10	24 (63.2%)
11–20	10 (26.3%)
21–30	3 (7.9%)
> 31	1 (2.6%)
Disease Laterality	
Left	25 (65.8%)
Right	13 (34.2%)
Presence of Scleroderma	
Linear Scleroderma (En Coup de Sabre)	14 (36.8%)
Morpheaform scleroderma	1 (2.6%)
None	23 (60.5%)
Known Pre-Existing Eye Condition	
Yes	6 (15.8%)
No	32 (84.2%)

References

1. Stone J. Parry–Romberg syndrome. *Practical Neurology*. 2006;6(3):185–188. doi:10.1136/jnnp.2006.089037

2. Stone J. Parry–Romberg syndrome. *Neurology*. 2003;61(5):674–676. doi:10.1212/wnl.61.5.674

3. Zhang D, Huang S, Zhang X, Ling L, Li B. Ocular manifestations and treatment progress of Parry–Romberg syndrome. *Int Ophthalmol*. 2025 May 17;45(1):202. doi: 10.1007/s10792-025-03574-7. PMID: 40381081.

4. Guerrerosantos J, Guerrerosantos F, Orozco J. Classification and treatment of facial tissue atrophy in Parry–Romberg disease. *Aesthetic Plastic Surgery*. 2007;31(5):424–434. doi:10.1007/s00266-006-0215-4

8:08–8:13 am

Risk Factors Associated with Frontalis Sling Reoperation for Congenital Ptosis in the IRIS® Registry

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¹Ophthalmology, Massachusetts Eye and Ear, Boston, Massachusetts, United States, ²Ophthalmology, Boston Medical Center, Boston, Massachusetts, United States, ³Ophthalmology, Boston Children's Hospital, Boston, Massachusetts, United States

Introduction: Pediatric ptosis requires surgical intervention to obviate amblyopia and restore function. For children with poor levator function, frontalis sling surgery is the preferred corrective approach, harnessing brow elevation to raise the upper lid.² However, reoperation is a recognized challenge: single-center series report rates ranging from 15–34%, driven by undercorrection, recurrent ptosis, and sling-related complications.^{3,4} Younger children—particularly those under 3 years—have consistently demonstrated higher reoperation rates compared to older pediatric patients, likely due to continued facial growth, altered lid dynamics over time, and the urgency of early amblyopia prevention prompting surgery before the brow-lid mechanism is fully mature.^{3,5} Surgical management of pediatric ptosis repair is challenging, but frontalis suspension with autologous or non-autologous slings has historically been the preferred technique for severe ptosis. This study leverages the AAO IRIS® Registry (Intelligent Research in Sight) to characterize the 5-year cumulative probability of frontalis sling reoperation and identify associated patient-level risk factors in a real-world, nationally representative cohort.

Methods: A retrospective cohort analysis was conducted using the IRIS® Registry. Children aged ≤18 years who underwent frontalis sling surgery (CPT 67901 or 67902) between January 1, 2013 and December 31, 2023 were included. Reoperation was defined as a subsequent ptosis repair procedure recorded in the registry. The primary outcome was the cumulative probability of reoperation, estimated using the Kaplan-Meier method. Multivariable Cox proportional hazard regression was used to evaluate associations between reoperation and patient-level and surgery-level factors. All analyses were performed with a significance threshold of $p < 0.05$.

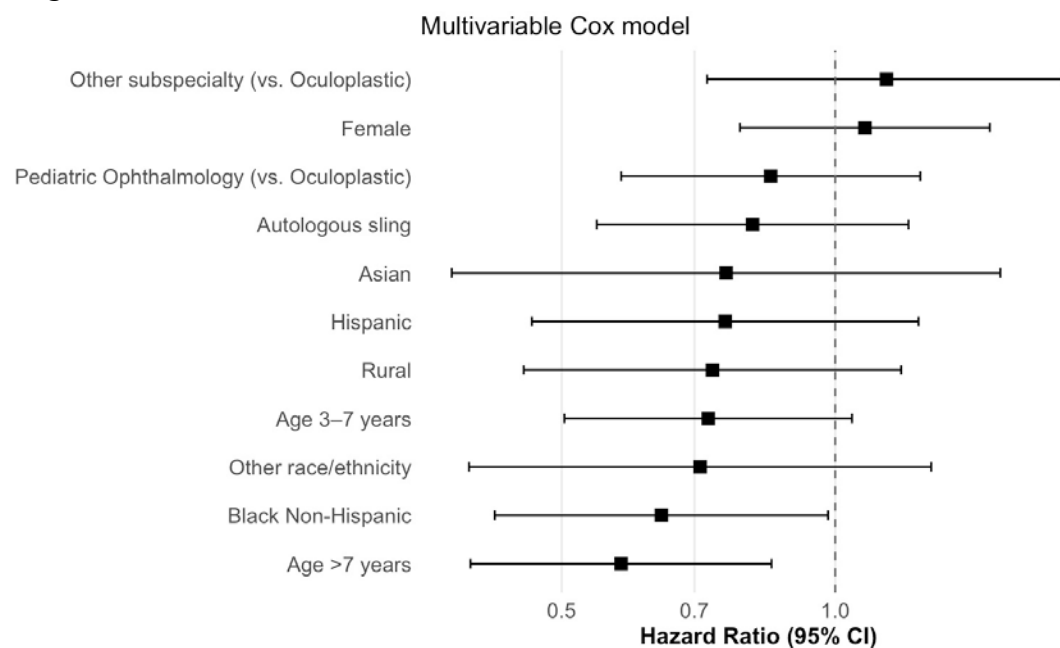
Results: 1,847 children who underwent frontalis sling surgery were identified (mean age 6 years; 65% male; 40% non-Hispanic White). The 5-year cumulative probability of reoperation was 16.2% (95% CI 14.5–18.0). On multivariable Cox regression, increasing age at the time of initial surgery was associated with a lower risk of reoperation: children aged 3–7 years (HR 0.73, 95% CI 0.50–1.04) and those older than 7 years (HR 0.58, 95% CI 0.40–0.85) had progressively lower hazard compared to the reference group of children aged ≤2 years. Neither sling material (autologous vs. non-autologous; $p > 0.05$) nor initial surgeon subspecialty ($p > 0.05$) was significantly associated with reoperation risk.

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Conclusions: In this large, nationally representative cohort, approximately 1 in 6 children required reoperation within 5 years of frontalis sling surgery—a rate consistent with prior single-center series.^{3,4} Younger age at surgery, particularly in those ≤ 2 years, was the primary modifiable risk factor for reoperation. This aligns with prior data showing higher redo rates in very young children, potentially reflecting the interplay of continued periorbital development and the clinical imperative to intervene early in high-risk amblyopia cases.⁵ These findings may help counsel families about reoperation likelihood and inform surgical planning for young children with congenital ptosis.

Figure 1



References

1. Griepentrog GJ, Diehl NN, Mohny BG. Incidence and demographics of childhood ptosis. *Ophthalmology*. 2011;118(6):1180–1183.
2. Ho YF, Wu SY, Tsai YJ. Factors associated with surgical outcomes in congenital ptosis: a 10-year study of 319 cases. *Am J Ophthalmol*. 2017;175:173–182.
3. Chua MR, Lo DM, Katowitz JA, Katowitz WR. Long term outcomes of frontalis suspension surgery using autogenous fascia lata slings in children with congenital ptosis. *Invest Ophthalmol Vis Sci*. 2018;59(9):88.
4. Alshamrani M, Allam A, Alsuhaibani AH. Outcome of silicone sling frontalis suspension in children with simple congenital and complex ptosis. *Br J Ophthalmol*. 2023. doi:10.1136/bjo-2022-322913.
5. Berar OV, Abergel E, Ben Simon G, et al. Reoperation for congenital ptosis: characteristics, success rates, and predicting factors. *Can J Ophthalmol*

8:13–8:18 am

Surgical Management and Reoperation Rates in Pediatric Acute Dacryocystitis: A Multicenter Study

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Introduction: Pediatric and adult dacryocystitis represent distinct clinical entities with different underlying pathophysiology and hence warrants different management paradigm. Pediatric acute dacryocystitis is an uncommon condition that most often occurs in the setting of congenital nasolacrimal duct obstruction. While the management of congenital nasolacrimal duct obstruction is typically probing with or without stenting, optimal surgical management of acute dacryocystitis in children is not well defined. This study seeks to evaluate surgical practice patterns for pediatric acute dacryocystitis and to compare the reoperation rates amongst different surgical approaches.

Methods: The Sight Outcomes Research Collaborative (SOURCE) repository was searched to identify patients younger than 18 years of age diagnosed with acute dacryocystitis from 2007 to 2023. Patients were identified using International Classification of Disease billing codes (ICD-9: 375.3, 375.32; ICD-10: H04.30, H04.32). Patients with a history of congenital facial asymmetry, orbital trauma, or facial trauma were excluded. Procedures were identified using Current Procedural Terminology (CPT codes) and operating room descriptions. Four categories of surgical intervention were identified: probing with stent (CPT 68815), probing without stent (CPT 68810, 68811, 68840), probing with balloon (68816), and dacryocystorhinostomy (CPT 31239, 68720).

Results: A total of 1,636 patients were included, of whom 822 (50.24%) were males. Overall, 156 (9.54%) underwent at least one surgery (95% Confidence interval [CI]=8.16% - 11.06%). The mean age at surgery differed significantly by procedure type ($p=0.021$): average age of patients that underwent probing without stent were at 1.43, probing with stent at 2.92, probing with balloon at 1.37, and dacryocystorhinostomy at 7.60. Reoperation rates did not differ significantly among the four surgical groups ($p=0.80$). Age did not significantly differ between patients who underwent surgical intervention and those who were managed medically ($p=0.078$).

Conclusions: In this large multicenter cohort, fewer than 10% of pediatric patients with acute dacryocystitis required surgical intervention, and the overall reoperate rate was low. Surgical approach varied by age, with probing favored in younger patients and dacryocystorhinostomy more commonly performed in older children. Importantly, reoperation rates were comparable across surgical techniques. These findings support an individualized approach to surgical management of pediatric acute dacryocystitis, guided by patient age, anatomy, and clinical presentation rather than concern for differential reoperation risk.

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References

1. Ali MJ, Joshi SD, Naik MN, Honavar SG. Clinical profile and management outcome of acute dacryocystitis: two decades of experience in a tertiary eye care center. *Semin Ophthalmol*. 2015 Mar;30(2):118-23.
2. Ali MJ. Pediatric Acute Dacryocystitis. *Ophthalmic Plast Reconstr Surg*. 2015;31(5):341-347.
3. Saha BC, Kumari R, Sinha BP. Clinical Outcome of Probing in Infants with Acute Dacryocystitis – A Prospective Study. *J Clin Diagn Res*. 2017 Aug;11(8):NC01-NC03.
4. Bothra N, Ali MJ. Congenital Nasolacrimal Duct Obstruction Update Study (CUP Study): Paper 4-Infantile Acute Dacryocystitis (InAD)–Presentation, Management, and Outcomes. *Ophthalmic Plast Reconstr Surg*. 2022;38(3):270-273.

8:18–8:23 am

A 15-year Single Center Review of Ptosis in Noonan Syndrome: Genotype-Specific Surgical Outcomes and Complication Patterns in a Pediatric Cohort

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Introduction: The role of genetics is becoming increasingly relevant in surgical management of syndromic phenotypes. The purpose of this study is to characterize surgical outcomes and genotype-specific patterns of ptosis in Noonan syndrome (NS) and NS-like syndromes – a population in which genetic subtype may meaningfully inform ophthalmic management.

Methods: A retrospective chart review was performed of patients seen at Texas Children's Hospital Ophthalmology clinic between January 2010 and October 2025 with ICD-10 code Q87.19 and clinical or molecular diagnosis of NS or NS-like syndrome. Demographic, genetic, systemic, and ophthalmic data, including ptosis laterality, management, and outcomes, were collected in REDCap.

Results: Ninety-six patients were identified; 88 had molecularly confirmed NS or NS-like syndrome (92%). The most common mutations were *PTPN11* (50%, n=44), *SOS1* (15.9%, n=14), *KRAS* (10.2%, n=9), and *RIT1* (7.9%, n=7). Ptosis was present in 36 patients (38%); 32 had molecular confirmation (89%). Ptosis was significantly less prevalent in patients with *PTPN11* mutations (23%, n=10; p=0.007) and significantly more prevalent in those with *KRAS* mutations (89%, n=8; p=0.001).

Among molecularly confirmed patients with ptosis (n=32), 23 presented bilaterally (71.9%), four with right-sided ptosis (12.5%), and five with left-sided ptosis (15.6%), totaling 55 ptotic eyes. Thirty-one eyes were surgical candidates (56.4%); nine completed initial repair at an outside hospital (OSH), three of which required revision at TCH. Nineteen eyes completed initial surgery at TCH and three have surgery scheduled.

Among *PTPN11*-associated ptotic eyes (n=18), eight required surgery (44%), six at TCH – four patients, three bilateral. Among *KRAS*-associated ptotic eyes (n=14), eight required surgery (57%), three at TCH – two patients, one bilateral. Of ten *SOS1*-associated ptotic eyes, one required surgery at TCH (p=0.017).

Of 19 eyes with initial TCH surgery, nine received a silicone frontalis sling – performed in *PTPN11* (n=3), *KRAS* (n=2), *RIT1* (n=2), and *SHOC2* (n=2) mutation-associated eyes. Four received an e-PTFE frontalis sling in *RAF1* (n=2), *KRAS* (n=1), and *NF1* (n=1) mutation-associated eyes. Five underwent levator resection in *PTPN11* (n=3), *SHOC2* (n=1), and *SOS1* (n=1) mutation-associated eyes, and one underwent Müller muscle-conjunctival resection in a *SHOC2* mutation-associated eye.

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Lagophthalmos requiring surgical revision occurred in four eyes. Two followed levator resection in a bilateral *PTPN11* patient; each resolved after one revision. Two followed silicone frontalis sling in a bilateral *RIT1* patient; each required three additional surgeries per eye before resolution, ultimately requiring a total of four procedures per eye.

Conclusions: To our knowledge, this study represents the largest single-center characterization of ptosis surgical outcomes in NS to date. Surgical repair carries a meaningful risk of lagophthalmos requiring revision, particularly following silicone frontalis sling and levator resection, with the severity of revision burden varying by both procedure type and genotype. Despite the known risks of thrombocytopenia and hypertrophic cardiomyopathy in NS, surgery was overall safe and well tolerated in this cohort, with no major bleeding or cardiac complications observed, including with the use of local anesthesia. These findings underscore the importance of genotype-informed ophthalmic surveillance and perioperative planning in this population.

References

1. Furlong-Dillard J, Bailly D, Amula V, Wilkes J, Bratton S. Resource Use and Morbidities in Pediatric Cardiac Surgery Patients with Genetic Conditions. *J Pediatr*. 2018 Feb;193:139-146.e1. doi: 10.1016/j.jpeds.2017.09.085. Epub 2017 Dec 12. PMID: 29246465.
2. Lee NB, Kelly L, Sharland M. Ocular manifestations of Noonan syndrome. *Eye (Lond)*. 1992;6(Pt 3):328-334. doi:10.1038/eye.1992.66
3. PA Harris, R Taylor, BL Minor, V Elliott, M Fernandez, L O'Neal, L McLeod, G Delacqua, F Delacqua, J Kirby, SN Duda, REDCap Consortium, The REDCap consortium: Building an international community of software partners, *J Biomed Inform*. 2019 May 9 [doi: 10.1016/j.jbi.2019.103208]
4. PA Harris, R Taylor, R Thielke, J Payne, N Gonzalez, JG. Conde, Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support, *J Biomed Inform*. 2009 Apr;42(2):377-81.
5. Squires, J.E., Alonso, E.M., Ibrahim, S.H., Kasper, V., Kehar, M., Martinez, M. and Squires, R.H. (2022), North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition Position Paper on the Diagnosis and Management of Pediatric Acute Liver Failure. *Journal of Pediatric Gastroenterology and Nutrition*, 74: 138-158. <https://doi.org/10.1097/MPG.0000000000003268>
6. van Trier DC, van der Burgt I, Draaijer RW, Cruysberg JRM, Noordam C, Draaisma JM. Ocular findings in Noonan syndrome: a retrospective cohort study of 105 patients. *Eur J Pediatr*. 2018;177(8):1293-1298. doi:10.1007/s00431-018-3183-1
7. van Trier DC, Vos AM, Draaijer RW, van der Burgt I, Draaisma JM, Cruysberg JR. Ocular Manifestations of Noonan Syndrome: A Prospective Clinical and Genetic Study of 25 Patients. *Ophthalmology*. 2016;123(10):2137-2146. doi:10.1016/j.opthta.2016.06.061



8:28–8:29 am

Smartphone-Based Facial Video Analysis for Monitoring Treatment Response after Botulinum Toxin Injection in Blepharospasm

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Introduction: Blepharospasm is characterized by involuntary periocular muscle contractions, which may cause intermittent eyelid closure, impaired daily activities, and, in severe cases, functional blindness. Although botulinum toxin injection is the mainstay of treatment, assessment of baseline symptom severity and treatment response has largely relied on patient self-report and clinician observation. In addition, diagnosis and severity grading can be challenging when typical spasms are not observed during outpatient visits.

We developed 'Twitch Log', a machine learning-assisted smartphone application designed to evaluate blepharospasm and hemifacial spasm using facial videos captured by smartphone cameras. The system applies artificial intelligence-based facial landmark detection to quantify periocular and eyelid movement parameters, including blink frequency, blink velocity, blink amplitude, eyelid closure duration, and muscular motor patterns (Figure 1). This study aimed to evaluate whether smartphone-derived digital video markers correlate with clinical severity scales and to explore their potential utility for diagnosis, treatment response assessment, and longitudinal monitoring before and after botulinum toxin injection.

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Methods: This retrospective cohort study included patients with blepharospasm who underwent botulinum toxin injection. Smartphone-captured facial videos were obtained before and after treatment and analyzed using a machine learning-assisted facial landmark detection algorithm. The application automatically quantified five objective eyelid movement parameters: blink frequency, defined as the number of blinks per minute; blink velocity, representing the average eyelid movement speed during blinking; blink amplitude, representing the average change in eye aperture during blinking; eye closure percentage, defined as the proportion of total recording time during which the eyes remained closed; and the Lagophthalmos Index, defined as the mean residual eye aperture area during maximal eyelid closure (Figure 1). Pre- and post-injection values were compared to assess treatment-related changes and to explore the clinical utility of these video-derived digital markers for objective monitoring of periocular spasm.

Results: Seven cases were analyzed using smartphone-captured facial videos obtained on the day of botulinum toxin injection and during post-injection follow-up (Table 1 and Figure 2). Because the therapeutic effect of botulinum toxin typically begins 2–3 days after injection, values measured on the injection day were defined as the pre-injection baseline. At 1 week after injection, app-derived blink frequency decreased in 6 of 7 cases, with the median value decreasing from 32.06 to 9.99 blinks/min. Eye closure percentage also decreased in 6 of 7 cases, with the median value decreasing from 19.94% to 1.10%, suggesting a marked reduction in the proportion of time during which the eyes remained closed. Blink amplitude decreased in 5 of 7 cases, although the median value remained similar at 0.10 before injection and 0.10 at 1 week. Blink velocity showed variable changes across cases, with the median value changing from 0.79 to 0.83. The Lagophthalmos Index, defined as the residual eye aperture area during maximal eyelid closure, increased in all 7 cases, with the median value increasing from 54.56 to 87.18 mm². These findings suggest that smartphone-derived video markers, particularly blink frequency, eye closure percentage, and the Lagophthalmos Index, can capture objective post-injection changes in periocular spasm.

Conclusions: Twitch Log enabled objective smartphone-based quantification of eyelid movement changes after botulinum toxin injection. Blink frequency, eye closure percentage, and the Lagophthalmos Index appeared to be useful digital markers for assessing treatment response in patients with blepharospasm. Smartphone-based video analysis may serve as a practical tool for longitudinal symptom monitoring, especially when spasms are intermittent or not observed during clinic visits.

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Figure 1

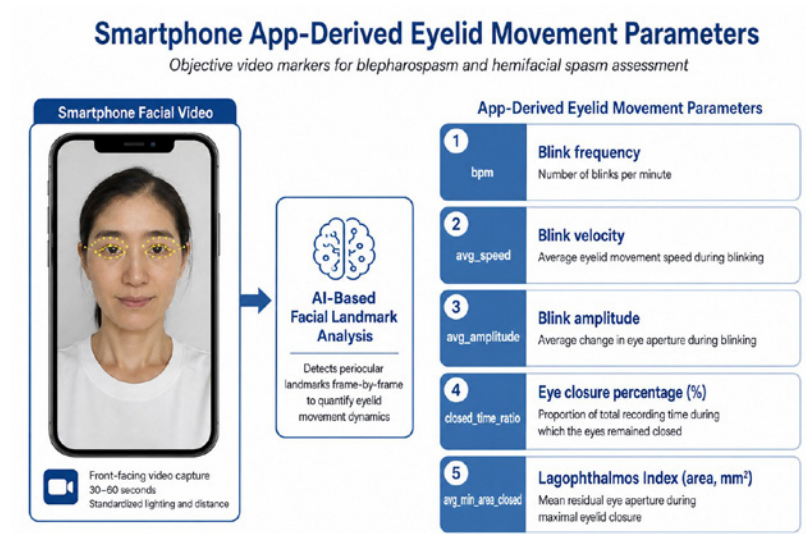


Figure 2

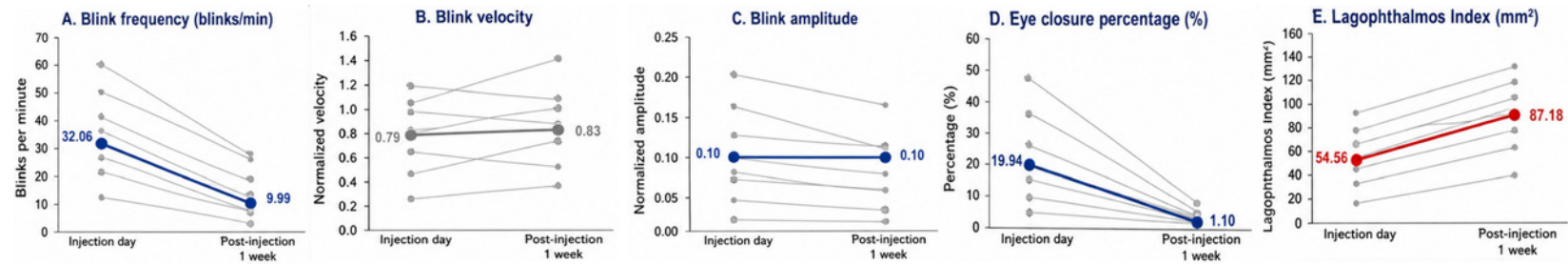
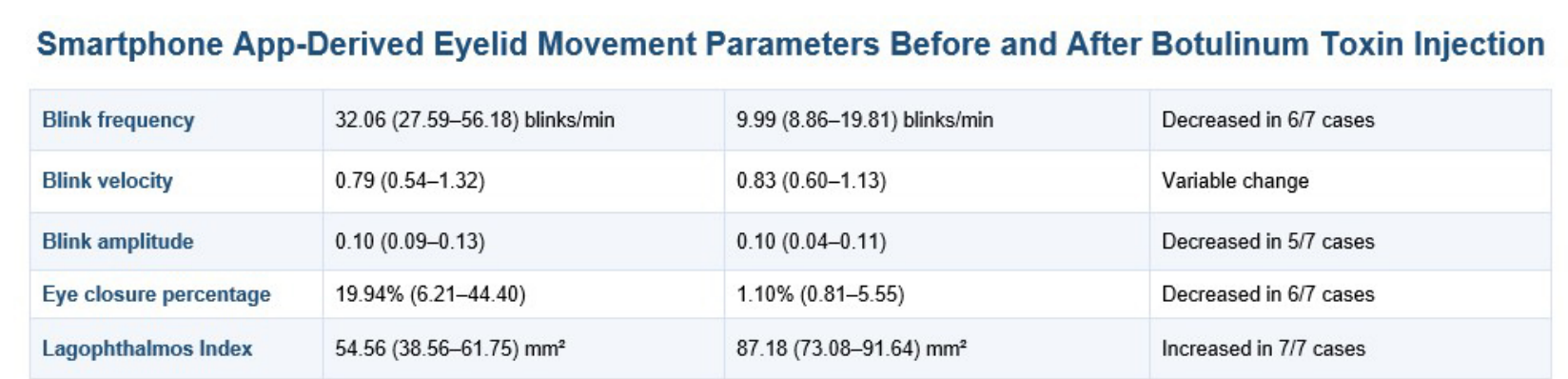


Figure 3



References

1. Trotta GF, Pellicciari R, Boccaccio A, Brunetti A, Cascarano GD, Manghisi VM, Fiorentino M, Uva AE, Defazio G, Bevilacqua V. A neural network-based software to recognise blepharospasm symptoms and to measure eye closure time. *Comput Biol Med.* 2019 Sep;112:103376.
2. Defazio G, Hallett M, Jinnah HA, Stebbins GT, Gigante AF, Ferrazzano G, Conte A, Fabbrini G, Berardelli A. Development and validation of a clinical scale for rating the severity of blepharospasm. *Mov Disord.* 2015 Apr;30(4):525–530.
3. Lindeboom R, De Haan R, Aramideh M, Speelman JD. The blepharospasm disability scale: an instrument for the assessment of functional health in blepharospasm. *Mov Disord.* 1995 Jul;10(4):444–449.
4. Huang S, Yang B, Huang X, Zhang H, Luo D, Tong G, Wang Y, Shao Y, Chen M, Gao Q, Ye J. Smartphone video-based early diagnosis of blepharospasm using dual cross-attention modeling enhanced by facial pose estimation. *NPJ Digit Med.* 2025 Aug 5;8(1):505.
5. Al Menabbawy A, Ruhser L, El Refaee E, Weidemeier ME, Matthes M, Schroeder HWS. From spasms to smiles: how facial recognition and tracking can quantify hemifacial spasm severity and predict treatment outcomes. *Acta Neurochir (Wien).* 2025 Jan 7;167(1):4.



Moderators: Pete Setabutr and Alison Watson

8:30–8:36 am

Assessing Intraoperative Measurement Precision in Müller’s Muscle–Conjunctival Resection: A Histologic and Objective Analysis of Resected Tissue

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Introduction: Muller’s muscle–conjunctival resection (MMCR) has remained an effective surgery for ptosis repair since the technique’s inception.¹ Over the years, the amount of tissue resection and even the need for titration of resection has been questioned.^{2–8}

Unrecognized variability of intraoperative measurements may account for the varied conclusions in the literature.

Given these mixed findings, assessment of if intraoperative targets accurately reflect the actual amount of tissue removed may be of value. In this study, we assess the agreement between the intended intraoperative measurements and objective pathology measurements of excised tissue in patients undergoing MMCR.

Methods: This is a nonrandomized prospective observational study including 30 consecutive samples from patients undergoing standard technique MMCR for primary ptosis repair by a single surgeon. Intraoperative measurements were recorded by the surgeon. After resection, tissues were stretched on cardboard, fixed in 10% buffered formaldehyde, they were measured by a blinded pathologist and processed routinely. Processed tissue was sectioned transversely along the long axis in 2–3 mm segments and paraffin-embedded. Five-micrometer-thick hematoxylin–eosin sections at 3 levels, 0.5 mm apart, sampling ~75% of the tissue were prepared on 24 of 30 specimens, scanned with whole-slide digital scanning system and displayed and analyzed with digital pathology viewer imaging software. The primary outcomes are the degree of agreement between intraoperative target width and actual width measured after resection and tissue fixation using Bland–Altman analysis, as well as the correlation between intraoperative target width

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and histologically measured aggregate cross-sectional tissue area using Pearson correlation. Clinical outcomes using pre and post-operative marginal reflex distance (MRD 1) was recorded for all patients.

Results: A Bland-Altman analysis was conducted on a sample of 30 eyes comparing intraoperative target measurements with the gross width of tissue after resection. The analysis demonstrated a mean bias of +1.04 mm. The limits of agreement were from -0.36 mm to +2.46 mm with moderate variability in differences (SD=0.72 mm) and a consistent positive bias.

A Pearson correlation analyzed the relationship between intraoperative target width and aggregate cross-sectional tissue area of the specimen. Correlations were assessed using two-tailed tests, and statistical significance was defined as $p < 0.05$. It was determined that there was a very weak, negative correlation that was not statistically significant (Pearson $r = -0.07$, $p = 0.73$) in a sample of 24 eyes. All patients achieved post-operative target MRD 1, no patients required surgical revision.

Conclusions: The intraoperative measurements had a positive systematic bias, overestimating the amount of tissue that is resected from patients. This phenomenon was consistent across all post-operative measurements, with 50% of measurements falling within 0.9 mm of agreement, 73% within 1.4 mm, 90% within 1.9 mm, and only 10% differing by more than 2.0 mm. These findings demonstrate that outliers were uncommon, with most differences below 1.4 mm. No significant correlation was found between intraoperative measurements and histological tissue area across 24 eyes.

The positive bias may partly reflect tissue shrinkage following excision and fixation, but variability in post-operative measurements and deviation from the target intraoperative widths suggests a lack of precision with titrated resection especially at intervals less than 2.0mm and may support a basis for standard tissue resection widths. This is particularly supported by the achievement of surgical clinical outcomes in all patients despite the observed variability.

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Figure 1

Difference Between Intraoperative and Post-Fixation Gross Tissue Length	n = 30 eyes	%
≤0.4 mm	3	10%
0.5-0.9 mm	12	40%
1.0-1.4 mm	7	23%
1.5-1.9 mm	5	17%
>2.0 mm	3	10%

Figure 2

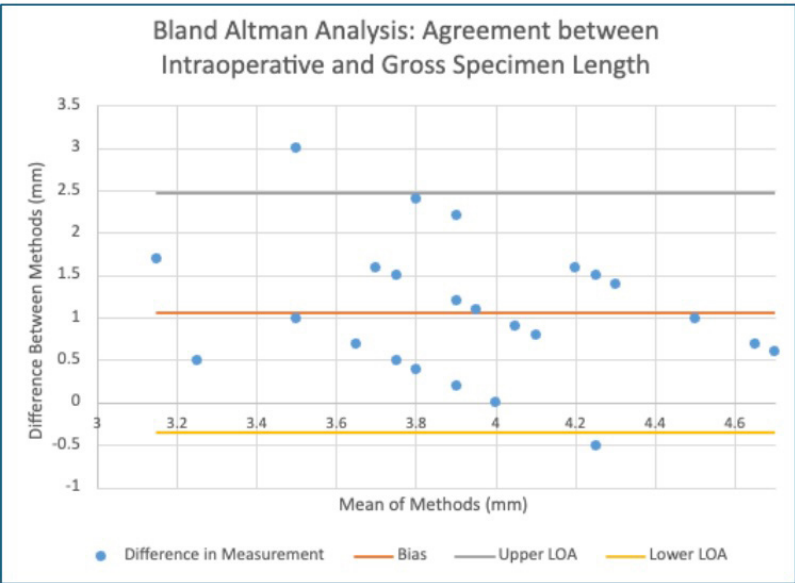
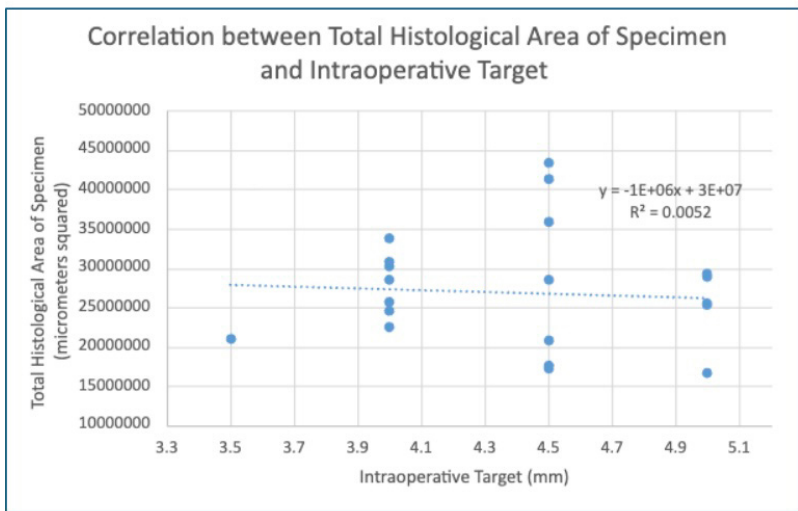


Figure 3



References

1. Putterman AM, Urist MJ. Müller muscle–conjunctiva resection. Technique for treatment of blepharoptosis. *Arch Ophthalmol*. 1975;93(8):619–623. doi:10.1001/archophth.1975.01010020595007
2. Dresner SC. Further modifications of the Müller’s muscle–conjunctival resection procedure for blepharoptosis. *Ophthalmic Plast Reconstr Surg*. 1991;7(2):114–122. doi:10.1097/00002341-199106000-00005
3. Dryden SC, Rho JE, Fowler SC, et al. Postoperative Clinical Outcomes Using Standard Variables Following Levator–Mullerectomy Advancement Blepharoptosis Surgery. *J Craniofac Surg*. 2021;32(6):e554–e556. doi:10.1097/SCS.00000000000007554
4. Liu MT, Totonchi A, Katira K, Daggett J, Guyuron B. Outcomes of mild to moderate upper eyelid ptosis correction using Müller’s muscle–conjunctival resection. *Plast Reconstr Surg*. 2012;130(6):799e–809e. doi:10.1097/PRS.0b013e31826d9cb0
5. Perry JD, Kadakia A, Foster JA. A new algorithm for ptosis repair using conjunctival Müllerectomy with or without tarsectomy. *Ophthalmic Plast Reconstr Surg*. 2002;18(6):426–429. doi:10.1097/00002341-200211000-00007
6. Morris CL, Morris WR, Fleming JC. A histological analysis of the Müllerectomy: redefining its mechanism in ptosis repair. *Plast Reconstr Surg*. 2011;127(6):2333–2341. doi:10.1097/PRS.0b013e318213a0cc
7. Zauberman NA, Koval T, Kinori M, Matani A, Rosner M, Ben-Simon GJ. Müller’s muscle–conjunctival resection for upper eyelid ptosis: correlation between amount of resected tissue and outcome. *Br J Ophthalmol*. 2013;97(4):408–411. doi:10.1136/bjophthalmol-2012-302541
8. Rootman DB, Sinha KR, Goldberg RA. Change in Eyelid Position Following Muller’s Muscle Conjunctival Resection With a Standard Versus Variable Resection Length. *Ophthalmic Plast Reconstr Surg*. 2018;34(4):355–360. doi:10.1097/IOP.0000000000000997

8:36–8:42 am

Frontalis Muscle Flaps for Severe Adult Ptosis or Apraxia of Eyelid Opening

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Introduction: To evaluate the surgical outcomes and safety of the frontalis muscle flap eyelid reanimation technique in adult patients with severe or complex ptosis due to myogenic, paralytic, congenital, or apraxia etiologies.

Methods: A retrospective case series of 31 eyes in 21 patients who underwent frontalis muscle flap surgery at a single academic oculoplastic practice. Main outcome measures included margin-to-reflex distance 1 (MRD1), levator function (LF), lagophthalmos, and complications. Surgical success was defined as a final MRD1 ≥ 1 mm. Paired t-test was used to compare preoperative and final postoperative MRD1 values.

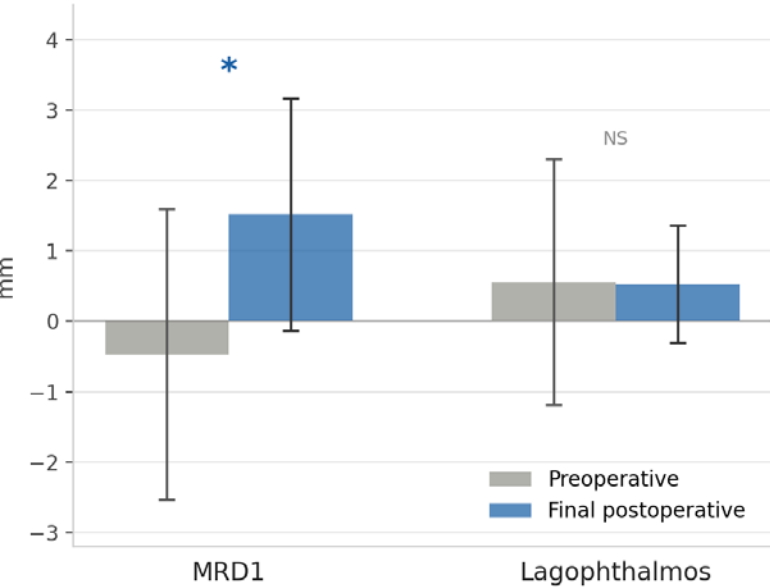
Results: There were 14 female (67%) and 7 male (33%) patients with a mean age of 50.2 years (range, 21.6–73.1). The predominant etiology was myogenic (71%), followed by paralytic (16%), apraxia of eyelid opening (6%), and mixed mechanism (6%). Underlying diagnoses included chronic progressive external ophthalmoplegia, oculopharyngeal muscular dystrophy, myotonic dystrophy, facioscapulohumeral muscular dystrophy, cranial nerve III palsy, and orbital trauma. Fifty-five percent of eyes had previously undergone at least one ptosis repair. Mean preoperative MRD1 was -0.47 mm (range, -4.5 to 5.0) with mean preoperative levator function of 4.2 mm. At a mean follow-up of 19.4 months (range, 1.0–113.6), mean final MRD1 improved significantly to 1.52 mm (range, -4.0 to 4.0 ; $p < 0.0001$). Surgical success was achieved in 25 of 31 eyes (80.6%). Mean final lagophthalmos was 0.53 mm, unchanged from the preoperative baseline of 0.56 mm. Complications occurred in 7 eyes (22.6%), including moderate intraoperative bleeding ($n=2$), recurrent apraxia ($n=2$), exposure keratopathy managed conservatively ($n=1$), flap dehiscence ($n=1$), and transient sensory changes ($n=1$). Three eyes (9.7%) required surgical revision.

Conclusions: Severe ptosis secondary to poor levator function or eyelid apraxia is a challenging condition with significant impact on visual function.¹ While this technique has been predominantly described in the pediatric population,^{2–4} few reports characterize its outcomes in adults with non-involutorial or mixed etiologies.⁵ In this cohort, the frontalis muscle flap achieved meaningful improvement in eyelid position, supporting its use as an effective salvage and primary procedure across a broad spectrum of adult ptosis etiologies.

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Figure 1



Error bars = ±1 SD. n=31 eyes for all measures. * p<0.0001 (paired t-test). NS = not significant

References

1. Eton EA, Carniciu AL, Prabhu SS, Wang GM, Kahana A. Treatment of congenital ptosis in infants with associated amblyopia using a frontalis muscle flap eyelid reanimation technique. *Ophthal Plast Reconstr Surg.* 2021;37(1):67–71.
2. Diab MMM, Abd-Elaziz K, Allen RC. Combined levator and frontalis muscle advancement flaps for recurrent severe congenital ptosis. *Eye.* 2023;37(6):1100–1106.
3. Medel R, Molina S, Vasquez LM, et al. Frontalis muscle flap versus maximal anterior levator resection as first option for patients with severe congenital ptosis. *Ophthal Plast Reconstr Surg.* 2018;34(6):565–569.
4. Spadaro JZ, Patel N, Kahana A. Frontalis muscle flap eyelid reanimation technique in adults with severe ptosis or apraxia of eyelid opening. *Orbit.* 2025;44(3):306–313.

8:42–8:48 am

BlinkAssist: Development of a Discreet Wearable Device to Restore Blink Function

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Introduction: Facial nerve palsy and hypometric blinking can result in incomplete eyelid closure, leading to exposure keratopathy and long-term corneal damage. Existing treatment options, including lubricating drops, moisture chambers, taping, and surgical interventions, are often laborious, inconvenient, and insufficient for dynamic blink restoration. Electrical stimulation to induce eyelid closure has long been proposed, however, prior systems have required bulky hardware, implanted components, or uncomfortable stimulation voltages that limit practical use.¹⁻³ This study evaluates a lightweight, flexible conductive polymer-based electrode system designed to safely and comfortably stimulate the orbicularis oculi muscle and achieve functional eyelid closure.

Methods: In this prospective experimental pilot study, a custom electrode array was fabricated using poly(3,4-ethylenedioxythiophen):polystyrene sulfonate (PEDOT:PSS), selected for its high conductivity, low impedance, mechanical flexibility, and low operating voltage requirements.^{4,5} Two electrodes were placed along the lower eyelid in line with the medial limbus and lateral canthus. Ten healthy participants were enrolled under an IRB-approved protocol. The primary outcome was eyelid closure per stimulation graded by two research members via slow-motion video recording. Secondary outcomes included subjective comfort, quality of movement, and adverse reactions. Each participant underwent ten single-pulse stimulation trials.

Results: All ten participants achieved full eyelid closure with electrical stimulation. Complete closure occurred in 68% of stimulations, significantly greater than chance by binomial test ($p < 0.001$). 93% of stimulations achieved at least 75% closure (Figure 2). Closure <50% occurred in <1% of stimulations. Mean stimulation current was 1.76 ± 0.55 mA. Comfort scores (1 = most comfortable; 10 = least comfortable) were highly favorable: mean pre-stimulation 1.2 ± 0.4 , during stimulation 2.6 ± 1.4 , and post-stimulation 1.7 ± 1.1 . No participant reported more than mild discomfort. Reflex secondary blinking was occasionally observed, although unilateral stimulation resulted in predominantly ipsilateral closure. 80% of participants rated the stimulation-evoked eyelid closure as “smooth”, the other 20% rated it as “jerky”. No adverse reactions were noted.

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Conclusions: This novel lightweight PEDOT:PSS-based stimulation system safely and effectively produced complete eyelid closure at low current levels with high comfort ratings. The thin electrodes can be concealed with light makeup, supporting potential for discreet everyday use. Movement quality was rated smooth in the majority of participants, refinement of stimulation parameters will be needed to improve closure naturalness. As a proof-of-concept study in healthy volunteers with a small sample size, future work will focus on evaluating this system in patients with facial nerve palsy to assess its role in preventing exposure-related ocular damage and restoring functional blink. These findings support a promising pathway toward a clinically useful, wearable therapeutic device.

Figure 1



Figure 2

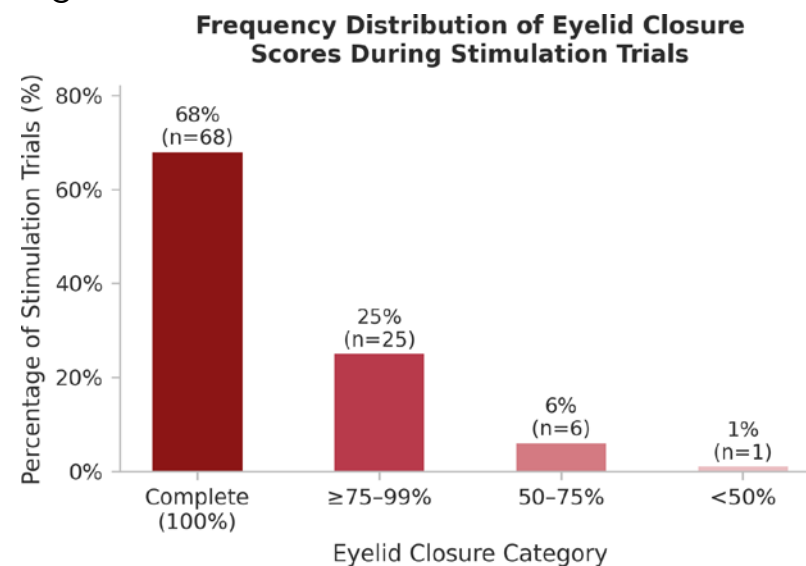


Figure 3



References

1. Scherrer E, Chaloupka K. Neurol Sci. 2024;45(5):1969-1977.
2. Frigerio A, et al. Plast Reconstr Surg. 2015;136(4):515e-523e.
3. Mäkelä E, et al. J Med Eng Technol. 2019;43(3):155-164.
4. Jiang Y, et al. Science. 2022;375(6587):1411-1417.
5. Kim E, et al. Adv Funct Mater. 2025;35(1):2411880.

8:48–8:54 am

Community-Acquired MRSA USA300 Periorbital Infections: Clinical Features, Risk Factors, and Outcomes in a Comparative Cohort Study

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Introduction: Methicillin-resistant *Staphylococcus aureus* (MRSA) infections are increasingly encountered in the broader community with the USA300 clone identified as the dominant strain in individuals without traditional risk factors.¹ Although this pathogen has been associated with periorbital infections,^{2,3} its clinical manifestation remains poorly characterized. This study compares the clinical features, management, and outcomes of MRSA-USA300 periorbital infections to Methicillin-sensitive *Staphylococcus aureus* (MSSA) and MRSA-non-USA300 strains in the largest cohort reported to date.

Methods: This is a retrospective cohort study at a single ophthalmic institution from February 2014 to August 2021, including all patients with a culture-proven *Staphylococcus aureus* periorbital infection of the brow, eyelid, orbit, lacrimal gland, or nasolacrimal system. Ocular surface and endophthalmitis cultures were excluded. Using antimicrobial susceptibility and whole genome sequencing, cases were divided into cohorts: MSSA, MRSA-USA300, MRSA-non-USA300. Patient demographics, risk factors, clinical features, management, and outcomes were collected. Statistical analysis was performed using 3-way ANOVA for categorical variables and Kruskal-Wallis test for continuous variables. Univariate and multivariate multinomial regression analyses were performed. All analyses utilized R, version 4.3.3 (R Project for Statistical Computing). Significance was defined as $p < 0.05$.

Results: A total of 231 infections were identified: MSSA (n=118), MRSA-USA300 (n=61), and MRSA non-USA300 (n=52). MRSA infections occurred in younger patients compared to MSSA (46.1 vs 62.7 years, $p < 0.001$) (Table 1), with MRSA-USA300 occurring in the youngest population (40 years, $p < 0.001$) (Table 2). Younger age remained independently associated with MRSA subtypes on univariable and multivariable analysis ($p < 0.001$) (Table 3a-b).

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Clinical presentation varied by strain. MRSA-USA300 most frequently presented as brow abscess (28%, n=17) compared to MRSA-non-USA300 (10%, n=5) and MSSA (4%, n=5). Alternatively, nasolacrimal infections predominated in MSSA (53%, n=63) but were less common in MRSA-USA300 (18%, n=11) (Table 2). MRSA strains, regardless of genotype, were more commonly associated with a cutaneous source of infection ($p<0.001$) (Table 1-3a). Rates of abscess formation, abscess size, post-septal involvement, and concurrent sinus disease were similar across groups. Polymicrobial infections were more common in MSSA compared to MRSA (22% vs 8%, $p=0.003$) (Table 1), which persisted in univariable analysis (Table 3a).

There was no difference in risk factor burden among cohorts ($p=0.189$) (Table 1-2). MRSA-USA300 most frequently occurred in individuals without identifiable risk factors (56%, n=34) compared to MSSA (37%, n=44) and MRSA-non-USA300 (42%, n=22) (Table 2). Immunosuppression and recent antibiotics were more common in MSSA compared to MRSA (31% v. 19%, $p=0.033$; 36% vs 23%, $p=0.031$) (Table 1). Alternatively, a prior MRSA infection was the greatest risk factor for MRSA ($p<0.001$) (Table 2).

Antibiotic initiation, duration, and surgical intervention were similar among groups; although, MRSA infections more commonly received antibiotics and MRSA-coverage after culture ($p=0.002$) (Table 1-2). Visual outcomes were universally favorable (Table 1-2).

Conclusions: Community-acquired MRSA, specifically USA300, accounts for a substantial proportion of *Staphylococcus aureus* periorbital infections. These cases often occur in younger patients without traditional risk factors and have a predilection for brow abscess formation and preseptal cellulitis. Screening for prior MRSA history appears most useful. Treatment and visual outcomes remain favorable across all strains.

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Table 1. Demographic and clinical characteristics of MSSA vs MRSA periorbital infections

	Entire Cohort (n=231) ¹	MSSA (n=118) ¹	MRSA (n=113) ¹	p-value ²
Demographics				
Age, years	54.6 (25.5)	62.7 (27.2)	46.1 (20.6)	p<0.001
Male	75 (32.5%)	36 (30.5%)	39 (34.5%)	p=0.575
Female	156 (67.5%)	82 (69.5%)	74 (65.5%)	
White	168 (72.7%)	87 (73.7%)	81 (71.7%)	p=0.964
Black	21 (9.1%)	10 (8.5%)	11 (9.7%)	
Asian	17 (7.4%)	8 (6.8%)	9 (8.0%)	
Hispanic	13 (5.6%)	6 (5.1%)	7 (6.2%)	
Unknown	12 (5.2%)	7 (5.9%)	5 (4.4%)	
Diagnosis				
Brow abscess	27 (11.7%)	5 (4.2%)	22 (19.5%)	
Dacryoadenitis	6 (2.6%)	3 (2.5%)	3 (2.7%)	
Nasolacrimal	93 (40.3%)	63 (53.5%)	30 (26.5%)	
Preseptal cellulitis (± abscess)	86 (37.2%)	36 (30.5%)	50 (44.2%)	
Orbital cellulitis (± abscess)	19 (8.2%)	11 (9.3%)	8 (7.1%)	
Infection source				
Cutaneous	128 (55.4%)	48 (40.7%)	80 (70.8%)	p<0.001
Other ³	103 (44.6%)	70 (59.3%)	33 (29.2%)	
Clinical features				
Abscess formation	147 (63.6%)	71 (60.2%)	76 (67.3%)	p=0.277
Abscess size ≤ 1cm**	14 (26.9%)	3 (15.0%)	11 (34.4%)	p=0.2
Abscess size > 1cm**	38 (73.1%)	17 (85.0%)	21 (65.6%)	
Post-septal involvement	19 (8.2%)	11 (9.3%)	8 (7.1%)	p=0.635
Concurrent sinus disease	14 (6.1%)	11 (9.3%)	3 (2.7%)	p=0.051
MRSA nares positivity**	17 (45.9%)	0 (0%)	17 (70.8%)	p<0.001
Polymicrobial culture**	35 (15.5%)	26 (22.4%)	9 (8.2%)	p=0.003
Identifiable risk factors				
Immunosuppression	58 (25.1%)	37 (31.4%)	21 (18.6%)	p=0.033
Prior MRSA infection	24 (10.4%)	3 (2.5%)	21 (18.6%)	p<0.001
Recent hospitalization (≤ 1 year)	24 (10.4%)	11 (9.3%)	13 (11.5%)	p=0.669
Recent antibiotic use (≤ 6 months)	69 (29.9%)	43 (36.4%)	26 (23.0%)	p=0.031
Intravenous drug use	15 (6.5%)	4 (3.4%)	11 (9.7%)	p=0.063
Environmental exposure	29 (12.6%)	17 (14.4%)	12 (10.6%)	p=0.431
Total number of risk factors				
0	100 (43.3%)	44 (37.3%)	56 (49.6%)	p=0.157
1	74 (32.0%)	43 (36.4%)	31 (27.4%)	
≥2	57 (24.7%)	31 (26.3%)	26 (23.0%)	
Management				
Antibiotics prior to culture	111 (48.1%)	50 (42.4%)	61 (54.0%)	p=0.088
Antibiotics prior to culture with MRSA coverage**	75 (67.6%)	32 (64.0%)	43 (70.5%)	p=0.543
Antibiotics after culture	203 (87.9%)	96 (81.4%)	107 (94.7%)	p=0.002
Antibiotics after culture with MRSA coverage**	170 (83.7%)	71 (74.0%)	99 (92.5%)	p<0.001
Total duration of antibiotics, days	11.3 (5.9)	10.8 (6.7)	11.8 (4.9)	0.219
Surgical intervention	147 (63.6%)	80 (67.8%)	67 (59.3%)	0.218
Visual acuity outcomes				
Visual acuity at initial presentation, logMAR	0.3 (0.5)	0.3 (0.6)	0.3 (0.5)	p=0.518
Visual acuity at final follow up, logMAR	0.3 (0.6)	0.4 (0.6)	0.3 (0.7)	p=0.215

¹ Mean (SD); n (%)² Welch Two Sample t-test; Fisher's exact test; NA³ Other includes non-cutaneous sources of infection, such as dacryoadenitis, nasolacrimal outflow infections, and orbital cellulitis

** Percentages calculated among patients with known data available

(continued)

Table 2. Clinical features of MSSA vs MRSA-non-USA300 vs MRSA-USA300 periorbital infections

	MSSA (n=118) ¹	MRSA non-USA300 (n=52) ¹	MRSA USA300 (n=61) ¹	p-value ²
Demographics				
Age, years	75 (46, 85)	53 (33, 65)	40 (30, 53)	p<0.001
Male	36 (30.5%)	17 (32.7%)	22 (36.1%)	p=0.752
Female	82 (69.5%)	35 (67.3%)	39 (63.9%)	
White	87 (73.7%)	32 (61.6%)	49 (80.4%)	p=0.58
Black	10 (8.5%)	6 (11.5%)	5 (8.2%)	
Asian	8 (6.8%)	6 (11.5%)	3 (4.9%)	
Hispanic	6 (5.1%)	4 (7.7%)	3 (4.9%)	
Unknown	7 (5.9%)	4 (7.7%)	1 (1.6%)	
Diagnosis				
Brow abscess	5 (4.2%)	5 (9.6%)	17 (27.9%)	
Dacryoadenitis	3 (2.5%)	1 (1.9%)	2 (3.3%)	
Nasolacrimal	63 (53.5%)	19 (36.5%)	11 (18.0%)	
Preseptal cellulitis (± abscess)	36 (30.5%)	24 (46.2%)	26 (42.6%)	
Orbital cellulitis (± abscess)	11 (9.3%)	3 (5.8%)	5 (8.2%)	
Infection source				
Cutaneous	48 (40.7%)	32 (61.5%)	48 (78.7%)	p<0.001
Other ³	70 (59.3%)	20 (38.5%)	13 (21.3%)	
Clinical features				
Abscess formation	71 (60.2%)	36 (69.2%)	40 (65.6%)	p=0.507
Abscess size ≤ 1cm**	3 (15.0%)	2 (16.7%)	9 (45.0%)	p=0.103
Abscess size > 1cm**	17 (85.0%)	10 (83.3%)	11 (55.0%)	
Post-septal involvement	11 (9.3%)	3 (5.8%)	5 (8.2%)	p=0.776
Concurrent sinus disease	11 (9.3%)	2 (3.8%)	1 (1.6%)	p=0.111
MRSA nares positivity**	0 (0%)	8 (88.9%)	9 (60.0%)	p<0.001
Polymicrobial culture**	26 (22.4%)	3 (5.9%)	6 (10.2%)	p=0.011
Identifiable risk factors				
Immunosuppression	37 (31.4%)	14 (26.9%)	7 (11.5%)	p=0.01
Prior MRSA infection	3 (2.5%)	8 (15.4%)	13 (21.3%)	p<0.001
Recent hospitalization (≤ 1 year)	11 (9.3%)	6 (11.5%)	7 (11.5%)	p=0.882
Recent antibiotic use (≤ 6 months)	43 (36.4%)	18 (30.8%)	10 (16.4%)	p=0.017
Intravenous drug use	4 (3.4%)	3 (5.8%)	8 (13.1%)	p=0.051
Environmental exposure	17 (14.4%)	6 (11.5%)	6 (9.8%)	p=0.679
Total number of risk factors				
0	44 (37.3%)	22 (42.3%)	34 (55.7%)	p=0.189
1	43 (36.4%)	15 (28.8%)	16 (26.2%)	
≥2	31 (26.3%)	15 (28.8%)	11 (18.0%)	
Management				
Antibiotics prior to culture	50 (42.4%)	24 (46.2%)	37 (60.7%)	p=0.062
Antibiotics prior to culture with MRSA coverage**	32 (64.0%)	15 (62.5%)	28 (75.7%)	p=0.456
Antibiotics after culture	96 (81.4%)	47 (90.4%)	60 (98.4%)	p=0.002
Antibiotics after culture with MRSA coverage**	71 (74.0%)	43 (91.5%)	56 (93.3%)	p=0.002
Total duration of antibiotics, days	10 (7, 14)	11 (7, 14)	12 (10, 15)	0.229
Surgical intervention	80 (67.8%)	32 (61.5%)	35 (57.4%)	0.335
Visual acuity outcomes				
Visual acuity at initial presentation, logMAR	0.1 (0.0, 0.4)	0.1 (0.0, 0.3)	0.0 (0.0, 0.2)	p=0.142
Visual acuity at final follow up, logMAR	0.2 (0.0, 0.5)	0.1 (0.0, 0.3)	0.0 (0.0, 0.1)	p=0.002

¹ Median (Q1, Q3); n (%)² Kruskal-Wallis rank sum test; Fisher's exact test; NA³ Other includes non-cutaneous sources of infection, such as dacryoadenitis, nasolacrimal outflow infections, and orbital cellulitis

** Percentages calculated among patients with known data available

(continued)

Table 3a. Univariate multinomial regression comparing MRSA-non-USA300 and MRSA-USA300 vs MSSA periorbital infections

Variable	Level	RRR (95% CI)		RRR (95% CI)		Global p-value
		MRSA-non-USA300 vs MSSA	p-value	MRSA-USA300 vs MSSA	p-value	
Age, years	Per unit increase	0.98 (0.97, 0.99)	0.005	0.97 (0.95, 0.98)	<0.001	<0.001
Sex	Male	1.11 (0.55, 2.23)	0.777	1.28 (0.67, 2.47)	0.452	0.754
Ethnicity	Black	0.80 (0.18, 3.46)	0.765	1.33 (0.24, 7.35)	0.741	0.571
Ethnicity	Hispanic	0.89 (0.17, 4.63)	0.889	1.33 (0.20, 9.08)	0.769	0.571
Ethnicity	Unknown	0.76 (0.15, 3.86)	0.742	0.38 (0.03, 4.55)	0.446	0.571
Ethnicity	White	0.49 (0.16, 1.52)	0.218	1.50 (0.38, 5.92)	0.561	0.571
Abscess Formation	Yes	1.49 (0.74, 2.98)	0.261	1.26 (0.66, 2.40)	0.481	0.490
Post-septal involvement	Yes	0.60 (0.16, 2.23)	0.442	0.87 (0.29, 2.62)	0.803	0.726
Concurrent sinus disease	Yes	0.39 (0.08, 1.82)	0.231	0.16 (0.02, 1.29)	0.085	0.070
Infectious source	Other (ref: cutaneous)	0.43 (0.22, 0.84)	0.013	0.19 (0.09, 0.38)	<0.001	<0.001
Number of risk factors	1 (ref: 0)	0.70 (0.32, 1.52)	0.365	0.48 (0.23, 1.00)	0.049	0.181
Number of risk factors	>1 (ref: 0)	0.97 (0.43, 2.16)	0.936	0.46 (0.20, 1.04)	0.063	0.181
Total antibiotic duration	Per unit increase	1.01 (0.95, 1.07)	0.716	1.05 (0.99, 1.11)	0.111	0.270
Surgical Intervention	Yes	0.76 (0.39, 1.50)	0.428	0.64 (0.34, 1.21)	0.169	0.366
Visual acuity at initial presentation, logMAR	Per unit increase	0.75 (0.38, 1.51)	0.422	0.97 (0.54, 1.72)	0.905	0.696
Visual acuity at final follow up, logMAR	Per unit increase	0.86 (0.46, 1.60)	0.635	0.63 (0.32, 1.24)	0.18	0.339
Polymicrobial culture	Yes	0.22 (0.06, 0.75)	0.016	0.39 (0.15, 1.01)	0.053	0.008

Table 3b. Multivariable multinomial regression comparing MRSA-non-USA300 and MRSA-USA300 vs MSSA periorbital infections

Variable	Level	Adjusted RRR (95% CI)		Adjusted RRR (95% CI)		Global p-value
		MRSA-non-USA300 vs MSSA	p-value	MRSA-USA300 vs MSSA	p-value	
Age, years	Per unit increase	0.96 (0.94, 0.98)	<0.001	0.95 (0.93, 0.97)	<0.001	<0.001
Sex	Male	0.71 (0.24, 2.08)	0.535	0.86 (0.31, 2.36)	0.773	0.822
Ethnicity	Black	0.83 (0.12, 5.89)	0.853	2.03 (0.13, 32.84)	0.619	0.170
Ethnicity	Hispanic	1.30 (0.16, 10.29)	0.804	3.40 (0.18, 63.56)	0.412	0.170
Ethnicity	Unknown	0.78 (0.06, 10.55)	0.85	2.21 (0.07, 67.05)	0.65	0.170
Ethnicity	White	0.35 (0.07, 1.85)	0.218	5.06 (0.47, 54.23)	0.18	0.170
Abscess Formation	Yes	1.09 (0.37, 3.22)	0.87	1.55 (0.55, 4.40)	0.41	0.703
Post-septal involvement	Yes	0.79 (0.11, 5.50)	0.816	0.89 (0.17, 4.81)	0.894	0.972
Concurrent sinus disease	Yes	0.69 (0.10, 4.91)	0.711	0.19 (0.02, 1.99)	0.166	0.294
Infectious source	Other (ref: cutaneous)	0.60 (0.18, 1.98)	0.401	0.24 (0.07, 0.81)	0.021	0.056
Number of risk factors	1 (ref: 0)	1.93 (0.58, 6.36)	0.281	1.01 (0.33, 3.09)	0.992	0.656
Number of risk factors	>1 (ref: 0)	2.49 (0.67, 9.26)	0.173	1.52 (0.41, 5.68)	0.533	0.656
Total antibiotic duration	Per unit increase	1.47 (0.93, 2.32)	0.097	1.29 (0.82, 2.04)	0.269	0.224
Surgical Intervention	Yes	1.03 (0.94, 1.12)	0.539	1.06 (0.97, 1.15)	0.194	0.421
Visual acuity at initial presentation, logMAR	Per unit increase	1.25 (0.40, 3.92)	0.705	0.43 (0.15, 1.21)	0.109	0.159
Visual acuity at final follow up, logMAR	Per unit increase	0.77 (0.20, 2.90)	0.694	2.44 (0.59, 10.03)	0.217	0.285
Polymicrobial culture	Yes	1.54 (0.49, 4.81)	0.462	0.53 (0.14, 1.99)	0.347	0.304

References

- Diekema DJ, Richter SS, Heilmann KP, et al. Continued emergence of USA300 methicillin-resistant *Staphylococcus aureus* in the United States: results from a nationwide surveillance study. *Infect Control Hosp Epidemiol*. Mar 2014;35(3):285–92. doi:10.1086/675283
- Rutar T, Chambers HF, Crawford JB, et al. Ophthalmic manifestations of infections caused by the USA300 clone of community-associated methicillin-resistant *Staphylococcus aureus*. *Ophthalmology*. Aug 2006;113(8):1455–62. doi:10.1016/j.ophtha.2006.03.031
- Foster CE, Yarotsky E, Mason EO, Kaplan SL, Hulten KG. Molecular Characterization of *Staphylococcus aureus* Isolates From Children With Periorbital or Orbital Cellulitis. *J Pediatric Infect Dis Soc*. Aug 17 2018;7(3):205–209. doi:10.1093/jpids/pix036

8:54–9:00 am

Safety and Efficacy of DaxibotulinumtoxinA-lanm for Benign Essential Blepharospasm and Hemifacial Spasm

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Introduction: Benign essential blepharospasm (BEB) and hemifacial spasm (HFS) are chronic, disabling disorders characterized by involuntary periocular and facial muscle contractions. OnabotulinumtoxinA is the current standard treatment and benefits most patients, but its effect lasts only about 3 months, requiring frequent reinjection and increasing treatment burden. DaxibotulinumtoxinA-lanm is a novel botulinum toxin type A formulation with prolonged duration in other indications, but has not been prospectively studied in BEB or HFS. We hypothesized it would provide clinically meaningful improvement with longer duration of effect than prior onabotulinumtoxinA.

Methods: This IRB-approved, HIPAA-compliant, prospective single-arm crossover study enrolled adults with BEB or HFS, baseline modified Jankovic Rating Scale (mJRS) score $\geq 4/8$, a validated physician-rated scale assessing spasm severity and frequency (0=asymptomatic, 8=maximum severity and frequency), with no prior surgical intervention and no neuromuscular systemic medications. Patients must have had an established dosing regiment of onabotulinumtoxinA prior to starting daxibotulinumtoxinA-lanm. Participants received daxibotulinumtoxinA-lanm at the time of their next scheduled treatment using an approximately 2:1 unit conversion from prior onabotulinumtoxinA dosing. Primary outcome was mJRS change from baseline to peak efficacy. Secondary outcomes included patient-reported time to waning, time to complete recurrence, treatment failure, and adverse events. Interim descriptive analyses were performed using patients with completed and interpretable follow-up data.

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Results: Of 20 patients receiving daxibotulinumtoxinA-lanm, mean total mJRS improved from 6.00 at baseline to 1.68 at first follow-up at 1 month, representing a mean reduction of 4.32 points (5 with BEB, 15 with HFS). Among patients with evaluable duration data, mean time to onset of symptom recurrence was 4.14 months (range 0-7; n=11), and mean time to complete recurrence was 4.53 months (range 0-8; n=10). Paired duration analysis showed increased time to onset of recurrence compared with prior onabotulinumtoxinA (2.18 vs 4.43 months; p=0.008; n=10) and increased time to complete recurrence (2.83 vs 4.61 months; p=0.046; n=9). Mean follow-up was 4.7 months (range, 1.4-7.9; n=12). One patient was a primary nonresponder and resumed prior onabotulinumtoxinA treatment. The most common adverse event reported was increased injection site discomfort relative to prior onabotulinumtoxinA, occurring in approximately one-third of patients. One patient experienced transient overcorrection, which resolved spontaneously within two weeks, and one reported transient facial asymmetry of unclear attribution. No serious treatment-related adverse events were identified.

Conclusions: In this prospective crossover study, daxibotulinumtoxinA-lanm demonstrates promising efficacy and safety for BEB and HFS, with significant mJRS improvement and prolonged duration of effect compared with prior onabotulinumtoxinA. These findings suggest daxibotulinumtoxinA-lanm may reduce injection frequency and treatment burden in periocular and facial dystonias.

References

1. Carruthers JD, Fagien S, Joseph JH, et al. DaxibotulinumtoxinA for injection for the treatment of glabellar lines: results from the SAKURA 1 and SAKURA 2 trials. *Plast Reconstr Surg*. 2020;145(1):45-58.
2. Solish N, Carruthers J, Kaufman J, et al. Overview of daxibotulinumtoxinA for injection: a novel formulation of botulinum toxin type A. *Drugs*. 2021;81(18):2091-2101.
3. Hellman A, Torres-Russotto D. Botulinum toxin in the management of blepharospasm: current evidence and recent developments. *Ther Adv Neurol Disord*. 2015;8(2):82-91.
4. Tambasco N, Filidei M, Nigro P, et al. Botulinum toxin for the treatment of hemifacial spasm: an update on clinical studies. *Toxins (Basel)*. 2021;13(12):881.
5. Bellows S, Jankovic J. Immunogenicity associated with botulinum toxin treatment. *Toxins (Basel)*. 2019;11(9):491.

9:00–9:06 am

Safety Profile of Local Tranexamic Acid Injection in Orbital and Oculofacial Surgery: A Large Retrospective Cohort Study of Adult and Pediatric Patients

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Introduction: Tranexamic acid (TXA) is an antifibrinolytic agent that, when administered subcutaneously, has been shown to reduce periocular ecchymosis following oculofacial plastic surgery. While thrombotic events and seizures have been reported with high plasma concentrations of intravenous TXA, the safety profile of subcutaneous administration remains incompletely characterized. Additionally, concerns regarding impaired wound healing have been raised in the aesthetic surgery literature, though evidence remains inconclusive.¹ Prior oculofacial studies evaluating subcutaneous TXA have not identified significant complications, although current evidence is limited to relatively small cohorts.^{2,3} Larger studies are needed to better characterize potential safety signals. We hypothesize that locally administered TXA, mixed with anesthetic for oculofacial surgery, is associated with low rates of both injection site and systemic complications.

Methods: A retrospective cohort study was performed via chart review of the electronic medical record database at a single tertiary care center. Analysis included consecutive patients who underwent oculofacial plastic surgery procedures by three surgeons after implementation of a local TXA injection protocol at a single institution from July 2023 to April 2026. The anesthetic admixture consisted of 1% lidocaine with 1:100,000 epinephrine, 0.5% bupivacaine, tranexamic acid (100 mg/mL), and 8.4% sodium bicarbonate in a 3:3:3:1 ratio, respectively (Figure 1). Only patients whose perioperative course did not involve anticoagulant medications were included.

Primary outcomes included local injection site complications and systemic adverse events. A secondary outcome was hemorrhagic events. Outcomes were stratified by surgical category (orbital, eyelid, lacrimal, and cosmetic) and by age group (pediatric <18 years vs adult).

Results: A total of 4,356 patients who received local TXA injection during oculofacial surgery were included. TXA was utilized across all surgical categories: eyelid (n=2,114), lacrimal (n=1,159), orbital (n=612), and cosmetic (n=471) (Figure 2). Minimal local injection site complications were identified, including tissue ischemia (n=2, 0.05%), allergic reaction (n=0), delayed wound healing (n=0), or retinal vascular occlusion (n=0) (Figure 3). No systemic adverse events were observed, including anaphylaxis (n=0), seizure (n=0), venous thromboembolism (n=0), or cerebrovascular accident (n=0). Subgroup analyses by surgical type and age group (pediatric vs adult) similarly demonstrated minimal intraoperative or postoperative complications.

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Hemorrhagic events (n=14, 0.32%) were encountered despite usage of local TXA, including 11 (0.25%) that were ameliorated with post-operative systemic TXA, 3 who required re-operation due to hemorrhage (n=2, 0.05% for in-office cauterization after mullerectomy and n=1, 0.02% for retrobulbar hematoma evacuation after orbital surgery), and 3 (0.07%) who required overnight admission for observation all for epistaxis (n=2, 0.05% after dacryocystorhinostomy and n=1, 0.02% after mucocele drainage).

Conclusions: In the largest retrospective series of adult and pediatric patients to date, locally administered TXA in oculofacial plastic surgery was associated with minimal injection site or systemic complications. Mullerectomy was the only procedure that required in-office cauterization for control of bleeding, while overnight admissions were most frequently needed for epistaxis after lacrimal or sinus surgery. Hemorrhagic events were rare with only 0.02% rate of retrobulbar hemorrhage, thus the use of local TXA does not appear to increase this risk relative to existing oculofacial reports of 0.06% to 3.1%.^{4,5} These findings support the safety of local TXA use across a broad range of oculofacial procedures.

Figure 1

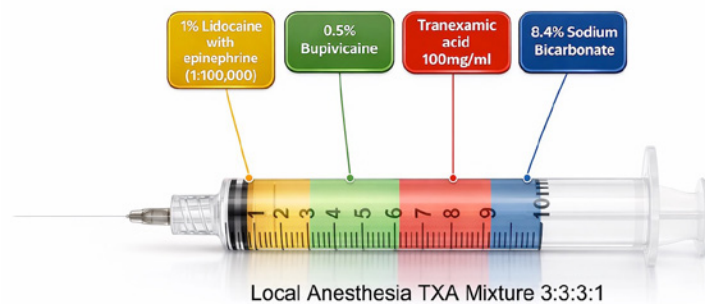


Figure 2

Figure 2. Characteristics of Patients Receiving Local Tranexamic Acid

Patient Characteristics	N (%)
Age	
Infants	1 (0.0%)
Children	127 (2.9%)
Adults	4,228 (97.1%)
Gender	
Men	1,914 (43.9%)
Women	2,441 (56.0%)
Nonbinary	2 (0.0%)
Oculofacial Surgery Category	
Orbit	612 (14.0%)
Eyelid	2,114 (48.5%)
Lacrimal	1,159 (26.6%)
Cosmetic	471 (10.8%)
Total	4,356

Figure 3

Figure 3. Perioperative Complications of Local Tranexamic Acid Cohort

Complications	N (%)
Injection Site	
Allergic reaction	0 (0.0%)
Delayed wound healing	0 (0.0%)
Tissue ischemia	2 (0.05%)
Retinal vascular occlusion	0 (0.0%)
Hemorrhagic Events	
Required post-op systemic TXA for control of bleeding	11 (0.25%)
Required admission without re-operation	3 (0.07%)
Required re-operation: in-office cauterization	2 (0.05%)
Required re-operation: orbitotomy for retrobulbar hematoma	1 (0.02%)
Systemic	
Anaphylaxis	0 (0.0%)
Seizure	0 (0.0%)
Venous thromboembolism	0 (0.0%)
Cerebrovascular accident	0 (0.0%)
Total	17 (0.39%)

References

- (1) Yalamanchili, S.; Talei, B.; Azizadeh, B.; Auersvald, A.; Frankel, A. S. Wound Healing Complications With Tranexamic Acid: Not the Silver Bullet After All. *Aesthet Surg J* 2023, 43 (12), 1409–1415. <https://doi.org/10.1093/asj/sjad177>.
- (2) Chen, T. H.; Fujimoto, D.; Feijó, E. D.; Rios, J. E.; de Figueiredo Rassi, M. N.; Leão, R.; Tao, J. P.; Limongi, R. M. Effect of Subcutaneous Injection of Tranexamic Acid on Ecchymosis and Edema After Oculofacial Surgery: A Prospective, Randomized, Split-Face, Double-Blind Study. *Aesthet Surg J* 2025, 45 (6), 563–567. <https://doi.org/10.1093/asj/sjaf036>.
- (3) Deng, W.; Kozlov, M.; Shinder, R. Effect of Subcutaneous Tranexamic Acid on Hemostasis and Ecchymosis in Oculofacial Procedures: A Double-Blind, Placebo-Controlled, Randomized Trial. *Ophthalmic Plast Reconstr Surg* 2026. <https://doi.org/10.1097/IOP.00000000000003194>.
- (4) Hass, A. N.; Penne, R. B.; Stefanyszyn, M. A.; Flanagan, J. C. Incidence of Postblepharoplasty Orbital Hemorrhage and Associated Visual Loss. *Ophthalmic Plast Reconstr Surg* 2004, 20 (6), 426–432. <https://doi.org/10.1097/01.iop.0000143711.48389.c5>.
- (5) Kansakar, P.; Sundar, G. Vision Loss Associated with Orbital Surgery – a Major Review. *Orbit* 2020, 39 (3), 197–208. <https://doi.org/10.1080/01676830.2019.1658790>.



9:17–9:18 am

Potential Benefit of Thyroidectomy in Aggressive Thyroid Eye Disease

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Introduction: Thyroidectomy is generally reserved for patients with thyroid disease who fail to achieve stable control on medical therapy, yet its effect on the course of thyroid eye disease (TED) remains unclear. This research evaluates the impact of thyroidectomy on ophthalmic and biochemical outcomes in TED.

Methods: A retrospective cohort including all patients evaluated at the multidisciplinary TED clinic between 2008 and 2024 were included. Patients were stratified into two groups based on whether they underwent thyroidectomy during their follow-up. Demographic, clinical, ophthalmic, and thyroid laboratory characteristics were recorded. Descriptive statistics, independent-samples t-tests, chi-square tests, and non-parametric analyses (including independent non-parametric testing of delta-TSH) compared patients with and without thyroidectomy, while paired t-tests assessed within-patient changes in Clinical Activity Score (CAS), visual acuity (VA), intraocular pressure (IOP), proptosis, and thyroid function tests (T3, T4, TSH, TSI).

Results: Of 369 patients, 11.7% underwent thyroidectomy (mean age 49.3 ± 16.2 years; 61% female). Baseline BCVA was good (OD 0.08 ± 0.21 , OS 0.08 ± 0.22), and color vision was normal (Ishihara OD 11.3 ± 2.0 , OS 11.4 ± 2.0 , HRR OD 5.0 ± 1.9 OS 5.0 ± 1.7). Mean proptosis measured by exophthalmometry was 20.4 ± 3.4 mm OD and 20.3 ± 3.6 mm OS and base of 112.0 ± 11.67 . Baseline intraocular pressure (IOP) in primary gaze averaged 15.8 ± 3.2 mmHg OD and 16.1 ± 3.5 mmHg OS. Thyroid laboratory parameters demonstrated marked variability, with elevated T3, T4, and TSI values at presentation, Thyroidectomy group had significantly higher TSI at presentation ($p = 0.026$).

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Within the whole cohort, CAS improved significantly over time (mean decrease from ~1.4 to ~0.6; $p < 0.001$), as reflected both by the absolute decrease and by a statistically significant reduction in the CAS ratio (final/baseline), while VA remained stable and IOP showed a modest but significant decline of ~1 mmHg per eye ($p < 0.001$). Thyroid laboratory parameters improved significantly, with reductions in T3 ($p < 0.001$), T4 ($p = 0.024$), and TSI ($p < 0.001$).

Thyroidectomy patients received more intensive TED therapies (e.g., higher IVGC, biologics and anti-thyroid treatments, radiation, and more IOP treatments; all $p < 0.001$) reflecting greater treatment needs. A trend toward greater improvement in clinical CAS was observed in the thyroidectomy group compared with the non-thyroidectomy group, although this did not reach statistical significance (Δ CAS -1.50 vs -0.76, $p = 0.11$).

Conclusions: Similar final outcomes despite higher TSI burden and more aggressive TED therapies in the thyroidectomy group indicate this cohort represented more difficult-to-treat disease. The comparable results alongside a trend toward greater CAS improvement suggest thyroidectomy benefits harder-to-treat, aggressive TED.

References

1. Bartalena L, Smith TJ. Treatment of Hyperthyroidism in Graves' Disease Complicated by Thyroid Eye Disease. *J Clin Endocrinol Metab*. 2025 Mar 17;110(4):922–930. doi: 10.1210/clinem/dgaf009. PMID: 39787151.
2. Kahaly GJ. Management of Graves Thyroidal and Extrathyroidal Disease: An Update. *J Clin Endocrinol Metab*. 2020 Dec 1;105(12):3704–20. doi: 10.1210/clinem/dgaa646. PMID: 32929476; PMCID: PMC7543578.
3. Burch HB, Cooper DS. Management of Graves Disease: A Review. *JAMA*. 2015 Dec 15;314(23):2544–54. doi: 10.1001/jama.2015.16535. Erratum in: *JAMA*. 2016 Feb 9;315(6):614. doi: 10.1001/jama.2016.0020. PMID: 26670972.



Moderator: Rachel K. Sobel

9:19–9:23 am

Targeted Nanobody–E3 Ligase Degradation of PABPN1: A Novel Treatment Strategy for Oculopharyngeal Muscular Dystrophy

Marissa Shoji

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Purpose: Oculopharyngeal muscular dystrophy (OPMD) is an autosomal dominant genetic myopathy caused by mutations in poly(A)-binding protein nuclear 1 (PABPN1), leading to progressive blepharoptosis, dysphagia, and proximal limb weakness. Current therapies are primarily supportive, with repeated surgeries often required, and do not address the underlying molecular pathology. This study designs and evaluates a novel gene-based, protein-level “degrade-and-replace” strategy using a nanobody–E3 ligase fusion construct to degrade pathogenic PABPN1 while concomitantly replenishing wild-type protein levels.

Methods: An in vitro OPMD model expressing green fluorescent protein (GFP)-tagged OPMD–PABPN1 was generated. A panel of candidate E3 ligases was screened using a GFP-binding nanobody to identify which had the highest OPMD–PABPN1 degradation. The highest-performing ligase was fused to PABPN1-specific nanobodies (3F5, 17F9) and evaluated using quantitative immunofluorescence and flow cytometry. A modified wild-type–PABPN1 construct (modWT–PABPN1) was engineered to reduce nanobody binding and was co-expressed with the nanobody–E3 ligase to assess concurrent protein replacement.

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Results: E3 ligase screening demonstrated different degrees of OPMD-PABPN1 degradation, with the E3 ligase SPOP producing the greatest reduction ($\sim 60\%$, $p < 0.001$, Figure 1). Nanobody-E3 ligase fusion constructs reduced OPMD-PABPN1 significantly more than control, nanobody alone, or E3 ligase alone (all $p \leq 0.009$, Figure 2,3). 17F9-SPOP achieved the greatest reduction (relative GFP intensity 0.15 ± 0.01 , $\sim 85\%$, $p < 0.001$). In co-expression experiments, OPMD-PABPN1 was reduced by 82% while modWT-PABPN1 retained 34% expression ($p = 0.02$, Figure 4), supporting partial preservation within a dual-action framework.

Conclusions: Gene-based nanobody-directed E3 ligase degradation with concurrent wild-type-protein replacement represents a novel, mechanistically distinct, and potentially disease-modifying therapeutic strategy for OPMD. By addressing mutant protein accumulation while maintaining PABPN1 levels, it may reduce disease progression and surgical burden in affected patients, including the need for repeated ptosis repair as well as procedures to address other systemic manifestations such as dysphagia. Beyond its immediate relevance to OPMD, this approach may offer a promising therapeutic platform for targeted protein degradation across protein-driven oculofacial and systemic diseases, with the potential to shift management of these conditions from repeated surgical correction or supportive measures toward disease-modifying treatment.

Figure 1

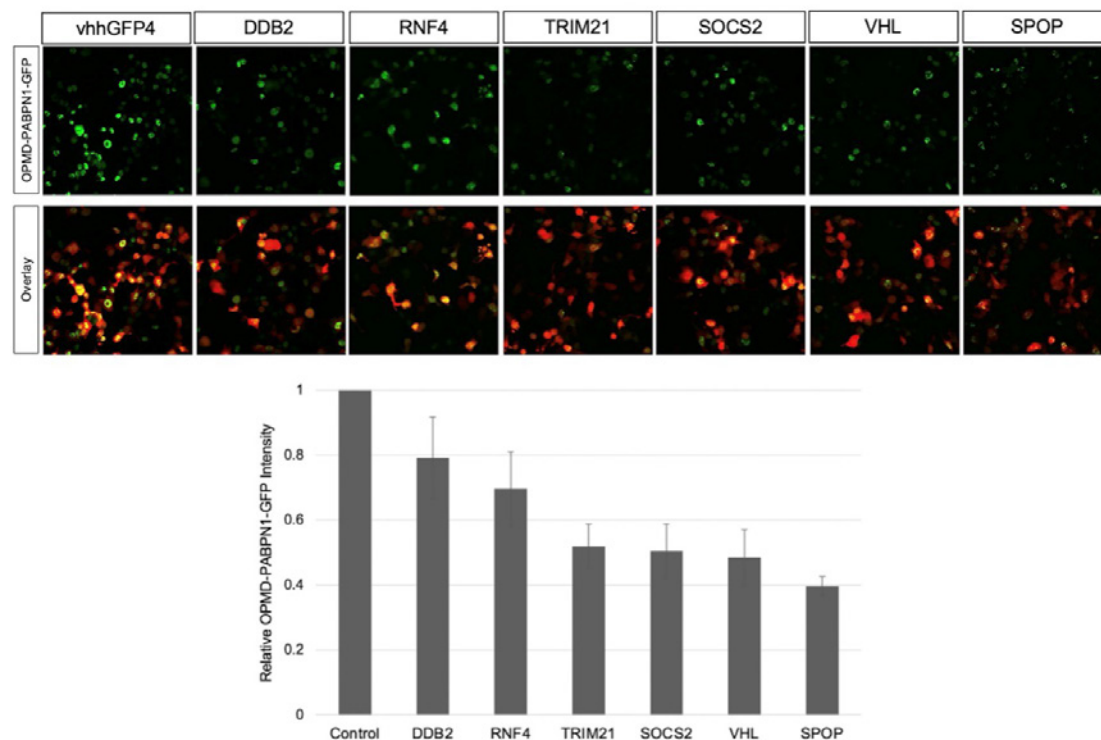
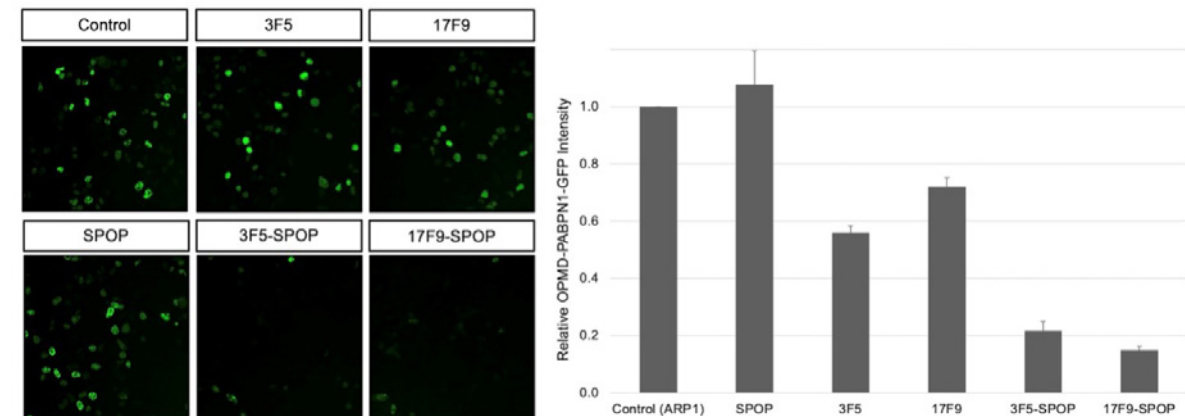


Figure 2



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Figure 3

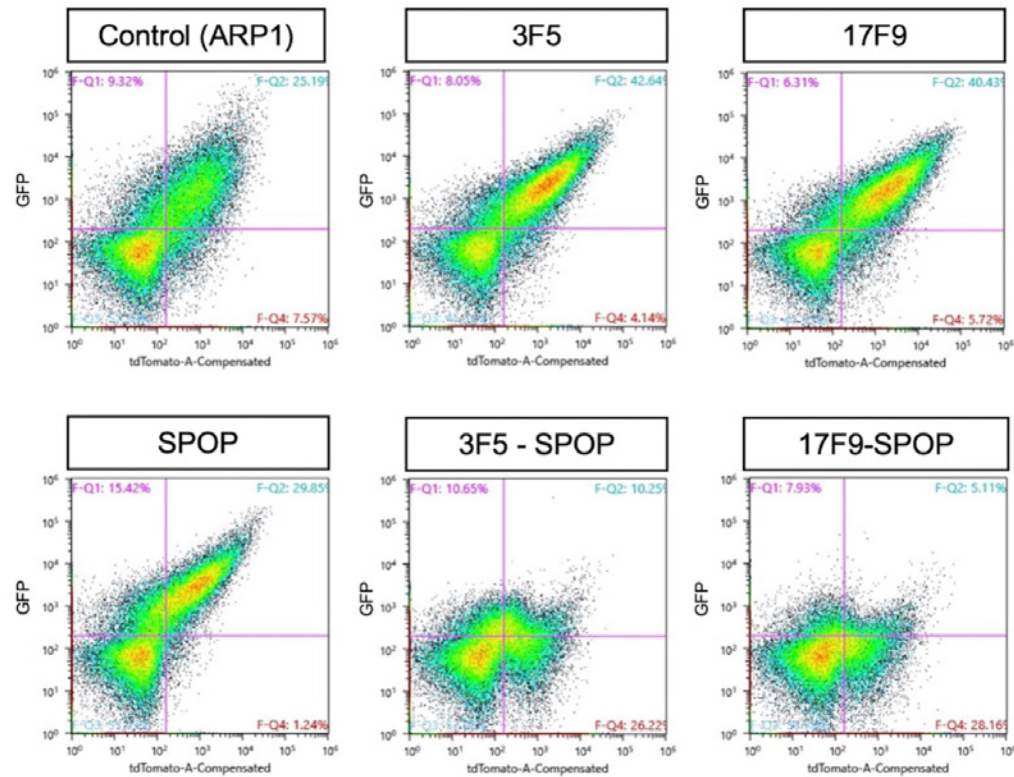
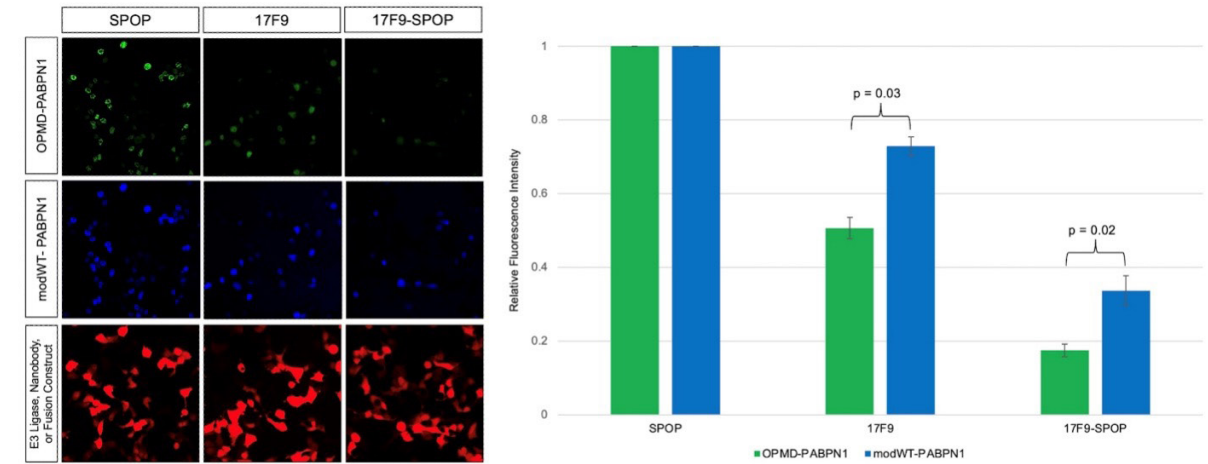


Figure 4



References

1. Allen RC et al. *Ophthalmic Plast Reconstr Surg*. 2009;25(2):103-108. doi:10.1097/IOP.0b013e3181994e21
2. Chartier A et al. *Hum Mol Genet*. 2009;18(10):1849-1859. doi:10.1093/hmg/ddp101
3. Jordan DR et al. *Ophthalmic Plast Reconstr Surg*. 2022;38(6):535. doi:10.1097/IOP.0000000000002118
4. Nallamilli B et al. *Mol Genet Metab*. 2021;132:S277. doi:10.1016/S1096-7192(21)00509-6
5. Park RB et al. *Orbit*. 2023;42(1):11-24. doi:10.1080/01676830.2022.2122514
6. Ribot C et al. *PLOS Genetics*. 2022;18(1):e1010015. doi:10.1371/journal.pgen.1010015
7. Strings-Ufombah V et al. *Mol Ther Nucleic Acids*. 2021;24:67-78. doi:10.1016/j.omtn.2021.02.017

9:23–9:27 am

Eyelid Malignancy in the Setting of Cosmetic Blepharopigmentation

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Introduction: Cosmetic blepharopigmentation involves the mechanical deposition of permanent pigmented ink below the eyelid lash line in the superficial dermis to simulate the appearance of eyeliner makeup (Figure 1A–C). The purpose of this study is to report a series of patients with blepharopigmentation who developed cutaneous eyelid malignancies and to describe the associated histopathologic findings in tattooed eyelid tissue. We present an analysis of the common risk profiles and explore the potential carcinogenic mechanisms that may underlie a relationship between blepharopigmentation and increased malignancy risk.

Methods: A 5-year, multi-practice retrospective chart review was performed to identify patients who developed histologically confirmed eyelid malignancies in the setting of prior blepharopigmentation. Data collected included age, time from tattoo placement to diagnosis, race, prior skin cancer, immunosuppression, smoking status, Fitzpatrick skin type, pigment color, tumor location, surgical management, histopathology, and follow-up.

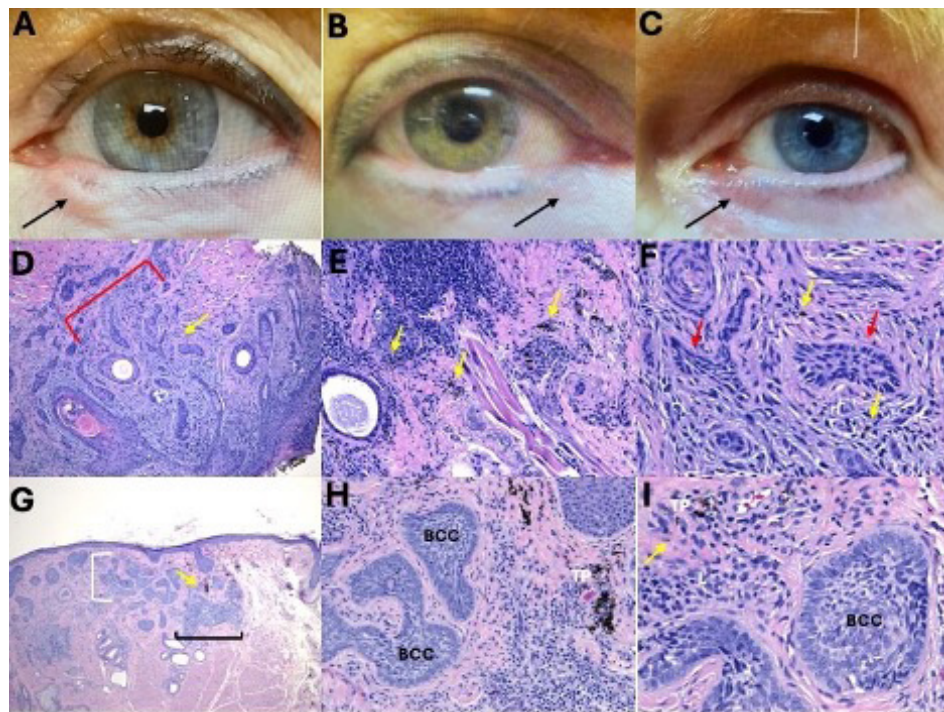
Results: Twenty females were included with a mean age of 73 years (range: 61–86 years). The majority were Caucasian (90%), followed by Asian descent (10%). All patients had black tattoo pigment along the upper and lower infra-lash lines placed more than 20 years prior to diagnosis (Figure 1A–C). Basal cell carcinoma (BCC, 85%) was most common, followed by squamous cell carcinoma (SCC, 15%). Tumors most frequently involved the lower eyelid (40%) and medial canthus (40%), followed by the lateral canthus (10%), and upper eyelid (10%). Most patients had Fitzpatrick skin types I–II (90%), and 25% were former smokers. Ten patients (50%) had a history of impaired immune function, and 30% had a previous history of skin cancer. Histopathologic analysis demonstrated dense pigment deposition with chronic inflammatory infiltrates in close spatial association with infiltrative carcinoma (Figure 1D–I). Histologically, nodular BCC was most common (50%), followed by invasive SCC (15%), infiltrative–nodular BCC (10%), infiltrative BCC (10%), superficial BCC (10%), and superficial–nodular BCC (5%). Average follow-up was 11 months. One patient with follow-up of 8 years had a recurrence of her nodular BCC twice.

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Conclusions: Cosmetic blepharopigmentation may represent a previously underrecognized risk factor for the development of eyelid malignancies in patients with established susceptibility factors such as fair skin, prior tobacco exposure, immune dysregulation, and chronic ultraviolet exposure. Long-standing pigment deposition with associated inflammation, in combination with carcinogenic components of tattoo ink and solar radiation, may contribute to keratinocyte transformation. Given the increasing popularity of cosmetic pigmentation procedures, awareness of potential long-term oncologic implications is warranted.

Figure 1



References

1. Kluger N, Koljonen V. Tattoos, inks, and cancer. *Lancet Oncol*. 2012;13(4):e161-e168.
2. Kluger N, Phan A, Debarbieux S, Balme B, Thomas L. Skin cancers arising in tattoos: Coincidental or not? *Dermatology*. 2008;217(3):219-221
3. Simmons K, Pan C, Heyde R. Blepharopigmentation: Histopathologic Observations and X-ray Microanalysis. *Ophthalmic Plast Reconstr Surg*. 1988;(1):57-62.

9:27–9:31 am

Localized Drug Delivery to the Nasolacrimal System Using a Shear-Thinning, Hyaluronic Acid-Based Hydrogel

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Introduction: The nasolacrimal drainage system is often viewed by clinicians as a simple conduit that channels tears from the ocular surface to the nasal cavity.¹ Histologic analyses demonstrate that the nasolacrimal system possesses epithelial and vascular features that are favorable for drug delivery.² These characteristics position the nasolacrimal system as an underrecognized but uniquely suited target for both local and systemic drug delivery.

Within the nasolacrimal system, the presence of the sodium iodide symporter (NIS) and its active uptake of radioactive iodine (I-131) have been well established.¹ Use of perchlorate, a competitive NIS inhibitor, has been considered in certain thyroid disorders characterized by increased exposure to I-131.³ Direct, compartmentalized delivery of perchlorate to the nasolacrimal system before I-131 administration may be a targeted strategy to reduce the risk of NLOO.

In this study, an injectable, shear-thinning hyaluronic acid-based hydrogel was developed and characterized for targeted, slow-release perchlorate delivery to the nasolacrimal system. Assessment of the feasibility of injection and removal using a novel *in vitro* model of the human nasolacrimal system was also performed.

Methods: A shear-thinning, hyaluronic acid-based hydrogel was developed with a perchlorate concentration of 50 mg/mL. Aliquots of the hydrogel were overlaid with a release medium consisting of either phosphate-buffered saline (PBS) alone or PBS with hyaluronidase. Aliquots of the release medium were collected and analyzed using Fourier transform infrared (FTIR) spectroscopy. Perchlorate concentration was quantified, and cumulative release was calculated.

In vitro injections were performed using a 3D-printed nasolacrimal system model to simulate clinical delivery. Injection characteristics, including perceived resistance, were assessed using a 5-point Likert scale. Enzymatic reversibility was evaluated by administering hyaluronidase into the model and observing hydrogel clearance.

Results: In PBS alone, an initial burst release of perchlorate was observed within the first hour, followed by plateauing kinetics with 29.8% release at 5 days. In the presence of hyaluronidase, cumulative release was increased at all time points, reaching 47.6% at 24 hours.

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In vitro testing demonstrated improved injectability of the hydrogel compared with a hyaluronic acid-based dermal filler of comparable Storage Modulus (G'), as reflected by lower subjective injection resistance scores. Subsequent hyaluronidase administration effectively degraded and cleared the hydrogel from the model, confirming enzymatic reversibility.

Conclusions: The findings of this study suggest that a shear-thinning HA-based hydrogel may serve as a feasible platform for local drug delivery within the nasolacrimal system. Using shear-thinning technology, administration of a high G' gel laden with perchlorate to the lacrimal system is shown to be possible. The drug delivery vehicle is retained securely in the nasolacrimal system, allows for sustained drug release, and can be intentionally removed in our *in vitro* model. The sustained perchlorate release observed in this study provides preliminary support for the concept of prophylactic NIS inhibition in patients undergoing I-131 therapy. This work reframes the nasolacrimal system and expands its therapeutic relevance. The development of a sustained-release hydrogel depot represents an initial step toward transforming the lacrimal drainage system from a surgically managed structure into a pharmacologically addressable target.

Figure 1

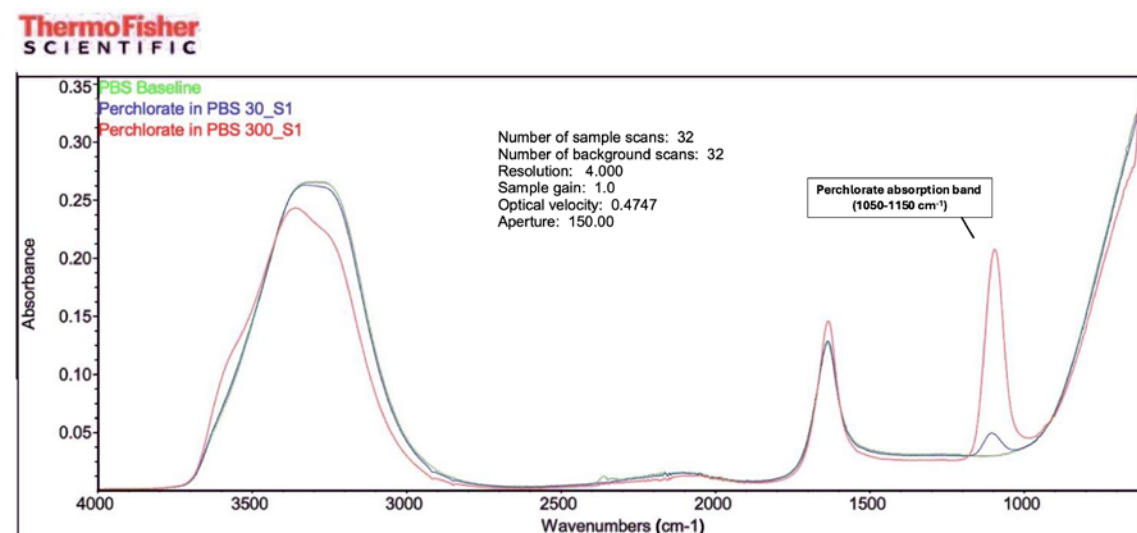
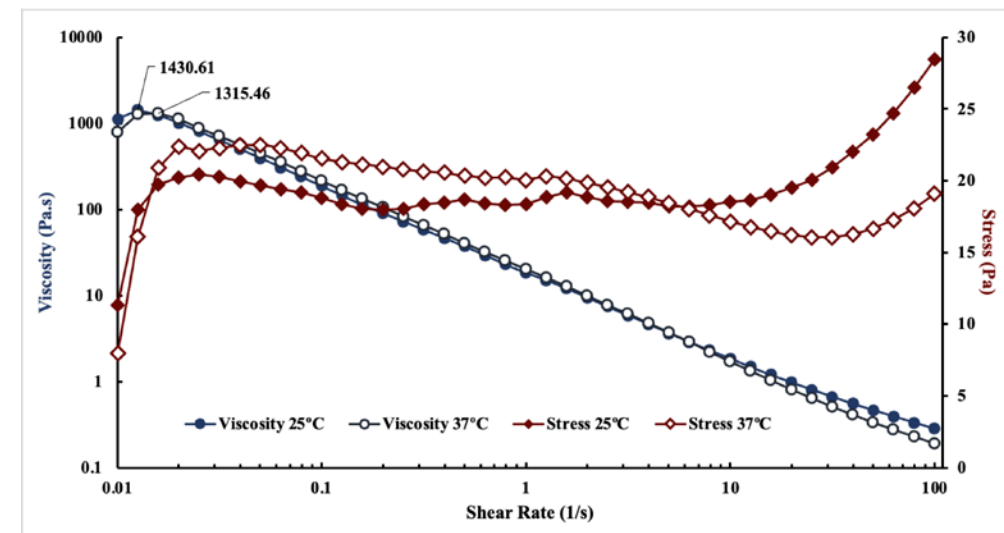


Figure 2



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Figure 3

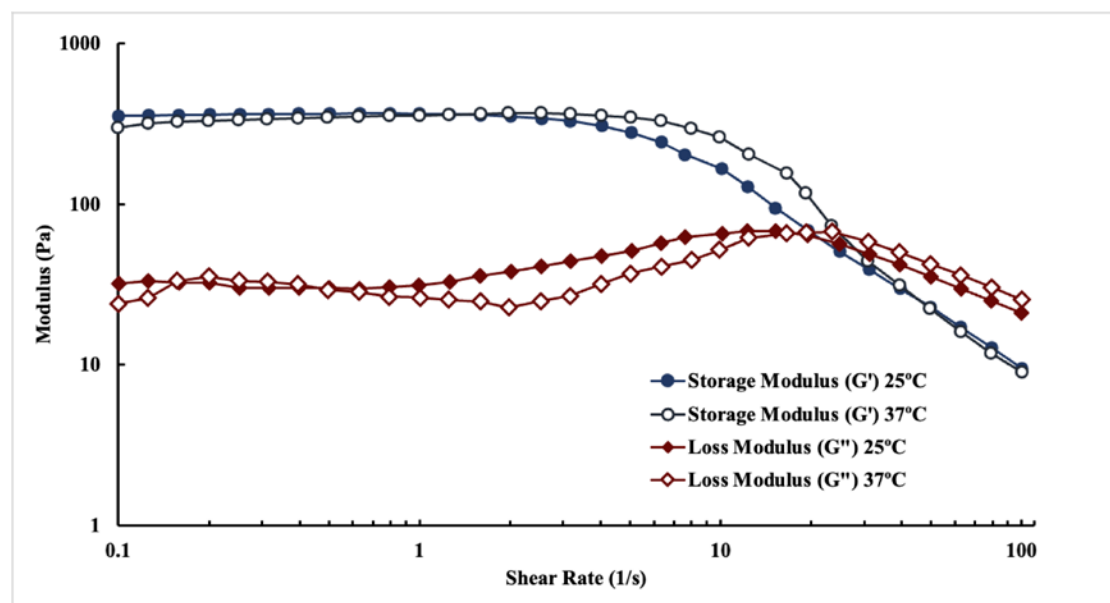
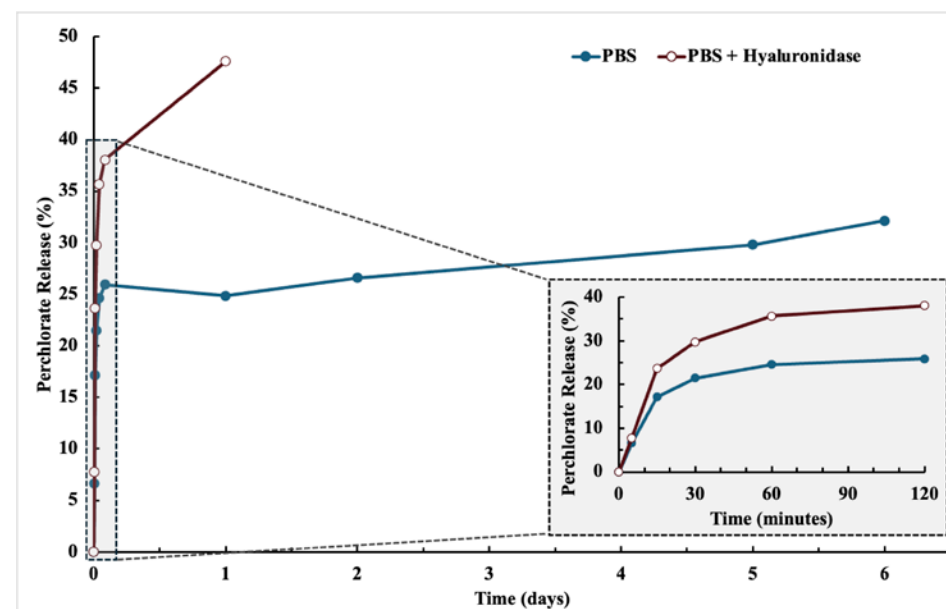


Figure 4



References

1. Morgenstern KE, Vadysirisack DD, Zhang Z, et al. Expression of sodium iodide symporter in the lacrimal drainage system: implication for the mechanism underlying nasolacrimal duct obstruction in I(131)-treated patients. *Ophthalmic Plast Reconstr Surg*. 2005;21(5):337-344. doi:10.1097/01.iop.0000179369.75569.a8
2. Paulsen F, Thale A, Kohla G, et al. Functional anatomy of human lacrimal duct epithelium. *Anat Embryol (Berl)*. 1998;198(1):1-12. doi:10.1007/s004290050160
3. Eilsberger F, Luster M, Feldkamp J. [Iodine-induced thyroid dysfunction]. *Med Klin Intensivmed Notfmed*. 2021;116(4):307-311. doi:10.1007/s00063-020-00699-8



Moderators: Ann Tran and Suzanne W. van Landingham

10:05–10:10 am

Large Population Study Identifies Novel FOXA3 Genetic Variant and Clinical Associations in Nasolacrimal Duct Obstruction

Michael Kryshchalsky¹, Kelsey Stuart², Robert Luben², Mahantesh Biradar², Narmien Murdock¹, Paul Foster², Anthony Khawaja², Kenneth Morgenstern³

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Introduction: The pathogenesis of primary acquired nasolacrimal duct obstruction (PANDO) is poorly understood. This study aims to identify novel genetic and clinical associations of PANDO using large national databases.

Methods: Case-control study and meta-analysis. PANDO cases were identified in 2,429 of 488,625 UK Biobank participants, and 3,633 of 457,563 participants in the FinnGen (Finland) database (total n=946,188). Clinical and genetic associations were assessed through multivariable Cox regression models and a genome-wide association study.

Results: Across the entire human genome, a single genetic variant was significantly associated with PANDO: rs8103278 in the *FOXA3* gene (UK Biobank: $p=7.2 \times 10^{-9}$, odds ratio 1.20; FinnGen: $p=1.4 \times 10^{-11}$, odds ratio 1.19; Meta-analysis: $p=3.9 \times 10^{-19}$, odds ratio 1.20). *FOXA3* has previously been shown to regulate goblet cell metaplasia, mucosal inflammatory cytokines, and epithelial cell dysfunction in asthma, allergic rhinitis, and cholelithiasis.^{1,2} In terms of clinical risk factors, older age, female sex, Asian ethnicity, greater adiposity, shorter height, regular alcohol consumption, anticholinergic use, and nasal septal deviation were also independently associated with incident PANDO.

Conclusions: Using nearly 1 million participants, this study is the first to identify a strong, replicable genetic association with PANDO: a single genetic variant, rs8103278, in the *FOXA3* gene. This finding sheds light into interesting pathophysiologic mechanisms driving this condition. Additional clinical risk factors suggest potential risk stratification targets.

References

1. El-Husseini ZW, Karp T, Lan A, et al. Improved Annotation of Asthma Gene Variants with Cell Type Deconvolution of Nasal and Lung Expression Quantitative Trait Loci. *Am J Respir Cell Mol Biol*. 2025;72(6):607–614. doi:10.1165/rcmb.2024-0251MA
 2. Sajuthi SP, Everman JL, Jackson ND, et al. Nasal airway transcriptome-wide association study of asthma reveals genetically driven mucus pathobiology. *Nat Commun*. 2022;13(1):1632. doi:10.1038/s41467-022-28973-7
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10:10–10:15 am

Prior DCR as an Independent Predictor of Endoscopic DCR Failure: A 516-Patient Survival Analysis

Henry Bair¹, Emma Anisman^{2,3}, Pragya Gupta³, Eshani Ragam^{1,3}, Alison Watson¹, Mindy Rabinowitz², Charlotte Marous¹

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Introduction: Patients presenting for endoscopic dacryocystorhinostomy (DCR) with a history of prior lacrimal drainage surgery are typically managed with the same surgical principles as primary cases, with the variable addition of intraoperative mitomycin C (MMC), and published series seldom distinguish their outcomes [1]. Whether prior DCR independently elevates failure risk, and whether this risk persists after adjustment for anatomic and procedural confounders, remains unresolved. We sought to quantify the independent effect of prior DCR on subsequent revision hazard to inform preoperative counseling and surgical planning.

Methods: Retrospective cohort of 516 consecutive endoscopic DCR patients with documented surgical history (July 2018 to July 2023, single academic institution). Patients were stratified by history of prior DCR on the operated side. Failure was defined as ipsilateral revision DCR, analyzed using Kaplan-Meier estimation, Cox proportional hazards regression, and multivariable adjustment for age, sex, narrow nasoseptal-lacrimal fossa (NS-LF) anatomy (previously defined in this cohort as <8.85 mm on preoperative CT by ROC analysis), concomitant septoplasty, MMC use, and chronic rhinosinusitis. Robustness was assessed by leave-one-failure-out and bootstrap resampling (1,000 iterations). Patients were censored at a common data-freeze date.

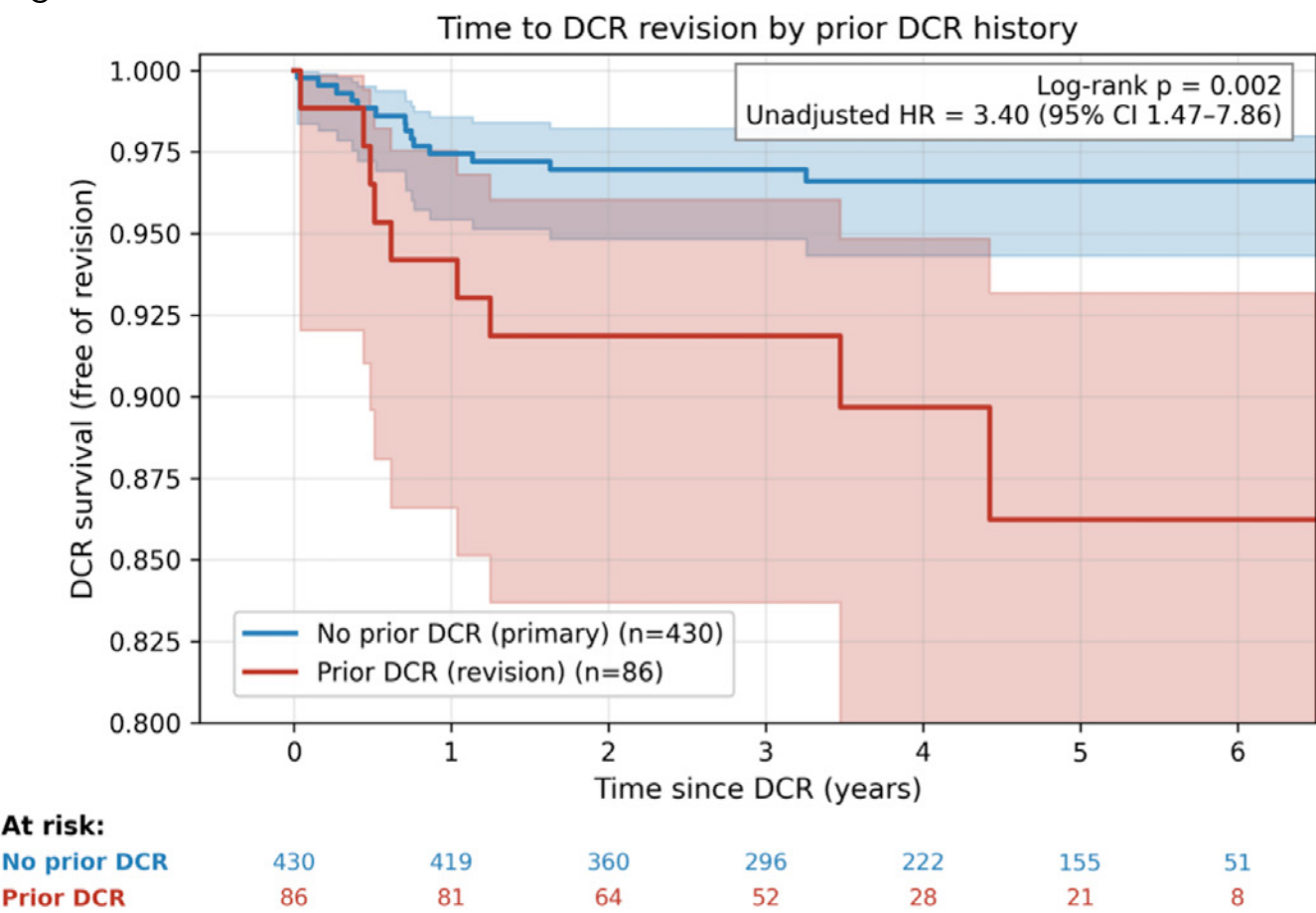
Results: Of 516 patients, 86 (16.7%) had undergone prior DCR and 430 (83.3%) were primary. Baseline demographics, NS-LF distribution, and dacryocystitis rates were comparable between groups, though mitomycin C was preferentially applied in revisions (52.3% vs 8.2%). Failure rate was 10.5% in revision cases versus 3.3% in primary cases (Fisher exact OR 3.47, 95% CI 1.45 to 8.31, $p=0.007$). In survival analysis (Figure 1), prior DCR conferred a threefold higher hazard of subsequent revision (unadjusted HR 3.40, 95% CI 1.47 to 7.86, $p=0.004$; log-rank $p=0.002$), with the proportional hazards assumption satisfied. The effect persisted after multivariable adjustment (adjusted HR 2.90, 95% CI 1.08 to 7.80, $p=0.035$) and in a sensitivity subset that additionally adjusted for chronic rhinosinusitis (adjusted HR 3.41, 95% CI 1.09 to 10.66, $p=0.035$). The bootstrap distribution placed HR above 1.0 in 98.9% of 1,000 resamples. Among the 22 failed patients with documented repeat DCR outcomes at one year, 19 (86.4%) achieved success. The highest-risk preoperative subgroup combined prior DCR with narrow NS-LF anatomy (7 of 38 failures, 18.4%), compared with 6 of 228 (2.6%) in patients with neither factor.

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Conclusions: Prior DCR is an independent predictor of subsequent endoscopic DCR failure, with threefold elevated hazard that persists after adjustment for anatomic, procedural, and inflammatory covariates. This risk is not explained by available measured confounders and warrants a distinct preoperative counseling framework for revision candidates. Among the patients with failure of revision DCR, subsequent repeat surgery is successful in approximately 85% of patients. These findings identify a readily ascertained preoperative factor that should be explicitly incorporated into risk stratification alongside anatomic assessment.

Figure 1



References

1. Allon R, Cohen O, Bavnik Y, et al. Long-term Outcomes for Revision Endoscopic Dacryocystorhinostomy—The Effect of the Primary Approach. *Laryngoscope*. 2021;131(3):E682–E688. doi:10.1002/lary.28795

10:15–10:20 am

A Simplified Technique for Minor Salivary Gland Transplantation in Severe Aqueous-Deficient Dry Eye

Denise Kim, Cameron Yang

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Introduction: Minor salivary gland transplantation (MSGT) to the conjunctival surface is a surgical option for severe aqueous-deficient dry eye, with multiple technical variations described. Because saliva shares key compositional features with aqueous tears, MSGT can provide continuous ocular surface lubrication for patients with Sjögren disease, Stevens-Johnson syndrome, graft-versus-host disease, and other refractory ocular surface disorders associated with reduced tear production.

Some MSGT techniques use a superior rectus tacking suture during graft placement; whether this step is necessary for graft vascularization and function remains unclear. We report our institutional experience with MSGT using a simplified approach that omits a superior rectus tacking suture, present clinical outcomes, and provide postoperative fluorescein angiography evidence of deep graft vascularization with this approach.

Methods: Retrospective case series of consecutive patients undergoing MSGT to the bulbar surface at a single institution (2021–present). Twelve patients (age range, 5–83 years) underwent 19 transplants. Patients had severe, refractory aqueous-deficient dry eye with significant ocular surface disease despite maximal medical therapy. All procedures were performed without a rectus muscle tacking suture. Improvement was assessed by patient-reported outcomes and the Oxford Grading Scheme for keratopathy; complications and need for revision were recorded. Postoperative fluorescein angiography was obtained in four grafts to assess graft vascularization.

Results: Sixteen of 19 grafts (84%) were associated with improved ocular surface findings (Figure 2) and/or patient comfort at follow-up. Of the remaining three grafts, one was recently performed with outcomes pending, one had limited improvement in the setting of ongoing bandage contact lens dependence for trichiasis, and one was lost to follow-up. Fluorescein angiography (Figure 4) demonstrated deep graft vascularization postoperatively despite omission of a superior rectus tacking suture. Postoperative challenges included graft override onto the cornea in two cases requiring surgical revision and one case of corneal infection.

Conclusions: MSGT was associated with improved ocular surface findings and patient comfort in the majority of treated eyes. Postoperative fluorescein angiography evidence of deep graft vascularization suggests a superior rectus tacking suture is not required for graft perfusion and function. This simplified technique may offer meaningful benefit for patients with severe, refractory aqueous-deficient dry eye, although prospective studies with standardized outcome measures are needed.

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Figure 1

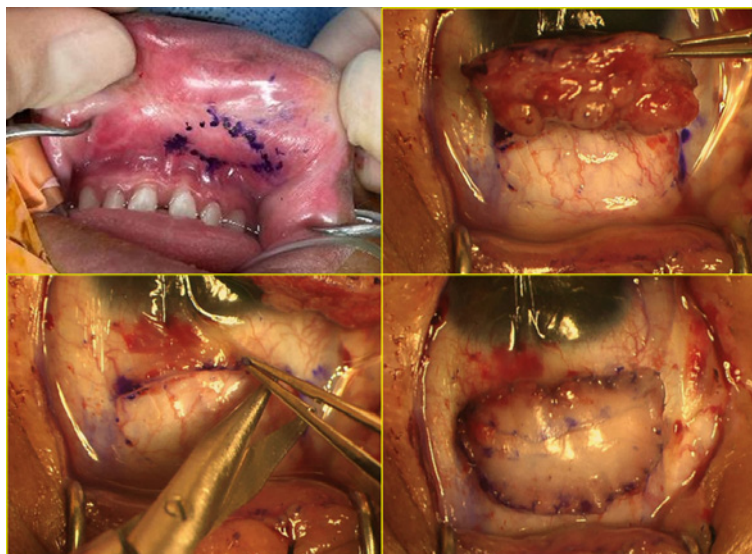


Figure 2

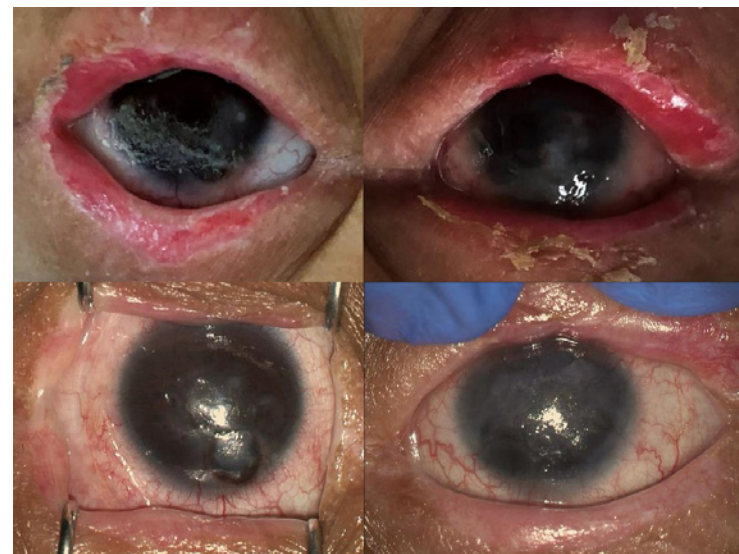


Figure 3



Figure 4



Figure 5



References

1. Geerling G, Raus P, Murube J. Minor salivary gland transplantation. *Dev Ophthalmol*. 2008;41:243-254. doi:10.1159/000131093
2. Marinho DR, Burmann TG, Kwitko S. Labial salivary gland transplantation for severe dry eye due to chemical burns and Stevens-Johnson syndrome. *Ophthalmic Plast Reconstr Surg*. 2010;26(3):182-184. doi:10.1097/IOP.0b013e3181b8c3ad
3. Sant' Anna AE, Hazarbassanov RM, de Freitas D, Gomes JÁ. Minor salivary glands and labial mucous membrane graft in the treatment of severe symblepharon and dry eye in patients with Stevens-Johnson syndrome. *Br J Ophthalmol*. 2012;96(2):234-239. doi:10.1136/bjo.2010.199901
4. Wakamatsu TH, Sant'Anna AEBPP, Cristovam PC, Alves VAF, Wakamatsu A, Gomes JAP. Minor Salivary Gland Transplantation for Severe Dry Eyes. *Cornea*. 2017;36 Suppl 1:S26-S33. doi:10.1097/ICO.0000000000001358
5. Vazirani J, Bhalekar S, Amescua G, Singh S, Basu S. Minor salivary gland transplantation for severe dry eye disease due to cicatrising conjunctivitis: multicentre long-term outcomes of a modified technique. *Br J Ophthalmol*. 2021;105(11):1485-1490. doi:10.1136/bjophthalmol-2020-316611

10:20–10:25 am

Autologous Minor Salivary Gland Transplant for Surgical Treatment of Severe Dry Eye Disease

Marissa K. Shoji^{1,2}, Sarah M. Cheng², Nahia Dib El Jalbout², Catherine Y. Liu², Bobby S. Korn², Don O. Kikkawa²

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Introduction: Dry eye disease is a prevalent condition causing significant ocular discomfort. Chronic, severe cases may lead to decreased vision, reduced quality of life, and potential consequences including corneal epitheliopathy, neovascularization, ulcers, or permanent vision loss. While many patients respond to conventional therapies including artificial tears, topical anti-inflammatory agents, contact lenses, or punctal occlusion, severe disease including that due to cicatrizing conditions may remain refractory to maximal medical management. Autologous minor salivary gland transplantation (MSGT) is a surgical technique in which intraoral donor glands are harvested and grafted to the conjunctiva with the goal of restoring ocular surface lubrication. This study aims to evaluate the surgical outcomes, efficacy, and safety of autologous MSGT in patients with ocular surface dryness refractory to conventional medical therapy.

Methods: A retrospective review was performed to assess patients who underwent MSGT at a single institution between 2018 and 2025 for severe dry eye disease. A graft consisting of oral mucosa, submucosa, and minor salivary glands was harvested from the inner lower lip and secured along the superior fornix, inferior fornix, or both. Outcomes included patient-reported symptom improvement, best-corrected visual acuity (BCVA), corneal fluorescein staining, and reduction in lubricant dependence.

Results: Twelve eyes (mean age 62.8 years, range 25–76; 83.3% female) underwent MSGT. Dry eye causes included Stevens–Johnson syndrome (SJS, n=2), ocular cicatricial pemphigoid (OCP, n=2), graft-versus-host disease (GVHD, n=2), predominantly ocular Sjogren’s syndrome (n=3), limbal stem cell deficiency from chemical burn (n=1), iatrogenic dry eye from cosmetic eyelid surgery performed abroad (n=1), and keratitis sicca after resection of lacrimal gland adenoid cystic carcinoma with subsequent orbital radiation (n=1). All patients had persistent and severe dry eye symptoms despite conservative measures (Figure 1A). Graft placement included the superior (n=6), inferior (n=3), and both inferior and superior (n=3) fornix, with a mean MSGT graft size 2.6 ± 0.5 cm² (Figure 1B). At a mean follow-up of 12.6 months, all eyes (100%) were reported clinically improved, with subjective improvement in patient-reported symptoms as well as corneal fluorescein staining across the cohort (Figure 1C, D). The majority (75%) reported decreased ocular lubricant dependence, and BCVA was stable or improved in all eyes. No ocular or donor site complications were noted, including intraoral hypesthesia or graft necrosis.

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Conclusions: In our experience, autologous minor salivary gland transplantation is an effective and well-tolerated surgical option for patients with severe, refractory dry eye disease across a range of etiologies. Prior studies have reported efficacy primarily in cicatrizing conjunctivitis due to SJS, OCP, and GVHD, with limited data on ocular burns. To our knowledge, this is the first report of MSGT utilized successfully for iatrogenic severe dry eye following cosmetic eyelid surgery and following lacrimal gland tumor resection and orbital radiation. Further investigation of MSGT as a surgical option in the stepwise management of severe dry eye disease is warranted.

Figure 1

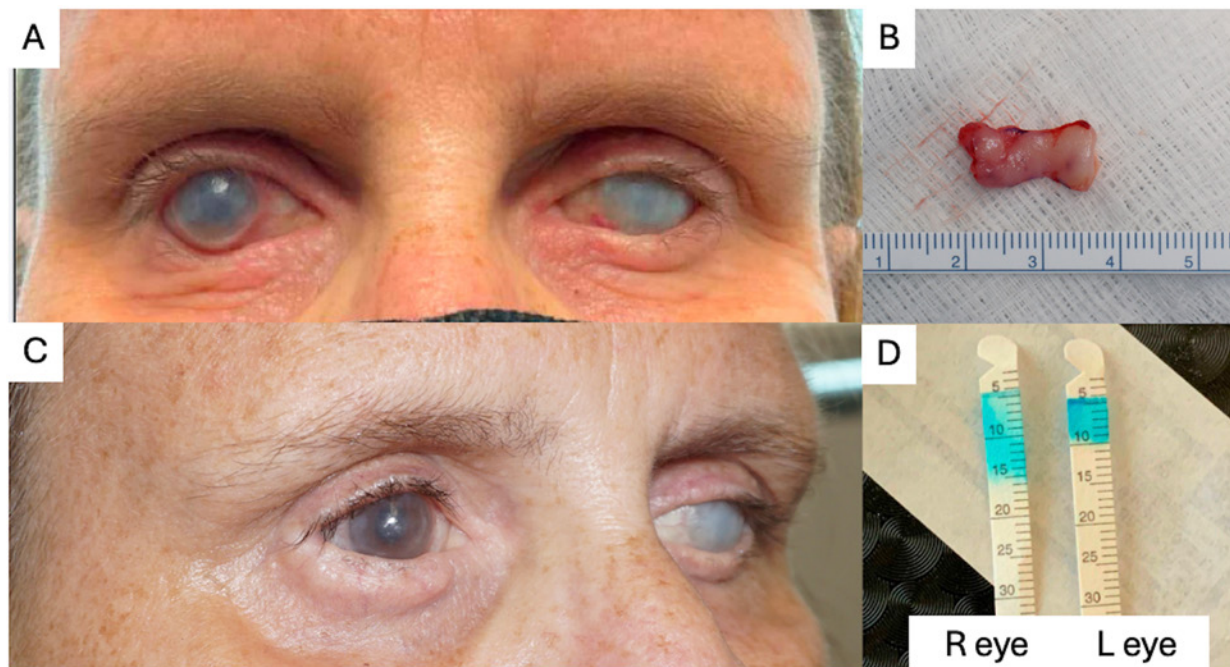


Figure 1. Patient with bilateral limbal stem cell deficiency from Sjogren's disease underwent right lower lid fornix reconstruction, lid retraction repair, and buccal minor salivary gland transplant (MSGT). A. Pre-operatively, significant bilateral corneal opacity, neovascularization, and conjunctival injection is noted. B. A buccal graft with mucosa, submucosa, and salivary glands is harvested and grafted into the right lower fornix. C. Postoperatively, there is significant improvement in patient symptoms, corneal opacity, neovascularization, and conjunctival injection on the right. D. Schirmer test confirms relative difference between right eye (with MSGT) and left eye (without MSGT) tear production 6 months postoperatively.

References

1. Wang et al. *International Journal of Surgery*, 2025.
2. Vazirani et al. *British Journal of Ophthalmology*, 2021.



FEATURED SPEAKER: GREGORY BORSCHER, MD

Moderator: Michael T. Yen

Friday, October 9

10:32-10:52 am

Corneal Neurotization for Oculoplastic Surgeons



Moderators: Robert A. Goldberg and Lora D. Glass

1:01–1:07 pm

Demographic Risk Factors for Thyroid Eye Disease in Pediatric Hyperthyroidism

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Introduction: Thyroid eye disease (TED) is an autoimmune orbitopathy occurring in the setting of thyroid dysfunction, most commonly Graves disease. While TED epidemiology has been well-characterized in adults, its risk profile in pediatric patients remains incompletely understood. Existing literature reports TED prevalence of 17–40% among pediatric Graves disease patients, with most cases described in the adolescent period, a pattern that contrasts with the findings of the present study.¹ Prior studies have also documented racial and ethnic variation in TED prevalence and age of peak presentation in adult populations, with Black patients demonstrating higher prevalence and younger peak ages compared to Caucasian patients, though comparable data in pediatric cohorts are lacking.^{2,3} Whether demographic factors including pubertal status, sex, and race/ethnicity independently influence TED risk among children with hyperthyroidism remains unstudied in large real-world cohorts. Identification of high-risk demographic subgroups could meaningfully inform ophthalmologic surveillance strategies in pediatric hyperthyroidism.

Methods: This retrospective cohort study utilized the TriNetX US Collaborative Network, a federated electronic health record database encompassing over 115 million patients across 67 healthcare organizations. Patients with incident thyrotoxicosis (ICD-10 E05.x) diagnosed at age ≤ 17 years were identified and stratified by sex, race/ethnicity, and pubertal status at diagnosis (prepubertal <13 years vs. adolescent 13–17 years). Patients with any TED-related diagnosis, medication, or procedure prior to index were excluded to ensure incident-only outcome ascertainment. The primary outcome was a TED composite including exophthalmic conditions, eyelid retraction, strabismus, disorders of binocular movement, exposure keratoconjunctivitis, and related orbital and adnexal diagnoses. Five-year Kaplan-Meier survival analyses with log-rank testing and Cox proportional hazards modeling were performed for each demographic comparison.

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Results: The analytic cohort included 23,396 pediatric patients with incident hyperthyroidism. Prepubertal patients (<13 years; n=7,159) demonstrated significantly higher 5-year TED risk than adolescent patients (13–17 years; n=16,237), with risks of 9.97% versus 6.87% respectively (HR 0.728, 95% CI 0.663–0.800 with adolescent as reference; log-rank $p<0.001$). Male and female patients demonstrated similar 5-year TED risk (6.70% vs. 7.37%; HR 0.93, 95% CI 0.83–1.05; $p=0.234$). Black (10.97%; HR 2.142, 95% CI 1.82–2.53; $p<0.001$), Hispanic (8.92%; HR 1.84, 95% CI 1.59–2.12; $p<0.001$), and Asian patients (8.20%; HR 1.61, 95% CI 1.27–2.02; $p<0.001$) each demonstrated significantly elevated TED risk relative to Non-Hispanic Caucasian patients (5.3%).

Conclusions: In this large real-world cohort of pediatric hyperthyroid patients, younger age at diagnosis and minority race/ethnicity were independently associated with elevated 5-year TED risk. Prepubertal children carried significantly higher TED risk than adolescents. Black, Hispanic, and Asian patients each demonstrated markedly elevated risk compared to Non-Hispanic Caucasian patients, highlighting meaningful racial disparities in pediatric TED burden. These findings support heightened ophthalmologic surveillance in younger children and minority populations with pediatric hyperthyroidism.

References

1. Li J, Austin J, Douglas RS, Nallasamy S. Pediatric hyperthyroidism and thyroid eye disease management. *J AAPOS*. 2023;27(3):123–128. doi: 10.1016/j.jaapos.2023.02.008
2. Ramesh S, Zhang QE, Sharpe J, et al. Thyroid eye disease and its vision-threatening manifestations in the Academy IRIS Registry: 2014–2018. *Am J Ophthalmol*. 2023;253:74–85. doi: 10.1016/j.ajo.2023.04.013
3. Wang D, Marous C, Celiker P, et al. The association of race with thyroid eye disease presentation and outcomes. *Front Ophthalmol*. 2024;3:1309850. doi: 10.3389/fopht.2023.1309850

1:07–1:13 pm

Extended 6-Week Teprotumumab Interval Reduces Audiometric Deterioration 2.6-Fold Compared to a Standard 3 Week Interval Schedule

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Introduction: Teprotumumab-related hearing dysfunction has been reported in 10% of patients in phase 2 and 3 RCTs, rising to 50% in “high risk” patients with pre-existing hearing dysfunction. 1,2,3 The FDA approved infusion protocol consists of 8 infusions administered 3 weeks apart. At present there is no established protocol specifically tailored to managing patients with hearing dysfunction. In this patient group, we increased the interval between infusions to 6 weeks. This study aims to objectively evaluate the incidence of teprotumumab induced ototoxicity in patients treated with 6-week intervals, using the gold standard of baseline and post treatment audiometry.

Methods: In this retrospective observational case series, consecutive patients who had been prescribed teprotumumab for the treatment of TED and had hearing loss at baseline (diagnosed with formal audiometry) were considered for inclusion. One group received treatment at the FDA recommended 3-week interval, while the second group received treatment every 6 weeks. All patients with baseline dysfunction were presented with the option of joining the 6-week group and were therefore allocated randomly. The primary outcome measure was clinically significant change in audiometry as defined per American Speech Language Hearing Association (ASHA) criteria. Audiometry was completed at baseline and at 24 weeks. Secondary outcomes included change in clinical activity score (CAS), proptosis as measured by exophthalmometry and the Gorman diplopia score.

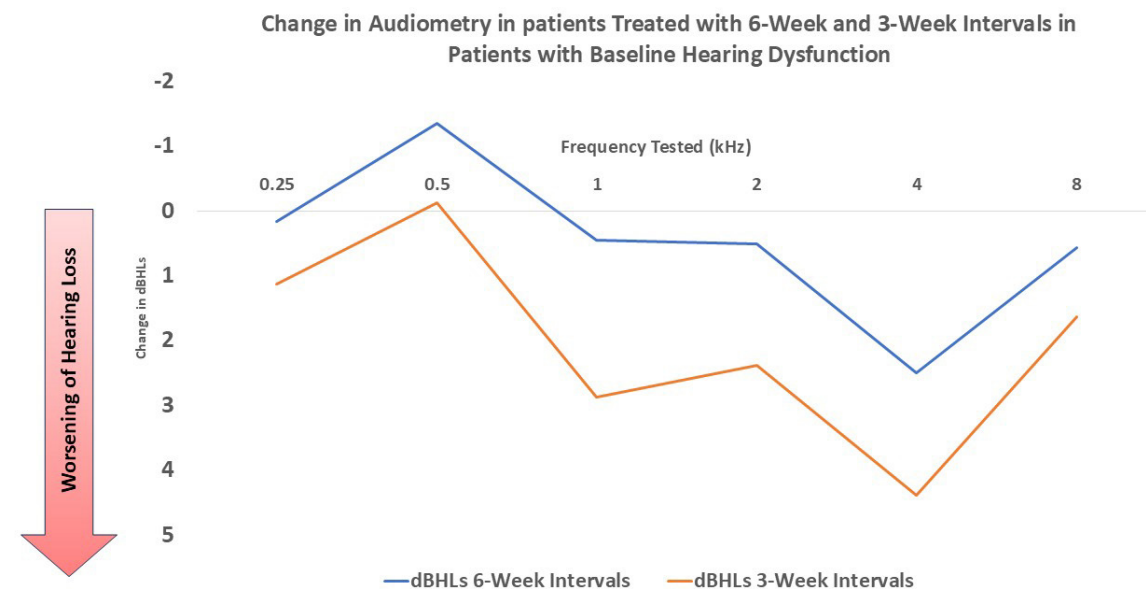
Results: Thirty-eight patients were included. 18 patients were in the 6-week interval group (13 females, 5 males, mean (SD) age: 57 (15)). 20 patients (16 females, 4 males) were placed in the 3-week interval group (mean (SD) age: 57 (12)). At 24 weeks, 3/18 (17%) patients in the 6-week group developed significant worsening of their hearing while 9/20 (45%) in the 3-week group developed significant worsening of hearing on audiometry ($p < 0.05$). The relative risk reduction of worsening hearing in the 6-week group was 62%. All changes were classified as mild; no moderate hearing changes were observed. There were no differences in efficacy between the two groups (change in CAS ($p = 0.4$), proptosis ($p = 0.3$) and diplopia scores ($p = 0.3$)).

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Conclusions: The 6-week interval regimen resulted in a 62% reduction in risk of hearing dysfunction in patients with TED. Treatment with this protocol did not compromise treatment efficacy for clinical outcomes such as; proptosis, CAS and the Gorman diplopia score. These findings lend support to the importance of audiometry screening prior to initiation of treatment and suggest that extending the interval between treatments may alleviate teprotumumab related hearing loss.

Figure 1



References

1. Smith TJ, Kahaly GJ, Ezra DG, Fleming JC, Dailey RA, Tang RA, Harris GJ, Antonelli A, Salvi M, Goldberg RA, Gigantelli JW, Couch SM, Shriver EM, Hayek BR, Hink EM, Woodward RM, Gabriel K, Magni G, Douglas RS. Teprotumumab for Thyroid-Associated Ophthalmopathy. *N Engl J Med*. 2017 May 4;376(18):1748-1761. doi: 10.1056/NEJMoa1614949. PMID: 28467880; PMCID: PMC5718164.
2. Douglas RS, Kahaly GJ, Patel A, Sile S, Thompson EHZ, Perdok R, Fleming JC, Fowler BT, Marocci C, Marinò M, Antonelli A, Dailey R, Harris GJ, Eckstein A, Schiffman J, Tang R, Nelson C, Salvi M, Wester S, Sherman JW, Vescio T, Holt RJ, Smith TJ. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020 Jan 23;382(4):341-352. doi: 10.1056/NEJMoa1910434. PMID: 31971679.
3. Keen JA, Correa T, Pham C, Claussen AD, Hansen MR, Carter KD, Shriver EM. Frequency and Patterns of Hearing Dysfunction in Patients Treated with Teprotumumab. *Ophthalmology*. 2024 Jan;131(1):30-36. doi: 10.1016/j.ophttha.2023.08.001. Epub 2023 Aug 9. PMID: 37567417.

1:13–1:19 pm

Predictors and Risk Stratification for Relapse After Teprotumumab for Thyroid Eye Disease

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Introduction: Relapse after teprotumumab for thyroid eye disease (TED) is common, but reliable predictors remain poorly defined. This study developed an exploratory multivariable model to predict relapse after teprotumumab and assess the feasibility of risk stratification.

Methods: This multicenter retrospective cohort study included patients with moderate-to-severe TED treated with ≥ 4 infusions of teprotumumab across 8 institutions, with ≥ 1 year of follow-up after treatment initiation. Relapse was defined as progression of disease signs or symptoms following a period of improvement or stability, adapted from OPTIC-X trial criteria: increased proptosis ≥ 2 mm, increased clinical activity score (CAS) ≥ 2 points, worsened diplopia, or increased extraocular muscle (EOM) restriction ≥ 1 point. Multivariable logistic regression was performed to identify predictors of relapse, with predicted probabilities used to stratify patients into risk groups.

Results: Relapse occurred in 187/355 patients (52.7%), with a median time to relapse of 11.3 months (IQR 8.5–14.1). On univariable analysis, older age (OR 1.20 per decade, 95% CI 1.02–1.40; $p=0.025$), greater number of prior TED treatments (OR 1.55 per treatment, 95% CI 1.14–2.17; $p=0.007$), active TED at baseline (OR 3.23, 95% CI 1.22–10.0; $p=0.026$), higher baseline diplopia (GDS ≥ 2 OR 1.67, 95% CI 1.09–2.56; $p=0.018$), and greater baseline proptosis (OR 1.07 per mm, 95% CI 1.01–1.15; $p=0.031$) were each associated with relapse. The final multivariable model incorporating age, smoking, CAS, GDS, TSI, and prior steroid treatment achieved an AUC of 0.737. Higher baseline diplopia severity (GDS ≥ 2) was the strongest independent predictor (adjusted OR 6.08, 95% CI 1.11–38.74; $p=0.044$).

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Exploratory risk stratification identified low-, intermediate-, and high-risk groups with observed relapse rates of 31.4%, 40.0%, and 74.3%, respectively. A simplified 6-item clinical checklist (smoking history, CAS ≥ 3 , GDS ≥ 2 , elevated TSI, prior steroid exposure, proptosis >22 mm) yielded relapse rates of 22% in the low-risk group versus 63% in the high-risk group, representing a practical bedside tool for risk stratification. Sensitivity analyses across treatment-naïve, 8-dose, and DON-excluded cohorts showed consistent results.

Domain-specific analysis revealed proptosis as the most common domain to meet relapse criteria (39.7%), followed by CAS (23.1%), diplopia (19.7%), and EOM restriction (15.2%). Notably, predictors differed across domains, with higher baseline severity in a given domain associated with relapse in that domain.

Conclusions: These findings support the feasibility of risk stratification for relapse after teprotumumab. Baseline disease phenotype, severity, and prior treatment burden are informative predictors of relapse, and multivariable modeling may guide future TED management and validation studies.

Figure 1

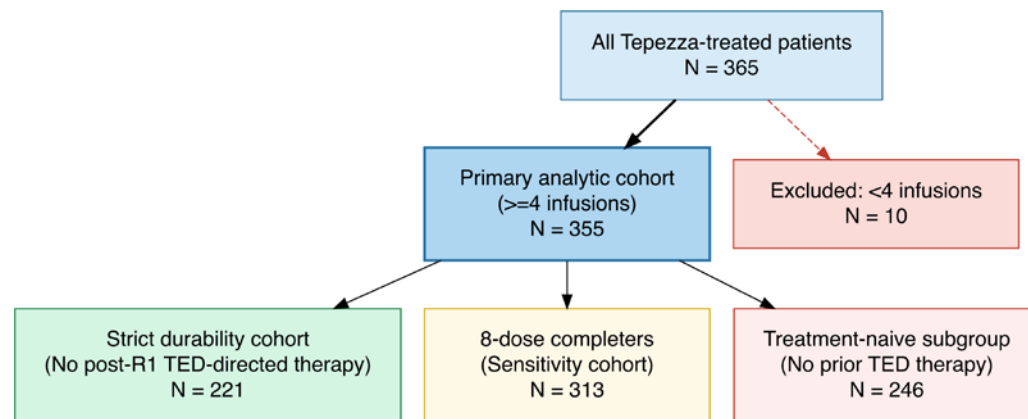
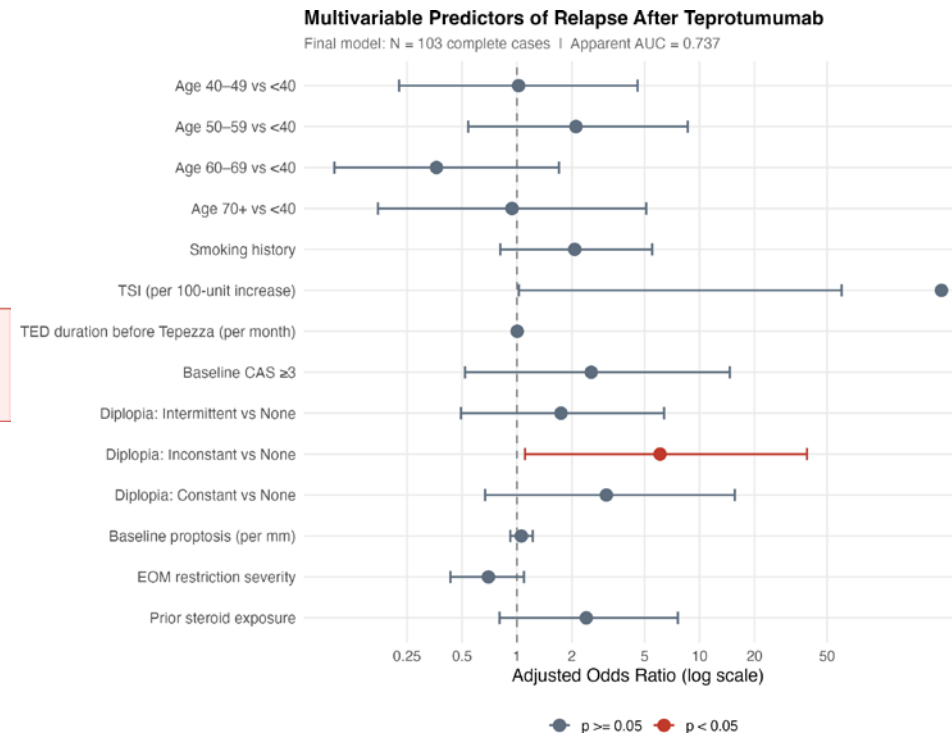


Figure 2



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Figure 3

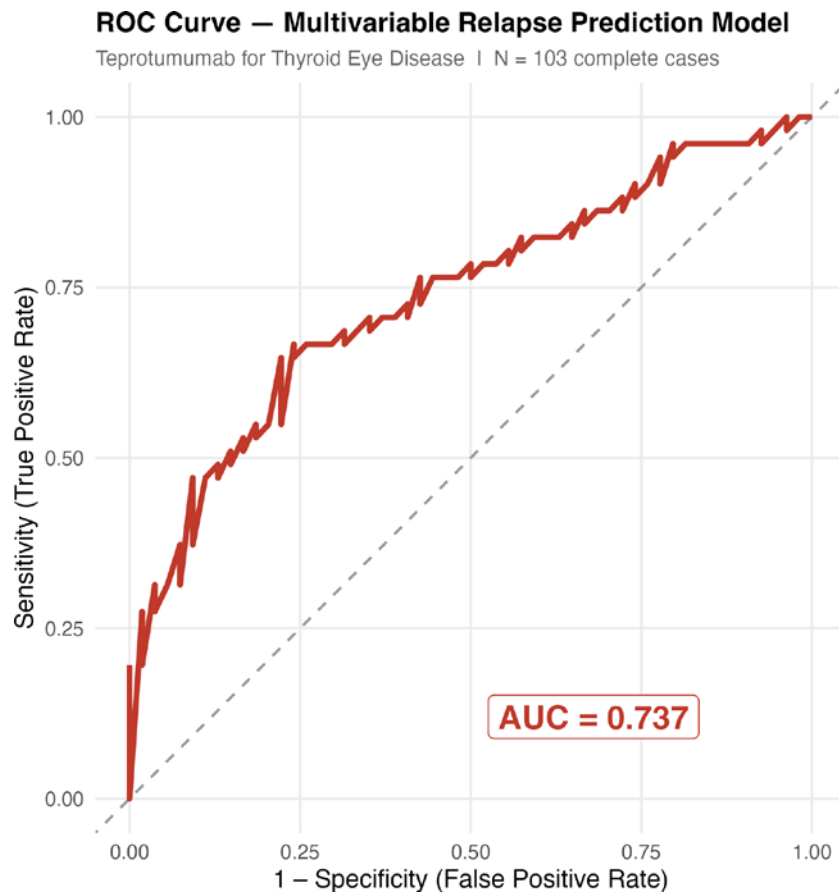
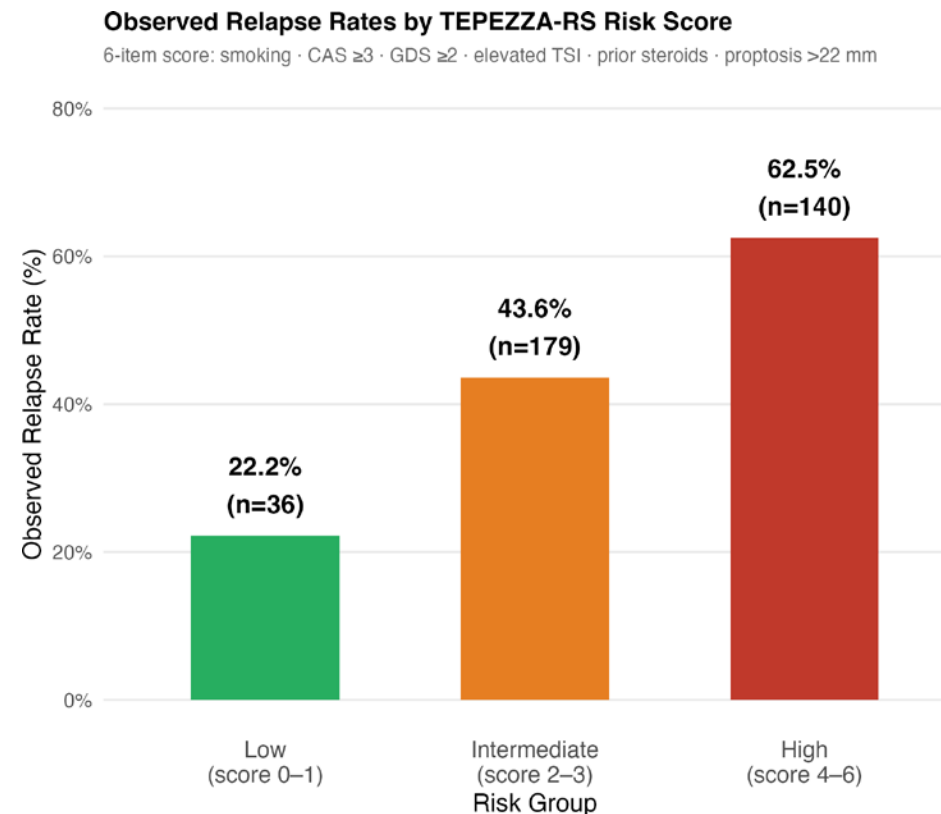


Figure 4



References

1. Douglas RS, Kahaly GJ, Patel A, Sile S, Thompson EHZ, Perdok R, Fleming JC, Fowler BT, Marcocci C, Marinò M, Antonelli A, Dailey R, Harris GJ, Eckstein A, Schiffman J, Tang R, Nelson C, Salvi M, Wester S, Sherman JW, Vescio T, Holt RJ, Smith TJ. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020 Jan 23;382(4):341-352. doi: 10.1056/NEJMod1910434.
2. Douglas RS, Kahaly GJ, Ugradar S, Elflein H, Ponto KA, Fowler BT, Dailey R, Harris GJ, Schiffman J, Tang R, Wester S, Jain AP, Marcocci C, Marinò M, Antonelli A, Eckstein A, Führer-Sakel D, Salvi M, Sile S, Francis-Sedlak M, Holt RJ, Smith TJ. Teprotumumab Efficacy, Safety, and Durability in Longer-Duration Thyroid Eye Disease and Re-treatment: OPTIC-X Study. *Ophthalmology*. 2022 Apr;129(4):438-449. doi: 10.1016/j.opthta.2021.10.017. Epub 2021 Oct 21.
3. Kahaly GJ, Douglas RS, Holt RJ, Sile S, Smith TJ. Teprotumumab for patients with active thyroid eye disease: a pooled data analysis, subgroup analyses, and off-treatment follow-up results from two randomised, double-masked, placebo-controlled, multicentre trials. *Lancet Diabetes Endocrinol*. 2021 Jun;9(6):360-372. doi: 10.1016/S2213-8587(21)00056-5. Epub 2021 Apr 15.
4. Hwang CJ, Rebollo NP, Mechels KB, Perry JD. Reactivation After Teprotumumab Treatment for Active Thyroid Eye Disease. *Am J Ophthalmol*. 2024 Jul;263:152-159. doi: 10.1016/j.ajo.2023.12.001. Epub 2023 Dec 23.
5. Rosenblatt TR, Chiou CA, Yoon MK, Wolkow N, Lee NG, Freitag SK. Proptosis Regression After Teprotumumab Treatment for Thyroid Eye Disease. *Ophthalmic Plast Reconstr Surg*. 2024 Mar-Apr 01;40(2):187-191. doi: 10.1097/IOP.0000000000002531. Epub 2023 Oct 4.

1:19–1:25 pm

Post-Treatment Proptosis Reduction as a Predictor of Regression of Exophthalmos after Teprotumumab Treatment in Thyroid Eye Disease

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Introduction: Teprotumumab has shown efficacy in reducing exophthalmos and clinical activity scores (CAS) in thyroid eye disease (TED). However, emerging real-world data has demonstrated that regression may occur in up to 42.0 – 58.8% of patients, raising questions about treatment durability.^{1,2} Despite growing clinical use of the medication, no framework currently exists for identifying which patients are most vulnerable to relapse. Thus, this study aims to determine demographic and clinical predictors of exophthalmos regression after treatment.

Methods: This retrospective study included patients with TED who received teprotumumab between February 2020 and January 2025 and had at least 6 months of follow-up. Regression was defined as ≥ 2 mm increase in exophthalmos at follow-up compared to immediate post-treatment measurements. Given the asymmetric nature of TED, each orbit was analyzed as an independent observation. Demographic and pre and post treatment clinical oculoplastic measures were compared between regression and non-regression groups. Generalized linear mixed effects models (GLMM) were used to identify independent predictors of regression.

Results: A total of 104 patients (208 orbits) were included (Table 1). The average follow up time was 25.94 (+/- 15.04) months. The overall average reduction in proptosis was -2.40 (+/- 2.67) mm comparing pre to post teprotumumab. Regression occurred in 41 patients (39.4%) in at least one orbit, with 69 (31.7%) total regressed orbits. No statistically significant differences were observed in baseline demographic characteristics between regression and non-regression groups, including age, sex, race, smoking status (current, former, never), BMI, or thyroid status. In univariable GLMM analyses, time from treatment to most recent follow-up (OR = 1.23 per month; 95% CI: 1.226, 1.231; $p < 0.001$) and magnitude of immediate post-treatment change in exophthalmos (OR = 0.544; 95% CI: 0.344, 0.861; $p = 0.009$) were significantly associated with regression. Both variables remained independently significant in multivariate analysis. Each additional millimeter of immediate post-treatment proptosis reduction (coded as negative change) was associated with a 47% increase in regression odds (AOR = 0.527; 95% CI: 0.327, 0.851; $p = 0.009$). The average reduction in exophthalmos after treatment was -3.27 (± 2.14) mm in the regression cohort compared to -1.92 (± 2.83) mm in the non-regression cohort (Figure 1, 0.009). Longer follow-up duration was independently associated with increased odds of regression (AOR = 1.18 per month; 95% CI: 1.053, 1.323; $p = 0.005$) with the (continued)

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regression cohort on average following up for 33.86 (± 14.65) months compared to the non-regression cohort with 22.03 (± 13.67) months of follow-up after treatment (Figure 2, <0.001).

Conclusions: While our study demonstrates a post-teprotumumab regression rate is comparable to prior reports, our results reveal that the best initial responders may have a higher risk of regression. One potential rationale is that robust responders may harbor greater underlying inflammatory burden uniquely sensitive to IGF-1R antagonism, one that resurges as teprotumumab's effect wanes beyond its 20-day half-life, resulting in orbital fibroblast reactivation through persistent TED activity.^{3,4} This suggests a role for monitoring and counseling based on clinical response characteristics, rather than patient baseline demographic profile. In addition, our results support the chronic autoimmune nature of thyroid eye disease and the need for additional studies looking at optimizing treatment regimens based on individual needs.

Figure 1

Table 1. Patient Demographics (n=104)

Sex	
Female	83 (79.0%)
Male	21 (20.0%)
Age, mean $\pm$ SD (years)	54.38 $\pm$ 14.82
Race/Ethnicity	
White	42 (40.4%)
Unknown	33 (31.7%)
Asian	22 (21.1%)
Black/African-American	5 (4.8%)
Native Hawaiian	1 (1.0%)
Other	1 (1.0%)
Hispanic	
Yes	19 (18.1%)
No	85 (81.0%)
Smoking status	
Never	64 (61.0%)
Former	30 (28.6%)
Current	10 (9.5%)
Thyroid disease	
Hyperthyroid	95 (90.5%)
Euthyroid	5 (4.8%)
Hypothyroid	4 (3.8%)

Figure 2

Figure 1.

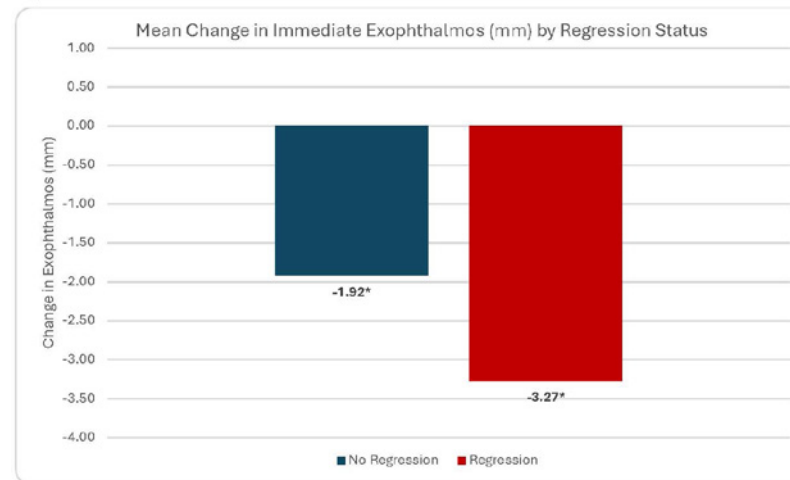
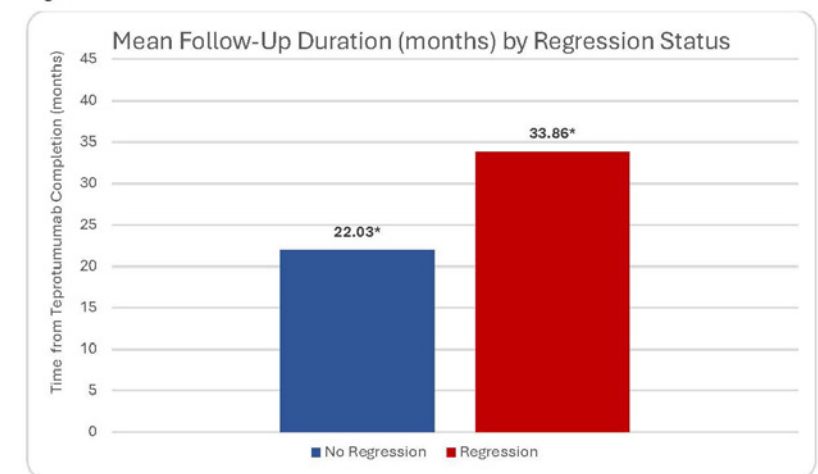


Figure 3

Figure 2.



References

- Rosenblatt TR, Chiou CA, Yoon MK, Lee NG, Wolkow N, Freitag SK. Extended Long-Term Follow-Up of Proptosis Regression After Teprotumumab Treatment for Thyroid Eye Disease. *Ophthalmic Plast Reconstr Surg*.
- Hwang CJ, Rebollo NP, Mechels KB, Perry JD. Reactivation After Teprotumumab Treatment for Active Thyroid Eye Disease. *Am J Ophthalmol*. 2024;263:152-159.
- Chen H, Mester T, Raychaudhuri N, et al. Teprotumumab, an IGF-1R blocking monoclonal antibody inhibits TSH and IGF-1 action in fibrocytes. *J Clin Endocrinol Metab*. 2014;99(9):
- Nie T, Lamb YN. Teprotumumab: A Review in Thyroid Eye Disease. *Drugs*. 2022;82(17):1663-1670.

1:25–1:31 pm

The Molecular Basis of Proptosis Reduction in Thyroid Eye Disease Patients after Teprotumumab Therapy

Sarah Cheng¹, Sainath Mamde², Hannah Indralingam², Weronika Bartosik², Catherine Liu¹, Bobby Korn¹, Don Kikkawa¹, Bing Ren^{2,3}

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Introduction: Thyroid eye disease (TED) is a multi-phasic disease progressing from acute to chronic, and in some patients to reactivated disease. IGF1R inhibitors have proven to be clinically effective in reducing proptosis, in ways not seen with conventional steroid use^{1,2}. But molecularly how does IGF1R inhibition do this, and what cell types are changing in this process? This study takes a single-nuclei level dive into TED and the response to IGF-R inhibition through the lens of single-nuclear multiomic studies.

Methods: Orbital fat was collected from 38 patients. 28 TED patients underwent orbital decompression, and 10 control patients received cosmetic decompression, orbital fat prolapse surgery, or blepharoplasty. Active TED (n = 3) was defined as having clinical activity score (CAS) at or over 4. Inactive TED (n = 11) was defined as having clinical activity score under 4 after passing the initial active phase of disease. Patients who received a full course of teprotumumab (n = 10) were defined as receiving 8 out of 8 treatments with teprotumumab started while in the active phase of disease. Reactivated TED was defined as patients with CAS > 4 after a period of inactivity of 1 year or more. Collected tissues underwent dissociation to single-nuclear cell suspension and were processed by 10X multiomic sequencing protocol and sequenced on the illumina NovaSeq. Data was subsequently analyzed by bioinformatic methods including cross-mapping to large-scale atlases on subcutaneous and abdominal adipose tissue^{3,4}.

Results: 340,114 total nuclei were cleaned to 281,085 high quality cells from orbital tissue of 38 patients from the five groups. These segregated into 9 major orbital cell types; fibroblasts (99,050), Adipocytes (53,466), macrophages (44,135), T-cells (18,428), endothelial cells (35,890), perivascular cells (24,731), B-cells (3,144), Mast cells (1,125), and plasma cells (1,116). Fibroblasts exhibited an early gene signature which reverted towards control patterns following teprotumumab treatment. Teprotumumab also reduced adipocyte nuclei proportion compared to untreated patients. Different states of TED were also found to have unique molecular signatures.

Conclusions: IGF1R inhibition changes the disease course of thyroid eye disease by restoring adipocyte population back towards percentages seen in non-TED patients. A collection of genes was found to parallel clinical activity level of patients, and IGF1R inhibition reduced the expression of these genes towards control levels. Unique molecular signatures at different disease states reveal possibilities for new treatments.

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References

1. Smith TJ, Kahaly GJ, Ezra DG, Fleming JC, Dailey RA, Tang RA, Harris GJ, Antonelli A, Salvi M, Goldberg RA, Gigantelli JW, Couch SM, Shriver EM, Hayek BR, Hink EM, Woodward RM, Gabriel K, Magni G, Douglas RS. Teprotumumab for Thyroid-Associated Ophthalmopathy. *N Engl J Med*. 2017 May 4;376(18):1748-1761.
2. Douglas RS, Kahaly GJ, Patel A, Sile S, Thompson EHZ, Perdok R, Fleming JC, Fowler BT, Marcocci C, Marinò M, Antonelli A, Dailey R, Harris GJ, Eckstein A, Schiffman J, Tang R, Nelson C, Salvi M, Wester S, Sherman JW, Vescio T, Holt RJ, Smith TJ. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020 Jan 23;382(4):341-352.
3. Emont MP, Jacobs C, Essene AL, Pant D, Tenen D, Colletuori G, Di Vincenzo A, Jørgensen AM, Dashti H, Stefek A, McGonagle E, Strobel S, Laber S, Agrawal S, Westcott GP, Kar A, Veregge ML, Gulko A, Srinivasan H, Kramer Z, De Filippis E, Merkel E, Ducie J, Boyd CG, Gourash W, Courcoulas A, Lin SJ, Lee BT, Morris D, Tobias A, Khera AV, Claussnitzer M, Pers TH, Giordano A, Ashenberg O, Regev A, Tsai LT, Rosen ED. A single-cell atlas of human and mouse white adipose tissue. *Nature*. 2022 Mar;603(7903):926-933.
4. Lazarescu O, Ziv-Agam M, Haim Y, Hekselman I, Jubran J, Shneyour A, Muallem H, Zemer A, Rosengarten-Levin M, Kitsberg D, Levin L, Liberty IF, Yoel U, Dukhno O, Adam M, Braune J, Müller C, Raulien N, Gericke M, Körner A, Murphy R, Blüher M, Habib N, Rudich A, Yeger-Lotem E. Human subcutaneous and visceral adipocyte atlases uncover classical and nonclassical adipocytes and depot-specific patterns. *Nat Genet*. 2025 Feb;57(2):413-426.

1:31–1:37 pm

Retreatment Patterns in Thyroid Eye Disease After Relapse Following Teprotumumab

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Introduction: Retreatment patterns after relapse following teprotumumab for thyroid eye disease (TED) remain poorly characterized. This study evaluated the frequency, timing, and patterns of additional TED-directed treatment after relapse following initial response to teprotumumab.

Methods: This multicenter retrospective cohort study included patients with moderate-to-severe TED treated with ≥ 4 infusions of teprotumumab across 8 institutions, with ≥ 1 year of follow-up after treatment initiation. Relapse was defined as progression of disease signs or symptoms following a period of improvement or stability, adapted from OPTIC-X trial criteria: increased proptosis ≥ 2 mm, increased CAS ≥ 2 points, worsened diplopia, or increased EOM restriction ≥ 1 point. Additional TED-directed treatments after relapse were recorded; retreatment categories were non-mutually exclusive. Patients were grouped into three durability categories: durable improvement (improving without meeting relapse criteria), relapse with sustained improvement relative to pretreatment baseline, and worsening beyond pretreatment baseline irrespective of initial treatment response. Domain-specific subgroup analyses evaluated relapse by a single predominant disease characteristic. Associations were assessed using logistic regression.

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Results: Among patients with relapse (187/355, 52.7%), retreatment occurred in 49.7% (93/187) while 50.3% (94/187) were managed with observation. Medical retreatment was administered in 18.2% (34/187) and surgical intervention in 26.7% (50/187). Repeat teprotumumab was the most common retreatment, administered in 24.6% (46/187) of patients who relapsed [13.8% (49/355) of the total cohort], with a median time to repeat treatment of 363.5 days after initial course completion. Other medical retreatments were administered in 18.2% patients (34/187), including IV steroids (12.3%), oral steroids (7.0%), orbital radiotherapy (2.7%), and tocilizumab (2.1%). Surgical retreatment consisted of orbital decompression (16.6%, 31/187), strabismus surgery (13.9%, 26/187), and thyroidectomy (4.8%, 9/187); 8.0% underwent both orbital decompression and strabismus surgery after teprotumumab.

Retreatment rates increased stepwise across durability categories: 1.8% among patients with durable improvement, 15.7% among those who relapsed but remained improved relative to pretreatment baseline, and 32.3% among those who worsened below pretreatment baseline severity. Retreatment was strongly associated with below-baseline worsening (28.8% vs 6.3%; $p < 0.001$), earlier relapse (median 8.9 vs 11.9 months; $p < 0.001$), inflammatory/CAS-predominant relapse (OR 15.7 (95% CI 6.62–43.82); $p < 0.001$), and extraocular motility worsening (OR 5.5 (95% CI 2.60–11.80), $p < 0.001$). By domain-specific relapse analysis, retreatment occurred in 48.8% of patients with CAS worsening, 48.2% with EOM worsening, 34.3% with diplopia worsening, and 28.4% with proptosis worsening. Retreatment rates varied significantly across institutions (0%–28.1%; $p < 0.0001$) despite similar baseline severity and relapse rates. Sensitivity analyses across 8-dose cohort, treatment-naïve subgroup analyses showed consistent results.

Conclusions: Nearly half of patients with relapse after teprotumumab underwent additional TED-directed treatment. Retreatment was most strongly associated with worsening below pretreatment baseline and with inflammatory or motility-predominant relapse phenotypes as well as institutional practice variation. These findings suggest that not all relapse cases carry equal clinical significance and that retreatment decisions are driven more by relapse severity and phenotype and provider preference rather than OPTIC-X criteria alone.

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Figure 1

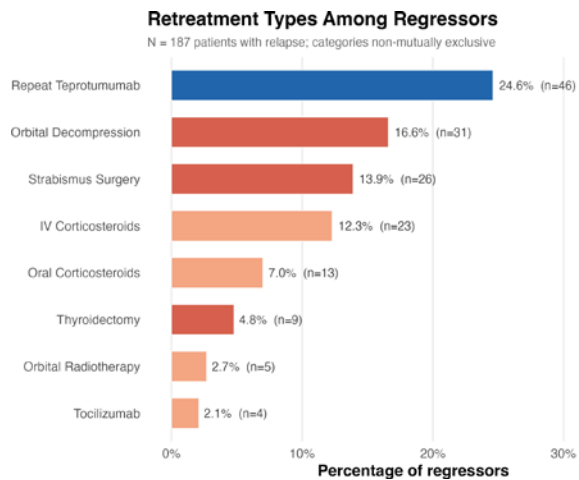


Figure 2

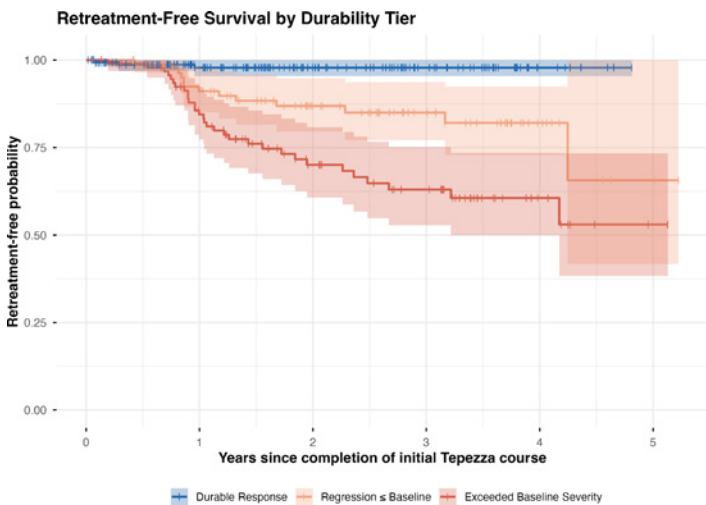


Figure 3

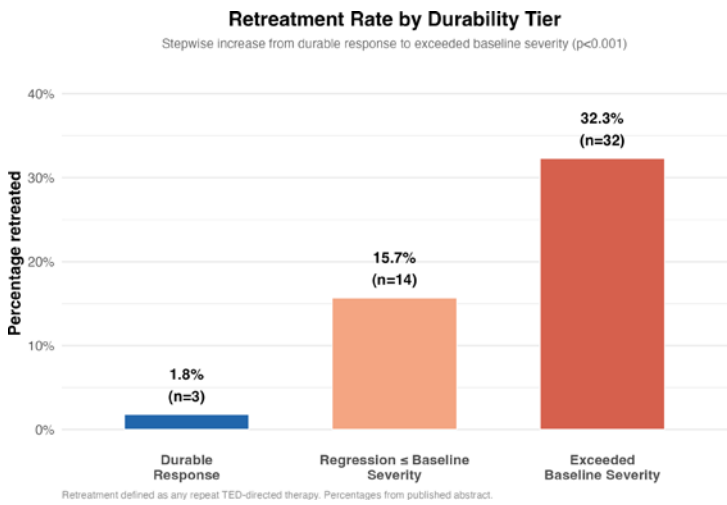


Figure 4

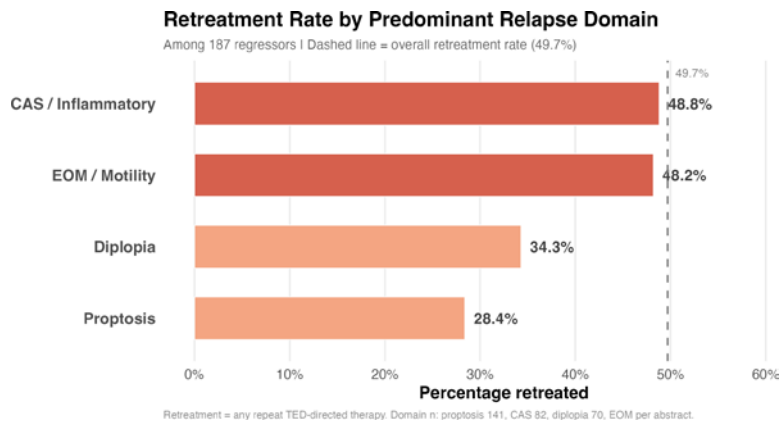
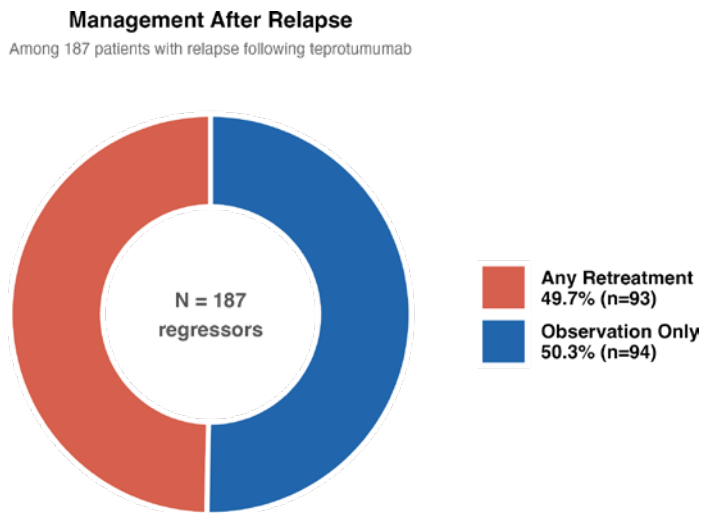


Figure 5



References

- Douglas RS, Kahaly GJ, Patel A, Sile S, Thompson EHZ, Perdok R, Fleming JC, Fowler BT, Marcocci C, Marinò M, Antonelli A, Dailey R, Harris GJ, Eckstein A, Schiffman J, Tang R, Nelson C, Salvi M, Wester S, Sherman JW, Vescio T, Holt RJ, Smith TJ. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020 Jan 23;382(4):341-352. doi: 10.1056/NEJMoa1910434.
- Douglas RS, Kahaly GJ, Ugradar S, Elflein H, Ponto KA, Fowler BT, Dailey R, Harris GJ, Schiffman J, Tang R, Wester S, Jain AP, Marcocci C, Marinò M, Antonelli A, Eckstein A, Führer-Sakel D, Salvi M, Sile S, Francis-Sedlak M, Holt RJ, Smith TJ. Teprotumumab Efficacy, Safety, and Durability in Longer-Duration Thyroid Eye Disease and Re-treatment: OPTIC-X Study. *Ophthalmology*. 2022 Apr;129(4):438-449. doi: 10.1016/j.ophttha.2021.10.017. Epub 2021 Oct 21.
- Hwang CJ, Rebollo NP, Mechels KB, Perry JD. Reactivation After Teprotumumab Treatment for Active Thyroid Eye Disease. *Am J Ophthalmol*. 2024 Jul;263:152-159. doi: 10.1016/j.ajo.2023.12.001. Epub 2023 Dec 23.
- Ugradar S, Parunakian E, Malkhasyan E, Chiou CA, Walsh HL, Joseph Tolentino J, Wester ST, Freitag SK, Douglas RS. The Rate of Re-treatment in Patients Treated with Teprotumumab: A Multicenter Study of 119 Patients with 1 Year of Follow-up. *Ophthalmology*. 2025 Jan;132(1):92-97. doi: 10.1016/j.ophttha.2024.07.018. Epub 2024 Jul 19.

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Moderators:

1:52–1:53 pm

Cannabis Use and Vaping as Risk Factors for Thyroid Eye Disease

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Introduction: Graves' disease is the most common cause of hyperthyroidism and has multiple systemic manifestations, including Thyroid Eye Disease (TED)¹. Cigarette smoking is a well-established modifiable risk factor for TED, and is consistently highlighted in large reviews of TED epidemiology and risk factors^{2,3}. Counseling regarding tobacco smoking cessation is therefore an important part of TED management.

In contrast, the effects of tobacco vaping and cannabis use remain unclear despite their increasing prevalence and shifting patterns of substance use^{4,5}. Clarifying their relationship to TED is important for patient counseling and risk stratification. This study evaluated whether vaping and cannabis use are associated with TED and TED requiring treatment in patients with Graves' disease.

Methods: In this retrospective case-control study, Graves' patients in our healthcare system (2014–2024) completed an anonymous survey assessing cigarette smoking, vaping, cannabis use, and other tobacco use. TED and TED requiring treatment (medication, surgery, or radiation) were self-reported. Associations between substance use and TED were examined using survey-weighted logistic regression.

Results: Of 1,546 invited patients, 336 (22%) responded. The median age was 55 years, and 85% were female. TED was reported by 21% of participants; 17% met criteria for TED requiring treatment. Cigarette smoking was associated with increased odds of TED (OR 1.60, 95% CI 1.0 – 2.56, $p = 0.05$) and TED requiring treatment (OR 1.67, 95% CI 1.01 – 2.78, $p = 0.047$) (Figure 1, 2). Cannabis use, vaping, and other tobacco products were not significantly associated with TED or TED requiring treatment. No participants reported exclusive vaping, precluding independent analysis of e-cigarette exposure. Hispanic ethnicity and older age were associated with higher odds of TED.

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Conclusions: Cigarette smoking remains a significant risk factor for TED among patients with Graves’. Cannabis and vaping were not associated with TED in this cohort, though interpretation is limited by the absence of exclusive e-cigarette users and self-reported exposures. Smoking cessation remains central to TED risk reduction, while future studies are needed to clarify the role of cannabis and vaping.

Figure 1

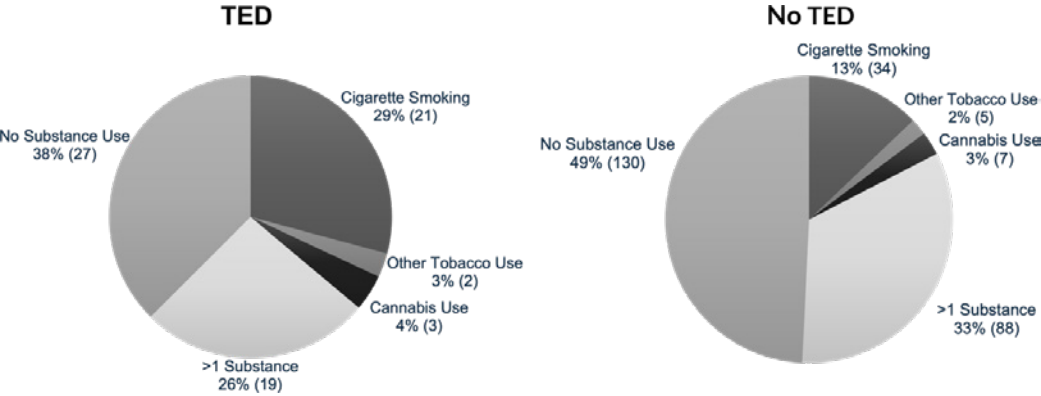
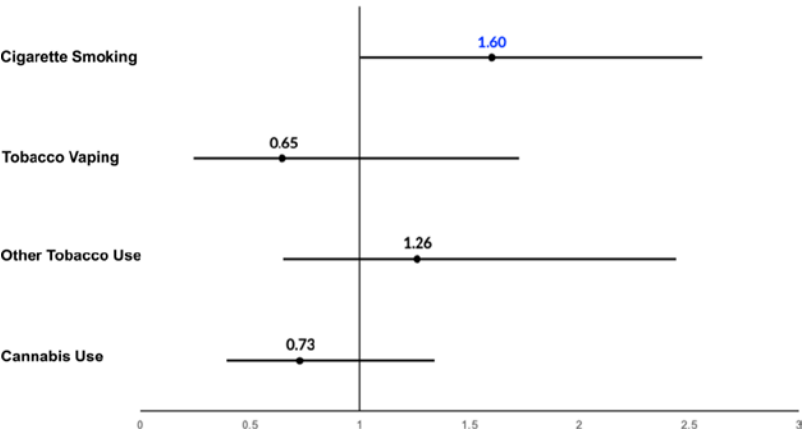


Figure 2



References

1. Smith TJ, Hegedüs L. Graves’ Disease. *N Engl J Med*. 2016;375(16):1552–1565. doi:10.1056/NEJMr1510030
2. Bartalena L, Gallo D, Tanda ML, Kahaly GJ. Thyroid Eye Disease: Epidemiology, Natural History, and Risk Factors. *Ophthalm Plast Reconstr Surg*. 2023;39(6S):S2–S8. doi:10.1097/IOP.0000000000002467
3. Thornton J, Kelly SP, Harrison RA, Edwards R. Cigarette smoking and thyroid eye disease: a systematic review. *Eye Lond Engl*. 2007;21(9):1135–1145. doi:10.1038/sj.eye.6702603
4. Vahratian A, Briones EM, Jamal A, Marynak KL. Electronic Cigarette Use Among Adults in the United States, 2019–2023. *NCHS Data Brief*. 2025;(524):CS356607. doi:10.15620/cdc/174583
5. Zellers SM, Ross JM, Saunders GRB, et al. Impacts of recreational cannabis legalization on cannabis use: a longitudinal discordant twin study. *Addict Abingdon Engl*. 2023;118(1):110–118. doi:10.1111/add.16016

1:53–1:54 pm

What's in My Face?: Patient Knowledge of Cosmetic Injectables and the Patient–Safety Implications of Product–Identity Recall

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Introduction: Dermal fillers and neuromodulators are among the most commonly performed minimally invasive cosmetic procedures, yet they carry rare but devastating complications including ophthalmic artery embolization, central retinal artery occlusion, and stroke. The periocular and glabellar regions — directly within the oculoplastic surgeon's scope of practice — are among the highest-risk anatomic sites for vision-threatening filler-associated vascular events, and emergent management depends critically on identification of the specific product injected. This study examines patient knowledge of prior, recent, and planned cosmetic injectable treatments at an academic oculoplastics practice.

Methods: Retrospective chart review of consecutive patients seen for cosmetic injectable treatment at a single academic oculoplastics practice (IRB exempt). Standardized pre-visit intake documentation, completed with every cosmetic injectable patient as part of routine clinical workup, was abstracted for 44 patients. Variables included demographics, prior injectable history, recalled products, treated areas, recent outside injections, treatment tracking behavior, recall of the most recent prior injection, understanding of the planned current treatment, satisfaction, and self-assessed product knowledge in the event of a complication. Specific-product recall was defined as the patient naming at least one specific brand-name product. Recall responses were compared against the actual injection administered at the index visit, abstracted from the medical record.

Results: Patients had a median age of 67 years (IQR 60–73); 95.5% were female and 88.6% were established. Most patients received multiple products at the index visit: 36.4% received both a neuromodulator and a filler, and 25.0% received three or more distinct products. The cohort was largely captive to the practice — only 11.4% reported any outside injections since their last visit, and 84.1% reported being “very satisfied” with prior care. Despite this continuity, knowledge gaps were substantial. Among patients with prior filler history, only 13/40 (32.5%) could name a specific filler, compared with 31/40 (77.5%) for prior neuromodulators — a 45-percentage-point gap. Among patients receiving multiple products at the index visit who also had prior filler history, only 4/18 (22.2%) could name a specific prior filler. Only 20/44 (45.5%) fully recalled their most recent injection at our clinic, and only 17/44 (38.6%) could clearly state the product and area planned for the current visit; verbatim responses included “whatever they choose to give me,” and “I let you guys decide.” Only 3/44 (6.8%) maintained any personal record of their treatments; 24/44 (54.5%) relied entirely on clinic records, and 11/44 (continued)

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(25.0%) did not track treatments at all. Self-assessed knowledge tracked poorly with actual recall: 22/44 (50.0%) believed they would know what product was in their face if a complication occurred, while only 32.5% could name a prior filler.

Conclusions: Patients presenting for cosmetic injectable treatment demonstrate substantial gaps in product-identity knowledge across past, recent, and imminent treatments — even within a loyal, established, highly satisfied single-clinic cohort. Recall is poorest for dermal fillers, the product class where identification most directly affects management of vision-threatening vascular complications, and is poorer still among patients receiving multiple concurrent products. Patient continuity, satisfaction, and self-assessed knowledge are unreliable proxies for treatment literacy, and few patients maintain any independent record of their care. Providers managing emergent injectable complications cannot depend on patient recall regardless of treatment continuity, supporting the need for accessible, portable, product-specific documentation and structured patient-facing tracking tools.

References

1. ASDS Consumer Survey on Cosmetic Dermatologic Procedures. American Society for Dermatologic Surgery; 2023.
2. Ortiz AE, Ahluwalia J, Song SS, Avram MM. Analysis of U.S. Food and Drug Administration data on soft-tissue filler complications. *Dermatol Surg.* 2020;46(7):958–961.
3. Beleznyay K, Carruthers JDA, Humphrey S, Jones D. Avoiding and treating blindness from fillers: a review of the world literature. *Dermatol Surg.* 2015;41(10):1097–1117.
4. Zhao F, Chen Y, He D, You X, Xu Y. Disastrous cerebral and ocular vascular complications after cosmetic facial filler injections: a retrospective case series study. *Sci Rep.* 2024;14(1):3495.
5. Zargaran D, Zoller F, Zargaran A, et al. Complications of cosmetic botulinum toxin A injections to the upper face: a systematic review and meta-analysis. *Aesthet Surg J.* 2022;42(5):NP327–NP336.

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Moderators: Sathyadeepak Ramesh and Ying Chen

1:55–2:01 pm

Photorealism and Predictive Accuracy of an Identity-Preserving AI Simulation Platform for Blepharoplasty: A Blinded Multi-Rater Validation Study

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Introduction: A crucial component of patient counseling prior to undergoing a facial procedure depends on aligning patient expectations with a realistic visual understanding of possible postoperative appearance. Patient-specific image simulation can improve shared decision-making, but its clinical value first depends on whether generated postoperative images are visually credible when compared with real surgical outcomes. Recent deep-learning studies have modeled postoperative appearance in blepharoptosis and thyroid eye disease, but we found no direct validation of AI-generated blepharoplasty simulations against actual postoperative blepharoplasty photographs.

We therefore developed a fine-tuned, patient-specific image-generation model for blepharoplasty outcome simulation. The clinical question was whether ophthalmology and oculoplastics-trained raters could distinguish simulated postoperative blepharoplasty images from true postoperative photographs when no preoperative image was shown. We hypothesized that discrimination accuracy would remain near random chance, supporting photorealism as a prerequisite for future studies of counseling utility and outcome prediction

Methods: This cross-sectional, retrospective, blinded multi-rater validation study used existing consented, de-identified periocular photographs from 45 patients: 15 upper, 15 lower, and 15 combined blepharoplasty cases. A fine-tuned patient-specific image-generation model generated a postoperative simulation from each preoperative photograph alone. Raters saw only the simulation and actual postoperative photograph, displayed side-by-side in randomized order, and selected which image was real. Preoperative photographs were withheld to preserve blinding, as natural visit-to-visit variation could reveal the real postoperative image. The primary endpoint was forced-choice discrimination accuracy versus 50% chance. All attendings were combined for role-stratified descriptive analysis.

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Results: Twenty-two raters completed the study: 14 residents and 8 attendings. Across 45 cases, there were 990 forced-choice judgments. Analytic cases represented 35 female and 10 male patients; age strata ranged from 18-25 to 71-75 years; race/ethnicity was Caucasian in 35, Hispanic in 6, African-American in 2, and Asian in 2. Overall discrimination accuracy was 509/990 (51.4%; Wilson 95% CI, 48.3%- 54.5%), not different from chance (exact binomial $P=0.391$). Accuracy by procedure was 52.7% for upper blepharoplasty, 49.4% for lower blepharoplasty, and 52.1% for combined blepharoplasty. Residents identified the real photograph in 314/630 judgments (49.8%); attendings identified it in 195/360 judgments (54.2%).

Conclusions: A fine-tuned patient-specific AI simulation model produced postoperative blepharoplasty images that expert raters could not distinguish from actual postoperative photographs above chance. These findings support photorealism of the generated counseling images, while not establishing prediction of individual surgical outcomes.

Figure 1

Study Flow

Blinded photorealism validation

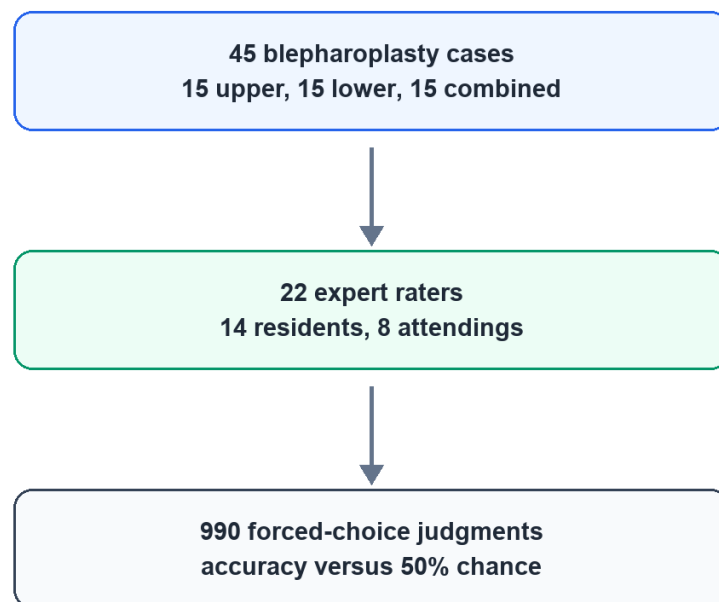


Figure 2

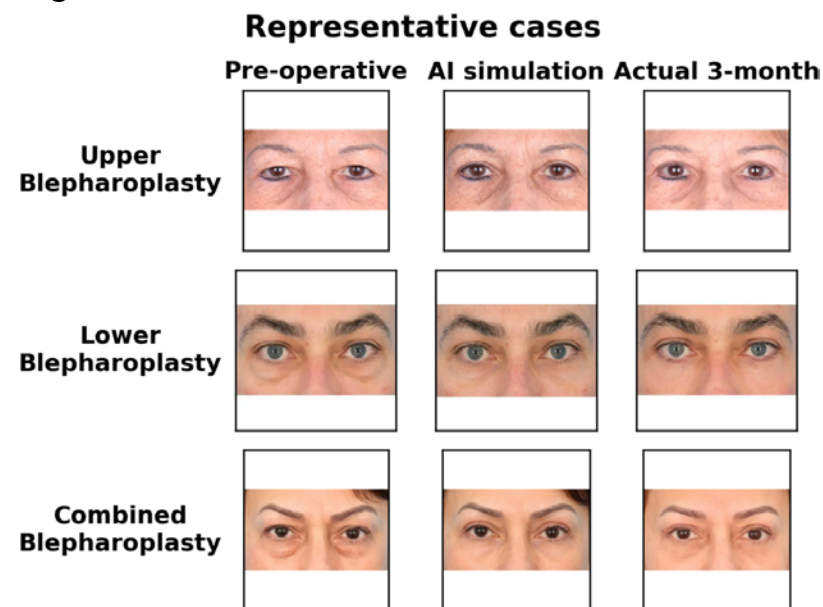
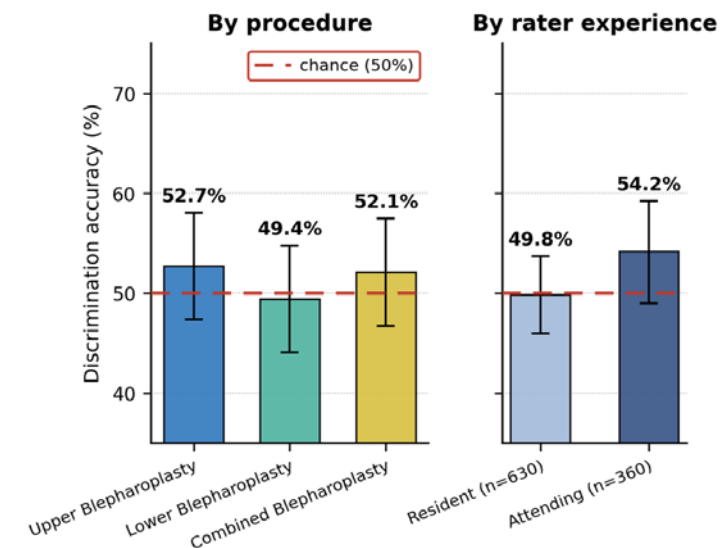


Figure 3

Photorealism: identifying the real post-operative photograph



References

1. Sun Y, Huang X, Zhang Q, et al. A fully automatic postoperative appearance prediction system for blepharoptosis surgery. *Ophthalmol Sci*. 2022;2(3):100169.
2. Yoo TK, Choi JY, Kim HK. A generative adversarial network approach to predicting postoperative appearance after orbital decompression for thyroid eye disease. *Comput Biol Med*. 2020;118:103628.
3. Huang S, Xie J, Yang B, et al. PtoisDiffusion: predicting postoperative appearance in blepharoptosis. *Front Cell Dev Biol*. 2024;12:1459336.

2:01–2:07 pm

Externalized Suture Elimination in Microscope-Assisted Lower Blepharoplasty: A Comparative Cohort Study

Ryo Kikuchi¹, Tomoyuki Kashima²¹Oculofacial Clinic Tokyo, Tokyo, Japan, ²Tokyo, Japan

Introduction: Lower eyelid blepharoplasty with orbital fat repositioning is an established technique for improving tear trough deformity and the lid-cheek junction. Transposed fat pedicles are commonly stabilized using temporary externalized fixation sutures; however, retained cheek sutures may contribute to early visible postoperative morbidity, local tissue tension, and patient discomfort. Fibrin glue-assisted fixation offers an alternative approach that eliminates retained externalized sutures while potentially maintaining postoperative eyelid position and safety. Although fibrin glue has been used in eyelid surgery, its role as a fixation method for transposed fat pedicles remains less well characterized. This comparative cohort study evaluates whether fibrin glue-assisted fixation without retained externalized sutures reduces early postoperative morbidity while preserving 3-month safety and eyelid position in microscope-assisted transconjunctival lower eyelid blepharoplasty.

Methods: This retrospective comparative cohort study included consecutive patients who underwent microscope-assisted transconjunctival lower eyelid blepharoplasty with orbital fat repositioning for tear trough correction. Patients were divided according to fixation method: temporary externalized suture fixation or fibrin glue-assisted fixation without retained externalized sutures. Patients with prior lower eyelid surgery, prior filler injection, bleeding disorders, or antithrombotic medication use were excluded. Standardized photographs were evaluated preoperatively and postoperatively at 1 week and 3 months. Primary outcomes were postoperative skin discoloration severity and absolute MRD-2 change at 1 week. Skin discoloration was graded according to color intensity. MRD-2 was measured from the pupil center to the lower eyelid margin using image analysis software, and absolute MRD-2 change from baseline was used as a surrogate marker of postoperative swelling or lower eyelid tension. Secondary outcomes included operative time and postoperative complications.

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Results: A total of 178 patients were included: 68 in the externalized suture fixation group and 110 in the fibrin glue-assisted fixation group. At postoperative week 1, skin discoloration was less severe in the fibrin glue-assisted fixation group. Grade 3 skin discoloration occurred in 6 patients (8.8%) in the externalized suture fixation group and 2 patients (1.8%) in the fibrin glue-assisted fixation group. The absolute MRD-2 change at postoperative week 1 was significantly smaller in the fibrin glue-assisted fixation group than in the externalized suture fixation group (0.72 ± 0.44 mm vs 1.21 ± 0.58 mm, $p<0.001$). At 3 months, MRD-2 change had returned toward baseline in both groups, with no significant difference between groups (0.15 ± 0.23 mm vs 0.18 ± 0.26 mm, $p=0.42$). Mean operative time was shorter in the fibrin glue-assisted fixation group than in the externalized suture fixation group (42.8 ± 10.4 minutes vs 51.6 ± 9.8 minutes, $p<0.001$). No increase in postoperative complications, including hematoma, infection, ectropion, diplopia, undercorrection, or revision, was observed in the fibrin glue-assisted fixation group.

Conclusions: In microscope-assisted transconjunctival lower eyelid blepharoplasty with fat repositioning, fibrin glue-assisted fixation without retained externalized sutures was associated with reduced early postoperative skin discoloration, smaller MRD-2 change, and shorter operative time without compromising 3-month lower eyelid position. Eliminating retained externalized fixation sutures may reduce early visible postoperative morbidity while preserving postoperative eyelid position and surgical safety.

Figure 1



Figure 2

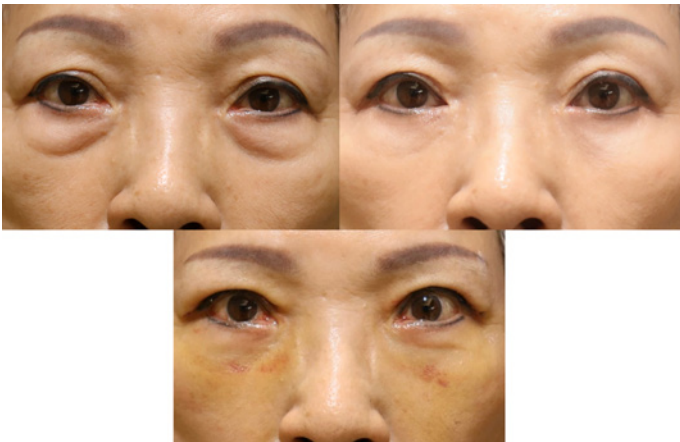


Table 1. Patient Demographics and Baseline Characteristics

Characteristic	Externalized suture fixation (n = 68)	Fibrin glue-assisted fixation (n = 110)	p value
Patients, n	68	110	—
Age, years	45.8 ± 13.2	44.1 ± 12.7	0.39
Female sex, n (%)	58 (85.3)	94 (85.5)	0.97
Bilateral surgery, n (%)	68 (100)	110 (100)	—
Preoperative MRD-2, mm	5.42 ± 0.61	5.39 ± 0.58	0.74
Follow-up, months	3.0	3.0	—
Prior lower eyelid surgery, n (%)	0 (0)	0 (0)	—
Prior filler injection, n (%)	0 (0)	0 (0)	—
Bleeding disorder, n (%)	0 (0)	0 (0)	—
Antithrombotic medication use, n (%)	0 (0)	0 (0)	—

Values are presented as mean ± standard deviation or number (%). MRD-2 = margin reflex distance 2.

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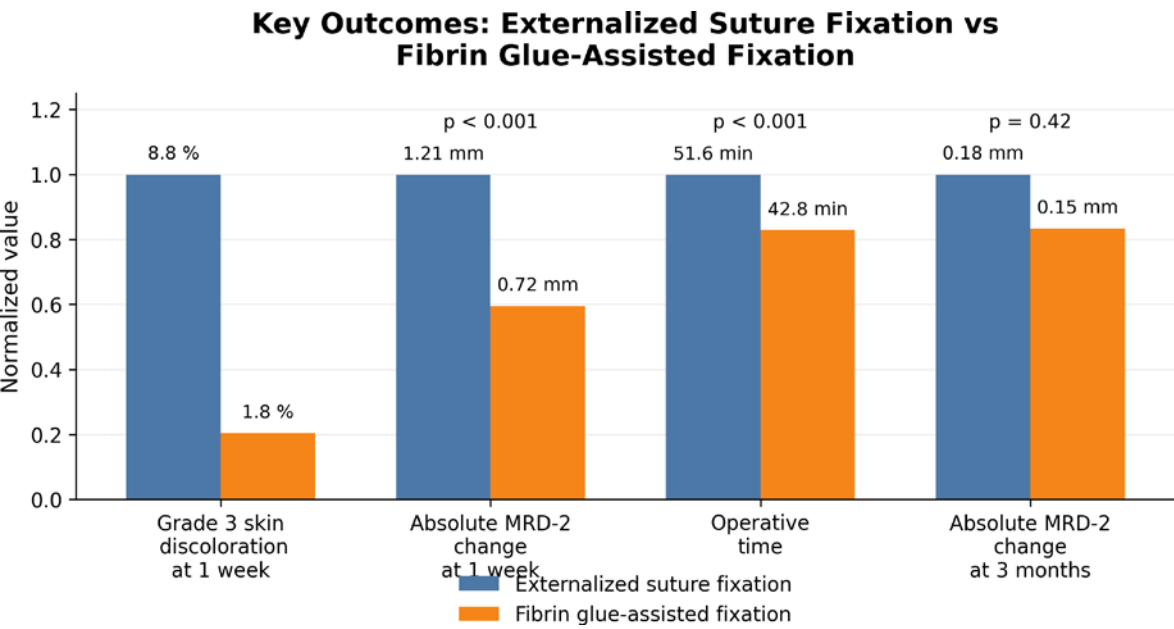


Table 3. Postoperative Complications

Complication	Externalized suture fixation (n = 68)	Fibrin glue-assisted fixation (n = 110)
Hematoma	1 (1.5)	0 (0)
Infection	1 (1.5)	3 (2.7)
Conjunctival adhesion	1 (1.5)	3 (2.7)
Ectropion / lower eyelid malposition	2 (2.9)	0 (0)
Diplopia	0 (0)	0 (0)
Inferior oblique scarring/injury	0 (0)	1 (0.9)
Undercorrection / persistent tear trough	5 (7.4)	3 (2.7)
Revision surgery	1 (1.5)	0 (0)

Values are presented as number (%).

References

1. Goldberg RA, Edelstein C, Balch K, Shorr N. Fat repositioning in lower eyelid blepharoplasty. Semin Ophthalmol. 1998;13:103-106.
2. Goldberg RA. Transconjunctival orbital fat repositioning: transposition of orbital fat pedicles into a subperiosteal pocket. Plast Reconstr Surg. 2000;105:743-748.
3. Oliver JD, Menapace D, Younes A, Recker C, Hamilton G, Friedman O. Validation of the modified SPREE questionnaire. Facial Plast Surg. 2018;34:95-101.
4. Kikuchi R, Meeprasertsagool K, Rojdamrongratana D, Kashima T. A comparison of fibrin glue versus suture for anchoring fat pedicles in transconjunctival lower eyelid blepharoplasty. JPRAS Open. 2025.

2:07–2:13 pm

Long-Term Durability of Lower Eyelid Retraction Repair Following Hard Palate Graft Surgery: A 10-year Retrospective Single-Institutional Analysis

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Introduction: Lower eyelid retraction poses significant functional and aesthetic challenges, yet long-term data on hard palate mucosa graft durability and comparative outcomes across thyroid eye disease and non-thyroid eye disease patients remain scarce.

Methods: A retrospective review was performed of all patients who underwent hard palate graft placement for lower eyelid retraction at a single academic institution from January 1, 2015 to January 1, 2025. Inclusion required preoperative and postoperative standardized primary gaze photographs. Lower eyelid position was quantified as MRD2 using ImageJ (National Institutes of Health, Bethesda, MD), with images calibrated to a horizontal visible iris diameter of 11.5 mm. Statistical analysis was conducted in R Studio; results are expressed as mean $\pm$ standard error or 95% confidence interval where appropriate.

Results: Forty-four eyes from 31 patients were included, with a mean follow-up of 612 ± 467 days. Mean preoperative MRD2 was 6.92 ± 1.13 mm, which improved to 5.36 ± 1.18 mm postoperatively, representing a statistically significant mean reduction of 1.56 ± 1.21 mm (22.6%; $t(43) = 8.58$, $p < 0.001$; Cohen's $d = 1.29$). In the subgroup of 19 eyes with follow-up of one year or greater, MRD2 correction remained stable and did not differ significantly from eyes with shorter follow-up ($p = 0.226$). Meaningful improvement was sustained across all follow-up duration subgroups, including those followed beyond two years (all $p \leq 0.012$). Among the 22 eyes with thyroid eye disease, mean MRD2 improvement was 1.22 ± 1.11 mm compared to 1.91 ± 1.23 mm in non-thyroid eye disease eyes, a difference that did not reach statistical significance ($p = 0.057$).

Conclusions: Hard palate grafts provide durable and clinically meaningful correction of lower eyelid retraction, with outcomes sustained well beyond one year of follow-up. Surgical results were comparable between patients with and without thyroid eye disease, supporting the utility of this technique across etiologies.

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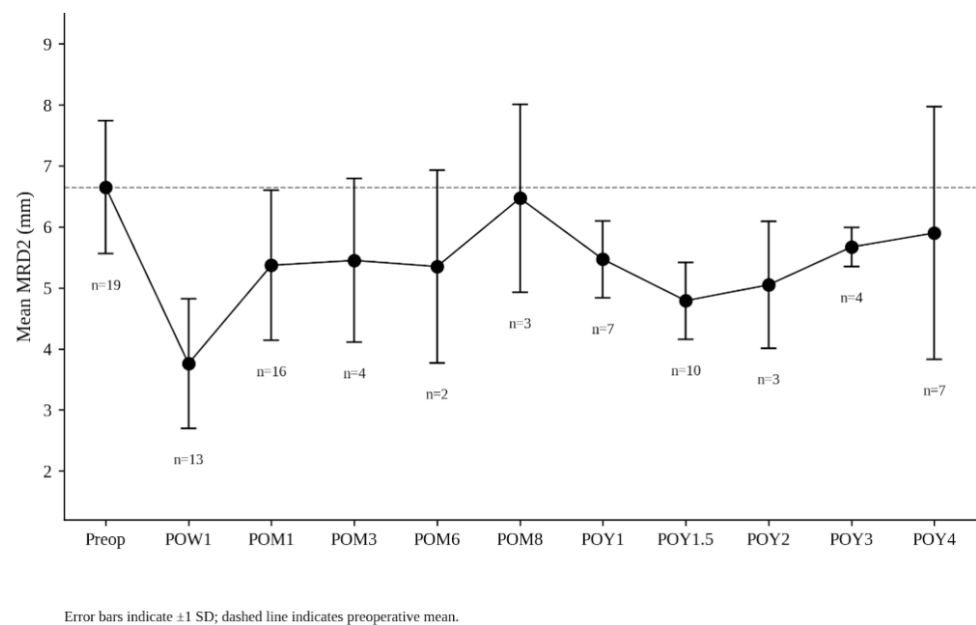


Figure 1. Mean margin-to-reflex distance 2 (MRD2) values (mm) at each follow-up timepoint in the long-term subset (>1 year follow-up; N= 19 eyes). Dots represent the mean MRD2 at each timepoint; error bars indicate ±1 standard deviation. The dashed horizontal line indicates the preoperative mean MRD2. Sample sizes at each timepoint are shown below the error bars.

Table 1: MRD2 Values (mm) at Each Follow-Up Timepoint for the Long-Term Subset (>1 Year Follow-Up)

Eye	Preop	POW1	POM1	POM3	POM6	POM8	POY1	POY1.5	POY2	POY3	POY4
1	6.19	—	4.95	—	—	—	—	—	—	—	4.41
2	6.21	—	4.85*	—	—	—	—	—	—	—	3.69
3	6.28	4.49	5.80	5.55	—	—	4.52**	5.38	—	—	5.54
4	9.23	—	7.36	7.27	6.47	—	—	—	—	—	4.88
5	7.80	4.66	6.19	—	—	7.44	—	—	—	—	7.77
6	8.19	5.44	7.16	—	—	7.27	—	—	—	—	9.60
7	6.43	—	5.53	—	—	—	6.42	—	—	5.96	5.39
8	5.80	3.78	5.36	—	—	—	6.05	—	—	5.84	—
9	5.85	3.23	4.87	—	—	—	5.24	—	—	5.64	—
10	7.43	4.80	—	—	—	—	5.51	—	—	5.23	—
11	6.79	1.82	4.54	—	—	—	5.54	4.57	5.25	—	—
12	7.32	2.90	4.21	—	—	—	5.05	5.66	5.97	—	—
13	4.78	2.18	3.99	4.18	—	—	—	3.90	3.92	—	—
14	5.13	4.34	—	—	—	4.69	—	5.74	—	—	—
15	6.35	3.16	3.75	—	4.23	—	—	4.36	—	—	—
16	7.50	—	7.16	—	—	—	—	4.16	—	—	—
17	7.14	—	6.47	—	—	—	—	4.44	—	—	—
18	5.79	3.96	—	—	—	—	—	4.78	—	—	—
19	6.15	4.08	3.68	4.80	—	—	—	4.89	—	—	—

PO, postoperative; W, week; M, month; Y, year. Dashes (—) indicate timepoints at which no measurement was recorded.
*This patient received a tarsorrhaphy 1 week before this MRD2 value
**This patient received a tarsorrhaphy 1 month before this MRD2 value

(continued)



Figure 2: Imaging of the right eye showing the durability of a hard palate in the lower lid in a patient with thyroid eye disease. From left to right: preoperative, postoperative month 6, postoperative 1 year, postoperative year 1 and a half, postoperative year 2. Their CAS score was 1 preoperatively and remained stable at 0-1 postoperatively without symptoms throughout the year. Their preoperative Hertel at base 105 was 20 and postoperative at base 95 was 18. They had a history of a thyroidectomy, strabismus surgery to the right inferior and superior rectus muscle, and 8 Tepezza infusions.

Table 2: MRD2 Outcomes in Thyroid Eye Disease vs Non-Thyroid Eye Disease Eyes

	TED (n=22)	Non-TED (n=22)	p (between groups, unpaired t-test)
	Mean ± SD	Mean ± SD	
Preoperative MRD2, mm	6.81 ± 1.02	7.03 ± 1.25	0.520
Postoperative MRD2, mm	5.59 ± 1.25	5.12 ± 1.09	—
MRD2 change, mm	1.22 ± 1.11	1.91 ± 1.23	0.057
p (within group, paired t-test)	< 0.001	< 0.001	—

MRD2, margin-to-reflex distance 2; SD, standard deviation; TED, thyroid eye disease. Between-group comparison of MRD2 change was done using an unpaired t-test. Within group comparison was done using a paired t-test.

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References

1. Kim KH, Baek JS, Lee S, et al. Causes and Surgical Outcomes of Lower Eyelid Retraction. *Korean J Ophthalmol*. 2017;31(4):290–298. doi:10.3341/kjo.2016.0059
2. Le Louarn C. Concentric Malar Lift in the Management of Lower Eyelid Rejuvenation or Retraction: A Clinical Retrospective Study on 342 Cases, 13 Years After the First Publication. *Aesthetic Plast Surg*. 2018;42(3):725–742. doi:10.1007/s00266-018-1079-0
3. Ben Simon GJ, Lee S, Schwarcz RM, McCann JD, Goldberg RA. Subperiosteal Midface Lift with or without a Hard Palate Mucosal Graft for Correction of Lower Eyelid Retraction. *Ophthalmology*. 2006;113(10):1869–1873. doi:10.1016/j.optha.2006.05.014
4. Zhang Z, Yanjun S, Ye X. Correction of Cicatricial Lower Eyelid Retraction and Entropion With Combined Scar Release, Hard Palate Graft, and Lateral Canthal Suspension. *Journal of Craniofacial Surgery*. 2024;35(2):622–625. doi:10.1097/SCS.00000000000009798
5. Putterman AM. Margin reflex distance (MRD) 1, 2, and 3. *Ophthalmic Plast Reconstr Surg*. 2012;28(4):308–311. doi:10.1097/IOP.0b013e3182523b7f
6. Patel MP, Shapiro MD, Spinelli HM. Combined hard palate spacer graft, midface suspension, and lateral canthoplasty for lower eyelid retraction: a tripartite approach. *Plast Reconstr Surg*. 2005;115(7):2105–2114.
7. Milbratz GH, Garcia DM, Guimarães FC, Fulco EA, Coelho RP, Suzuki H. Multiple radial midpupil lid distances: a simple method for lid contour analysis. *Ophthalmic Plast Reconstr Surg*. 2012;28(2):140–144.
8. Kang D, Shao J, Zhu X, Jiao R, Fan X. Analysis of lid contour in thyroid eye disease with upper and lower eyelid retraction using multiple radial midpupil lid distances. *Orbit*. 2016;35(6):333–339.
9. Shao J, Lin M, Chen H. Automatic measurement and comparison of normal eyelid contour by age and gender using image-based deep learning. *Ophthalmol Sci*. 2024;4(5).
10. Ding J, Wang Y, Zhang S. Correction of lower eyelid retraction with hard palate graft in the anophthalmic socket. *Ophthalmic Plast Reconstr Surg*. 2019;35(1):59–63.

2:13–2:19 pm

Radical Excision of Cicatricial Middle Lamella: A Spacer-Free Approach for Correcting Post-Cosmetic Lower Eyelid Retraction

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Introduction: Post-cosmetic lower eyelid retraction is frequently associated with middle lamellar scarring and multifactorial structural abnormalities, including anterior lamellar shortage and horizontal laxity¹, has traditionally been managed with combinations of scar release, horizontal tightening, midface elevation, and spacer grafting^{2,3}. However, spacer grafts are associated with donor-site morbidity, graft-related complications, and no single graft material has been shown to be clearly superior³. To evaluate the outcomes of microscope-assisted complete excision of middle-to-posterior lamellar scar tissue without spacer grafting for the correction of lower eyelid retraction following cosmetic lower eyelid procedures.

Methods: A retrospective review was conducted of 36 patients (57 eyelids) presenting with lower eyelid retraction after cosmetic procedures. Among these, 13 patients (18 eyelids) with clinically diagnosed middle-to-posterior lamellar cicatricial contracture and a minimum follow-up of 3 months were included. The mean age was 47 ± 13 years, and all patients were female. The mean follow-up period was 4.9 ± 2.6 months. Prior procedures included transcutaneous fat repositioning (6 patients, 10 eyelids), transconjunctival fat repositioning (4 patients, 5 eyelids), lower eyelid lowering procedures (2 patients, 3 eyelids), and combined fat removal with fat injection (1 patient, 1 eyelid). All eyelids underwent microscope-assisted complete excision of fibrotic middle-to-posterior lamellar tissue, including the scarred orbital septum. The procedure was performed via transconjunctival or transcutaneous approaches under high magnification. Additional procedures were selectively performed, including horizontal tightening (5 eyelids) and skin grafting (2 eyelids). Notably, spacer grafts were not used in any case. Pre- and postoperative MRD2 were compared.

Results: Mean MRD2 improved significantly from 8.34 ± 1.47 mm preoperatively to 6.38 ± 0.72 mm postoperatively, achieving a mean reduction of 1.95 ± 1.16 mm ($P < 0.001$). All eyelids showed objective improvement in position and globe apposition. Selective additional procedures included horizontal tightening (5 eyelids) and skin grafting (2 eyelids). No major complications, such as hematoma, vision loss, or significant recurrence of retraction, were observed within the follow-up period.

Conclusions: Microscope-assisted radical excision of pathological middle lamellar scar tissue provides a reliable, spacer-free correction for post-cosmetic lower eyelid retraction. These findings indicate that cicatricial contracture of the middle lamella, particularly the scarred orbital septum, represents the primary mechanical tether responsible for eyelid malposition in selected cases.

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Previous studies have suggested that selected cases may be treated without spacer grafts⁴; however, the present technique further advances this concept by enabling complete excision of the pathological middle lamella. By eliminating this mechanical tether, eyelid position can be restored without the need for spacer grafting, thereby avoiding graft-related morbidity and limitations.

Figure 1

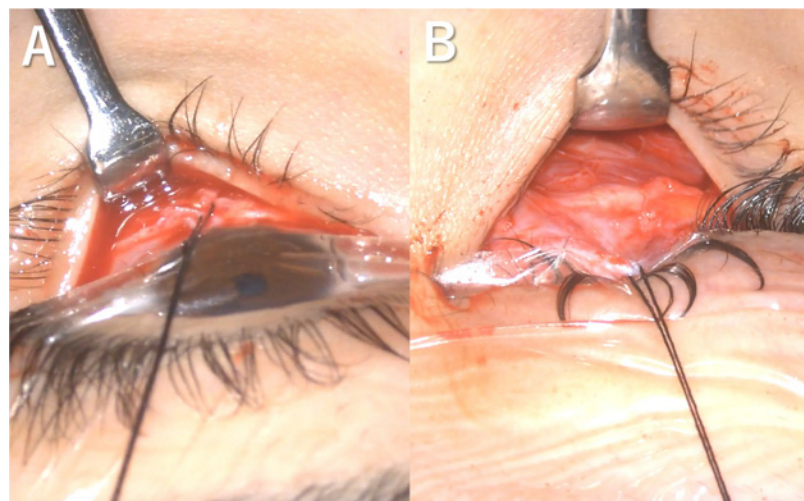


Figure 2

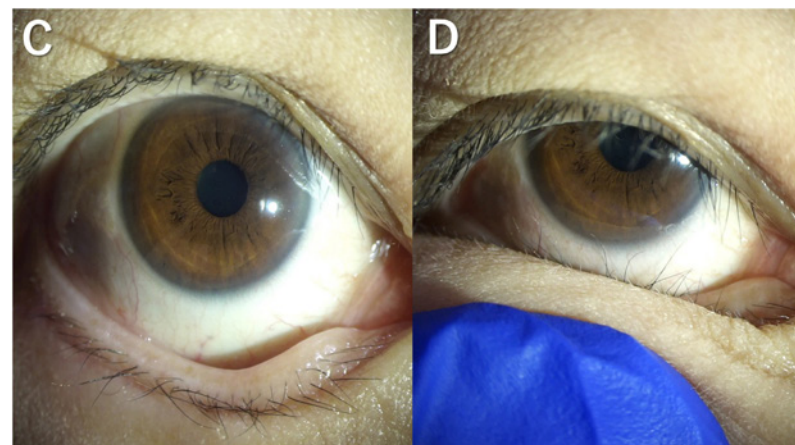
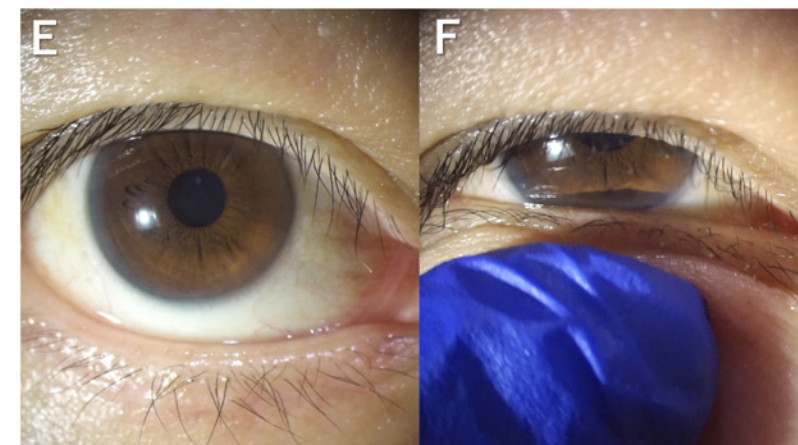


Figure 3



References

1. [postblepharoplasty lower eyelid retraction](#). *Aesthet Surg J*;34:995-1004,2014.
2. Patel BC, Patipa M, Anderson RL, McLeish W. Management of postblepharoplasty lower eyelid retraction with hard palate grafts and lateral tarsal strip. *Plast Reconstr Surg*;99:1251-60,1997.
3. Park E, Lewis K, Alghoul MS. Comparison of Efficacy and Complications Among Various Spacer Grafts in the Treatment of Lower Eyelid Retraction: A Systematic Review. *Aesthet Surg J*;37:743-754,2017.
4. Taban MR. Lower Eyelid Retraction Surgery Without Internal Spacer Graft. *Aesthet Surg J*;37:133-136,2017.

2:19–2:25 pm

Conservative Lateral Orbicularis Oculi Myomectomy for the Correction of Crow's Feet Wrinkles

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King Saud University, Riyadh, Saudi Arabia

Introduction: To evaluate the aesthetic, functional, quality of life, and safety outcomes of a standardized, conservative lateral orbicularis oculi myomectomy performed during upper blepharoplasty with/without browplasty for correction of crow's feet wrinkles

Methods: This retrospective series reviewed all patients aged 18 years or older who underwent a 1.5 × 1.5 cm lateral orbicularis oculi myomectomy by a single surgeon between May 2023 and May 2025, in conjunction with upper eyelid blepharoplasty with/without browplasty. Crow's feet severity was graded pre and postoperatively using the Carruthers validated crow's feet grading scale by a masked physician reviewer. Patient-reported outcomes were collected via electronic questionnaire, including overall, aesthetic, functional, and quality of life satisfaction (5-point Likert scales) and adverse event items. Only patients who had minimum of 6 months postoperative follow up and completed electronic satisfaction questionnaire were included.

Results: 407 patients were included; 282 (69.3%) underwent concomitant blepharoplasty and browplasty and 125 (30.7%) blepharoplasty alone. The cohort was predominantly female (400 patients), with a median age of 45 years. Median followup was 21 months (range, 9–34 months). Preoperative crow's feet severity was comparable between the two groups. Postoperatively, crow's feet grading scale (CFGs) scores decreased significantly and this was observed more in the group with concomitant blepharoplasty and browplasty (table 1 & 2). There was no significant statistical between the change in CFGs scores and the age of the patients, presence of chronic medical conditions, or smoking. Overall, 95.3% of patients were satisfied or very satisfied, with significantly higher satisfaction with appearance, function, and quality of life in the browplasty group (all $p < 0.01$). Adverse events were infrequent and transient such as ocular dryness (~10%) and localized numbness (~4%). Only one patient complained of persistent mild depression at the site of lateral orbicularis oculi myomectomy which was managed successfully with hyaluronic acid filler injection.

Conclusions: A conservative lateral orbicularis oculi myomectomy performed with upper blepharoplasty with/without browplasty provided significant improvement in crow's feet severity, high patient satisfaction, and a low complication rate. This was observed more in patients with concomitant blepharoplasty and browplasty.

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Table1: Preoperative and Postoperative Crow’s Feet Grading Scale (CFGs) Distribution for Lateral Orbicularis Oculi Myomectomy with Blepharoplasty Alone group (Total Number 125 Patients)

CFGs grade	Description	Preoperative CFGs Assessment		Postoperative CFGs Assessment	
		At Rest	Maximum Smile (Dynamic)	At Rest	Maximum Smile (Dynamic)
0	No wrinkles	5 (4%)	0	8 (6.4%)	4(3.2)
1	Very fine wrinkles	34 (27.2%)	6 (4.8%)	71 (56.85)	31(24.8)
2	Fine wrinkles	45 (36.0%)	17 (13.6)	40 (32.0%)	79 (63.2%)
3	Moderate wrinkles	27 (21.6%)	59 (47.2%)	5(4.0%)	10(8.0%)
4	Severe wrinkles	14 (11.2%)	43(34.4%)	1(.08%)	1(0.8%)
Total		125 (100%)	125 (100%)	125 (100%)	125 (100%)

Table2: Preoperative and Postoperative Crow’s Feet Grading Scale (CFGs) Distribution for Lateral Orbicularis Oculi Myomectomy with Concomitant Blepharoplasty and Browplasty group (Total Number 282 Patients)

CFGs grade	Description	Preoperative CFGs Assessment		Postoperative CFGs Assessment	
		At Rest (static)	Maximum Smile (Dynamic)	At Rest (static)	Maximum Smile (Dynamic)
0	No wrinkles	12 (4.3%)	0	25(8.9%)	16 (5.7%)
1	Very fine wrinkles	75 (26.6%)	14 (5.0%)	170 (60.3%)	104 (36.9%)
2	Fine wrinkles	102 (36.2%)	37 (13.1%)	84 (29.8%)	154 (54.6%)
3	Moderate wrinkles	62 (22.0%)	132 (46.8%)	3 (1.1)	8 (2.8%)
4	Severe wrinkles	31 (11.0%)	99 (35.1%)	0	0
Total		282 (100%)	282 (100%)	282 (100%)	282 (100%)

2:25–2:31 pm

A New Protocol for Filler-Induced Blindness and Orbital Compromise Based on Systematic Analysis of Intra-Arterial Thrombolytic Treatment and International Consensus

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Introduction: Cosmetic fillers, especially hyaluronic acid (HA) gel fillers, have become increasingly popular in recent years, along with an increase in ischemic complications such as vision loss. Cosmetic fillers can embolize and occlude the ophthalmic artery and other internal or external carotid system end arteries, ultimately leading to irreversible orbital damage if not treated emergently. A method of prompt, targeted intravascular filler dissolution is critical for visual recovery in these patients. We sought to evaluate the efficacy of a novel intra-arterial therapy (IAT) using hyaluronidase (HYAL) and/or thrombolytics for the emergent management of hyaluronic acid filler-related vision loss and other ischemic complications.

Methods: PubMed, Scopus, Embase, and Medline were used to identify literature on IAT for vision loss after HA filler injection or autologous fat transfer. Demographic, procedural, and clinical data was abstracted from eligible studies with a primary focus on recanalization of the affected artery and patterns of visual acuity improvement.

Results: 200 eligible cases of IAT for HA fillers were reviewed. Complete or partial successful artery recanalization was achieved in 89.5% of cases, of which 40.0 % had visual improvement. Cases with initial light perception (LP) had a higher rate of visual improvement following IAT than those with no LP post-filler injection (58.7% vs 34.4%, respectively). Visual improvement was observed more frequently after IAT with HYAL and thrombolytics vs. HYAL alone (64.5% vs. 35.5%). Duration to IAT was not associated with improved visual acuity. An additional review of 15 reported cases of IAT for lipo-filling (fat grafting) associated vision loss as well as one case of intravenous (IV) thrombolytics was also analyzed.

Conclusions: Overall, timely intra-arterial HYAL with thrombolytics can effectively recanalize filler-occluded arteries and has the potential to reverse vision loss or prevent further orbital compromise and phthisis bulbi. Based on this systemic analysis, a simplified international protocol is proposed.

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Figure 1

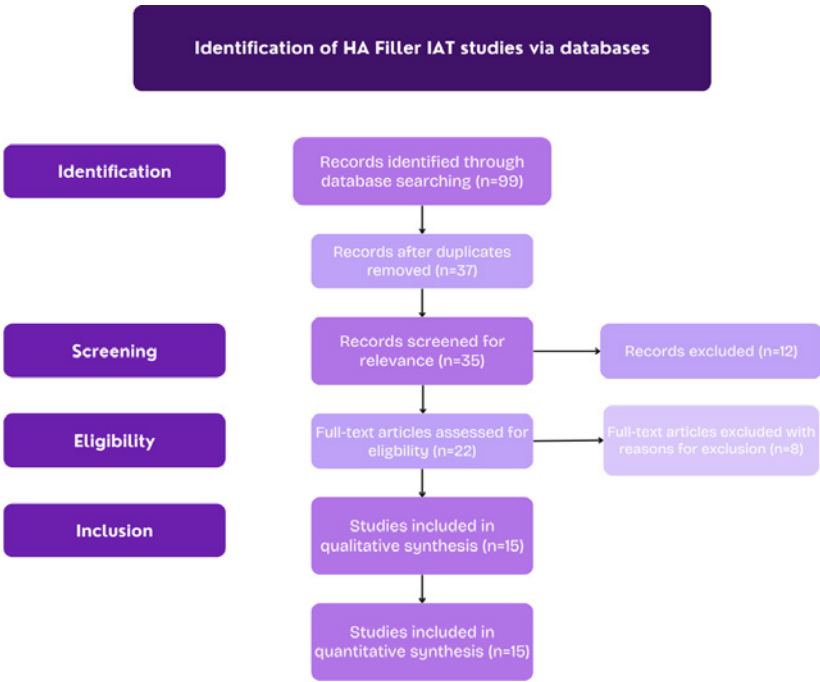


Figure 2

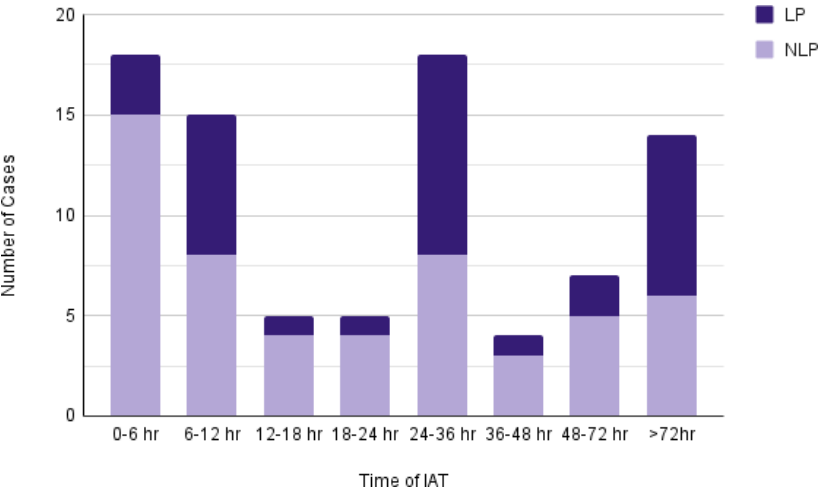
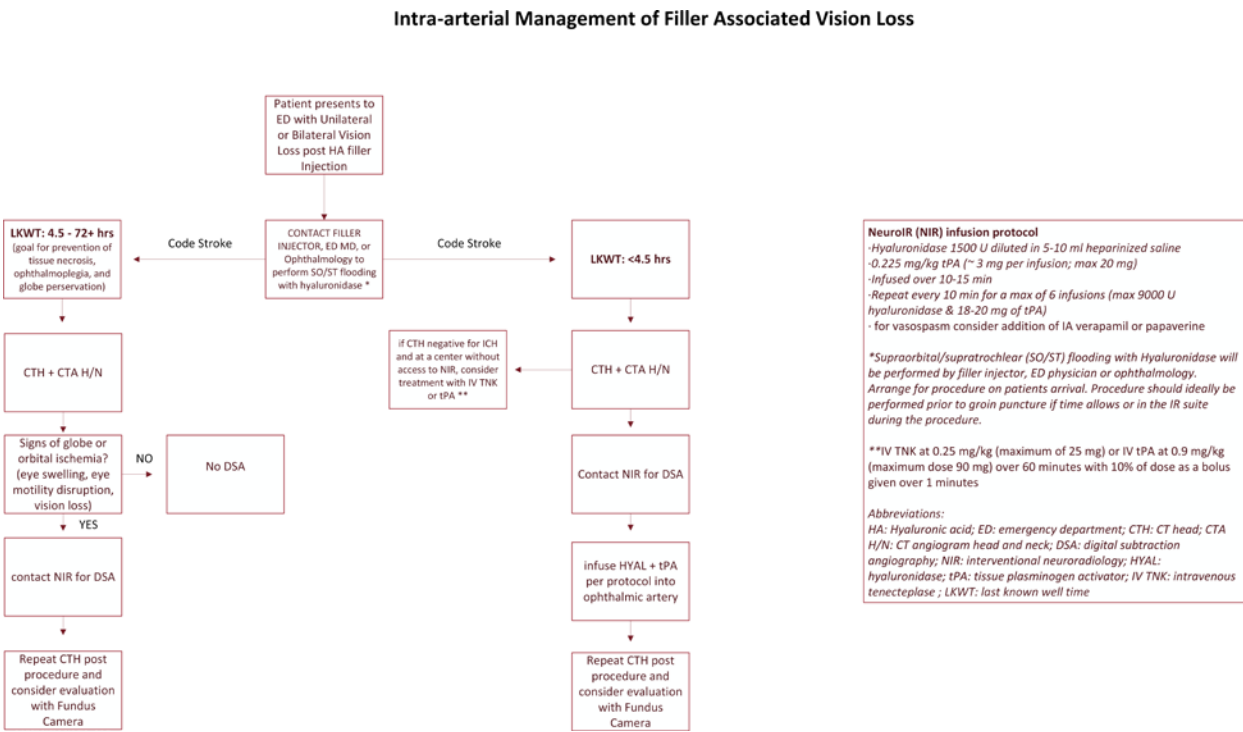


Figure 3



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Figure 4

Filler-Related Orbital Compromise Intra-Arterial Thrombolysis Protocol for Neuro-Interventionalists Prepared for ISAC by Sandy Zhang-Nunes, MD and Shaili Davuluru, BA		
1 PREPARATION & MATERIALS		
<u>Transfemoral Catheterization</u> • 5- French Sheath • 0.035 Guidewire (Cook Bentston) • Heparinized Saline • (Flush + 80 units/kg IV) <i>Imaging</i> • Ultrasound Guidance	<u>Intra-Arterial Infusion</u> • 1cc syringe • 10cc syringe (reservoir) Pharmacologic Agents ** • Hyaluronidase (1500U) • Heparinized Saline (for dilution) <i>Optional</i> • Thrombolytic Agent ◦ Tenecteplase (0.25 mg/kg, max 25mg) ◦ Alteplase (max 20-50mg) ◦ Urokinase (300,000 IU) ◦ Streptokinase (8mg) • Anti-Vasospasmotic ◦ Papaverine (30 to 90 mg) ◦ Verapamil (2 to 5mg) ** Prepare for maximum of 6 infusions containing indicated quantities **	
<u>Intracranial Catheterization</u> • 5-French guide catheter (Envoy) • Rotating hemostatic valve • 0.035 Angled Glide wire • Heparinized Saline Flush • 167 Microcatheter (Head Duo) • 008-014 Microwire (Hybrid) <i>Imaging</i> • Angiogram		
2 CATHETERIZATION ACCESS		
1 Inguinal Local Anesthesia + Ultrasound-guided Micropuncture kit to common femoral artery	2 Insert 5-French Sheath transfemorally or transradially over 0.035 guidewire + heparinized saline flush	3 Infuse Heparin 80 units/kg intravenously
3 INTRACRANIAL ACCESS + THROMBOLYSIS		
4 Introduce angled guidewire through 5-French Envoy guide connected to heparinized saline flush + rotating hemostatic valve, and track up to aortic arch	5 Guide catheter advanced into respective proximal internal carotid artery after visualizing common carotid. + Cranial Angiogram	6 Withdraw glide wire; Exchange for head duo microcatheter over hybrid microwire and track up to supraclinoid under roadmap guidance
7 Withdraw microwire; Microcatheter retracted until ostium of ophthalmic artery (OA) is selected. + OA Angiogram	8 Infuse Hyaluronidase 1500U diluted in 5-10mL heparinized saline + Thrombolytics +/- Papaverine (30-90mg) over 5-10 mins + OA Angiogram	9 Repeat every 10 minutes for a max of 6 infusions. Withdraw microcatheter + Post-IAT Angiogram. Withdraw guide, sheath, and close arteriotomy

(continued)

Figure 5

Hyaluronic Acid Filler-Related Orbital Compromise

Emergent Interventional Protocol

Prepared for ISAC by Sandy Zhang-Nunes, MD, Shaili Davuluru, BA, and Linda Wu, BA

1

STOP TREATMENT

Immediately CEASE filler injection

ACTIVATE pre-planned protocol and training

2

Transfer to Specialist

If available
Phone #:

Consider as an emergency similar to stroke.
Transfer to Stroke Hospital, if available
Stroke Team/physician #:

****Proceed with other steps at same time,
do not delay transfer****

3

ASSESS VISUAL ACUITY

Assess each eye with other eye closed

Count Fingers

Hand Motion

Light Perception

OCULAR MASSAGE

- Instruct patient to apply circular massage with continuous pressure to closed eye (indenting sclera 2-3mm without causing severe pain)
- Patient to apply for 5 secs, then rest for 5 secs for 15 minutes each cycle.^{4,5}

WARM COMPRESS

- Improves blood flow, vasodilation.^{27,28}
- Apply microwavable compress that retains heat x 10 minutes

ACUTE TREATMENT HYALURONIDASE

Flood Supraorbital/Supratrochlear Region

- Inject Hyaluronidase (HYAL) 600-1500 U (if with lidocaine, without epinephrine) to the filler and ischemic site as soon as possible and massage injection site.^{1,4,14}
- ~500U HYAL per 3cm x 3cm for involved skin tissue.¹⁷
- Continue q10-15 min (150-300 U) HYAL with massage until attention from stroke team and/or receive intra-arterial treatment below.

Refer to ophthalmologist to consider:

Peribulbar HYAL or if unable to accomplish intra-arterial HYAL (facial, supraorbital, supratrochlear arteries)

POSSIBLE FURTHER TREATMENT*

Acute

*Limited evidence, refer to resource handout for risks and benefits of intervention

Aspirin

100-300mg orally immediate dose, then 75mg daily x 3-5 days or until improvement.^{12,34}
Follow ischemic stroke treatment protocol.

Intraocular Pressure Lowering*

If Available, Timolol 0.5% drops 1-2x. Limited evidence, but can dislodge embolus.³²

Thrombolytic Therapy

IV Tenecteplase may be beneficial within 4.5 to 6 hours, similar to stroke or CRAO protocol.³⁰⁻⁴⁰

Steroids

IV or oral steroid taper can decrease inflammation around tissue injury from filler-related occlusion.^{8,42-44}

Vasodilators

E.g 50/50 Nitrous/O2 reasonable.⁴¹ Mixed evidence for others with risk of hypotension and worsening ischemia (e.g nitropaste/nitroglycerin, sildenafil, pentoxifylline)

Hyperbaric Oxygen

Improves ischemic discoloration, stimulates angiogenesis, collagen maturation within 24-72 hours.^{27,29}

Subacute

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References

1. Kim BJ, You HJ, Jung I, Kim DW. Ophthalmoplegia with skin necrosis after a hyaluronic acid filler injection. *J Cosmet Dermatol*. 2020;19(6):1307-1310. doi:10.1111/jocd.13403
2. Kim EG, Eom TK, Kang SJ. Severe Visual Loss and Cerebral Infarction After Injection of Hyaluronic Acid Gel. *J Craniofac Surg*. 2014;25(2):684. doi:10.1097/SCS.0000000000000537
3. Kato JM, Matayoshi S. Visual loss after aesthetic facial filler injection: a literature review on an ophthalmologic issue. *Arq Bras Oftalmol*. 2022;85(3):309-319. doi:10.5935/0004-2749.20220048
4. Foster J, Aakalu VK, Freitag SK, et al. Vision-Threatening Complications of Soft Tissue Fillers: A Report by the American Academy of Ophthalmology. *Ophthalmology*. 2025;132(8):935-944. doi:10.1016/j.opththa.2025.01.020
5. Hayreh SS. Central retinal artery occlusion. *Indian J Ophthalmol*. 2018;66(12):1684-1694. doi:10.4103/ijo.IJO_1446_18
6. Tobalem S, Schutz JS, Chronopoulos A. Central retinal artery occlusion - rethinking retinal survival time. *BMC Ophthalmol*. 2018;18(1):101. doi:10.1186/s12886-018-0768-4
7. King M, Walker L, Convery C, Davies E. Management of a Vascular Occlusion Associated with Cosmetic Injections. *J Clin Aesthetic Dermatol*. 2020;13(1):E53-E58.
8. Svoronos AA, Scott NL. Vision recovery after ocular massage for cosmetic filler-induced ophthalmic artery occlusion. *Am J Ophthalmol Case Rep*. 2024;36:102229. doi:10.1016/j.ajoc.2024.102229
9. Snozzi P, van Loghem JAJ, Nguyen H, Luft AR, Saeed P. Management of Visual Loss Following Hyaluronic Acid Filler Injections: An Algorithm-based Approach. *Plast Reconstr Surg Glob Open*. 2026;14(3):e7576. doi:10.1097/GOX.00000000000007576
10. Doyon VC, Liu C, Fitzgerald R, et al. Update on Blindness From Filler: Review of Prognostic Factors, Management Approaches, and a Century of Published Cases. *Aesthet Surg J*. 2024;44(10):1091-1104. doi:10.1093/asj/sjae091
11. DeLorenzi C. Transarterial degradation of hyaluronic acid filler by hyaluronidase. *Dermatol Surg Off Publ Am Soc Dermatol Surg Al*. 2014;40(8):832-841. doi:10.1097/DSS.0000000000000062
12. Fu H, Fu Q, Yu Y, et al. Efficacy of Superselective Intra-arterial Recanalization of Embolized Arteries Resulting from Facial Hyaluronic Acid Injection. *Aesthetic Plast Surg*. 2024;48(18):3561-3567. doi:10.1007/s00266-024-04004-2
13. Kim A, Kim SH, Kim HJ, Yang HK, Hwang JM, Kim JS. Ophthalmoplegia as a complication of cosmetic facial filler injection. *Acta Ophthalmol (Copenh)*. 2016;94(5):e377-379. doi:10.1111/aos.12893
14. Kim YK, Jung C, Woo SJ, Park KH. Cerebral Angiographic Findings of Cosmetic Facial Filler-related Ophthalmic and Retinal Artery Occlusion. *J Korean Med Sci*. 2015;30(12):1847-1855. doi:10.3346/jkms.2015.30.12.1847
15. Nguyen HH, Tran HTT, Duong QH, Nguyen MD, Dao HX, Le DT. Significant Vision Recovery from Filler-Induced Complete Blindness with Combined Intra-Arterial Injection of Hyaluronidase and Thrombolytic Agents. *Aesthetic Plast Surg*. 2022;46(2):907-911. doi:10.1007/s00266-021-02658-w
16. Oh BL, Jung C, Park KH, Hong YJ, Woo SJ. Therapeutic Intra-arterial Hyaluronidase Infusion for Ophthalmic Artery Occlusion Following Cosmetic Facial Filler (Hyaluronic Acid) Injection. *Neuro-Ophthalmol*. 2014;38(1):39-43. doi:10.3109/01658107.2013.830134
17. Park KH, Kim YK, Woo SJ, et al. Iatrogenic occlusion of the ophthalmic artery after cosmetic facial filler injections: a national survey by the Korean Retina Society. *JAMA Ophthalmol*. 2014;132(6):714-723. doi:10.1001/jamaophthalmol.2013.8204
18. Wang Y, Li Q, Ye Y, et al. Intraarterial Thrombolytic Treatment for Visual Deficits Caused by Hyaluronic Acid Filler: Efficacy, Safety, and Prognostic Factors. *Plast Reconstr Surg*. 2023;152(6):1226-1233. doi:10.1097/PRS.00000000000010374
19. Wang J, Shen H, Liu T, Li Q, Lyu Z, Yu Y. An Efficacy and Safety Study of Intra-arterial Recanalization of Occluded Ophthalmic Arteries in Patients with Monocular Blindness Caused by Injection of Hyaluronic Acid in Facial Tissues. *Aesthetic Plast Surg*. 2021;45(4):1573-1578. doi:10.1007/s00266-021-02224-4
20. Wu Q, Fu Q, Xu X, Zheng C, Zhang J, Chen M. Superselective Ophthalmic Artery Thrombolytic Therapy for Hyaluronic Acid Embolization: A Case Report. *Clin Cosmet Investig Dermatol*. 2022;15:1459-1463. doi:10.2147/CCID.S367481
21. Xu X, Zhou G, Fu Q, et al. Efficacy of intra-arterial thrombolytic therapy for vision loss resulting from hyaluronic acid filler embolization. *J Cosmet Dermatol*. 2021;20(10):3205-3212. doi:10.1111/jocd.14111
22. Zhang L, Luo Z, Li J, et al. Endovascular Hyaluronidase Application Through Superselective Angiography to Rescue Blindness Caused by Hyaluronic Acid Injection. *Aesthet Surg J*. 2021;41(3):344-355. doi:10.1093/asj/sjaa036
23. Zhang LX, Lai LY, Zhou GW, et al. Evaluation of Intraarterial Thrombolysis in Treatment of Cosmetic Facial Filler-Related Ophthalmic Artery Occlusion. *Plast Reconstr Surg*. 2020;145(1):42e-50e. doi:10.1097/PRS.00000000000006313

(continued)

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24. Zheng C, Fu Q, Zhou GW, et al. Efficacy of Percutaneous Intraarterial Facial/Supratrochlear Arterial Hyaluronidase Injection for Treatment of Vascular Embolism Resulting From Hyaluronic Acid Filler Cosmetic Injection. *Aesthet Surg J*. 2022;42(6):649–655. doi:10.1093/asj/sjab425
25. Lee S, Jung J ho, Seo J, Kim EG. Ischemic Stroke Caused by a Hyaluronic Acid Gel Embolism Treated with Tissue Plasminogen Activator. *J Neurocritical Care*. 2017;10(2):132–135. doi:10.18700/jnc.170020
26. Chiang C, Zhou S, Liu K. Intravenous Hyaluronidase with Urokinase as Treatment for Arterial Hyaluronic Acid Embolism. *Plast Reconstr Surg*. 2016;137(1):114. doi:10.1097/PRS.0000000000001931
27. Wu Q, Zhou G, Xu X, et al. Exploring Superselective Intraarterial Thrombolysis for Autologous Fat Injection-Induced Vision Loss. *Aesthet Surg J*. 2024;44(5):NP337–NP346. doi:10.1093/asj/sjae005
28. Azizjalali P, Zaresharifi S, Benyamin B, Alipour F, Kassir M, Dadkhahfar S. Stroke and ischemic ocular syndrome following facial injection of autologous fat managed by tissue plasminogen activator. *J Cosmet Dermatol*. 2024;23(2):403–405. doi:10.1111/jocd.16028
29. Park SJ, Woo SJ, Park KH, et al. Partial recovery after intraarterial pharmacomechanical thrombolysis in ophthalmic artery occlusion following nasal autologous fat injection. *J Vasc Interv Radiol JVIR*. 2011;22(2):251–254. doi:10.1016/j.jvir.2010.10.023
30. Chen Y, Zhang Y liang, Luo SK. Experimentally Induced Arterial Embolism by Hyaluronic Acid Injection: Clinicopathologic Observations and Treatment. *Plast Reconstr Surg*. 2019;143(4):1088. doi:10.1097/PRS.00000000000005456
31. Ahn SJ, Kim JM, Hong JH, et al. Efficacy and safety of intra-arterial thrombolysis in central retinal artery occlusion. *Invest Ophthalmol Vis Sci*. 2013;54(12):7746–7755. doi:10.1167/iovs.13-12952
32. Schumacher M, Schmidt D, Jurklies B, et al. Central Retinal Artery Occlusion: Local Intra-arterial Fibrinolysis versus Conservative Treatment, a Multicenter Randomized Trial. *Ophthalmology*. 2010;117(7):1367–1375.e1. doi:10.1016/j.optha.2010.03.061
33. Prabhakaran S, Gonzalez NR, Zachrison KS, et al. 2026 Guideline for the Early Management of Patients With Acute Ischemic Stroke: A Guideline From the American Heart Association/American Stroke Association. *Stroke*. Published online January 26, 2026. doi:10.1161/STR.0000000000000513
34. Schrag M, Youn T, Schindler J, Kirshner H, Greer D. Intravenous Fibrinolytic Therapy in Central Retinal Artery Occlusion: A Patient-Level Meta-analysis. *JAMA Neurol*. 2015;72(10):1148–1154. doi:10.1001/jamaneurol.2015.1578
35. Mac Grory B, Lavin P, Kirshner H, Schrag M. Thrombolytic Therapy for Acute Central Retinal Artery Occlusion. *Stroke*. 2020;51(2):687–695. doi:10.1161/STROKEAHA.119.027478
36. Shahjouei S, Bavarsad Shahripour R, Dumitrascu OM. Thrombolysis for central retinal artery occlusion: An individual participant-level meta-analysis. *Int J Stroke*. 2024;19(1):29–39. doi:10.1177/17474930231189352
37. National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. *N Engl J Med*. 1995;333(24):1581–1587. doi:10.1056/NEJM199512143332401
38. Shaltoni HM, Albright KC, Gonzales NR, et al. Is intra-arterial thrombolysis safe after full-dose intravenous recombinant tissue plasminogen activator for acute ischemic stroke? *Stroke*. 2007;38(1):80–84. doi:10.1161/01.STR.0000251720.25337.b0
39. Gurwitz JH, Gore JM, Goldberg RJ, et al. Risk for intracranial hemorrhage after tissue plasminogen activator treatment for acute myocardial infarction. Participants in the National Registry of Myocardial Infarction 2. *Ann Intern Med*. 1998;129(8):597–604. doi:10.7326/0003-4819-129-8-199810150-00002
40. Chatterjee S, Chakraborty A, Weinberg I, et al. Thrombolysis for pulmonary embolism and risk of all-cause mortality, major bleeding, and intracranial hemorrhage: a meta-analysis. *JAMA*. 2014;311(23):2414–2421. doi:10.1001/jama.2014.5990
41. McCann M. Intravenous Hyaluronidase for Visual Loss Secondary to Filler Injection: A Novel Therapeutic Approach. *JCAD - The Journal of Clinical and Aesthetic Dermatology*. Accessed December 8, 2025. <https://jcadonline.com/intravenous-hyaluronidase-visual-december-2019/>
42. Hurkal O, Sibar S, Cenetoglu S, Tuncer S, Elmas C, Seymen CM. Arterial Occlusion After Hyaluronic Acid Injection: Treatment With Hyaluronidase and Streptokinase. *Ann Plast Surg*. 2021;87(6):e137–e144. doi:10.1097/SAP.0000000000002962
43. Powers WJ. Acute Ischemic Stroke. *N Engl J Med*. 2020;383(3):252–260. doi:10.1056/NEJMcip1917030
44. Mendelson SJ, Prabhakaran S. Diagnosis and Management of Transient Ischemic Attack and Acute Ischemic Stroke: A Review. *JAMA*. 2021;325(11):1088–1098. doi:10.1001/jama.2020.26867
45. Minhas JS, Chithiramohan T, Wang X, et al. Oral antiplatelet therapy for acute ischaemic stroke. *Cochrane Database Syst Rev*. 2022;1(1):CD000029. doi:10.1002/14651858.CD000029.pub4
46. Madala S, Bao YK, Lee JH, Gluckstein J, Chang J, Zhang-Nunes S. Phthisical eye and orbital ischemia after cosmetic platelet-rich plasma injection to the forehead. *Am J Ophthalmol Case Rep*. 2024;34:101968. doi:10.1016/j.ajoc.2023.101968



Moderators: Sara Wester and Robert Kersten

2:42–2:45 pm

Pericranial Flap, Biodegradable Temporizing Matrix and Modified Fricke Cheek Flap for Reconstruction of a Large Forehead, Brow and Upper Eyelid Defect

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Introduction: Large defects of the forehead, particularly when involving the lid/brow complex pose a challenge to facial reconstructive surgeons. We present a novel reconstructive technique involving a pericranial flap with Biodegradable Temporizing Matrix to reconstruct the forehead, combined with a laterally based banner flap to reconstruct the upper eyelid and brow defect.

Methods: 44 yo F presented to the oculoplastics clinic with a recurrent dermatofibrosarcoma protuberans (DFSP) of the forehead and medial right brow. The tumor was previously excised, followed by radiation ten years prior. She was treated with imatinib as neoadjuvant therapy with plans to resect the involved area after six months of therapy. Over this time, the lesion decreased in size both clinically and radiologically. The patient subsequently underwent Mohs micrographic excision, with incomplete resection of the tumor at the level of the right orbit. The following day the patient was taken to the OR with plans to reconstruct the defect and continue with imatinib therapy indefinitely rather than pursuing exenteration.

Intraoperatively the periorbital of the anterior orbital roof was excised and sent for frozen sections, confirming diffuse involvement of the DFSP. Ultimately the defect involved a large portion of the forehead and glabella, resulting in exposed frontal bone, and extended into the nasal brow and upper eyelid, exposing the orbital soft tissue. A laterally based banner flap, designed as an inverted Fricke cheek flap, was transposed into the upper eyelid and brow defect. A pericranial flap with an overlying Biodegradable Temporizing Matrix was used to reconstruct the defect of the forehead. The patient later underwent split thickness skin grafting to the biodegradable temporizing matrix.

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Post-operatively the patient did well. She underwent six triamcinolone and 5-fluoruracil injections with resultant improved thickness of the banner flap. One year following surgery, she has continued imatinib, which she has tolerated well. There has been no appreciable tumor on imaging and clinically has shown no sign of recurrence. There is some webbing of the medial canthus post-operatively but over all her cosmesis is very good.

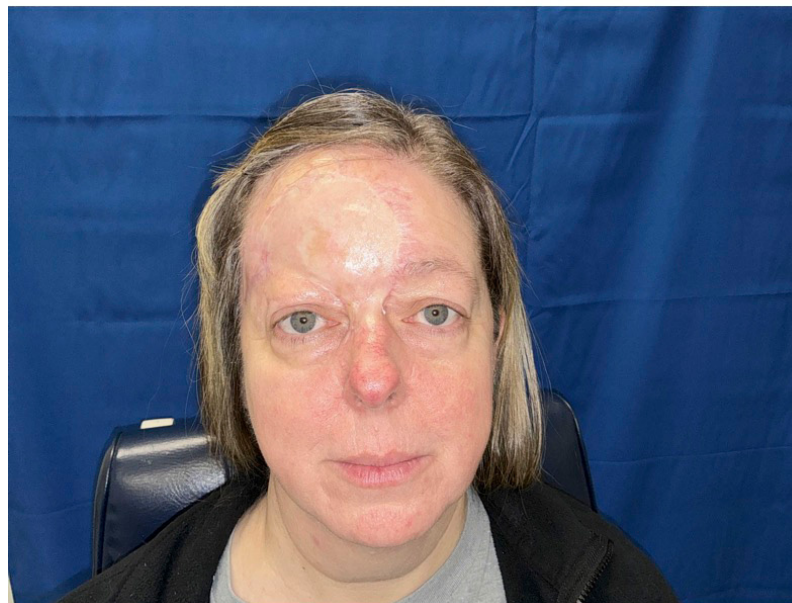
Results: This case presents a novel reconstructive approach for a large defect of the forehead, brow and upper eyelid. The modified Fricke cheek flap provides a robust flap to reconstruct upper eyelid and brow. Combining a pericranial flap with Biodegradable Temporizing Matrix gives several advantages in reconstructing the exposed bones of the skull. Given the history of previous radiation, the pericranial flap brings a robust vascular supply. The Biodegradable Tissue Matrix provides an excellent wound bed for split thickness grafting after adequate time has passed for vascular ingrowth. In our opinion it provides improved cosmesis compared to split thickness skin grafting alone or free flap, giving improved thickness and match to the surrounding tissue.

Conclusions: Combining a flap to reconstruct the upper eyelid and brow with a pericranial flap and synthetic matrix to reconstruct the forehead may provide very good cosmetic and functional outcomes.

Figure 1



Figure 2



2:45–2:48 pm

Management of Massive Recurrent Orbital Venolymphatic Malformation Following Sclerotherapy

ChaiTeck Choo

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Introduction: Orbital venolymphatic malformations are challenging due to their infiltrative nature. While sclerotherapy is commonly used, massive or recurrent lesions may worsen and require surgical intervention.

This is a case of a 50-year-old woman with an 18-year history of recurrent orbital VLM, presenting with severe pain, visual decline, and marked proptosis. MRI showed a large retrobulbar mass occupying the orbit. Initial sclerotherapy led to acute worsening, prompting surgery (FIG.1).

Methods: Surgical Video: An extended superolateral orbitotomy was performed via a brow incision (FIG.2). After bone flap creation, meticulous microdissection was used to separate the lesion from encased normal structures. The recti muscles were displaced but preserved. Fibrin sealant was injected to solidify the lesion, facilitating controlled dissection and debulking, with careful hemostasis. Orbital structures were reconstructed with restoration of volume and anatomical integrity.

Results: Despite early postoperative edema, the patient achieved excellent functional and cosmetic recovery (FIG.3).

Conclusions: Extended superolateral orbitotomy is an effective salvage approach for massive VLMs refractory to sclerotherapy, with microsurgical precision critical to preserving vision and ocular motility.

Figure 1

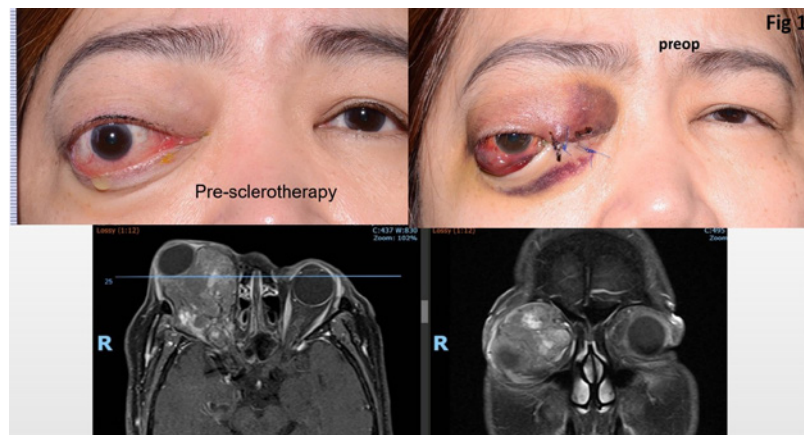


Figure 2



Figure 3



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References

1. Katz S, Rootman J, et al. Combined venous lymphatic malformations of the orbit (so-called lymphangiomas) *Ophthalmology*, 105, 176-184 Jan 1998.
2. Nassiri N, Rootman J, Rootman DB, et al. Orbital lymphaticovenous malformations: current and future treatments *Surv Ophthalmol*. 2015; 60:383-405.
3. Syeed Mehbub Ul Kadir, Sadia Sultana, Nishat Parveen et al Orbital lymphatic-venous malformation: A Review on the Management Strategies. *J.Natl.Inst.Ophthalmol*. 2022;5(2):45-51.
4. Tsai YJ, Chao A, et al, Classification, diagnosis, and management of orbital venous-lymphatic malformations: Current state-of-the-art. *Taiwan J Ophthalmol*. 2025 Mar 10;15(1):4-13.
5. Das, S., Agrawal, A., Burathoki, S. K., Nandolia, K. K., Juneja, A., & Samanta, R. (2022). Orbital Venolymphatic Malformation Treated With Sodium Tetradecyl Sulfate: A Case Report. *Cureus*, 14(9).

2:48–2:51 pm

Lower Eyelid Re-tensioning Using Autologous Fascia Lata Sling: Surgical Technique

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Introduction: Lower eyelid retraction in the setting of facial palsy is often challenging to manage, particularly after failed ectropion repair, where tissue laxity, scarring, and poor orbicularis function limit standard approaches. We present a surgical technique using an autologous fascia lata sling for correction of persistent lower eyelid retraction in this context.

Methods: A 71-year-old man with neurotrophic and neuroparalytic keratopathy and persistent left lower eyelid retraction following multiple prior eyelid surgeries underwent reconstruction using autologous fascia lata. A strip of fascia lata was harvested from the thigh and fashioned into a narrow graft. Through medial, central, and lateral eyelid incisions, the graft was passed in a suborbicularis plane. Medially, it was secured to the medial canthal tendon. Laterally, fixation was achieved by passing the graft through a drill hole in the lateral orbital rim and securing it with non-absorbable sutures. The eyelid was re-tensioned to the desired position, and all incisions were closed in layers.

Results: The procedure resulted in improved lower eyelid position with restoration of eyelid support. Postoperatively, the patient demonstrated reduction in ocular surface symptoms, including epiphora and dryness.

Conclusions: Autologous fascia lata sling provides a stable and effective option for lower eyelid retraction in complex cases of facial palsy, particularly after failed prior surgeries, where conventional techniques may be insufficient.

References

1. Jowett N. Lower Eyelid Management in Facial Paralysis. *Facial Plast Surg*. 2023 Feb;39(1):47-52. doi: 10.1055/s-0042-1759616. Epub 2022 Dec 23. PMID: 36564035.
2. Kim MJ, Choi YM, Kim N, Choung HK, Khwarg SI. The effects of using spacer grafts on lower-eyelid retraction surgery in patients with facial nerve palsy. *Eur J Ophthalmol*. 2022 Jul;32(4):2072-2077. doi: 10.1177/11206721211051931. Epub 2021 Oct 9. PMID: 34632836.
3. Dolar Bilge A. Lower eyelid retraction repair using autologous auricular scapha cartilage. *Int Ophthalmol*. 2024 Jul 4;44(1):313. doi: 10.1007/s10792-024-03165-y. PMID: 38965129.
4. Zhou YL, Wang WJ, Chen G, Ma H, Wang W. Enhancing Lower Eyelid Suspension Outcomes Through Pre-surgical Facial Nerve Reanimation: A Comparative Study. *Aesthetic Plast Surg*. 2024 Nov;48(21):4291-4298. doi: 10.1007/s00266-024-04241-5. Epub 2024 Aug 1. PMID: 39090311.
5. Shapira Y, Ullrich K, Masqood S, Okafor L, Malhotra R. Eyelid Skin Grafting in Young Patients with Facial Nerve Palsy. *J Clin Med*. 2024 Apr 8;13(7):2142. doi: 10.3390/jcm13072142. PMID: 38610907; PMCID: PMC11012737.
6. Keilani C, Sahel JA, Nordmann JP, Boumendil J. Combined Dermis Spacer Graft, Lateral Canthopexy and Subperiosteal Midface Lifting in the Management of Lower Eyelid Retraction Secondary to Chronic Facial Nerve Palsy. *J Maxillofac Oral Surg*. 2026 Apr;25(2):608-615. doi: 10.1007/s12663-022-01688-4. Epub 2022 Feb 8. PMID: 41971473; PMCID: PMC13066032.

2:51–2:54 pm

Subcutaneous Temporal Brow Lift Technique Avoiding Flap Tension and Over-Resection

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Introduction: Brow ptosis contributes significantly to upper facial aging, which can be both functional and cosmetic. Subcutaneous pretrichial temporal brow lifts offer a reliable and reproducible approach to repair while preserving muscular integrity and minimizing complications. The challenge, however, is often accurate intraoperative determination of skin resection volume to avoid over-resection, flap tension, and resultant poor scarring. We describe our subcutaneous temporal brow lift technique employing the D'Assumpção facelift clamp as an objective intraoperative tool for individualized skin flap quantification to achieve controlled, individualized skin excision to prevent such complications.

Methods: Following preoperative marking from the nasal limbus extending 3.5–4 cm laterally along the pretrichial hairline, subcutaneous infiltration with lidocaine 2% and epinephrine 100:000 is performed. A pretrichial incision is made and an inferior forehead flap is carefully elevated in the subcutaneous plane, preserving the underlying musculature. A blunt pawing dissection technique, combined with direct headlight illumination and transillumination, facilitates maintenance of the correct plane and care to avoid injury to vascular structures and underlying musculature. Dissection is extended past the orbital rim, medially to the nasal limbus and laterally to the lateral canthus. Hemostasis is rarely required. After bilateral release, the base of the D'Assumpção facelift clamp is steadied along on the superior edge of the incision and its three prongs are applied in respective positions along the flap to quantify skin flap resection: the central prong is marked centrally, medial prong medially, and lateral prong laterally. The pretrichial incision is then extended approximately one centimeter laterally and the markings are connected in a semicircular pattern to mark the skin for incision. Although resection quantity is individualized, resection most commonly measures approximately 4.5–5 cm horizontally and 1.5–2 cm vertically per side. Closure is achieved with surgical staples, and a supraorbital block is administered with 0.25% bupivacaine at the end of the case for increased postsurgical patient comfort. A cotton-gauze and self-adherent headwrap is applied and removed after 24 hours. Staples are removed 10–14 days postoperatively. Please refer to the attached surgical technique video.

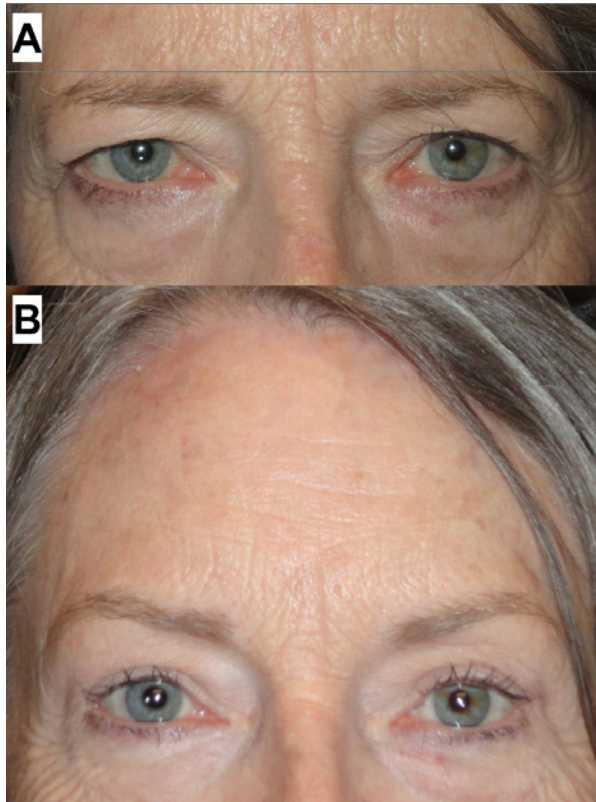
Results: Use of the D'Assumpção facelift clamp allows for precise, patient-specific determination of skin resection volume in all cases, which minimizes the risks of over-resection, excessive flap tension, and secondary scarring. In our experience, this approach yields favorable aesthetic outcomes, both in terms of brow recontour and incision, with low rates of complications, such as hematoma, flap necrosis, and lasting dysesthesia. A pre- (A) and four-months postoperative (B) case example has been provided in Figure 1.

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Conclusions: The subcutaneous temporal brow lift with D'Assumpção clamp-guided resection is a safe, reproducible technique that allows controlled tissue removal and minimizes tension-related complications.

Figure 1



2:54–2:57 pm

Oculofacial Application of Robot-Assisted Microsurgery

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Introduction: While robot-assisted microsurgery is shifting the face of soft tissue reconstructive surgery with innovations such as the DIEP (deep inferior epigastric perforator) flap for breast reconstruction¹, the technology's use in oculofacial surgery is relatively nascent, being employed for orbital fat decompression, lacrimal gland procedures, and some oncologic reconstructions²⁻⁴. As trained microsurgeons, oculofacial plastic surgeons are well positioned to advance the facial applications of robotic microsurgery. The Symani surgical system is designed for microsurgery with small wristed instruments and high motion scaling, promising to improve a surgeon's ability to perform complex microsurgical tasks, advancing patient care with new reconstructive options, reduced recovery times and decreased risk of iatrogenic injury. This cadaver simulation seeks to provide proof of concept, identify relative safety risks, and develop workflow metrics to guide clinical translation.

Methods: In this cadaveric simulation study, 3 oculofacial plastic surgeons completed introductory training sessions with non-study specimens on the robotic microsurgical system with a 3-dimensional heads-up exoscope (Figure 1) then employed the robot while performing procedures on two fresh refrigerated, non-preserved, adult donors. Procedures included canalicular laceration repair (Figure 2) and end-to-end vessel anastomosis for defect reconstruction using a pedicled free flap harvested from the post-auricular region (Figure 3).

The objective was to assess the suitability of the robotic microsurgical system during simulated procedures on human full-body cadavers for specific sub-tasks and identify steps which may benefit from robotic assistance. Secondary objectives included assessment of safety, task performance, and workflow. Findings will be used to generate effect size estimates to power future studies.

Results: The robotic microsurgical system improved stability and control of 12-0 suture when suturing sub-millimeter structures. There was no unintended specimen contact by the robot arms in this project. After gaining familiarity, the authors saw task performance improve steadily using the robotic platform. Maneuvering the equipment and patient positioning required additional time and space relative to a standard surgical microscope.

Conclusions: The robotic microsurgical system has safe, practical applications for oculofacial plastic procedures involving fine, small-scale movements in non-confined spaces such as microsuturing of free flap end-to-end vessel anastomosis.

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Figure 1

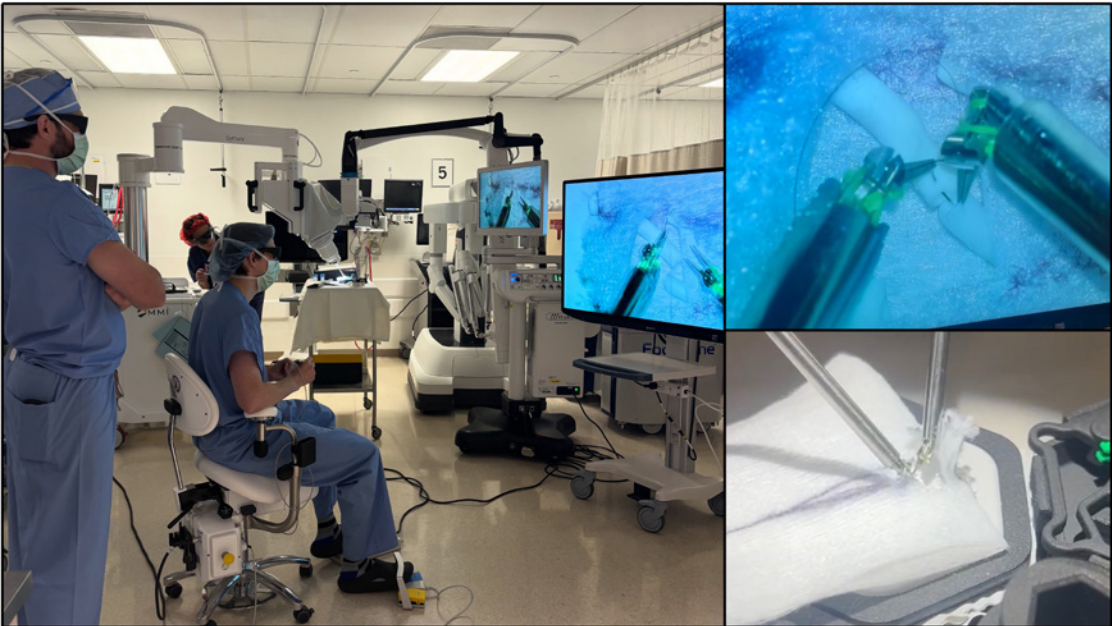


Figure 2

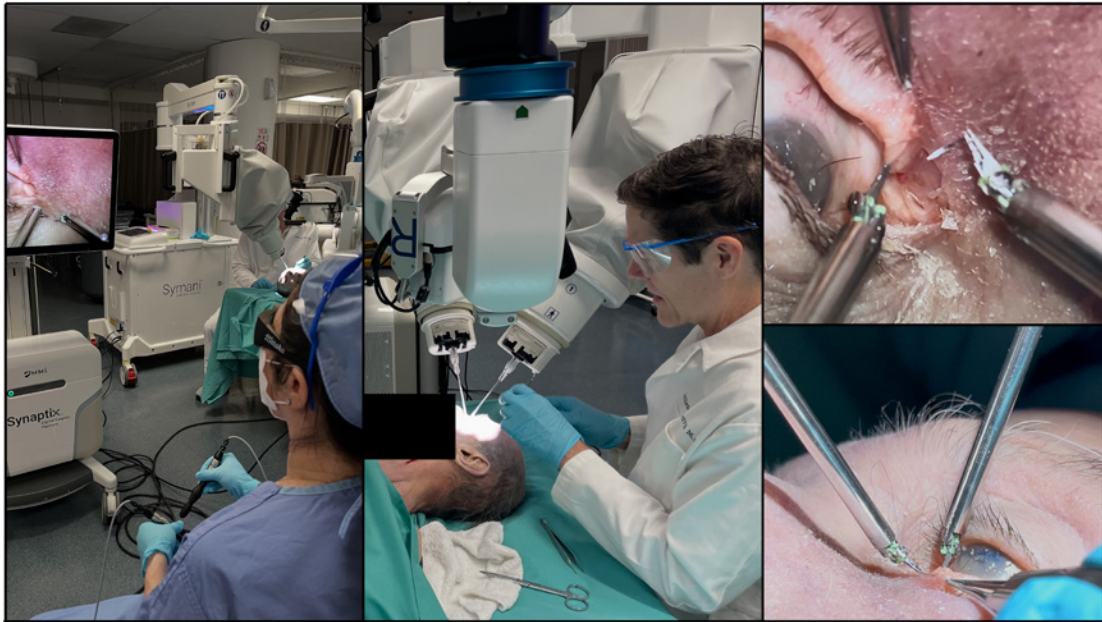
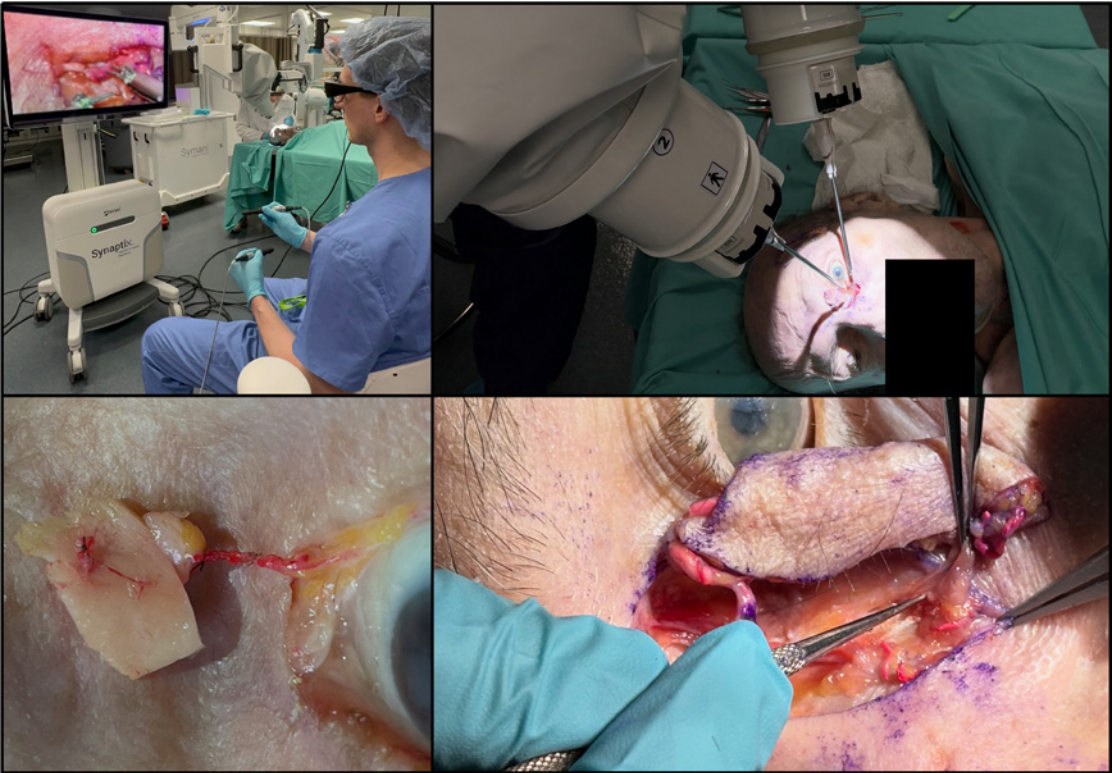


Figure 3



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References

1. Morkuzu S, Bayezid KC, Ozmen BB, Eren SF, Farhat S, McLennan AL, James AJ, Nikkhah D, Azoury SC, Djohan RS, Bishop SN, Schwarz GS. Evolution and Adaptations of Robotic DIEP Flap Surgery: A Systematic Review. *J Craniofac Surg*. 2025 Jan-Feb;36(1):362-367. doi: 10.1097/SCS.00000000000010790
2. Nocini R, Marini L, Michelutti L, Zilio C, et al. Use of robotic surgery for the management of orbital diseases: a comprehensive review. *Medicina (Kaunas)*. 2025 Jun 12;61(6):1081. doi: 10.3390/medicina61061081
3. Struebing F, Boecker A, Vollbach F, Weigel J, Kneser U, Bigdeli AK, Gazyakan E. Robot-assisted microsurgery: a single-center experience of 100 cases. *Journal of robotic surgery*. 2024 Dec 17;19(28). doi: 10.1007/s11701-024-02175-3
4. Spille J, et al., Head and neck free flap reconstruction: A prospective case series with the Symani® Surgical System. *J Craniomaxillofac Surg*. 2025. doi: 10.1016/j.jcms.2025.08.009

2:57–3 pm

Juxta-Canalicular Tarsoconjunctival Flap Repair of Medial Lower Eyelid Retraction and Lagophthalmos

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Introduction: Medial lower eyelid retraction and lagophthalmos often defy standard eyelid surgical procedures.¹⁻⁷ Medial canthal surgeries are limited by risks to the canalicular apparatus. A medial intermarginal adhesion tarsorrhaphy can improve eyelid closure but portends poor cosmesis with eyelid margin alterations.⁷ The authors herein describe and evaluate the efficacy of a juxta-canalicular tarsoconjunctival suspension flap (JTSF) procedure to improve medial lower eyelid malposition and facial appearance in patients with medial lid retraction and lagophthalmos.

Methods: Surgical technique description and retrospective chart review of consecutive patients between 2025 and 2026 who received a JTSF placed medially for symptomatic medial eyelid retraction and lagophthalmos. Pre- and post-operative symptoms, upper and lower eyelid position, lagophthalmos, epiphora score, ophthalmologic biomicroscopic findings, cosmesis, complications, and subsequent treatments were recorded.

Surgical Technique: Figure 1A demonstrates medial lower eyelid retraction and lagophthalmos, pre-operatively. With the upper eyelid everted, a 15 blade and scissors are used to develop a tarsoconjunctival flap (Figure 1B), taking care to preserve the upper canaliculus. The lower punctum is dilated and a Bowman lacrimal probe is introduced into the lower canaliculus. The medial lower eyelid is incised at the gray line and the epithelium denuded, taking care to ensure that the lower canaliculus is not damaged (Figure 1C). The leading edge of the flap is secured to the medial lower eyelid margin, in juxta position to the superior aspect of the lower eyelid canaliculus using interrupted 5-0 polyglactin sutures (Figure 1D). With the flap secured, the medial lower eyelid margin advances slightly under the upper eyelid margin (Figure 1E).

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Results: A total of 11 patients were included (Figure 2). Each patient reported subjective improvement in exposure symptoms such as eye irritation, epiphora, and photosensitivity. All were satisfied with the cosmetic appearance, including four who had a disfiguring prior intermarginal adhesion medial tarsorrhaphy(Figure 3). Figure 4 displays the improvements in lagophthalmos and the well-concealed appearance of the small flap camouflaged under the upper eyelid margin. Any exposed tissue is inconspicuous since the flap matches the pink plica semilunaris. Objective metrics of medial lagophthalmos, exposure keratopathy, epiphora, and eyelid retraction improved in all cases. Complications were rare but included flap dehiscence (n=2) and nasal visual field obstruction (n=1); all were mild and besides flap repeat suturing in 2 patients no further surgical intervention was required.

Conclusions: A juxtacanalicular tarsoconjunctival flap was very effective in this series of patients with medial eyelid malposition due to various vectors and who failed prior standard procedures. This procedure achieved good cosmesis and was minimally invasive.

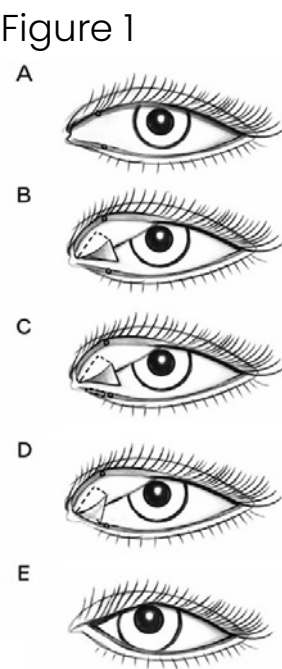
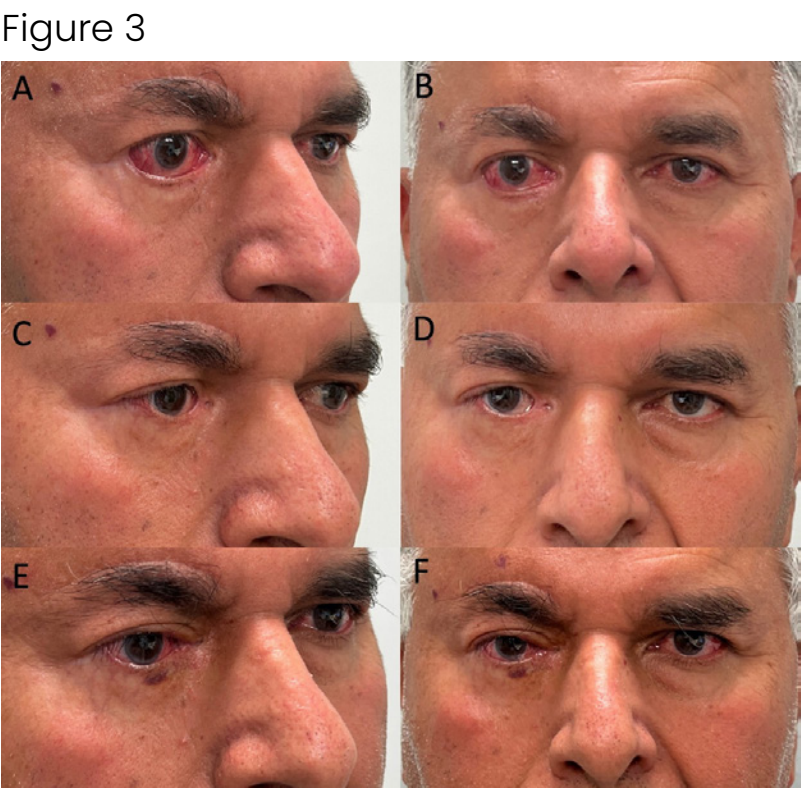


Figure 2

Figure 2. Characteristics of patients receiving juxtacanalicular tarsoconjunctival suspension flap for correction of medial lagophthalmos

Case	Etiology	Age & Gender	Prior Surgeries	Intervention	MRD2	Lagophthalmos	Complications
1	Paralytic, Cicatricial	62 M	Gold weight, gold weight removal, lateral TSF with LTS, medial tarsorrhaphy, takedown of medial tarsorrhaphy	JTSF, medial canthus Z-plasty, lower silicone stent	8->4.5mm	7->3mm	None
2	Paralytic	71 M	Medial tarsorrhaphy (dehiscence) with medial canthoplasty, lateral TSF	JTSF	6->4mm	5->2.5mm	Dehiscence required revision
3	Paralytic, Involutional	72 M	Lateral TSF, direct brow lift	JTSF, medial spindle	4.5->4mm	3.5->3mm	Partial dehiscence
4	Paralytic	71 F	Lateral TSF with LTS	JTSF, platinum weight	5->4mm	4->2.5mm	None
5	Paralytic	60 F	Lateral TSF	JTSF, expansion of lateral TSF	6->3.5mm	5->0.5mm	None
6	Cicatricial	61 F	Excision and reconstruction for skin cancer, lateral TSF	JTSF, skin graft to upper eyelid	4.5->3.5mm	1.5->0mm	None
7	Cicatricial	38 F	Canalicular laceration repair, CDCR with Jones tube, medial canthopexy with Z-plasty	JTSF	5.5->4mm	1.5mm->0mm	None
8	Paralytic	67 F	Gold weight (extruded, required removal), palpebral spring (migrated, required removal), cartilage spacer graft, lateral TSF	JTSF	4.5->4mm	3.5->2.5mm	None
9	Cicatricial, Globe dystopia	87 F	Jones tube (multiple revisions), multiple mucous membrane or hard palate grafts, multiple medial canthoplasties and Z-plasties, orbital decompression, lateral TSF, medial tarsorrhaphy, external entropion repair	JTSF	5->3mm	4->1mm	Visual field obstruction requiring partial flap takedown
10	Paralytic	73 M	Lateral TSF with LTS	JTSF, expansion of lateral TSF, medial spindle	8->4mm	9->4mm	None
11	Paralytic, Globe dystopia	36 M	Lateral TSF with LTS, medial tarsorrhaphy, partial takedown of medial tarsorrhaphy	JTSF	5.5->4mm	2.5->0.5mm	None

JTSF, juxta-canalicular tarsoconjunctival suspension flap; TSF, tarsoconjunctival suspension flap; LTS, lateral tarsal strip



(continued)

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References

1. Smith B, DeDambournenea A. Tarsconjunctival "pillar" for paralytic lower lid support. In: *19th Annual Scientific Symposium of the American Society of Ophthalmic Plastic and Reconstructive Surgery*. ; 1988.
2. Tanenbaum M, Gossman MD, Bergin DJ, et al. The tarsal pillar technique for narrowing and maintenance of the interpalpebral fissure. *Ophthalmic Surg*. 1992;23(6):418-425.
3. Castroviejo-Bolibar M, de Damborenea A, Fernández-Vega A. Surgical repair of paralytic lagophthalmos by medial tarsal suspension of the lower lid. *Br J Ophthalmol*. 1996;80(8):708-712. doi:10.1136/bjo.80.8.708
4. Seiff SR, Chang JS. The staged management of ophthalmic complications of facial nerve palsy. *Ophthalmic Plast Reconstr Surg*. 1993;9(4):241-249. doi:10.1097/00002341-199312000-00003
5. Seiff SR, Sullivan JH, Freeman LN, Ahn J. Pretarsal fixation of gold weights in facial nerve palsy. *Ophthalmic Plast Reconstr Surg*. 1989;5(2):104-109. doi:10.1097/00002341-198906000-00005
6. Lisman RD, Smith B, Baker D, Arthurs B. Efficacy of surgical treatment for paralytic ectropion. *Ophthalmology*. 1987;94(6):671-681. doi:10.1016/s0161-6420(87)33395-0
7. Demirci H, Frueh BR. Palpebral spring in the management of lagophthalmos and exposure keratopathy secondary to facial nerve palsy. *Ophthalmic Plast Reconstr Surg*. 2009;25(4):270-275. doi:10.1097/IOP.0b013e3181ab6f08



FEATURING! BREAKOUT SESSIONS

Friday, October 9

Academic Practice

Moderator: Steven M. Couch

Panelists: Steven M. Couch, Cesar A. Briceno, Catherine J. Hwang, Edward J. Wladis, and Andrea L. Kossler

Building a successful academic career – Steven M. Couch

Physician wellness – Cesar A. Briceno

Practice optimization – Catherine J. Hwang

Leadership – Edward J. Wladis

Compensation – Andrea L. Kossler

Large Group Private Practice

Moderator: Scott M. Goldstein

Panelists: Scott M. Goldstein, Ana Carolina Victoria, Cameron Nabavi, Sean M. Blaydon, Jeffrey A. Nerad, and Michael Nordlund

Practice Growth – Scott M. Goldstein

Managing volume – Ana Carolina Victoria

Relationship management – Cameron Nabavi

Practice mix – Sean M. Blaydon

Private equity – Jeffrey A. Nerad and Michael Nordlund

Solo and Small Group Practice

Moderator: Andrea A. Tooley

Panelists: Andrea A. Tooley, Larissa A. Habib, Christina Choe, Paul Phelps, and Kathryn P. Winkler

Hiring – Andrea A. Tooley

Growing referrals – Larissa A. Habib

Out of network billing as a solo practice business model – Christina Choe

Efficiency – Paul Phelps

Risk management – Kathryn P. Winkler

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Michael K. Yoon	Author	1-Amgen 2-Viridian 3-Sling	1-Researcher 2-Researcher 3-Researcher	1-No 2-Yes 3-Yes

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1 Characterization of the Popular Hunter Eye Aesthetic

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Introduction: Aesthetic trends and beauty standards surrounding the periocular region are constantly evolving. This shifting environment is influenced in part by the rising popularity and accessibility of social media.¹⁻³ The Hunter Eye configuration, also termed predator eye, is modeled around the goal of creating a prominent piercing gaze, in contrast to what some may consider to be more vulnerable-appearing “prey” or “doe eyes”.^{4,5} The look is characterized by an almond shape, narrow vertical interpalpebral fissure, and a positive canthal tilt with minimal inferior scleral show. Increased upper eyelid hooding may also be a component. Like any aesthetic goal, the Hunter Eye appearance varies from patient to patient, but a few critical elements are common. The surgical approach to achieve this goal involves maneuvers to reduce tarsal platform show, reduce relative lower eyelid retraction, reduce vertical interpalpebral fissure height, induce positive canthal tilt, and reduce relative proptosis or induce relative enophthalmos. This may be achieved using a customized surgical approach that may include lateral canthal maneuvers, orbital decompression, lower eyelid retraction repair with spacer graft, and upper and lower blepharoplasty or ptosis repair. While the literature is extensive on describing each individual surgical technique, there has yet to be a work of literature that describes Hunter Eyes and the combination of customized surgical techniques used to achieve this look. In this case series, we will discuss this periocular aesthetic configuration that has gained traction in recent years and the different surgical techniques that exist and approaches that have been taken to accomplish the aesthetic.

Methods: We present a series of 24 patients who have undergone a customized surgical plan to achieve the Hunter Eye configuration. All surgeries were performed by a single surgeon. Each patient gave permission for their health data to be used in this project and has been sufficiently deidentified. Informed consent was obtained from each patient before each surgical procedure. Patients were excluded if they had less than six months of follow up data. External photographs were obtained pre-operation and at post-operative week two, post-operative month three, and post-operative year one. Patient satisfaction scores were obtained through a standardized questionnaire rating their post-operative results as very dissatisfied, somewhat dissatisfied, somewhat satisfied, and very satisfied.

Results: All 24 patients responded to the standardized questionnaire stating they were very satisfied with their post-operative outcomes.

Conclusions: Although the definition of Hunter Eye may vary from patient to patient, with the use of a customized approach, it is an achievable aesthetic look. Surgeons specializing in periocular aesthetics should be aware of the increasingly requested Hunter Eye appearance and be able to identify the core elements of this configuration as well as what combination of surgical techniques and maneuvers can be used to achieve this aesthetic.

Figure 1



Figure 2



References

1. Braun SE, O'Connor MK, Hornick MM, Cullom ME, Butterworth JA. Global Trends in Plastic Surgery on Social Media: Analysis of 2 Million Posts. *Aesthet Surg J*. 2021;41(11):1323-1332. doi:10.1093/asj/sjab185
2. Park SSE, Akella SS, Moon JY, et al. Building Your Brand: Analysis of Successful Oculoplastic Surgeons on Social Media. *Ophthalmic Plast Reconstr Surg*. 2020;36(6):582-589. doi:10.1097/IOP.0000000000001654
3. Sokolov D, Gupta S. Is the interest and search volume for aesthetic surgery predictive of equity market performance? An analysis of Google trends data as a leading indicator of the S&P 500 index. [Abstract 326]. *Journal of Investigative Medicine*. 2023;71(1):NP1- NP702. <https://doi.org/10.1177/10815589221142328>
4. Punda V. Hunter eyes vs prey eyes. *mewing.app*. Published June 27, 2023. Accessed August 28, 2023. <https://www.mewing.app/blog/hunter-eyes-vs-prey-eyes>
5. Looksmax.org. How to get hunter eyes [THEORY]. *Looksmax.org*. Published July 30, 2023. Accessed August 28, 2023. <https://looksmax.org/threads/how-to-get-hunter-eyes-theory.784183/>

2 Deep Plane Versus SMAS Facelift Techniques: A Systematic Review and Meta-Analysis of Patient Satisfaction, Complications, and Longevity

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Introduction: Facial rejuvenation through rhytidectomy is among the most commonly performed aesthetic surgical procedures, with 78,482 procedures recorded in the United States in 2023. Despite decades of technical evolution, persistent debate surrounds the optimal surgical approach, particularly between deep plane and superficial musculoaponeurotic system (SMAS) techniques. The deep plane approach, popularized by Hamra in 1990, involves dissection beneath the SMAS to release the retaining ligaments, with proponents claiming superior longevity, more natural contour, and lower complication rates than SMAS facelift surgery techniques.

These claims carry significant influence on surgeon training, marketing, and patient counseling, yet the comparative evidence base has not been rigorously synthesized. Two recent meta-analyses reached discordant conclusions, and no review has integrated the most recent technical innovations or applied GRADE certainty assessment. The clinical question addressed by this study is whether published evidence supports a measurable advantage of deep plane over SMAS facelift in patient satisfaction, complication burden, facial nerve safety, or longevity.

Methods: A PRISMA 2020-compliant systematic review and random-effects meta-analysis was conducted across MEDLINE, EMBASE, Web of Science, and OpenAlex from January 2000 to April 2026. Eligible studies included randomized trials, prospective and retrospective cohort studies, and case series of ≥ 10 adult patients comparing deep plane and SMAS facelift, or reporting outcomes for either technique. Two prior systematic reviews were integrated as Level II evidence. Effect estimates were pooled using R metafor with DerSimonian–Laird estimation; heterogeneity quantified by I^2 . Evidence certainty graded using GRADE.

Results: Seventeen studies encompassing 3,476 patients met inclusion criteria (mean age 45–72 years, 89.2% female; follow-up 6 months–30 years). Pooled patient satisfaction was 91.2% for deep plane versus 87.8% for SMAS, yielding a recomputed risk ratio of 1.04 (95% CI 0.98–1.11, low-certainty evidence). Complication rates demonstrated substantial heterogeneity (68.1%; range 0–17.2%), precluding reliable pooling. Pooled facial nerve injury rates were uniformly low: 0.37% temporary and 0.09% permanent across 3,205 patients. Longevity data from a single revision-only deep plane cohort ($n=93$) showed mean 10.9 years to revision; one comparable SMAS series reported 11.9 years.

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Conclusions: Low-certainty evidence does not support a statistically significant patient-satisfaction advantage for deep plane over SMAS facelift, and complication and longevity comparisons are limited by heterogeneous reporting. Surgeon experience, anatomic precision, and individual patient factors likely outweigh broad technique categorization in determining outcomes. High-quality prospective comparative trials with standardized outcomes and independent follow-up are needed before claims of superiority can responsibly inform practice or patient counseling.

References

1. Khoury S, et al. *Aesthetic Plast Surg.* 2025;49(21):5895–5903.
2. Awad SA, et al. *Zagazig Univ Med J.* 2025;31(4):234–245.
3. Hamra ST. *Plast Reconstr Surg.* 1990;86(1):53–61.
4. Stuzin JM, et al. *Plast Reconstr Surg.* 1992;89(3):441–449.
5. Page MJ, et al. *BMJ.* 2021;372:n71.

3 Treatment Options for Malar Festoons: A Narrative Review

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Introduction: Malar festoons are drooping folds of skin and soft tissue below the lower eyelid, held to the cheek by fibrous ligaments. Unlike conventional lower eyelid rhytids or orbital fat herniation, they are often resistant to correction by standard blepharoplasty and may recur after treatment. A wide range of surgical and nonsurgical options have been proposed; however, no consensus on optimal management exists. This review aims to characterize treatment strategies for festoons and evaluate the supporting evidence.

Methods: A literature search of PubMed and Cochrane was conducted in April 2026 using the terms festoon, malar mound, and malar bag combined with relevant treatment terms. Results were limited to English-language human studies. 40 articles were identified with 15 studies meeting inclusion criteria.

Results: Fifteen studies comprising 370 patients were included. These were all retrospective cohort studies and case series. Surgical direct excision was the most studied intervention. Asaadi et al. (2023, n=89) reported 94.4% improvement with a 6.7% recurrence rate. Gupta et al. (2023, n=75) demonstrated statistically significant improvement in blinded photographic grading across all views up to 12 years ($p<0.0001$), a 2.7% recurrence rate, and mean patient satisfaction of 9.5/10. Intralesional sclerotherapy using tetracycline or doxycycline showed statistically significant reductions in blinded photographic festoon grading across three cohort studies: Perry et al. (2015, n=11) reported grade reduction from 2.1 to 1.2 ($p<0.001$), Godfrey et al. (2019, n=20 sides) from 2.5 to 0.9 ($p<0.001$), and Chon et al. (2020, n=61) reported improvement in 59%. Safir et al. (2024, n=20) reported blinded grading improvement from 2.81 to 1.6 ($p<0.001$) using thermomechanical microporation with topical tetracycline, with 85% reporting moderate-to-significant improvement. Subperiosteal midface lift achieved complete festoon resolution in 83% of patients (Hoenig et al., n=12). A single case report described complete resolution following fractional microneedle radiofrequency combined with TCA peel. No study used a validated outcome measure or directly compared treatment modalities.

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Conclusions: According to the literature, the treatment options for malar festoons include surgical direct excision, intralesional sclerotherapy, subperiosteal midface lift, thermomechanical microporation with topical tetracycline, and energy-based devices. All available evidence is small retrospective studies with highly variable designs and outcome reporting. Surgical direct excision was associated with consistent and durable outcomes in 8 series. Intralesional sclerotherapy represents an emerging nonsurgical option with some efficacy in 3 series. Prospective, controlled studies of the treatments for festoons are warranted.

Figure 1. PRISMA Flow Diagram for Study Selection.

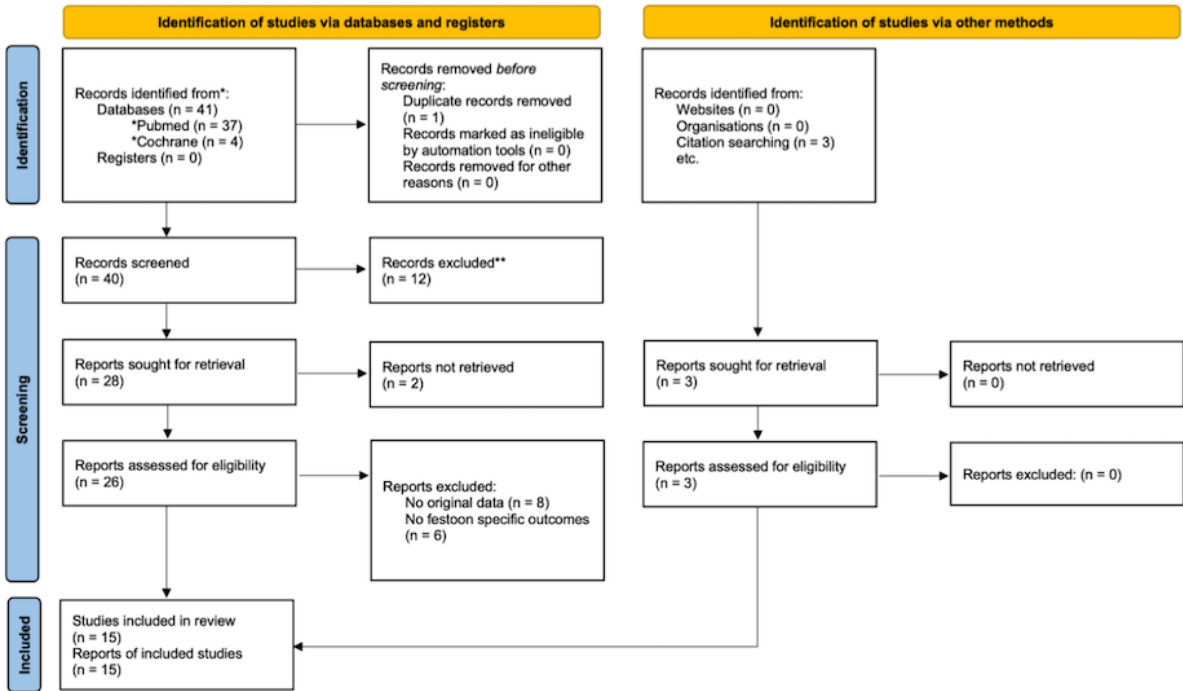


Table 1: Summary of treatment outcomes for malar festoons by intervention type

Intervention	Improvement Rate	Patients (Studies)	Certainty of Evidence (GRADE)
Surgical direct excision	94%	426 (8)	Very low
Intralesional tetracycline injections	59%	72 (2)	Very low
Intralesional doxycycline injections	64%*	11 (1)	Very low
Thermomechanical microporation + topical tetracycline	85%	20 (1)	Very low
Subperiosteal midface lift	83%	13 (2)	Very low
Fractional microneedle RF + TCA peel	100%	1 (1)	Very low

*Footnote: Doxycycline figure represents festoon grade reduction rather than patient-reported improvement rate, which was not reported.

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References

1. Rosenberg GJ. Correction of saddlebag deformity of the lower eyelids by superficial suction lipectomy. *Plast Reconstr Surg*. 1995;96(5):1061-1065.
2. Bellinvia P, Klinger F, Bellinvia G. Lower blepharoplasty with direct excision of skin excess: a five-year experience. *Aesthet Surg J*. 2010;30(5):665-670.
3. Hoenig JF, Knutti D, de la Fuente A. Vertical subperiosteal mid-face-lift for treatment of malar festoons. *Aesthetic Plast Surg*. 2011;35(4):522-529.
4. Einan-Lifshitz A, Hartstein ME. Treatment of festoons by direct excision. *Orbit*. 2012;31(2):89-92.
5. Krakauer M, Aakalu VK, Putterman AM. Treatment of malar festoon using modified subperiosteal midface lift. *Ophthal Plast Reconstr Surg*. 2012;28(3):e68-e70.
6. Liapakis IE, Paschalis EI. Liposuction and suspension of the orbicularis oculi for the correction of persistent malar bags: description of technique and report of a case. *Aesthetic Plast Surg*. 2012;36(2):342-346.
7. Perry JD, Mehta VJ, Costin BR. Intralesional tetracycline injection for treatment of lower eyelid festoons: a preliminary report. *Ophthal Plast Reconstr Surg*. 2015;31(5):401-403.
8. Asaadi M. Etiology and treatment of congenital festoons. *Plast Reconstr Surg*. 2018;141(4):949-956.
9. Godfrey KJ, Kally P, Dunbar KE, et al. Doxycycline injection for sclerotherapy of lower eyelid festoons and malar edema: preliminary results. *Ophthal Plast Reconstr Surg*. 2019;35(6):566-570.
10. Žgaljardić Z, Žgaljardić I, Jurić F. Treatment of malar mound and festoon with fractional microneedle bipolar radiofrequency combined with 15% TCA peel. *J Cosmet Dermatol*. 2021;20(6):1757-1761.
11. Asaadi M, Gazonas CB, Didzbalis CJ, Colon A, Tran BNN. Outcomes of surgical treatment of malar mounds and festoons. *Plast Reconstr Surg*. 2023;151(4):573e-582e.
12. Gupta LY, Gupta SS, Bamberger JN, Gupta KR. Mini-incision direct festoon access, cauterization, and excision (MIDFACE): a 12-year analysis of a novel festoon surgery. *Plast Reconstr Surg*. 2023;152(1):69-80.
13. Botti G, Botti C, Fabbri M, et al. Direct excision of malar bags: back to the basics. *Aesthet Surg J*. 2024;44(3):245-253.
14. Safir M, Waizer I, Safir A, Hartstein ME, Artzi O. Percutaneous delivery of liquid tetracycline using a thermal resurfacing drug delivery system for the treatment of festoons. *Dermatol Surg*. 2024;50(2):158-163.
15. Gur Z, Burkat CN, Liu C, Kikkawa DO, Korn BS. Single-stage management of recalcitrant eyelid festoons. *Ophthal Plast Reconstr Surg*. 2025;41(1):45-51.

4 Analysis of Postoperative Infection Rates in Transconjunctival Fat Repositioning with or without Povidone-Iodine Conjunctival Irrigation

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Introduction: Transconjunctival fat repositioning (so-called “Hamra method”) is widely performed for the treatment of lower eyelid deformities, including tear trough deformity and infraorbital dark circles [1,2]. Although the procedure is considered minimally invasive, postoperative infection remains a rare but clinically significant complication [3].

Povidone-iodine conjunctival irrigation is commonly used as an antiseptic measure in ophthalmic surgery [4,5]; however, its effectiveness in reducing postoperative infection in lower eyelid surgery has not been fully established.

The purpose of this study was to evaluate the effect of povidone-iodine conjunctival irrigation on postoperative infection rates in patients undergoing transconjunctival fat repositioning.

Methods: A total of 852 consecutive cases undergoing transconjunctival fat repositioning were retrospectively analyzed.

Patients were divided into two groups based on the use of povidone-iodine conjunctival irrigation:

- Non-iodine group (n = 521)
- Iodine group (n = 331)

The primary outcome was postoperative infection. Postoperative infection was defined based on clinical findings requiring antibiotic treatment.

Subgroup analyses were performed for:

1. Hamra-only procedures
2. Combined upper eyelid surgery
3. History of prior fat removal at another clinic
4. No history of prior fat removal

Statistical analysis was performed using Fisher’s exact test, with $P < 0.05$ considered significant.

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Results: The overall infection rate was 1.92% (10/521) in the non-iodine group and 0.60% (2/331) in the iodine group ($P = 0.17$) (Figure 1).

In Hamra-only procedures, infection occurred in 1.46% (4/274) of the non-iodine group and 0.71% (1/141) of the iodine group ($P = 0.65$).

In cases combined with upper eyelid surgery, infection rates were 2.43% (6/247) in the non-iodine group and 0.53% (1/190) in the iodine group ($P = 0.12$).

Among patients with prior fat removal, infection rates were comparable between groups (3.3% vs 3.0%, $P = 1.00$).

In patients without prior fat removal, infection occurred in 1.83% (9/491) of the non-iodine group and 0.34% (1/298) of the iodine group ($P = 0.18$).

Across all analyses, infection rates were consistently lower in the iodine group, although no statistically significant differences were observed (Figure 2). The relative risk of postoperative infection was approximately 3.2 times higher in the non-iodine group compared to the iodine group.

Figure 1. Comparison of overall postoperative infection rates between the non-iodine and iodine groups.

The infection rate was lower in the iodine group (0.60%) compared to the non-iodine group (1.92%), although the difference did not reach statistical significance ($P = 0.17$, Fisher's exact test).

Figure 2. Subgroup analysis of postoperative infection rates.

Infection rates were consistently lower in the iodine group across all subgroups, including

Hamra-only procedures, combined upper eyelid surgery, and cases without prior fat removal. No statistically significant differences were observed in any subgroup.

Conclusions: Povidone-iodine conjunctival irrigation was associated with a consistently lower rate of postoperative infection in transconjunctival fat repositioning.

Although statistical significance was not achieved, likely due to the low incidence of infection, the magnitude and consistency of risk reduction suggest a clinically meaningful benefit.

The lack of statistical significance may be attributable to the low event rate and insufficient statistical power.

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Routine use of povidone-iodine irrigation may be a simple and effective strategy to reduce postoperative infection risk in lower eyelid surgery.

Further prospective studies are warranted to validate these findings.

Figure 1
Postoperative Infection Rate by Povidone-Iodine Use

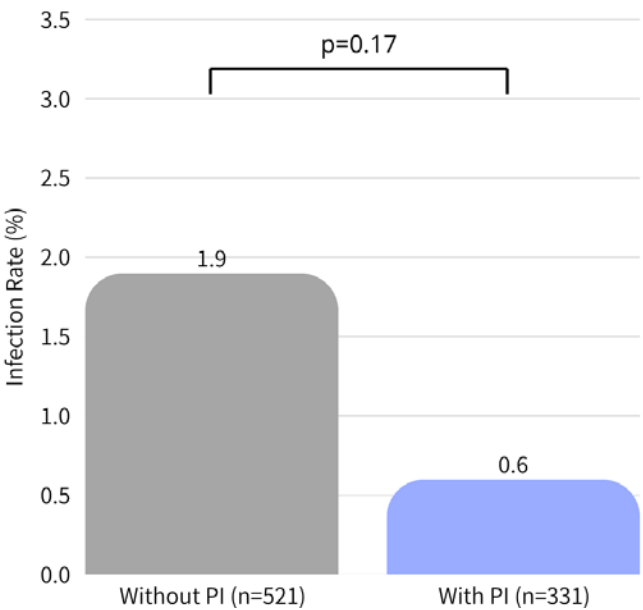
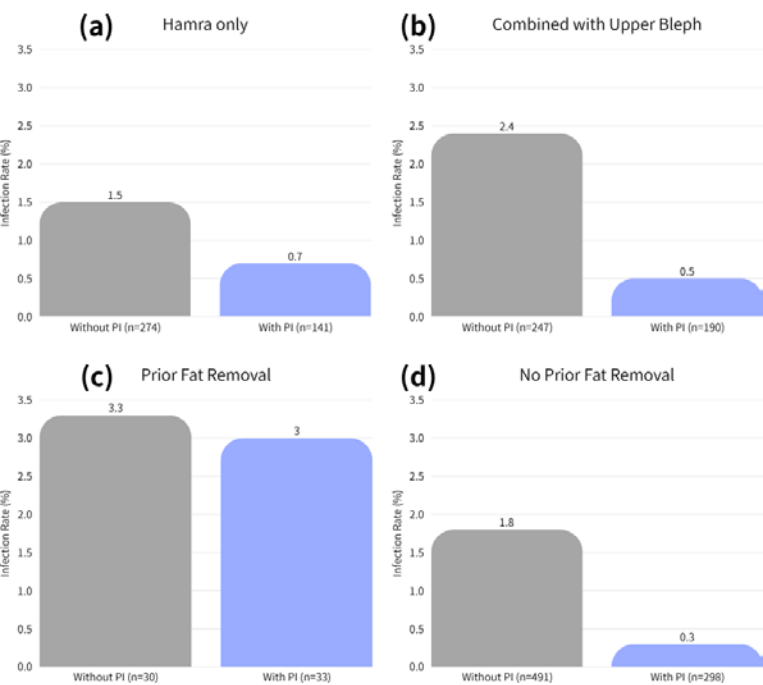


Figure 2
Subgroup Analysis of Infection Rates



References

1. Hamra ST. Arcus marginalis release and orbital fat preservation. *Plast Reconstr Surg.* 1995.
2. Goldberg RA. Transconjunctival orbital fat repositioning. *Plast Reconstr Surg.* 2000.
3. Carter SR, et al. Infection rate following blepharoplasty. *Ophthalmology.* 2002.
4. Quiroga LP, et al. Effect of 5% povidone-iodine irrigation. *Ophthalmic Plast Reconstr Surg.* 2010.
5. Kanclerz P. Antisepsis for Blepharoplasty. *Ophthalmic Plast Reconstr Surg.* 2024.

5 Association of Demodex Blepharitis and Eyelid Malignancy: A Multi-Center Case-Control Study

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Introduction: Demodex blepharitis is a common inflammatory eyelid condition caused by mite infestation and characterized by eyelid margin inflammation, with a prevalence of 58% in the US¹⁻³. Chronic inflammation has been implicated in carcinogenesis⁴. The association between demodex blepharitis and eyelid carcinoma has been investigated in only one prior study, which found the prevalence of demodex in patients with basal cell carcinoma to be 65.6% compared to 23.3% in control cases, suggesting that demodicosis may be a triggering factor for carcinogenesis in eyelid carcinomas^{5,6}. The purpose of this study is to further investigate the prevalence of Demodex blepharitis in patients with eyelid carcinoma compared to matched controls.

Methods: A retrospective case-control study was conducted on patients seen at two academic oculoplastic clinics between April 2024 and February 2026. The absence or presence of eyelash collarettes were routinely recorded at these clinic visits. The prevalence of collarettes was compared between patients with a biopsy-proven eyelid malignancy and a control group of patients presenting to oculoplastic clinic during the same time period for any other reason. Controls were matched by age, race and medical history. Fisher's exact test was used to assess associations, and odds ratios with 95% confidence intervals (CIs) were calculated.

Results: Sixty patients with eyelid carcinoma (mean age 71.4 +/- 10.3 years; 53% female; 93% White) and 60 matched controls (mean age 67.5 +/- 11.0 years; 53% female; 88% White) were included. Malignancies comprised 53 basal cell carcinomas (88%) and 7 squamous cell carcinomas (12%). Demodex blepharitis was significantly more prevalent in cancer patients than controls (48% vs. 18%, p = 0.001). Patients with eyelid carcinoma had 4.17-fold higher odds of Demodex infestation (95% CI: 1.82-9.53). Demodex prevalence was 47% in basal cell carcinoma and 57% in squamous cell carcinoma.

Conclusions: Demodex blepharitis was significantly associated with eyelid malignancy in this multi-center case-control study. Chronic inflammation related to Demodex infestation may contribute to carcinogenesis or serve as a clinical marker of increased malignancy risk. Larger prospective studies are warranted to clarify the relationship and to evaluate whether early identification and treatment of Demodex blepharitis may have implications for eyelid cancer prevention.

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References

1. Ye, Qian et al. "The prevalence of ocular Demodex folliculorum in 2253 young males." *Scientific reports* vol. 12,1 22346. 26 Dec. 2022, doi:10.1038/s41598-022-26782-y
2. Correa Fontt, J et al. "Prevalence of Demodex spp. in eyelashes of a university's population in Santiago, Chile." "Prevalencia de Demodex spp. en pestañas de una población universitaria en Santiago, Chile." *Archivos de la Sociedad Espanola de Oftalmologia* vol. 95,4 (2020): 159-163. doi:10.1016/j.ofal.2020.01.008
3. Trattler, William et al. "The Prevalence of *Demodex* Blepharitis in US Eye Care Clinic Patients as Determined by Collarettes: A Pathognomonic Sign." *Clinical ophthalmology (Auckland, N.Z.)* vol. 16 1153-1164. 15 Apr. 2022, doi:10.2147/OPTH.S354692
4. Kundu JK, Surh YJ. Emerging avenues linking inflammation and cancer. *Free Radic Biol Med*. 2012 May 1;52(9):2013-37. doi: 10.1016/j.freeradbiomed.2012.02.035. Epub 2012 Mar 3. PMID: 22391222.
5. Erbagci, Zülal et al. "High incidence of demodicidosis in eyelid basal cell carcinomas." *International journal of dermatology* vol. 42,7 (2003): 567-71. doi:10.1046/j.1365-4362.2003.01928.x
6. Gao, Ying-Ying et al. "High prevalence of Demodex in eyelashes with cylindrical dandruff." *Investigative ophthalmology & visual science* vol. 46,9 (2005): 3089-94. doi:10.1167/iovs.05-0275

6 Comparative Evaluation of Vision-Language Models (VLMs) – GPT-4V and Gemini in Ptosis Detection, Assessment and Surgical Decision-Making

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Introduction: Vision-language models (VLMs) are emerging as potential tools in clinical image interpretation and decision support. Their applicability in oculoplastic surgery, particularly in the evaluation and management of blepharoptosis, remains largely unexplored.

Methods: Forty patients with unilateral or bilateral blepharoptosis were assessed using standardized clinical photographs along with brief clinical information, including age and sex. Two VLMs – OpenAI's GPT-4V and Google's Gemini – and three experienced oculoplastic surgeons independently evaluated each case.

For the VLMs, prompts were standardized across all cases, with identical instructions provided to both models. Each model was asked to assess the presence of ptosis, determine laterality and severity, estimate levator function, and recommend surgical management based on the provided images and clinical context. No iterative prompting or feedback was permitted.

Raters documented the presence of ptosis, laterality, ptosis grade, and whether surgical intervention was recommended. Eye-level ptosis status was determined using a predefined gold-standard key. For operative decision-making, the reference standard was defined as majority agreement (≥ 2 of 3) among the surgeons. Diagnostic performance was assessed using sensitivity, specificity, predictive values, and accuracy. Agreement with surgeon consensus was evaluated using percentage agreement and Cohen's kappa (κ). McNemar testing was used to assess for systematic differences in surgical recommendations.

Results: A total of 80 eyes were analyzed, of which 45 (56.3%) had ptosis. At the eye level, Gemini demonstrated higher diagnostic performance than GPT-4V, with sensitivity of 0.96, specificity of 0.94, and overall accuracy of 0.95, compared with 0.91, 0.86, and 0.89, respectively.

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For operative decision-making, surgeon consensus recommended surgery in 42 of 80 eyes (52.5%). Gemini showed higher agreement with surgeon consensus than GPT-4V, with overall agreement of 0.94 ($\kappa = 0.87$) compared with 0.88 ($\kappa = 0.75$). Gemini also demonstrated higher sensitivity (0.98 vs 0.93) and specificity (0.90 vs 0.82) for operative recommendation. McNemar testing was not statistically significant for either model ($p > 0.05$), indicating no consistent directional bias.

Conclusions: Both VLMs demonstrated good performance in ptosis detection and surgical decision-making; however, Gemini showed consistently higher accuracy and agreement with expert consensus compared with GPT-4V. These findings highlight that the clinical utility of VLMs in oculoplastic decision-making is model-dependent and requires careful validation prior to clinical implementation.

Figure 1

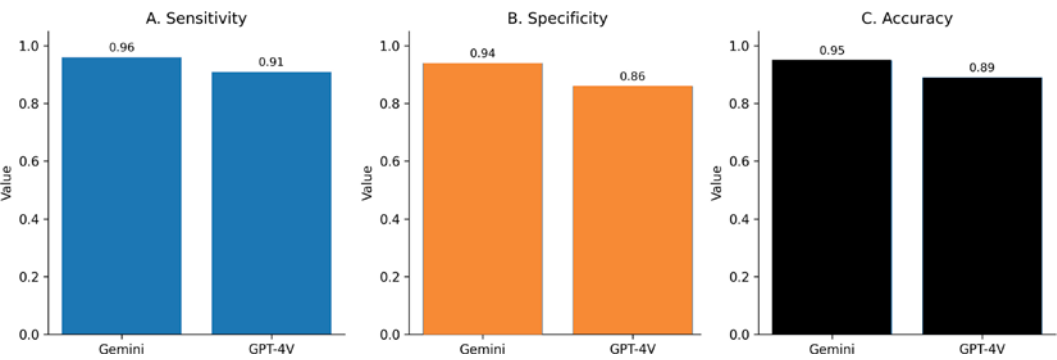
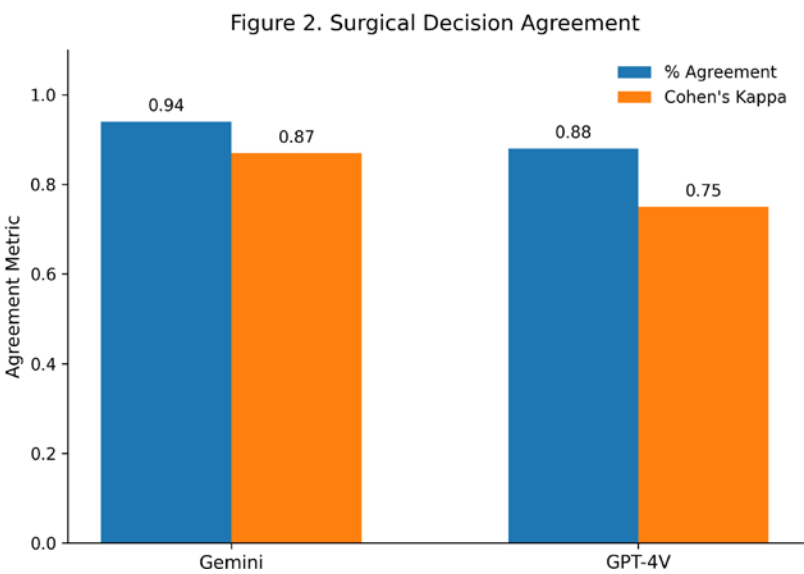


Figure 2



References

1. Meer E et al. Artificial Intelligence in Oculoplastics: A Review. *Ophthalmic Plast Reconstr Surg* . 2025;41(4):372-387.
2. Tan L et al. Functional blepharoptosis screening with generative augmented deep learning from external ocular photography. *Orbit* . 2025;44(6):698-704.
3. Waisberg E et al. Generative artificial intelligence in ophthalmology. *Surv Ophthalmol*. 2025;70(1):1-11.
4. Zhang et al. Global research of artificial intelligence in eyelid diseases: A bibliometric analysis. *Heliyon* . 2024 Jul 20;10(14):e34979.

7 Floppy Eyelid Syndrome Associated with Increased 10-Year Incidence of Mortality

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Introduction: Floppy eyelid syndrome (FES), an often underdiagnosed eyelid laxity disorder, is associated with a number of serious cardiovascular and metabolic dysfunctions through the obstructive sleep apnea and chronic hypoxia mechanism. While it is recognized as a systemic marker of connective tissue disease, its independent contribution to all-cause mortality hasn't been evaluated at population scale.

Methods: Using Epic Cosmos, FES patients (n=56381) with subsequent mortality within 10 years were compared to the general population (GP; n>300M). Mantel-Haenszel stratified odds ratios (OR) controlled for age, sex, race, ethnicity, obstructive sleep apnea, obesity, type 2 diabetes, hypertension, hyperlipidemia, alcohol use disorder, and tobacco use. Cumulative 10-year incidence and number needed to harm (NNH) were compared using two-proportion z-test and chi-square.

Results: FES patients had significantly elevated adjusted odds of all-cause mortality (OR 2.10 [95%CI 2.08–2.12], p<0.001). Ten-year cumulative mortality was 9.18% (FES) vs. 2.60% (GP) (NNH=15.2; p<0.001). Elevated odds persisted after independent adjustment for race/ethnicity, age/sex, and all comorbidities. The leading cause of death was cardiac arrest (n=137, 2.6% of FES deaths), followed by sepsis (n=37, 0.7%) and acute respiratory failure with hypoxia (n=28, 0.5%). Among the 534 FES patients (0.97%) who underwent eyelid repair surgery, the pooled odds of 10-year mortality matched that of the general population (1.015 [0.923–1.116], p=0.411), indicating that surgical correction of FES is associated with normalization of excess mortality risk. In contrast, FES patients who did not undergo repair retained a 3.8x elevated crude mortality odds versus the general population (3.821 [3.715–3.931], p<0.001), suggesting that surgical intervention may represent a critical and underutilized opportunity to reduce the systemic mortality burden of this condition. Ten-year POAG incidence demonstrated a significant non-linear pattern across severity stages: mild 6.75%, moderate 5.58%, severe 7.63% (p<0.001). NAION incidence did not differ significantly across severity stages after correction (mild 0.53%, moderate 0.42%, severe 0.20%), suggesting NAION risk is not driven by FES severity alone.

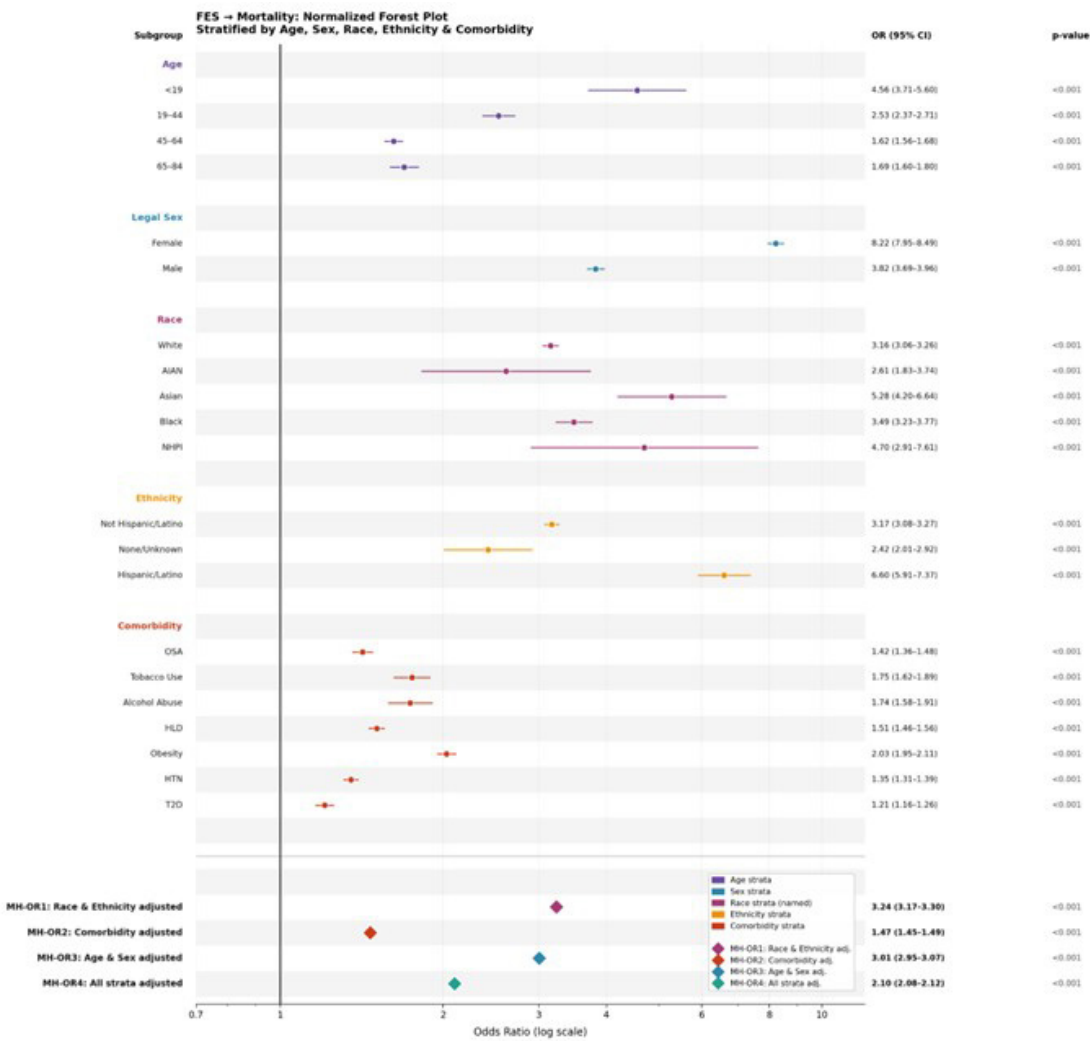
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Conclusions: One in eleven patients diagnosed with floppy eyelid syndrome dies within 10 years, a 2.1x elevated mortality risk that persists after full adjustment for sleep apnea, metabolic disease, age, and sex. Floppy eyelid surgery is associated with improved mortality risks and may have implications for clinical surveillance and timely multidisciplinary referral.

Figure 1



References

1. Zulfiqar M, Tahir M, Dhedhi HAA, Uddin A, Afridi MK, Yokolo H, Waqas SA. Rising Mortality from Sleep Apnea and Hypertension in U.S. Adults: A 23-Year Epidemiological Analysis And Impact of the COVID-19 Pandemic (2000-2023). J Epidemiol Glob Health. 2026 Apr 11. doi: 10.1007/s44197-026-00552-9. Epub ahead of print. PMID: 41964734.
2. Lu YH, Wu C, Liu JP, Wang ZY. Association between the Geriatric Nutritional Risk Index and all-cause mortality in older adults with obstructive sleep apnea symptoms: A retrospective cohort study. Medicine (Baltimore). 2026 Apr 10;105(15):e48289. doi: 10.1097/MD.00000000000048289. PMID: 41961662.

8 Kikuchi-Fujimoto Disease Presenting as Refractory Eyelid Lesions Mimicking Chalazia

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Introduction: Kikuchi-Fujimoto disease is a rare, benign, typically self-limited inflammatory disorder characterized by necrotizing lymphadenitis. It most commonly affects young patients and presents with cervical lymphadenopathy and fever, often mimicking infectious, autoimmune, or malignant processes. Extranodal involvement is uncommon, and ocular manifestations are rare, with reported findings including uveitis, retinal vascular disease, optic neuropathy, and lacrimal gland inflammation. Periocular involvement is unusual; to date, only two reported cases in the English literature have described eyelid edema with lacrimal gland enlargement attributed to Kikuchi disease. To our knowledge, there are no prior reports of Kikuchi disease presenting with eyelid lesions.

Methods: This is a case report.

Results: A 16-year-old male with a remote history of biopsy-proven Kikuchi disease, initially diagnosed in 2020 after presenting with cervical lymphadenopathy, fevers, and neck pain, presented with a 2-year history of recurrent left upper and lower eyelid lesions diagnosed as chalazia (Figure 1). He underwent multiple incision and drainage procedures yielding solid, granular material. MRI demonstrated diffuse cervical, parotid, and supraclavicular lymphadenopathy with enhancement of the lacrimal glands and eyelids (Figure 2). A biopsy was performed of the eyelid lesions with concurrent intralesional corticosteroid injection. Histopathology demonstrated (3A–3B) vasculocentric lymphocytic infiltrate with pale areas and rare secondary follicles, (3C–3D) granular necrotic material with karyorrhectic debris and focal eosinophilic necrosis, and (3E–3F) fibrosis with T-cell-predominant inflammation; immunohistochemistry showed weak CD4 staining in histiocytes and plasmacytoid dendritic cells (3G), CD8>CD4 predominance (3H), sparse CD20+ B cells within follicles (3I), and CD123+ plasmacytoid dendritic cells clustering in perivascular and necrotic regions (3J), supporting extranodal Kikuchi disease without evidence of lymphoma. At postoperative month one, there was marked improvement in eyelid contour and resolution of thickening, with no evidence of recurrence (Figure 4).

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Conclusions: Extranodal Kikuchi disease involving the eyelid is rare and may closely mimic refractory chalazia, leading to repeated interventions and delayed diagnosis. This case represents, to our knowledge, the first reported presentation of Kikuchi disease manifesting as chronic eyelid lesions mimicking chalazia. Recognition of atypical features including recurrence, solid lesion contents, and associated lymphadenopathy is critical. Biopsy should be considered in persistent or unusual cases to exclude malignancy and identify rare inflammatory etiologies. This case expands the spectrum of ocular involvement in Kikuchi disease and underscores the importance of maintaining a broad differential in atypical eyelid pathology.

Figure 1



Figure 2

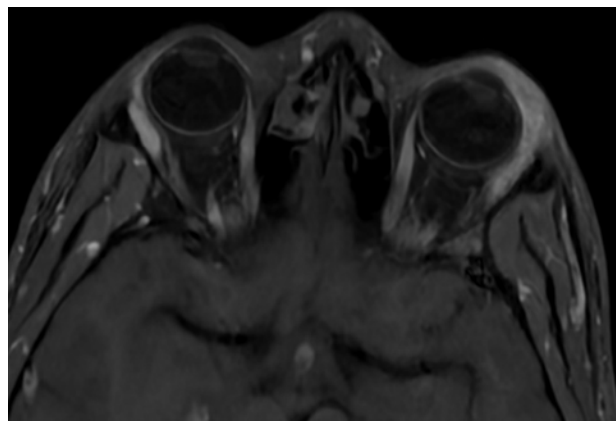


Figure 3

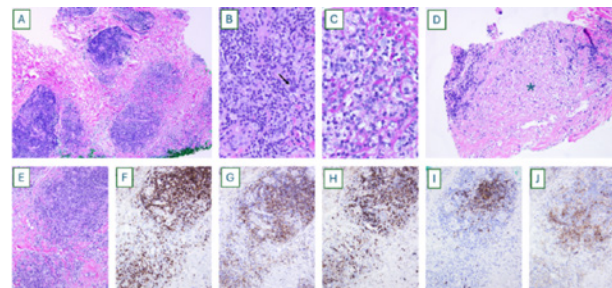
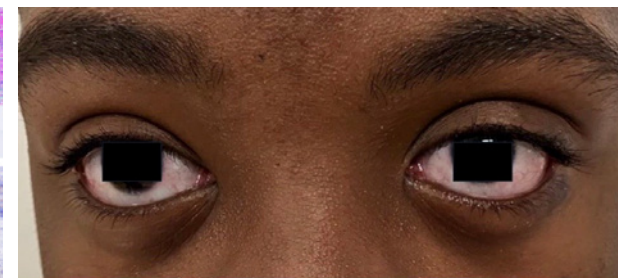


Figure 4



References

1. Chavis PS, Fallata A, Al-Hussein H, Clunie D, Huaman A. Lacrimal gland involvement in Kikuchi-Fujimoto disease. *Orbit*. 1998 Jun;17(2):113-117. doi: 10.1076/orbi.17.2.113.2763. PMID: 12048711.
2. Guerriero S, Ruggeri E, Piscitelli D, Pomes L. Kikuchi-Fujimoto disease: a rare case of orbital involvement. *Orbit*. 2012 Dec;31(6):420-2. doi: 10.3109/01676830.2012.689081. Epub 2012 May 25. PMID: 22632034.
3. Bosch X, Guilabert A, Miquel R, Campo E. Enigmatic Kikuchi-Fujimoto disease: a comprehensive review. *Am J Clin Pathol*. 2004;122(1):141-152.

9 Phenome-Wide Analysis of Blepharospasm in the All of Us Research Program

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Introduction: Blepharospasm is a focal dystonia characterized by forceful, involuntary eyelid closure¹. While prior work has characterized blepharospasm clinically, its pathophysiology remains unknown. Recent studies have implicated neural dysfunction² and ocular disease³ as possible contributors, though their timing and joint contribution to blepharospasm risk has not yet been studied. Understanding these disease relationships is important for refining diagnostic criteria, identifying potentially modifiable risk factors, and informing future mechanistic studies.

This study utilizes electronic health records (EHR) and surveys from a diverse cohort in the All of Us Program to analyze blepharospasm comorbidities, including a phenome-wide association study (PheWAS) and temporal mapping of neurological and ocular conditions.

Methods: We conducted a retrospective case-control study using the All of Us workbench, identifying 288 individuals with blepharospasm and 1,440 controls. Controls were matched on age, sex, race, and healthcare utilization. Demographics, lifestyle, and family history were analyzed using surveys, while comorbid conditions were assessed using electronic health records (EHR). All conditions, including blepharospasm, were considered only if they appeared in at least two EHR encounters to improve diagnostic validity. Conditional logistic regression was used for analyses of specific conditions and a phenome-wide association study (PheWAS) to systematically evaluate comorbidities.

Results: Targeted analysis confirmed literature findings⁴ including female predominance (71.5%), late onset (mean diagnosis age 55.7), and association with conditions like Parkinson's disease (OR=4.05) and Sjogren's syndrome (OR=3.20) (Fig. 1, 2). PheWAS identified 13 Bonferroni-significant conditions ($p < 4.03e-4$), including abnormal involuntary movements (OR=8.31) and tear film insufficiency (OR=2.90) (Fig. 3). Temporal analysis of disease categories revealed that neurological and ocular conditions were significantly enriched both before (neuro OR=2.61; ocular OR=2.12) and after (neuro OR=3.93; ocular OR=2.79) blepharospasm diagnosis, peaking in the year surrounding diagnosis (Fig. 4). Further examination revealed that patients with both pre-diagnostic neurological and ocular conditions faced substantially greater odds than either burden alone (OR=8.36, $p < 0.001$).

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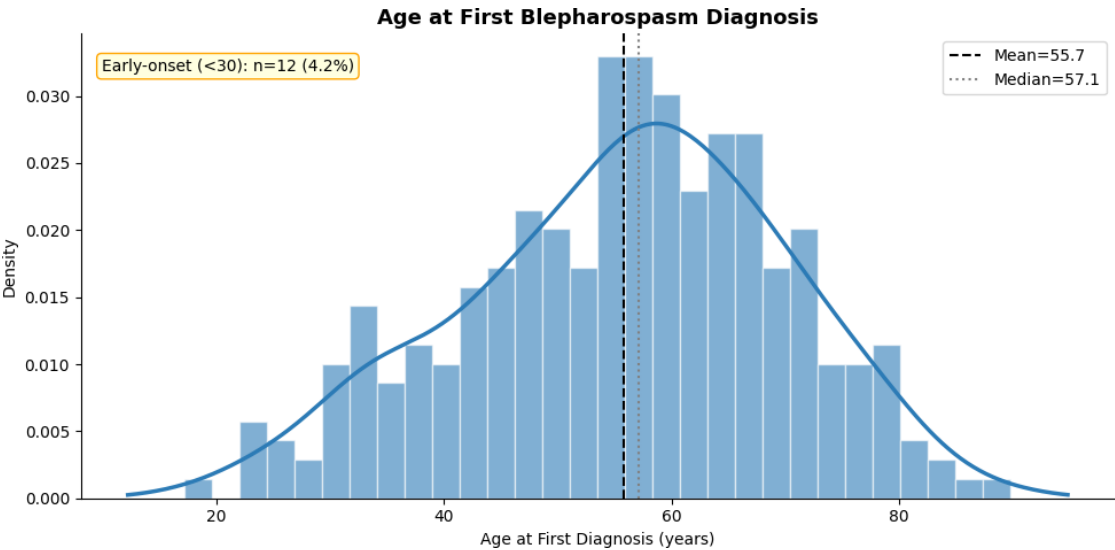
Conclusions: This study validates known clinical associations of blepharospasm while expanding its phenotypic characteristics. The enrichment of neurological and ocular disease both pre- and post-blepharospasm diagnosis supports a model of shared pathophysiology, rather than an antecedent injury-driven model of blepharospasm susceptibility. These findings provide a foundation for future mechanistic and prospective validation studies, aimed at clarifying blepharospasm pathophysiology.

Figure 1

Table 1. Demographic Characteristics

Characteristic	Blepharospasm (n=288) — n (%)	Controls (n=1,440) — n (%)
Sex at Birth		
Female	206 (71.5%)	1,030 (71.5%)
Male	75 (26.0%)	375 (26.0%)
Other/Skip	7 (2.4%)	35 (2.4%)
Race		
White	184 (63.9%)	920 (63.9%)
Black or African American	30 (10.4%)	150 (10.4%)
More than one population	11 (3.8%)	71 (4.9%)
Asian	8 (2.8%)	40 (2.8%)
Other/Skip	55 (19.1%)	259 (18.0%)
Ethnicity		
Not Hispanic or Latino	230 (79.9%)	1,174 (81.5%)
Hispanic or Latino	46 (16.0%)	219 (15.2%)
None/Skip	12 (4.2%)	47 (3.3%)

Figure 2



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Figure 3

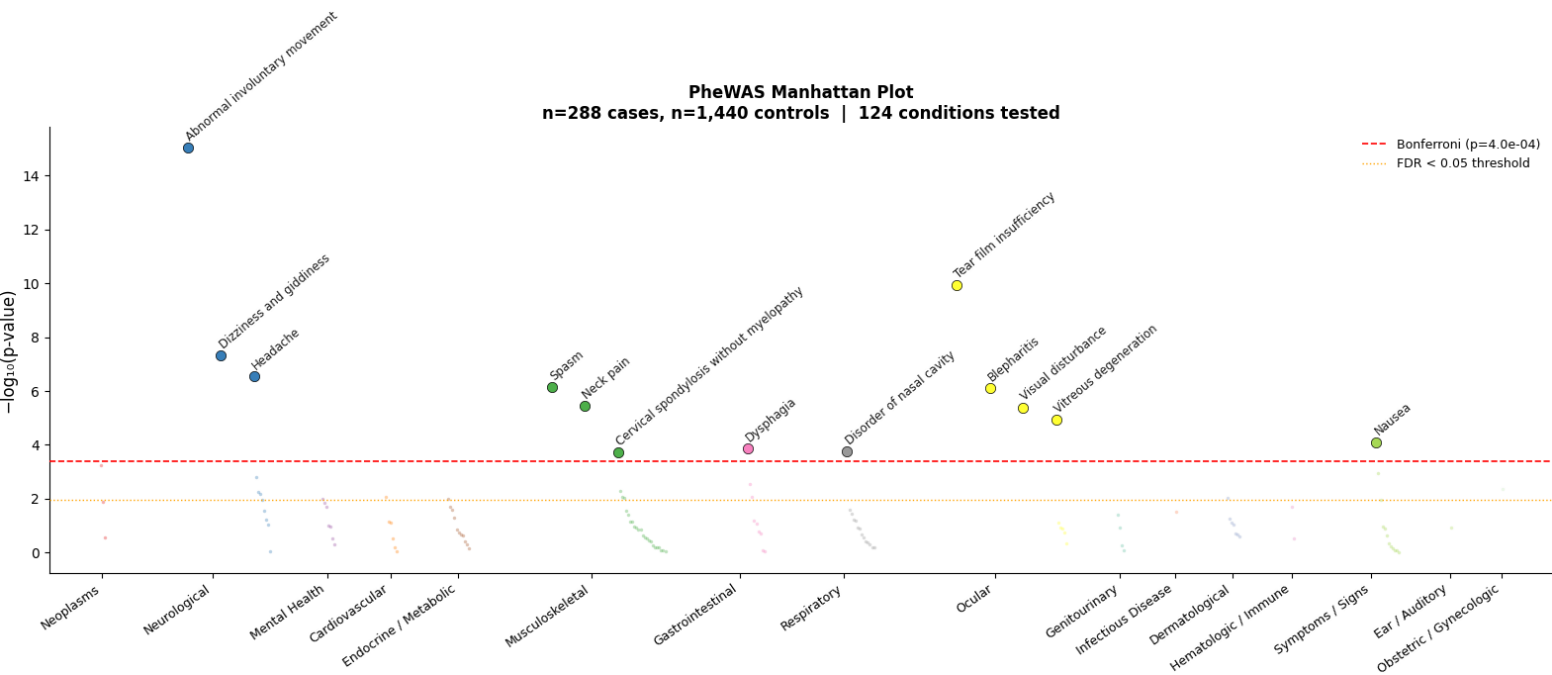
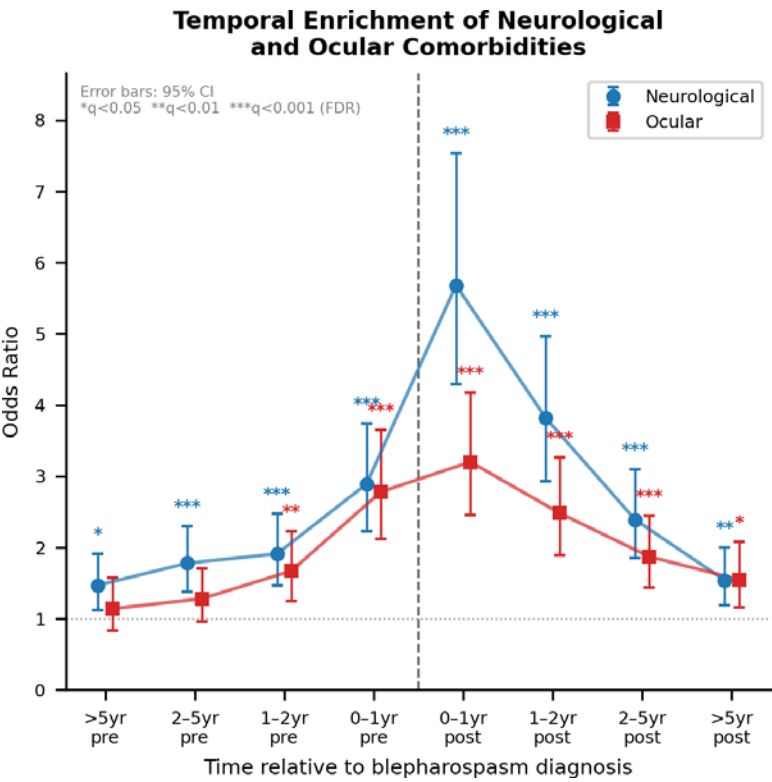


Figure 4



References

1. Zhu, Lixia, et al. "The Pathogenesis of Blepharospasm." *Frontiers in Neurology*, vol. 14, Jan. 2024, p. 1336348, <https://doi.org/10.3389/fneur.2023.1336348>.
2. Xu, Jinping, et al. "Abnormal Supplementary Motor Areas Are Associated with Idiopathic and Acquired Blepharospasm." *Parkinsonism & Related Disorders*, vol. 121, 2024, p. 106029, <https://doi.org/10.1016/j.parkreldis.2024.106029>.
3. Ferrazzano, Gina, et al. "Motor and Non-Motor Symptoms in Blepharospasm: Clinical and Pathophysiological Implications." *Journal of Neurology*, vol. 266, no. 11, 2019, pp. 2780–85, <https://doi.org/10.1007/s00415-019-09484-w>.
4. Sun, Yng, et al. "Epidemiology of Benign Essential Blepharospasm: A Nationwide Population-Based Retrospective Study in Taiwan." *PLoS ONE*, vol. 13, no. 12, Dec. 2018, p. e0209558. PubMed Central, <https://doi.org/10.1371/journal.pone.0209558>.

10 Predictive Modeling of Post-Mohs Defect Sizes in Periocular Basosquamous Carcinoma: A Matched-Cohort Analysis

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Introduction: Basosquamous carcinoma (BSC) is a form of periocular non-melanoma skin carcinoma (NMSC) that remains incompletely characterized. While basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are the most common periocular skin malignancies, recent prospective data suggest that BSC may be more common than previously reported. Gualdi et al. reported a BSC incidence of 4.8% among over 6,000 non-melanoma skin cancers, a higher rate than the 1.2–2.7% range described in earlier retrospective reviews.

A key consideration when planning Mohs microscopic surgery is the post-operative defect size, as accurate prediction facilitates surgical planning, reconstruction strategy, and patient counseling. Previous literature has examined the relationship between pre-operative tumor dimensions and post-operative defect size for BCC and SCC. To our knowledge, however, similar studies have not been conducted on BSC.

The purpose of this study was to develop a predictive model for post-Mohs defect size in periocular BSC using preoperative ImageJ measurements and to compare post-operative defect size across BSC, BCC, and SCC.

Methods: This study was a retrospective review of all periocular BSC, BCC, and SCC cases that underwent Mohs surgery at a single academic center between 2010–2025. Inclusion in the study was limited to cases with both pre-Mohs and post-Mohs clinical photographs, which provided a sample of 11 BSC cases, 69 BCC cases, and 26 SCC cases. The areas of the pre-operative lesions and post-operative defects were obtained using ImageJ and standardized using average corneal diameter by sex. A linear regression model was used to develop a predictive model for BSC. A multivariable linear regression model with interaction terms was used to assess differences in the relationship between pre-operative lesion size and post-operative defect size across tumor types.

Results: Preoperative lesion area strongly predicted final defect size in BSC ($R^2 = 0.91$, $p < 0.001$, $y = 5.32x - 32.33$). Mean defect size expansion was greatest in BSC (211.65 mm²), followed by BCC (108.42 mm²) and SCC (51.45 mm²).

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The relationship between pre-operative lesion size and post-operative defect size differed significantly by tumor type. BSC demonstrated a significantly steeper slope compared to BCC (interaction $\beta = -3.38$, $p < 0.001$) and SCC (interaction $\beta = -4.08$, $p < 0.001$), indicating that increases in pre-operative lesion size were associated with proportionally larger increases in post-operative defect size in BSC compared to other tumor types.

Conclusions: Post-Mohs defect size in periocular BSC may be predicted using ImageJ measurements. Furthermore, the relationship between pre-operative lesion size and post-operative defect size may differ significantly across tumor types, with BSC demonstrating the greatest proportional increase compared to BCC and SCC.

References

1. Carter KD, Nerad JA, Whitaker DC. Clinical factors influencing periocular surgical defects after Mohs micrographic surgery. *Ophthalmic Plast Reconstr Surg*. Mar 1999;15(2):83-91.
2. Gualdi G, Soglia S, Fusano M, et al. Characterization of Basosquamous Cell Carcinoma: A Distinct Type of Keratinizing Tumour. *Acta dermato-venereologica*. 2021;101(1):adv00353.
3. Scofield-Kaplan SM, Jackson C, Gurney T, McDonnell E, Mancini R. Predictive Value of Preoperative Periocular Skin Cancer Measurements for Final Mohs Defect Size. *Ophthalmic Plast Reconstr Surg*. Nov/Dec 2019;35(6):604-608.

11 Topical Steroids for the Treatment of Cicatricial Ectropion in Patients with Cutaneous T-cell Lymphoma

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Introduction: Cutaneous T-cell lymphoma (CTCL) is a non-Hodgkin lymphoma characterized by infiltration of the skin by a malignant proliferation of T-cells. (1) Periocular manifestations include cicatricial ectropion, erythematous patches, plaques, eyelid thickening, blepharitis, nodular lesions, and madarosis (2, 3). Early-stage disease is treated with topical medications, photochemical therapies, and radiation therapy, while advanced-stage disease often requires a multidisciplinary approach and includes systemic therapy as well. Limited data are available on the treatment of periocular disease (4).

Methods: We performed a retrospective review of 19 patients with periorbital involvement of CTCL between 2004 and 2025. Patients without follow-up were excluded. The objective of the review was to assess the frequency of cicatricial ectropion and its response to topical steroid treatment. Response to treatment was defined as improvement in the skin erythema and in the degree of eyelid cicatricial ectropion.

Results: Fourteen of the 17 patients (82%) with eyelid involvement with CTCL had diffuse erythematous infiltration, and 3 (18%) had discrete nodular lesions. Systemic disease staging was I, II, and IV in 3 (18%), 4 (23%), and 10 (59%) patients, respectively. Nine patients (53%) had lower eyelid cicatricial ectropion secondary to diffuse eyelid involvement with CTCL. All patients received topical lubrication, and 13 (76%) were treated with topical Ophthalmic steroid ointment applied to the eyelid skin. Median follow-up time was 2 years (range 0.2–13 years). Overall, 12 of 13 patients (92.3%) treated with topical steroid ointment responded, showing improvement in eyelid involvement with CTCL. All 9 patients with cicatricial ectropion treated with steroids showed a response to treatment, and 6 patients (67%) achieved complete resolution of ectropion. At last follow-up 2 (12%), 8 (47%), and 7 (42%) of patients were in complete remission, alive with disease, or died of their disease, respectively.

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Conclusions: Topical corticosteroid Ophthalmic ointment was effective in resolving or partially improving cicatricial ectropion in most patients with CTCL involving eyelids. Surgical options for correcting ectropion in these patients are limited by the extent of skin involvement in their disease. This treatment potentially reduces reliance on surgery or radiation in the periocular area in these patients.

Figure 1. A. Patient with a stage IIB cutaneous T-Cell lymphoma involving the upper and lower eyelid skin and causing bilateral severe lower eyelid cicatricial ectropion and mild bilateral upper eyelid ectropion. Eyelid involvement and ectropion progressed despite systemic therapy with peginterferon alpha-2a, narrow-band UVB phototherapy, and topical steroid cream applied to multiple body areas. The patient was treated with topical Ophthalmic steroid ointment with a gradual improvement of his ectropion at 1 month (B) and 4 months (C).

Figure 1



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References

1. Larocca C, Kupper T. Mycosis Fungoides and Sézary Syndrome: An Update. *Hematol Oncol Clin North Am*. 2019;33(1):103–120. doi:10.1016/j.hoc.2018.09.001
2. Cook BE Jr, Bartley GB, Pittelkow MR. Ophthalmic abnormalities in patients with cutaneous T-cell lymphoma. *Ophthalmology*. 1999 Jul;106(7):1339–44. doi: 10.1016/S0161-6420(99)00721-6. PMID: 10406618.
3. Jusufbegovic D, Char DH. Clinical Variability of Ocular Involvement in Mycosis Fungoides. *JAMA Ophthalmol*. 2015;133: 1127–1134.
4. Trautinger F, Eder J, Assaf C, et al. European Organisation for Research and Treatment of Cancer consensus recommendations for the treatment of mycosis fungoides/ Sézary syndrome – Update 2017. *Eur J Cancer*. 2017;77:57–74. doi:10.1016/j.ejca.2017.02.027

12 Does Punctal Size Correlate with Tearing Symptoms: A Prospective AS-OCT Study

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Introduction: Epiphora is a common and frustrating symptom. In the absence of nasolacrimal duct obstruction, there are often multiple factors that contribute, including evaporative and/or aqueous deficient dry eye syndrome, blepharitis, eyelid laxity and/or eyelid malposition. Although the puncta are the entry point to the lacrimal drainage system, there is a lack of consensus regarding the role that punctal size plays in the tearing patient. Anterior segment optical coherence tomography (AS-OCT) offers a rapid, non-contact method of imaging the punctum with high spatial resolution. This study aimed to assess the relationship between patient-reported epiphora severity and punctal size, measured with AS-OCT, while accounting for other factors that are commonly believed to contribute to tearing.

Methods: This prospective observational study enrolled adult patients scheduled for oculoplastic day surgery at a tertiary care hospital. All participants underwent standardized imaging of the lower lacrimal puncta with eyelids open, obtained using a single Spectralis OCT device with the Anterior Segment Module (Heidelberg Engineering, Germany). Epiphora severity was quantified using the Munk score. A standardized clinical examination sheet including several metrics aimed at capturing other factors contributing to tearing was completed (Table 1). All patients underwent nasolacrimal irrigation to confirm patency and were excluded if over 25% obstruction was noted. Standardized clinical photographs were then obtained, and ImageJ was utilized to measure MRD1, MRD2 and maximal lower eyelid distraction. Patients without epiphora symptoms (Munk scores 0 and 1) were included as the control group.

Three punctal parameters were measured from AS-OCT images utilizing methodology employed in prior series: external punctal diameter (EPD: tangent between highest points on nasal and temporal punctal walls), internal punctal diameter (IPD: at luminal diameter at 100um depth from the punctal opening), and punctal depth (PD: vertical distance from the external opening to the deepest visible lumen)¹ (Figure 1). Descriptive statistics were calculated for all variables. Independent quantitative data were analyzed by use of the Mann-Whitney U test.

Results: Following exclusion of those with > 25% NLDO (n=23), a total of 136 eyes from 70 patients were included. The mean age of the tearing group (n=67) was 69.0 ± 11.8 years, and the control group (n=68) was 67.0 ± 10.4 years. Roughly half of the participants were

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female (51%). The mean Munk score was 1.67 ± 1.63 (Figure 2). Mean punctal size was as follows: EPD=587.6um $\pm$ 166.4um, IPD=175.6um $\pm$ 124.9um, PD=254.9um $\pm$ 175.3um.

No significant difference in EPD ($p=0.35$), IPD ($p=0.28$), or PD ($p=0.88$) was found between tearing and control group.

Conclusions: In this prospective AS-OCT study, no significant association was identified between punctal size and patient-reported epiphora severity. External punctal diameter, internal punctal diameter, and punctal depth did not differ significantly between epiphora and control groups. These findings suggest that static punctal morphology alone may not be a primary determinant of epiphora, and that other factors likely play a more substantial role. Further statistical analysis is underway to better understand the role of punctal size when multiple complex factors commonly believed to contribute to tearing symptoms are taken in account.

Figure 1

Table 1. Summary of the subjective and objective data collected on the standardized clinical exam data sheet.

Standardized Clinical Data Collection Sheet				
Patient Survey		External	Ocular Surface	Snapback test
Do Artificial Tears relieve your tearing?	What factors worsen your tearing?	Entropion Ectropion MGD Trichiasis Eyelid Notch Lagophthalmos	Punctate Epitheliopathy (1-4) Pterygium Pinguecula Conjunctivochalsis	Positive to a blink

Figure 2

Figure 1. A representative AS-OCT image demonstrating the methodology utilized for measurement of the external punctal diameter (EPD), internal punctal diameter (IPD) and punctal depth (PD).

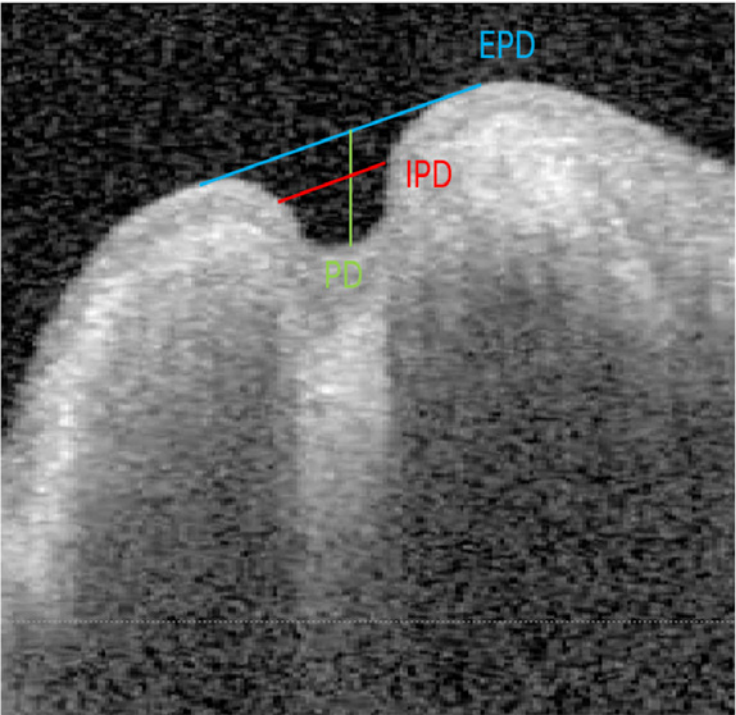
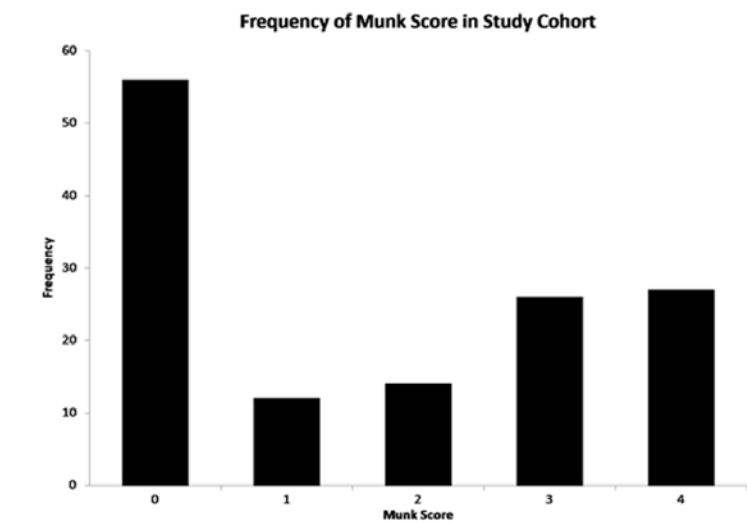


Figure 3

Figure 2. Bar graph demonstrating the distribution of Munk score across all participants included in this study.



References

1. Timlin, H.M., Keane, P.A., Day, A.C., Salam, T., Abdullah, M., Rose, G.E. and Ezra, D.G. (2016), Characterizing the lacrimal punctal region using anterior segment optical coherence tomography. *Acta Ophthalmol*, 94: 154-159. <https://doi.org/10.1111/aos.12906>

13 Characterizing Optical Properties of Facial Non-Melanoma Skin Lesions Using Spatial Frequency Domain Imaging: A Pilot Study

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Introduction: Noninvasive characterization of periocular skin optical properties is critical for understanding tissue alterations associated with periocular pathologies. Spatial frequency domain imaging (SFDI) provides quantitative, *in vivo* assessment of tissue absorption and scattering, making it a promising tool for clinical evaluation of the periocular region.

This study evaluates the feasibility of SFDI for periocular imaging of non-melanoma cutaneous malignancies (NMCM) along the facial region, establishing a foundation for future investigations of disease-related tissue changes.

Methods: Under an approved IRB protocol, facial imaging was performed using the Reflect RS™ (Modulim) SFDI system to acquire calibrated diffuse reflectance over a 15 × 20 cm² field of view at ~0.5 mm spatial resolution. Illumination was provided by eight light-emitting diodes spanning 470–871 nm, with sinusoidal spatial patterns projected onto the face (Figure 1).

Three patients with facial NMCM were imaged (1 basal cell carcinoma (BCC) and 2 squamous cell carcinoma (SCC)) to capture both lesional regions and adjacent normal-appearing tissue for comparison.

Results: Patient 1 was an 81-year-old Fitzpatrick type II male with a well-differentiated SCC of the right nasolabial/malar region and remote smoking history. At 851 nm, the lesion showed decreased absorption (μ_a ~0.004–0.005 vs 0.01–0.011 mm⁻¹) with increased reduced scattering (μ'_s ~1.6–1.9 vs 1.52–1.55 mm⁻¹). At 591 nm, lesion scattering was reduced (μ'_s ~1.0–1.2 vs 1.4–1.8 mm⁻¹) (Table 1).

Patient 2 was a 73-year-old Fitzpatrick type I male with superficially invasive SCC of the right lateral zygomatic region, HIV on antiretroviral therapy, and former smoking history. The lesion demonstrated increased absorption (μ_a ~0.015–0.02 vs ~0.01 mm⁻¹) and increased scattering (μ'_s ~1.5 vs 1.2–1.3 mm⁻¹) at 851 nm, with similar trends at 591 nm (Figure 2, Table 1).

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Patient 3 was a 74-year-old Fitzpatrick type II female with BCC of mixed adnexal/infiltrative subtype and prior topical and systemic therapies including imiquimod, fluorouracil, and vismodegib. The lesion demonstrated slightly decreased absorption ($\mu_a \sim 0.0063\text{--}0.0069$ vs $\sim 0.0073\text{--}0.0074 \text{ mm}^{-1}$) and reduced scattering ($\mu'_s \sim 1.3$ vs $\sim 1.5 \text{ mm}^{-1}$) at 851 nm. At 591 nm, absorption was similar, while scattering was further reduced in the lesion ($\mu'_s \sim 1.6\text{--}1.7$ vs $1.8\text{--}2.0 \text{ mm}^{-1}$) (Table 1).

Conclusions: This exploratory study supports SFDI for quantitative characterization of facial non-melanoma cutaneous malignancies, demonstrating tumor-specific, wavelength-dependent optical signatures linked to tissue scattering and absorption. Increased reduced scattering in squamous cell carcinoma, particularly at 851 nm, is most consistent with keratinization and stromal heterogeneity, whereas decreased μ'_s in basal cell carcinoma likely reflects reduced keratin content and altered tumor–stroma architecture. Variations in absorption likely reflect differences in vascularity and inflammatory activity, with superficially invasive SCC demonstrating the greatest combined optical changes. Wavelength dependence reflects depth sensitivity, with 591 nm emphasizing superficial structure and 851 nm capturing deeper stromal and keratin-related contributions. Prior or ongoing immunomodulatory and cytotoxic therapies may further influence these signatures. Collectively, these findings support SFDI as a noninvasive biomarker with potential for diagnosis and longitudinal monitoring, although larger multicohort studies are required for validation.

Figure 1

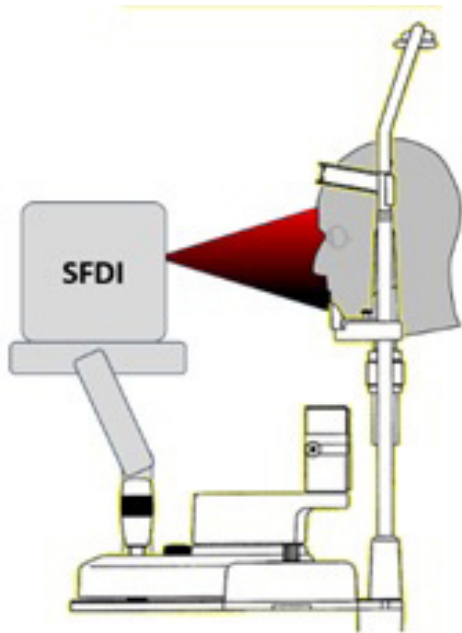


Figure 2

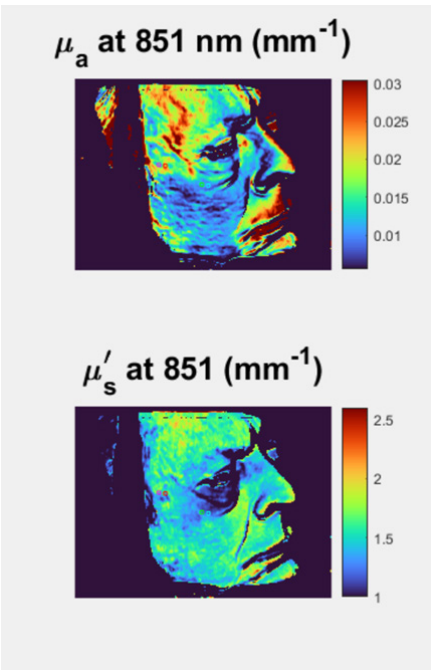


Figure 3

Patient	Diagnosis / Site	Key Clinical Features	Wavelength	Lesion μ_a (mm-1)	Lesion μ'_s (mm-1)	Normal μ_a (mm-1)	Normal μ'_s (mm-1)
1	Well-differentiated SCC (right nasolabial)	81M, Fitz II, remote smoker	851 nm	↓ (0.004–0.005)	↑ (1.6–1.9)	↑ (0.01–0.011)	↑ (1.52–1.55)
			591 nm		↓ (1.0–1.2)		↑ (1.4–1.8)
2	Superficially invasive SCC (right lateral zygoma)	73M, Fitz I, HIV on ART	851 nm	↑ (0.015–0.02)	↑ (1.5)	~0.01	1.2–1.3
			591 nm	↑	↑		
3	Infiltrative BCC (adnexal/infiltrative)	74F, Fitz II, prior therapies including vismodegib	851 nm	↓ (0.0063–0.0069)	↓ (1.3)	0.0073–0.0074	1.5
			591 nm	↓	↓↓ (1.6–1.7)	↓	1.8–2.0

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References

1. Kennedy GT, et al. Spatial frequency domain imaging: a quantitative, noninvasive tool for in vivo monitoring of burn wound and skin graft healing. *J Biomed Opt.* 2019;24:1–9.
2. Cuccia DJ, Bevilacqua F, Durkin AJ, Ayers FR, Tromberg BJ. Quantitation and mapping of tissue optical properties using modulated imaging. *J Biomed Opt.* 2009;14:024012.
3. Phan T, et al. Characterizing reduced scattering coefficient of normal human skin across different anatomic locations and Fitzpatrick skin types using spatial frequency domain imaging. *J Biomed Opt.* 2021;26.
4. Ediriwickrema LS, et al. Multimodal optical imaging of the oculofacial region using a solid tissue-simulating facial phantom. *J Biomed Opt.* 2024;29:086002.
5. Konecky SD, Owen CM, Rice T, Valdés PA, Kolste K, Wilson BC, Leblond F, Roberts DW, Paulsen KD, Tromberg BJ. Spatial frequency domain tomography of protoporphyrin IX fluorescence in preclinical glioma models. *J Biomed Opt.* 2012 May;17(5):056008.
6. Rohrbach DJ, Zeitouni NC, Muffoletto D, Saager R, Tromberg BJ, Sunar U. Characterization of nonmelanoma skin cancer for light therapy using spatial frequency domain imaging. *Biomed Opt Express.* 2015 Apr 20;6(5):1761–6.
7. Tank A, Vergato C, Waxman DJ, Roblyer D. Spatial frequency domain imaging for monitoring immune-mediated chemotherapy treatment response and resistance in a murine breast cancer model. *Sci Rep.* 2022 Apr 7;12(1):5864.

14 Lateral Orbitotomy with Bone Takedown: A 10-Year Single Institution Review of Orbital Mass Pathology, Size, and Location

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Introduction: Lateral orbitotomy with bone takedown is the preferred surgical corridor for space-occupying lesions of the lateral and retrobulbar orbit, yet a comprehensive characterization of the pathologic diagnoses, volumetric size, and orbital location of masses specifically necessitating this approach has not been well described in the literature.

Methods: A retrospective review was performed of all patients who underwent lateral orbitotomy with bone takedown at Bascom Palmer Eye Institute from January 1, 2015 to January 1, 2025. Operative notes and preoperative imaging were reviewed to collect lesion pathology, orbital location, and three-dimensional measurements. Lesion volumes were calculated from axial, coronal, and sagittal imaging using sphere or ellipsoid formulas based on lesion morphology. IRB approval was obtained and all data were de-identified per HIPAA standards. Statistical analyses were performed using R Studio (version 4.3.1).

Results: Fifty patients underwent lateral orbitotomy with bone takedown over the study period. The cohort was 58% male with a mean age of 46.6 ± 17.1 years (range 5 to 86). The left orbit was involved in 56% of cases. The cohort was predominantly White (82%), followed by Black or African American (10%), with 28% identifying as Hispanic or Latino. Case volume demonstrated an overall upward trend, with a mean of 3.9 ± 2.1 cases per year. Mean lesion volume was $4.76 \pm 2.38 \text{ cm}^3$ (range 0.21 to 10.24 cm^3). The most common pathologic diagnosis was cavernous hemangioma ($n = 16$, 32%), followed by pleomorphic adenoma ($n = 7$, 14%), adenoid cystic carcinoma ($n = 6$, 12%), and schwannoma ($n = 5$, 10%). The majority of lesions were benign ($n = 43$, 86%), with malignant lesions accounting for 14% of cases ($n = 7$).

Conclusions: Lateral orbitotomy with bone takedown serves a diverse spectrum of orbital pathologies at a high-volume tertiary referral center, with case volume increasing over the study period. This characterization of mass pathology, size, and location offers meaningful insight into the clinical indications and surgical planning considerations for this approach.

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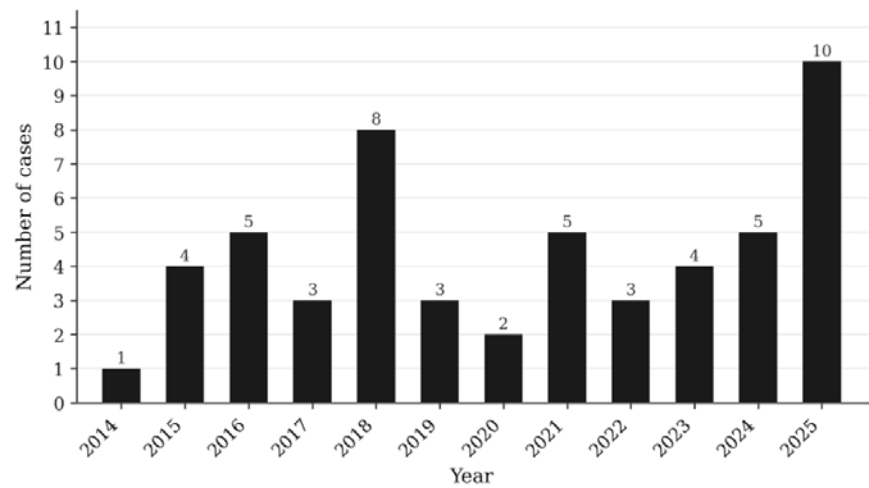


FIGURE 1. Annual frequency of lateral orbitotomy with bone take-down (2014–2025)

TABLE 2. Lateral Orbitotomy with Bone Take-Down Stratified by Pathology						
Pathology	Anterior–posterior (cm)	Medial–lateral (cm)	Superior–inferior (cm)	Posterior edge to apex (cm)	Anterior edge to apex (cm)	Volume (cm ³)
Cavernous hemangioma (n = 19)	1.96 ± 0.43	2.04 ± 0.36	1.74 ± 0.34	0.95 ± 0.63	2.76 ± 0.48	3.89 ± 1.46
Pleomorphic adenoma (n = 7)	1.90 ± 0.70	1.81 ± 0.54	1.93 ± 0.69	2.86 ± 0.39*	4.57 ± 0.83*	4.11 ± 2.50
Schwannoma (n = 5)	2.18 ± 0.34	2.08 ± 0.11	2.20 ± 0.60	1.97 ± 0.29	3.31 ± 0.49	5.29 ± 1.85
Adenoid cystic carcinoma (n = 6)	2.01 ± 0.37	1.77 ± 0.34	2.22 ± 0.79	2.28 ± 0.87	4.59 ± 0.45	4.35 ± 2.44
Dermoid cyst (n = 2)	2.77 ± 0.54	2.02 ± 0.20	2.26 ± 0.24	1.45 ± 0.00	4.19 ± 0.92	6.78 ± 2.66
Xanthogranuloma (n = 1)	1.84	2.53	2.25	1.45	4.82	5.48
Solitary fibrous tumor (n = 1)	1.91	0.90	2.07	1.55	3.02	1.86
Neurofibroma (n = 1)	1.98	4.17	1.46	3.80	5.43	9.94
Mucocele (n = 1)	3.02	2.71	2.32	0.00	3.67	0.87
Metastatic tumor (pancreatic) (n = 1)	0.99	1.30	1.29	0.00	1.55	4.64
Membranous fibrovascular tissue (n = 1)	2.20	2.13	1.89	0.00	3.44	4.64
Lymphoid hyperplasia (n = 1)	2.03	1.63	2.29	3.62	4.98	3.97
Hematic cyst (n = 1)	2.41	2.26	2.26	2.12	4.15	6.45
Hemangioma (non-cavernous) (n = 1)	2.72	3.02	2.56	0.00	3.35	11.01
Granular cell tumor (n = 1)	1.71	1.11	1.07	0.00	2.16	1.06
Implant Infection (n = 1)	1.85	2.30	3.13	1.98	3.74	6.97
Atypical melanocytic neoplasm (spitzoid) (n = 1)	3.19	1.97	1.86	3.50	3.82	3.50

*Two of the masses are located superior to the plane of the apex and the n = 5 for posterior and anterior edge measurements. Values reported as mean ± SD. AP, anterior–posterior; ML, medial–lateral; SI, superior–inferior; Post., posterior; Ant., anterior.

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Figure 2. Preoperative MRI of a right orbital schwannoma demonstrating three-dimensional measurement in coronal (21.1 mm × 23.0 mm), axial (25.3 mm), and sagittal (21.9 mm) views, yielding a calculated lesion volume of 6.12 cm³. The mass is well-circumscribed and intraconal, consistent with a benign peripheral nerve sheath tumor.

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ONCOLOGY

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References

1. Rootman J, Stewart B, Goldberg RA. Orbital Surgery: A Conceptual Approach. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2014.
2. Nerad JA. Techniques in Ophthalmic Plastic Surgery. Philadelphia: Elsevier Saunders; 2010.
3. Shields JA, Shields CL. Eyelid, Conjunctival, and Orbital Tumors. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2016.
4. Cockerham KP, Bejjani GK, Kennerdell JS, Maroon JC. Surgery for orbital tumors. Part II: transorbital approaches. Neurosurg Focus. 2001;10(5):E3.
5. Harris GJ, Logani SC. Eyelid crease incision for lateral orbitotomy. Ophthal Plast Reconstr Surg. 1999;15(1):9-16.
6. Bonavolonta G, Strianese D, Grassi P, et al. An analysis of 2,480 space-occupying lesions of the orbit from 1976 to 2011. Ophthal Plast Reconstr Surg. 2013;29(2):79-86.
7. Verity DH, Rose GE. Lateral orbitotomy: a review. Eye. 1991;5(1):13-18.

15 Primary Intraocular Astrocytoma with Focally Anaplastic Features Presenting as an Exophytic Orbital Mass: Clinicopathologic and Molecular Correlation

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Introduction: Optic pathway gliomas (OPGs) are a group of astrocytic tumors arising anywhere from the optic nerve to the optic chiasm. They account for 4% of all orbital tumors, occurring mostly sporadically. Additionally, they are strongly associated with Neurofibromatosis type 1 (NF1) and typically manifest early in life (90% occurring within the first two decades). Most OPGs are pilocytic astrocytomas (PAs), low-grade tumors that progress slowly, are located anteriorly, and manifest with proptosis, diplopia, and vision loss. More aggressive tumor subtypes such as diffuse and anaplastic astrocytomas (AAs) represent only about 10% of all gliomas and typically present in older patients. Extensive orbital compromise is exceedingly rare as the tumors often originate posteriorly and invade beyond the optic chiasm and hypothalamus. We report an unusual case of a 71-year-old man with an aggressive focally anaplastic astrocytoma originating anteriorly with complete visual loss, orbital pain and bleeding necessitating orbital exenteration.

Methods: Case report of a 71-year-old man with a five year history of progressive proptosis, eyelid swelling, pain, and recent spontaneous bleeding.

Results: MRI demonstrated a large enhancing mass arising from the anterior right globe. Biopsy showed an IDH-wildtype astrocytic neoplasm. Due to uncontrolled pain and bleeding, exenteration performed. Pathology revealed an intraocular astrocytoma with piloid architecture and anaplastic features. Molecular profiling identified TERT promoter mutation and fluorescence in situ hybridization demonstrated intact CDKN2A copy number.

Conclusions: Primary intraocular astrocytomas are exceedingly rare and may mimic more common orbital malignancies. Integration of histopathology with modern molecular profiling is essential for accurate classification and prognostication of astrocytic tumors arising in non-CNS locations. Treatment may include metastatic workup, excision, and possible exenteration in advanced orbital cases.

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Figure 1: Exophytic mass originating from the anterior right exhibits large tumor involving globe.



Figure 2: Axial MRI with contrast exhibits large tumor involving anterior right globe and orbit.

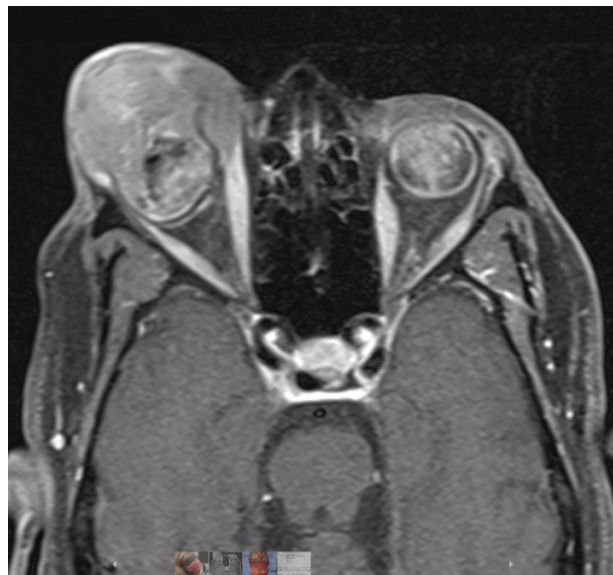


Figure 3: Exenteration specimen. Figure 4



Impression

Orbital contents, right: Exenteration specimen
Intraocular astrocytoma with piloid and focally aggressive features, completely excised (See note.)
Calcification
Hyalinization
Inflammation, chronic, mild
Hemorrhage
Optic nerve: Atrophy, diffuse, marked

NOTE: Immunohistochemical studies show that tumor cells label with GFAP. P53 labels approximately 25% of tumor cells. There is focal loss of H3K27me3 expression. Ki-67 index is variable, with up to 8-10% in selected focal areas. PHH3 reveals rare mitotic figures. These results point to a focally anaplastic astrocytic neoplasm. Next generation sequencing is recommended.

The case was reviewed by Dr. Sakir Gultekin, Professor of Pathology, Director of Neuropathology, at the University of Miami Miller School of Medicine who renders the above diagnosis.

References

1. Louis DN, Perry A, Reifenberger G, et al. The 2016 World Health Organization classification of tumors of the central nervous system: a summary. *Acta Neuropathologica*. 2016;131(6):803-820.
2. Dutton JJ. Gliomas of the anterior visual pathway. *Survey of Ophthalmology*. 1994;38(5):427-452.
3. Shapey J, Danesh-Meyer HV, Kaye AH. Diagnosis and management of optic pathway glioma. *Journal of Clinical Neuroscience*. 2011;18(12):1585-1591.
4. Rodriguez FJ, Lim KS, Bowers D, Eberhart CG. Pathological and molecular advances in pediatric low-grade astrocytoma. *Annual Review of Pathology*. 2013;8:361-379.
5. Killela PJ, Reitman ZJ, Jiao Y, et al. TERT promoter mutations occur frequently in gliomas and a subset of tumors derived from cells with low rates of self-renewal. *Proceedings of the National Academy of Sciences USA (PNAS)*. 2013;110(15):6021-6026

16 Transorbital Approaches for Skull Base Tumors: Outcomes of a Multidisciplinary Surgical Experience in 26 patients

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Introduction: The transorbital endoscopic approaches are gaining popularity in recent years and use the orbit as an entry point to the skull base. It has the advantages of shorter operating time, shorter hospital stay, and reduced surgical bleeding while providing similar gross tumor resection rates or visual improvement compared to traditional transcranial approaches. This approach requires close collaboration within a multidisciplinary team, typically including an orbital and oculoplastic surgeon, neurosurgeon, and skull base or sinus surgeon. The orbital and oculoplastic surgeon plays a critical role in managing the orbital component of the disease and providing safe access to the skull base for the remainder of the surgical team. In this study, the authors evaluated their experience with transorbital approaches to skull base tumors performed by a multidisciplinary team.

Methods: A retrospective analysis was performed of 26 patients who underwent a transorbital approach to skull base tumors by a multidisciplinary team.

Results: The mean age was 51 years. Seven patients (27%) were male, and 19 (73%) were female. Sphenoid wing meningioma was the most common diagnosis (n = 13), consistent with the published literature. Additional diagnoses included fibrous dysplasia (n = 3), metastatic breast carcinoma and olfactory neuroblastoma (n = 2 each), and squamous cell carcinoma, papilloma, fibrosarcoma, pleomorphic adenoma, angiofibroma, and leiomyosarcoma (n = 1 each). The mean hospital stay was 1 day (median 1 day; range 0–4 days). Visual acuity remained stable in 19 patients (73%), improved in 5 patients (19%), and decreased in 2 patients (8%). Early postoperative complications included periocular swelling (n = 10), diplopia (n = 3), and ptosis (n = 2). Long-term complications included periocular numbness (n = 3), ptosis (n = 2), and diplopia (n = 1). Transient cerebrospinal fluid leaks occurred only in 1 patient.

Conclusions: The transorbital approach is a multidisciplinary procedure associated with short hospital stays and rapid postoperative recovery. It has emerged as an increasingly favored minimally invasive alternative for select skull base pathologies that previously required craniotomy. The present series adds to the growing body of evidence supporting the safety and efficacy of this approach, with favorable visual outcomes and a low complication profile comparable to published data.

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ONCOLOGY

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References

1. Austria QM, Stevens SM, Coombs A, Lelli GJ Jr, Schwartz TH, Godfrey KJ. Ophthalmic Outcomes of Transorbital Endoscopic Skull Base Surgery. *Ophthalmic Plast Reconstr Surg*. 2025 Sep 29
2. Zoli M, Sollini G, Rustici A, Guaraldi F, Ascoli S, Altavilla MV, Orsatti A, Faustini-Fustini M, Pasquini E, Mazzatenta D. Endoscopic Transorbital Approach for Spheno-Orbital Tumors: Case Series and Systematic Review of Literature. *World Neurosurg*. 2023 Sep;177:e239–e253
3. Vural A, Carobbio ALC, Ferrari M, Rampinelli V, Schreiber A, Mattavelli D, Doglietto F, Buffoli B, Rodella LF, Taboni S, Tomasoni M, Gualtieri T, Deganello A, Hirtler L, Nicolai P. Transorbital endoscopic approaches to the skull base: a systematic literature review and anatomical description. *Neurosurg Rev*. 2021 Oct;44(5):2857-2878.

17 Association Between Changes in Thyroid Stimulating Immunoglobulin and Orbital Volumes Following Teprotumumab Treatment in Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) is an autoimmune disease that causes significant orbital changes, ocular discomfort, and in some cases vision loss.¹ Thyroid stimulating immunoglobulin (TSI) is involved in TED pathogenesis and reflects clinical activity and severity of TED.² Orbital changes (orbital fat, rectus muscles, and optic nerve) can be objectively quantified via imaging such as MRI and CT.³

Teprotumumab is the only FDA-approved treatment for TED and its response is currently assessed using changes in proptosis, clinical activity score, and diplopia.⁴ Although neither serology nor imaging is part of the current treatment response assessment, orbital imaging provides the most direct quantitative assessment of the disease teprotumumab targets, while TSI's role as a treatment response marker is less established.⁴⁻⁶

This study aims to explore whether changes in TSI and orbital volumes are coupled at the patient level following teprotumumab treatment to help determine whether TSI could serve as a marker for tracking volumetric treatment response.

Methods: This was a single-center retrospective cohort study of adults with TED treated with teprotumumab between March 2020 and July 2024. Pre- and post-treatment TSI values were extracted from the medical record. Because TSI assays vary, values were normalized to multiples of the assay-specific upper limit of normal (TSI ratio), enabling cross-assay comparison. Orbital structures were segmented from head MRI/CT scans using an nnU-Net-based pipeline trained on multi-atlas label fusion-derived pseudo-labels.^{7,8} Volumes of the optic nerve, globe, orbital fat, and recti muscles were extracted from segmentation masks using voxel counting with affine-based physical volume conversion. Twelve patients with complete paired data were analyzed. Pre/post TSI was compared using a paired t-test as were the pre/post volumes. Associations between change in TSI and changes in orbital volumes were examined individually (e.g.: fat alone, recti muscle alone) and as composite measures (e.g., fat plus recti muscle) and were assessed using univariable linear regression with HC3 heteroskedasticity-consistent robust standard errors.

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Results: The TSI ratio decreased significantly from 25.70 to 9.05 following teprotumumab treatment (paired t-test, $p = 0.012$; Figure 1). Paired comparisons of pre- and post-treatment orbital volumes showed no significant changes in the optic nerve, globe, orbital fat, or recti muscles in either orbit (all $p > 0.05$). Despite the absence of detectable mean volume changes, univariable linear regression demonstrated a significant association between change in TSI ratio and change in combined orbital fat plus recti muscle volume bilaterally ($r = +0.7361$, $p = 0.020$; Figure 2), the right eye ($r = +0.6907$, $p = 0.030$; Figure 3), and the left eye ($r = +0.7569$, $p = 0.030$; Figure 4).

Conclusions: Teprotumumab significantly reduced TSI but did not produce detectable mean change in orbital volumes. However, patient-level changes in TSI were significantly associated with patient-level changes in combined orbital fat and rectus muscle volume, indicating that immunologic and anatomic responses to teprotumumab may be coupled. This preliminary evidence supports further evaluation of TSI as an accessible marker of treatment response that could provide longitudinal information about volumetric treatment response, particularly when serial imaging is impractical.

Figure 1

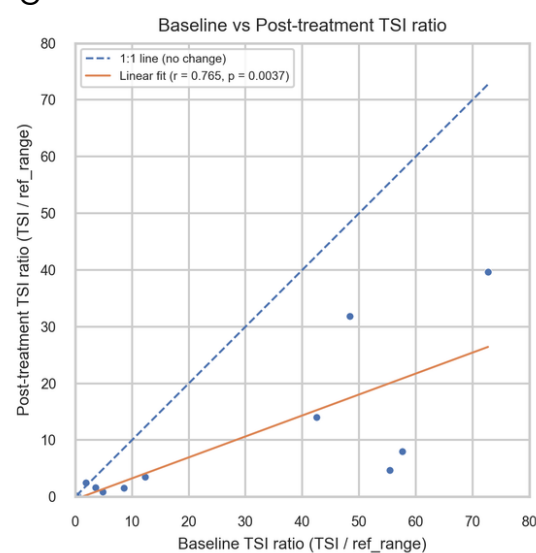


Figure 1. Scatter plot of baseline vs post-treatment TSI ratio (%) ($n = 12$). The dashed line indicates no change from baseline, and the solid line represents the linear fit between baseline and post-treatment values.

Figure 2

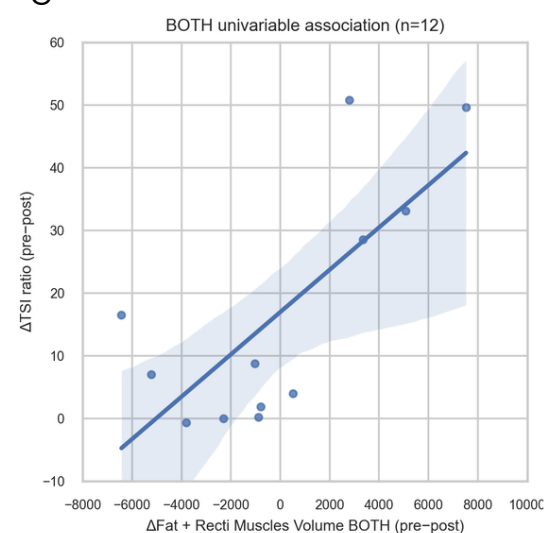


Figure 2. Scatter plot of per-subject change in average orbital fat plus recti muscle volume (mm^3) of both eyes vs change in TSI ratio (%) ($n = 12$). The solid line shows the univariable linear regression fit with 95% confidence interval shading.

Figure 3

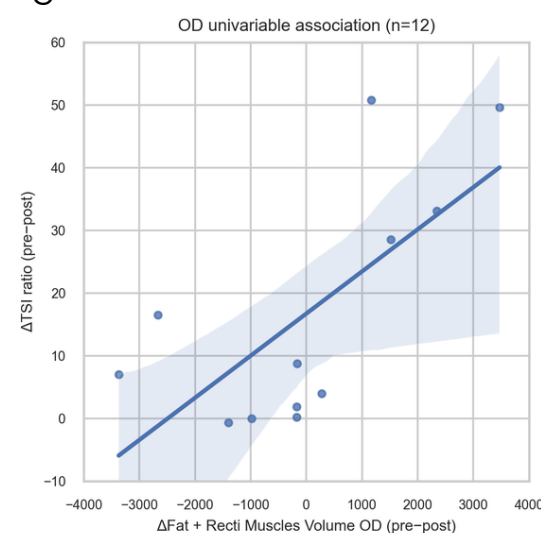


Figure 3. Scatter plot of per-subject change in average orbital fat plus recti muscle volume (mm^3) of right eye (OD) vs change in TSI ratio (%) ($n = 12$). The solid line shows the univariable linear regression fit with 95% confidence interval shading.

Figure 4

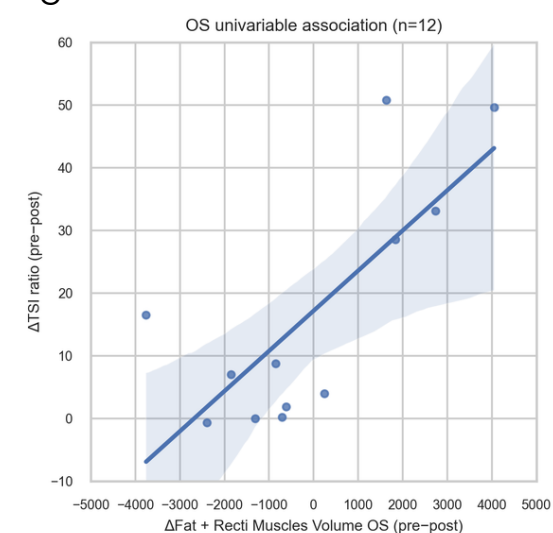


Figure 4. Scatter plot of per-subject change in average orbital fat plus recti muscle volume (mm^3) of left eye (OS) vs change in TSI ratio (%) ($n = 12$). The solid line shows the univariable linear regression fit with 95% confidence interval shading.

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References

1. Smith TJ, Hegedüs L. Graves' Disease. Longo DL, ed. *N Engl J Med*. 2016;375(16):1552-1565. doi:10.1056/NEJMr1510030
2. Ponto KA, Kanitz M, Olivo PD, Pitz S, Pfeiffer N, Kahaly GJ. Clinical Relevance of Thyroid-Stimulating Immunoglobulins in Graves' Ophthalmopathy. *Ophthalmology*. 2011;118(11):2279-2285. doi:10.1016/j.optha.2011.03.030
3. Burch HB, Perros P, Bednarczuk T, et al. Management of Thyroid Eye Disease: A Consensus Statement by the American Thyroid Association and the European Thyroid Association. *Thyroid Off J Am Thyroid Assoc*. 2022;32(12):1439-1470. doi:10.1089/thy.2022.0251
4. Douglas RS, Kahaly GJ, Patel A, et al. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020;382(4):341-352. doi:10.1056/NEJMo1910434
5. Wang Q, Cheng J, Yang C, et al. Teprotumumab N01 for thyroid eye disease in China: clinical outcomes and quantitative MRI correlations. *Front Med*. 2026;13:1805546. doi:10.3389/fmed.2026.1805546
6. Song C, Wang X, Ma Q, et al. Age-dependent diagnostic and treatment response prediction of TBII and TSI in Graves' orbitopathy: integration with orbital MRI biomarkers. *Front Immunol*. 2025;16:1657160. doi:10.3389/fimmu.2025.1657160
7. Panda S, Asman AJ, DeLisi MP, Mawn LA, Galloway RL, Landman BA. Robust optic nerve segmentation on clinically acquired CT. In: Ourselin S, Styner MA, eds. 2014:90341G. doi:10.1117/12.2043715
8. Isensee F, Jaeger PF, Kohl SAA, Petersen J, Maier-Hein KH. nnU-Net: a self-configuring method for deep learning-based biomedical image segmentation. *Nat Methods*. 2021;18(2):203-211. doi:10.1038/s41592-020-01008-z

18 CT Volumetric Analysis of Lateral Orbital Decompression Targeting the Frontal Trigone in Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) is an inflammatory condition characterized by expansion of the extraocular muscles and orbital adipose tissue, leading to eyelid retraction, exposure keratopathy, and vision-threatening compressive optic neuropathy. When surgical intervention is indicated, orbital decompression is achieved by removal of bony orbital walls and/or orbital fat to relieve proptosis and compressive optic neuropathy. Deep lateral wall decompression has been advocated alone or in combination with medial wall decompression for a balanced approach, with a favorable diplopia profile compared to inferomedial techniques.^{1,2} Surveys of oculoplastic surgeons have documented substantial variation in preferred decompression technique, and no single approach has been universally adopted.³

Goldberg et al. conceptualized three regions of thick bone in the deep lateral orbit available for surgical removal: the lacrimal keyhole (frontal bone), the sphenoid door jamb (greater wing of sphenoid), and the basin of the inferior orbital fissure (zygomatic bone), with a combined mean potential volume of 5.6 cm³.⁴ The sphenoid bone is most frequently cited as the primary target for lateral wall decompression, while the contribution of the frontal bone has been less studied.⁵ The purpose of this study is to quantify the amount of bone removed from each of these three compartments following lateral orbital decompression targeting the frontal trigone in patients with TED.

Methods: This is a retrospective case series of patients with TED who underwent lateral orbital decompression, including the frontal trigone, by a single surgeon between August 2015 and June 2025. Pre- and post-operative computed tomography (CT) images were segmented using medical image segmentation Research software to generate three-dimensional models of the bony orbit. Volume changes were quantified independently for three anatomical compartments: the zygomatic bone, frontal bone, and sphenoid bone. The primary outcome was mean change in bony volume per compartment and in total.

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ORBITAL DISEASE

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Results: Twenty-one orbits from 12 patients (9 bilateral, 3 unilateral) met inclusion criteria with both pre- and post-operative CT scans available for analysis. Mean volume removed per compartment (cc, mean $\pm$ SEM): zygomatic, 0.59 ± 0.04 (17.2% of total removed); frontal, 1.37 ± 0.11 (40.0%); sphenoid, 1.46 ± 0.15 (42.6%); total, 3.43 ± 0.16 . Total bony volume removed per orbit ranged from 1.80 to 4.61 cc. The frontal bone and sphenoid bone contributed comparable volumes (1.37 cc and 1.46 cc, respectively), together accounting for 82.8% of total volume removed.

Conclusions: Lateral orbital decompression utilizing the frontal trigone approach results in substantial bony volume removal across all three deep lateral wall compartments. Notably, removal of the superolateral orbital wall (frontal bone) achieves a similar volumetric reduction compared with deep lateral wall (sphenoid bone), together accounting for 82.8% of total bony volume removed. The mean total volume removed (3.43 cc) is consistent with estimated available bone in prior studies⁴, and compares favorably with published series demonstrating extensive lateral wall removal contributes significantly to exophthalmos reduction.^{6,7} To our knowledge, this is the first CT-based volumetric analysis of lateral orbital decompression specifically targeting the frontal trigone in patients with TED, and these data may serve as a benchmark for future comparative outcomes studies and surgical planning.

Figure 1

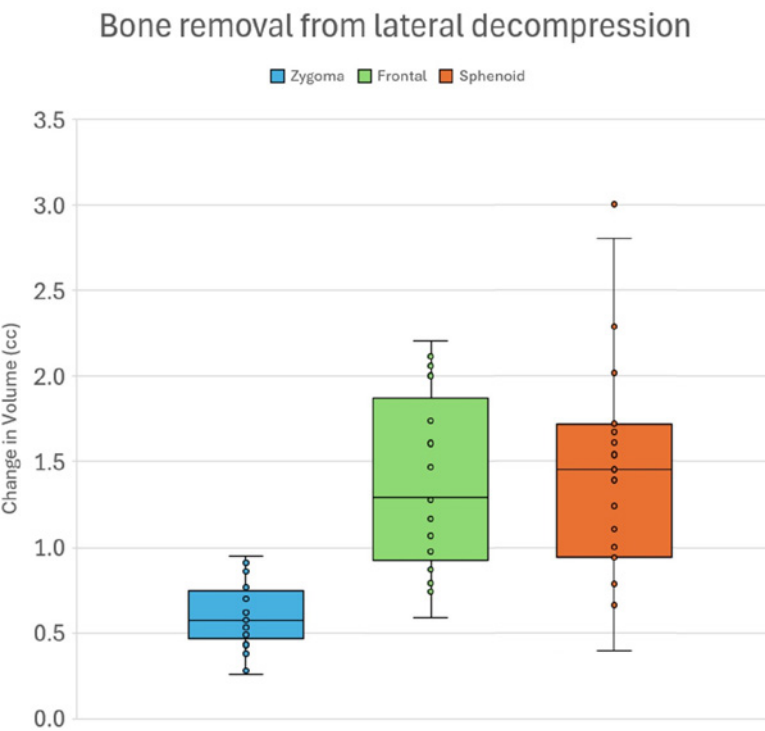
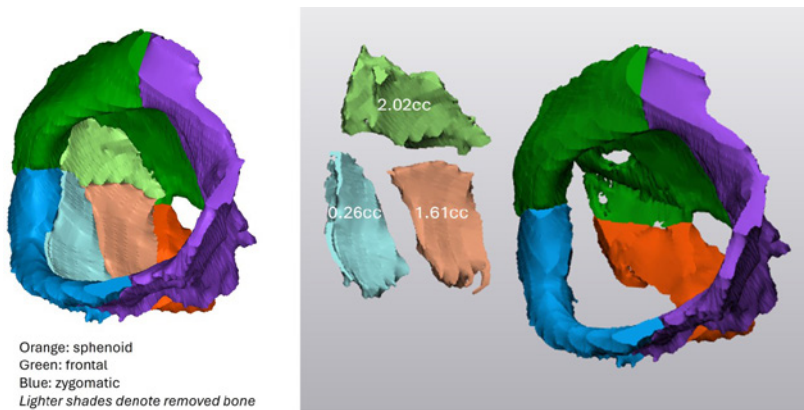


Figure 2



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References

1. Williams JS, Shriver EM. Surgical management of the orbit in thyroid eye disease: lateral orbital decompression. *Curr Opin Otolaryngol Head Neck Surg*. 2021;29(4):289–293.
2. Graham SM, Brown CL, Carter KD, Song A, Nerad JA. Medial and lateral orbital wall surgery for balanced decompression in thyroid eye disease. *Laryngoscope*. 2003 Jul;113(7):1206–9. doi: 10.1097/00005537-200307000-00017. PMID: 12838020.
3. Reich SS, Null RC, Timoney PJ, Sokol JA. Trends in orbital decompression techniques of surveyed American Society of Ophthalmic Plastic and Reconstructive Surgery members. *Ophthal Plast Reconstr Surg*. 2016;32(6):434–437.
4. Goldberg RA, Kim AJ, Kerivan KM. The lacrimal keyhole, orbital door jamb, and basin of the inferior orbital fissure: three areas of deep bone in the lateral orbit. *Arch Ophthalmol*. 1998;116(12):1618–1624.
5. Sobti M, Brogan K, Patel R, et al. Impact of sphenoid trigone size and extraocular muscle thickness on the outcome of lateral wall orbital decompression for thyroid eye disease. *Oral Maxillofac Surg*. 2024;28(1):307–313.
6. Cho RI, Choe CH, Elner VM. Ultrasonic bone removal versus high-speed burring for lateral orbital decompression: comparison of surgical outcomes for the treatment of thyroid eye disease. *Ophthal Plast Reconstr Surg*. 2010;26(2):83–87.
7. Baldeschi L, MacAndie K, Hintschich C, et al. The removal of the deep lateral wall in orbital decompression: its contribution to exophthalmos reduction and influence on consecutive diplopia. *Am J Ophthalmol*. 2005;140(4):642–647.

19 Durability of Clinical Response and Patterns of Reactivation After Teprotumumab for Active Thyroid Eye Disease

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Introduction: Thyroid Eye Disease (TED) is an autoimmune inflammatory disease which leads to an expansion of orbital tissues and resultant signs and symptoms including proptosis, diplopia, eyelid retraction among others. Teprotumumab is a human monoclonal antibody to the insulin-like growth factor I receptor (IGF-IR) approved by the FDA for the treatment of TED, shown to have a favorable early response in active TED patients. The long-term durability of teprotumumab has been shown to wane in recent reports. Hwang et al found 47% of treated patients displayed disease reactivation, and at most 33% of patients demonstrating continued response two years after treatment.¹ Ugradar et al described a 24% retreatment rate in their multi-center study with a one year follow up, and only found older age to be potentially implicated with need for retreatment.² Rosenblatt et al reported regression of proptosis in 65% of eyes, with 25% of patients having worse proptosis than pretreatment.³ The aim of this study is to evaluate the durability of teprotumumab and what factors could be driving the regression and reactivation of the disease.

Methods: This is a retrospective single-center interventional case series of active TED patients treated with teprotumumab as monotherapy from January 2020 to December 2024. Patients received infusions of teprotumumab (initial dose: 10 mg/kg, subsequent doses: 20 mg/kg) every three weeks for eight total infusions. Demographics, smoking status, disease duration, duration of dysthyroidism, thyroid serology (fT3, fT4, TSH, TPO, TRAB, TSI, thyroglobulin Ab), prior systemic thyroid medical or surgical therapy, and EUGOGO TED severity were recorded. Exclusion criteria included age ≥ 2 mm in either eye, improvement in Gorman score ≥ 1 , and improvement in CAS ≥ 2 . Reactivation was defined as worsening proptosis ≥ 2 mm in either eye and/or worsened CAS of ≥ 2 points and/or worsened diplopia score ≥ 1 from the week 24 visit. Durable response was defined as proptosis, CAS, and diplopia not reaching reactivation threshold. Data were analyzed via univariate and multivariate logistic regression.

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Results: 128 patients with a mean age of 56 (18-79), 78% of whom were female, 78% of whom were Caucasian, 21% of whom were current smokers met study criteria. 116 had Graves disease, 6 had hypothyroidism, and 6 were euthyroid. Mean duration of dysthyroidism was 4.2 years. 118 were on oral thyroid medication, 18 had past radioactive iodine treatment, and 11 had prior thyroidectomy. Patients had a mean TED duration of 4.6 months (2-11) and a mean CAS score of 4.7 (3-7). 10 (8%) had mild disease, 102 (80%) had moderate-severe disease, and 16 (12%) had sight-threatening disease. Early response to teprotumumab was largely favorable with 108 patients (84%) showing proptosis response with a mean improvement of 3.3mm (0-9), 99 patients (77%) showing diplopia response with a mean improvement of 1.8 (0-4), and 118 patients (92%) showing a CAS response with mean improvement of 3.3 (0-6) at the week 24 visit. Durable response was seen in 79 patients (62%) for proptosis (mean 3.1mm), 78 (61%) for diplopia (mean 1.4), and 100 (78%) for CAS (mean 2.9) at a mean last follow up of 20.4 months (12-32) after last infusion. 68 patients (53%) showed a mean proptosis regression of 2.2mm (0.5-8). 45 patients (35%) reached a level of reactivation for proptosis at a mean of 11.1 months (2-19), 22 (17%) reached reactivation for CAS at a mean of 10.8 months (3-14), and 50 (39%) reached reactivation for diplopia at a mean of 10.2 months (2-15). 35 patients (27%) showed reactivation for both proptosis and CAS, 29 (23%) showed reactivation for proptosis, CAS and diplopia concurrently. Reactivation of any of the 3 variables was seen within 6 months in 36 patients (28%), 6-12 months in 61 patients (48%), and >12mos in 31 patients (24%). 28 patients (22%) had proptosis at last follow-up worse than pre-treatment. 47 (37%) patients elected for additional TED treatment following teprotumumab – 38 (30%) opted for surgery (majority eyelid retraction repair), while 9 (7%) received teprotumumab retreatment. There was a potential association found with proptosis reactivation and age (OR 1.16, p=0.07), and sight-threatening disease vs mild disease (OR 1.37, p=0.42). Sex, race, smoking, TED duration, duration of dysthyroidism, thyroid status, serologies/autoantibodies, and past systemic thyroid treatments did not show an association with reactivation.

Conclusions: Despite a good early clinical response to teprotumumab, there is waning durability over time. The majority of patients show regression in proptosis and diplopia within one year of final teprotumumab infusion, whereas CAS generally stays low indicating a low activity of disease after treatment. Most patients maintained some proptosis, diplopia, and CAS improvement over time compared with pretreatment levels, although a sizeable minority (22%) of patients showed worse proptosis compared to pretreatment. Age and disease severity may be important variables in disease reactivation. Overall, patients should be counseled that the initial positive effects of teprotumumab can diminish over time. These results should be considered by clinicians when deciding on TED treatment.

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Figure 1

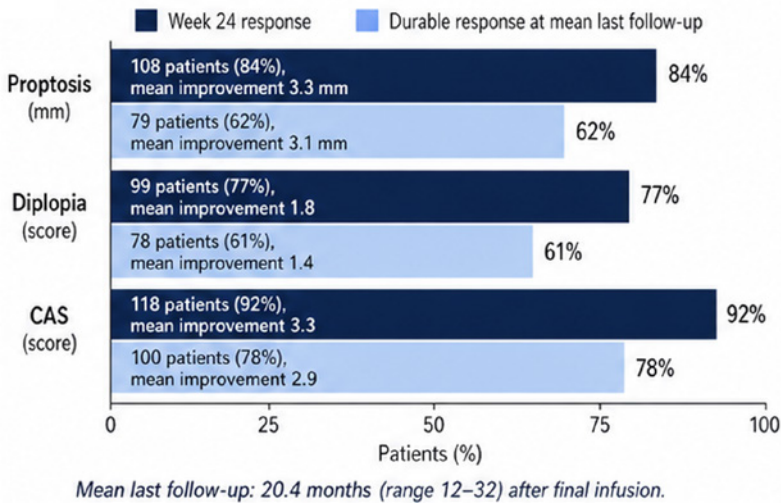


Figure 2

Proptosis regression 68 patients (53%), mean regression 2.2 mm (range 0.5–8).	Reactivation thresholds reached		
	Outcome	Patients, n (%)	Mean time to reactivation
	Proptosis (≥ 2 mm)	45 (35%)	11.1 months (range 2–19)
	Diplopia (increase ≥ 1)	50 (39%)	10.2 months (range 2–15)
		CAS (increase ≥ 2)	22 (17%) 10.8 months (range 3–14)
Concurrent reactivation		Timing of reactivation of any of the 3 variables	
Proptosis + CAS	35 (27%)	Within 6 months	6–12 months >12 months
Proptosis + CAS + diplopia	29 (23%)	36 (28%)	61 (48%) 31 (24%)

References

1. Hwang CJ, et al. Reactivation After Teprotumumab Treatment for Active Thyroid Eye Disease. Am J Ophthalmol. 2024;263:1529.

2. Ugradar S, et al. The Rate of ReTreatment in Patients Treated with Teprotumumab: A Multicenter Study of 119 Patients with 1Year FollowUp. Ophthalmology. 2025;132(1):927.

3. Rosenblatt TR, et al. Proptosis Regression After Teprotumumab Treatment for Thyroid Eye Disease. Ophthalmic Plast Reconstr Surg. 2024;40(2):18791.

20 Effect of Teprotumumab on Dysregulated Thyroid Function in Thyroid Eye Disease

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Introduction: A hallmark of hyperthyroid Graves' disease is disruption of steady state free T4 (FT4) and TSH levels. Autoantibodies targeting TSHR overstimulate the thyroid gland to elevate FT4, resulting in reduced TSH release and an *abnormally elevated FT4:TSH ratio*.¹

Teprotumumab, a systemically delivered drug approved for treating thyroid eye disease (TED), targets IGF-IR, which forms a physical/functional complex with TSHR, leading to functional paralysis of the IGF-IR-TSHR complex. This receptor complex is expressed in orbital fibroblasts, fibrocytes and thyroid epithelial cells.^{2,3}

The aim of this study is to address whether teprotumumab, by inhibiting IGF-IR-TSHR function, resets thyroid hormone levels and reestablishes a more physiological steady- state. Our hypothesis is that IGF-IR modulates the TSHR function in the thyroid gland, and the inhibition of teprotumumab reduces the responsiveness of the thyroid, thus reducing FT4:TSH ratios.

Methods: This retrospective study included hyperthyroid patients with TED with functioning thyroid glands who had been under stable control with methimazole for ≥ 6 months prior to teprotumumab treatment. Patients with prior surgical thyroidectomy or radioactive iodine (RAI) ablation were excluded. Those with thyroid medication adjustments during the study period were also excluded to reduce confounding effects on thyroid function tests (TFTs). TFTs (TSH, FT4) and autoantibodies (TSI) were collected within 6 months before and after 8 teprotumumab infusions. Pre- and post-treatment values were compared using paired t-tests for TSH, FT4, and TSI. A logarithmic transformation was used to assess changes in FT4/TSH ratios. Significance was defined as a p -value <0.05 .

Results: Table 1 details the demographics of the cohort ($n=39$). TSH increased from 0.87 ± 1.43 to 2.08 ± 2.33 $\mu\text{IU/mL}$ ($p=0.008$) after treatment with teprotumumab, while FT4 remained stable from 1.33 ± 0.62 to 1.29 ± 0.53 ng/dL ($p=0.770$), consistent with the physiological adjustment of TSH levels to maintain constant FT4 level. The logarithmic ratio of FT4/TSH decreased from 1.04 ± 1.11 to 0.27 ± 1.08 ($p=0.004$) after treatment. This corresponded to a change in the average FT4/TSH ratio of 1.52 to 0.61 pre- and post- treatment. TSI decreased from 14.70 ± 16.43 to 2.57 ± 4.87 ($p=0.001$) after treatment.

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Conclusions: We evaluated the effect of teprotumumab on steady state serum FT4 and TSH levels in hyperthyroid Graves disease patients with functioning thyroid glands who were on stable methimazole dosages. TSH levels were significantly increased (> two-fold), while FT4 levels remained stable, leading to a 2.5-fold decrease in FT4:TSH ratios.

IGF-IR may meaningfully modulate TSHR function in the thyroid gland. Teprotumumab, by inhibiting IGF-IR-TSHR complexes, may be resetting FT4 levels and thus reestablishing a more physiological steady-state.

Figure 1

Table 1. Patient Demographics (n=39)

Sex	
Female	29 (74.4%)
Male	10 (25.6%)
Age, mean ± SD (years)	49.41 ± 14.80
Race/Ethnicity, n	
White	12 (30.8%)
Asian	7 (18.0%)
Other	12 (30.8%)
Black/African-American	6 (15.3%)
Unknown	2 (5.1%)
Smoking status	
Never	24 (61.5%)
Former	14 (35.9%)
Current	1 (2.6%)

Figure 2

Table 2. Thyroid Function Test Results — Pre vs. Post-Teprotumumab

Marker	Pre-Tepro (Mean ± SD)	Post-Tepro (Mean ± SD)	n	p-value
TSH (μIU/mL)	0.87 ± 1.43	2.08 ± 2.33	36	0.008
Free T4 (ng/dL)	1.33 ± 0.62	1.29 ± 0.53	36	0.770
Free T4/TSH	1.52	0.61		
Free Log(T4/TSH)	1.04 ± 1.11	0.27 ± 1.08	36	0.004
TSI (IU/L)	14.70 ± 16.43	2.57 ± 4.87	24	0.001

References

1. Yao P, Xie Y, Wang Y, Liang C, Huang B. Comparison between thyroid stimulating immunoglobulin and TSH-receptor antibodies in the diagnosis and management of Graves’ disease. Front Endocrinol (Lausanne). 2024 Nov 28.

2. Chen H, Mester T, Raychaudhuri N, Kauh CY, Gupta S, Smith TJ, Douglas RS. Teprotumumab, an IGF-1R blocking monoclonal antibody inhibits TSH and IGF-1 action in fibrocytes. J Clin Endocrinol Metab. 2014 Sep

3. Gianoukakis AG, (PMID: 16410300)

21 Linsitinib, an Orally Administered IGF-1R Inhibitor, Demonstrates Sustained Posttreatment Durability in Moderately to Severely Active Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) is a rare vision-threatening autoimmune disease characterized by periorbital edema, proptosis, and, in some cases, optic nerve compression.¹ Its pathophysiology includes dysregulation of the insulin-like growth factor 1 receptor (IGF-1R) pathway, and it commonly occurs in patients with Graves' disease.² Treatment of TED generally involves rehabilitative surgery (eg, surgical decompression of the orbit), radiotherapy, or medical therapies, such as methylprednisolone, tocilizumab, and the intravenously infused teprotumumab, which has potential auditory and glycemic side effects.^{1,2}

Linsitinib is an orally administered (PO) IGF-1R inhibitor previously studied in over 800 patients for oncology indications. Here, we present the durability of response of linsitinib through week 72 in patients with moderately to severely active TED who completed 24 weeks of linsitinib treatment.

Methods: The LIDS phase 2b/3, randomized, double-masked, placebo-controlled study was designed to evaluate the safety and efficacy of linsitinib in patients with active, moderate-to-severe TED. Patients were randomized 1:1:1 to receive placebo PO, linsitinib 75 mg PO twice daily (BID), or linsitinib 150 mg PO BID. The primary end point was the percentage of proptosis responders (reduction from baseline of ≥ 2 mm) at week 24. Responders were followed after discontinuation of linsitinib at week 24, while receiving no TED-specific therapy.

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Results: A total of 90 patients were randomized evenly across the groups. A significantly higher percentage of patients treated with linsitinib 150 mg BID experienced a proptosis response vs patients who received placebo (52% vs 19%; $P = .010$). Across both linsitinib treatment groups, 20 patients were responders at the week 24 time point. Despite the short 4-hour half-life of linsitinib, the vast majority of patients maintained proptosis response through week 72 (48 weeks off therapy). Specifically, of the week 24 responders, 19/20 (95%) maintained response at week 28, 19/20 (95%) at week 36, 17/18 (94%) at week 48, 17/18 (94%) at week 60, and 14/17 (82%) at week 72. These results differ from IGF-1R antibody therapies, which have published proptosis recurrence rates between 29% and 54%.^{3,4} Over the prolonged post-linsitinib period, no new safety signals emerged, consistent with the treatment period safety, and no new cases of IGF-1R events of interest, such as hearing impairment or hyperglycemia, were reported.

Conclusions: Linsitinib 150 mg BID demonstrated clinically meaningful and statistically significant improvements compared to placebo in moderate-to-severe TED. The response durability of linsitinib after completing treatment at week 24 was maintained for 48 weeks while receiving no other TED-specific therapies, despite effective clearance of linsitinib in only 1 day due to its 4-hour half-life, in contrast to the longer 20-day half-life of IGF-1R antibody therapies that require 3 to 4 months for near-complete clearance from the body. This durability differs markedly from reported post-discontinuation proptosis recurrence rates of the IGF-1R antibodies. With its overall favorable safety profile, particularly with respect to IGF-1R events of interest, convenient oral administration, and substantial durability, linsitinib has the potential to become a new treatment option for the management of TED.

References

1. Burch HB, et al. *Eur Thyroid J*. 2022;11(6):e220189.
2. Yu CY, et al. *Indian J Ophthalmol*. 2022;70(7):2335-2345.
3. Douglas RS, et al. *Ophthalmology*. 2022;129(4):438-449.
4. Rosenblatt TR, et al. *Ophthalmic Plast Reconstr Surg*. Published online February 16, 2026. doi: 10.1097/IOP.00000000000003197

22 Lipid-Lowering Therapy and Risk of Thyroid Eye Disease in Adults with Hyperthyroidism and Hyperlipidemia

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Introduction: Thyroid eye disease (TED) is an autoimmune orbitopathy occurring in the setting of thyroid dysfunction, most commonly Graves disease, and develops in approximately one-quarter of affected patients. Statins exert pleiotropic anti-inflammatory and anti-fibrotic effects on orbital fibroblasts in vitro, and prior real-world cohort studies have linked statin therapy to reduced TED incidence. However, whether the protective effect is dose-dependent, shared with non-statin lipid-lowering therapies (LLTs), or specific to statin pleiotropy rather than LDL reduction itself remains unknown. Discriminating among these mechanisms is necessary to inform clinical recommendations and to determine whether broader LLT classes might confer similar protection.

Methods: This retrospective cohort study utilized the TriNetX US Collaborative Network, a federated electronic health record database encompassing over 121 million patients. Adults aged 18 years or older with concurrent hyperthyroidism (ICD-10 E05) and hyperlipidemia (E78) were identified and stratified by lipid-lowering exposure: any LLT, any statin, low-plus-moderate-intensity statin, or high-intensity statin (American College of Cardiology/American Heart Association 2018 classification). Patients with any TED-related diagnosis, medication, or procedure prior to index were excluded. To discriminate statin pleiotropy from broader lipid-pathway effects, a parallel IMPROVE-IT-style contrast compared new users of any non-statin LLT with required concurrent statin exposure against (1) LLT-naïve comparators and (2) clean statin-only users. Outcomes included incident exophthalmos, refined TED, and a composite TED endpoint. Patients were 1:1 propensity score matched on demographics and comorbidities, and followed in a 5-year time window (180 to 1,825 days post-index). Kaplan-Meier survival analyses with log-rank testing and Cox proportional hazards modeling were performed for each comparison.

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Results: The analytic cohort included 146,419 matched patients across six cohort comparisons. A clear dose-response gradient was observed across statin intensity tiers: relative to LLT-naïve patients, any LLT exposure was associated with a 27% reduction in composite TED (HR 0.73, 95% CI 0.66–0.80), any statin a 32% reduction (HR 0.68, 95% CI 0.61–0.76), low-plus-moderate intensity a 37% reduction (HR 0.63, 95% CI 0.53–0.74), and high-intensity therapy a 51% reduction (HR 0.49, 95% CI 0.42–0.58; P-for-trend <0.001). Effects were strongest for incident exophthalmos in the high-intensity stratum (HR 0.37, 95% CI 0.26–0.54). In the IMPROVE-IT-style contrast, the addition of non-statin LLT to statin therapy conferred protection against LLT-naïve patients (composite TED HR 0.63, 95% CI 0.50–0.79; n=7,235 matched pairs) but no incremental protection over clean statin-only therapy (composite TED HR 1.00, 95% CI 0.81–1.24; n=8,838 matched pairs).

Conclusions: In this large real-world cohort of hyperthyroid and hyperlipidemic adults, statin therapy was associated with substantial reductions in incident TED that scaled with intensity, supporting a true pharmacologic effect rather than residual confounding. The addition of non-statin LLT to statin therapy conferred no incremental TED protection, indicating that statin-class pleiotropy, not broader LDL-pathway lowering, is the operative mechanism. These findings suggest that high-intensity statin therapy may have a role in primary TED prevention among at-risk hyperthyroid patients with concurrent dyslipidemia and argue against expectation of similar protection from non-statin lipid-lowering agents.

References

1. Stein JD, Childers D, Gupta S, et al. Risk factors for developing thyroid-associated ophthalmopathy among individuals with Graves disease. *JAMA Ophthalmol*. 2015;133(3):290–296.
2. Barnett BP, Bahn RS, Garrity JA, et al. Statin use and risk of thyroid eye disease in patients with Graves disease. *Cureus*. 2025;17(2):e54321.
3. Cannon CP, Blazing MA, Giugliano RP, et al. Ezetimibe added to statin therapy after acute coronary syndromes. *N Engl J Med*. 2015;372(25):2387–2397.
4. Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol. *Circulation*. 2019;139(25):e1082–e1143.
5. Smith TJ, Hegedus L. Graves disease. *N Engl J Med*. 2016;375(16):1552–1565.

23 Oculomotor Nerve Superior Division Orbital Schwannoma: Two Case Series

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Introduction: Orbital schwannomas are rare peripheral nerve sheath tumors arising from proliferation of myelin-producing Schwann cells. They are typically slow-growing, benign, and noninvasive. Most orbital schwannomas originate from sensory nerves, most commonly the ophthalmic branch (V1) of the trigeminal nerve, particularly the frontal nerve. Although schwannomas can arise from motor nerves, this is much less common. In this report, we describe the extremely rare occurrence of orbital schwannomas arising from the superior division of the oculomotor nerve (CN III) in two patients.

Methods: This retrospective case series includes management of two patients with orbital schwannomas arising from the superior division of the oculomotor nerve. Clinical examination, ophthalmic imaging, and neuroimaging, including magnetic resonance imaging (MRI) of the orbits, were performed. Both patients underwent lateral orbitotomy with tumor excision.

Results: Case 1: A 17-year-old girl presented with three months of blurry vision in the right eye. Visual acuity was 20/60. She had a right relative afferent pupillary defect (RAPD) and standard automated perimetry demonstrated a central scotoma. Cranial nerve function was otherwise intact. MRI showed a 2.0 × 1.9 × 1.6 cm well-marginated, homogeneously enhancing intraconal mass. She underwent lateral orbitotomy with excision; frozen section and final pathology confirmed schwannoma. Immediately postoperatively, she had complete paralytic ptosis and restricted supraduction of the operative eye. These deficits resolved near completely by postoperative week 6, with BCVA improving to 20/30 and corresponding visual field improvement. Case 2: A 30-year-old woman referred with progressive visual decline over the preceding eight months during pregnancy. Her vision was counting fingers at three feet, with a dense RAPD. Cranial nerve function was otherwise intact. MRI revealed a 1.3 × 0.9 × 0.9 cm well-marginated, homogeneously enhancing lesion at the left orbital apex. She also underwent lateral orbitotomy with excision, and pathology again confirmed schwannoma. Postoperatively, she had complete ptosis of the left upper eyelid. By postoperative month 3, the eyelid position had normalized. BCVA improved to 20/80, and her visual field defect improved significantly, with mean deviation improving from -23.59 to -7.39.

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ORBITAL DISEASE

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Conclusions: These cases describe a rare presentation of orbital schwannomas involving the superior division of the oculomotor nerve. These cases are noteworthy in that neither had oculomotor nerve or other cranial nerve dysfunction prior to excision. These cases are also notable in that both patients experienced transient postoperative ptosis and one had supraduction deficits consistent with involvement of the superior division of CN III, with full or near-full recovery. Despite close association with the nerve, surgical excision can yield favorable visual and functional outcomes. These cases highlight the importance of thorough preoperative counseling, including discussion of potential postoperative deficits.

Figure 1. (A) Case 1 preoperative axial view MRI demonstrating a $2.0 \times 1.9 \times 1.6$ cm well-marginated, homogeneously enhancing intraconal mass. (B) External photo at post op week one showing right eye ptosis and supraduction deficit. (C) External photo at post op week 6 showing near resolution of ptosis.

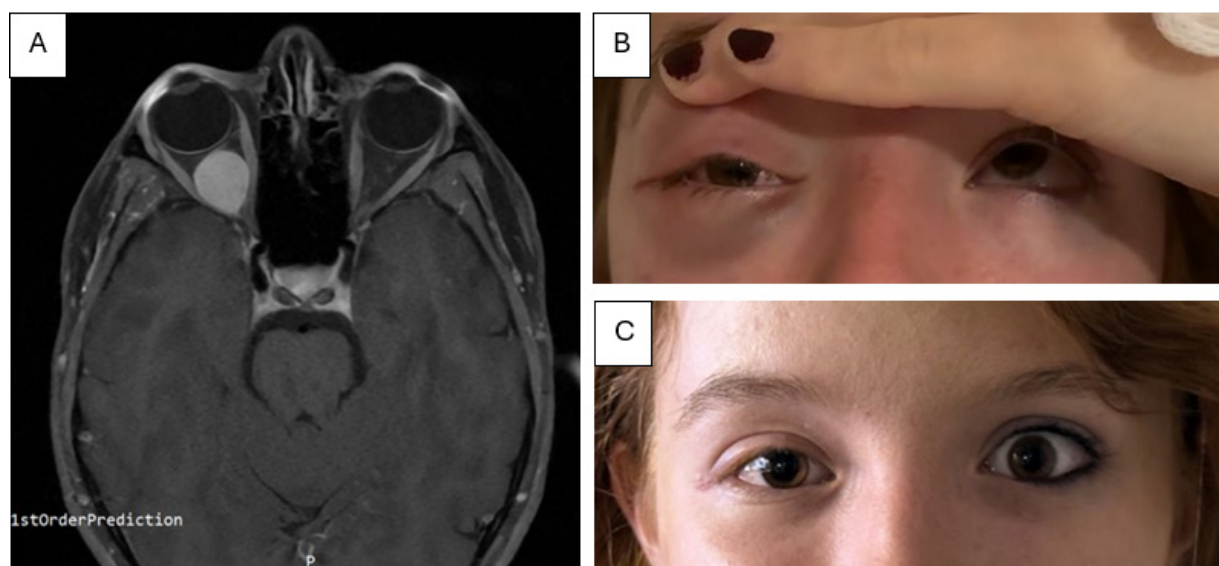
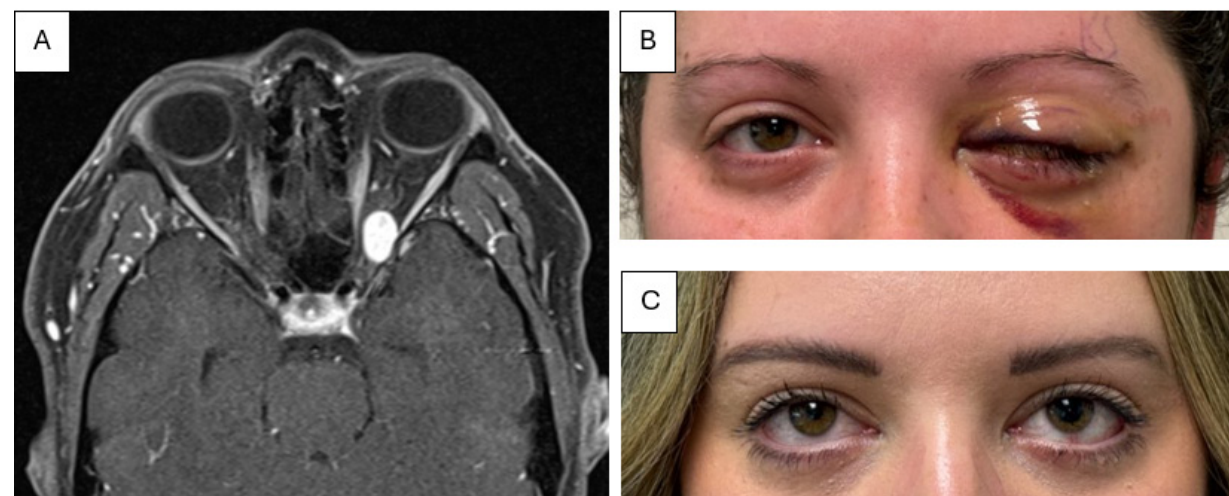


Figure 2. (A) Case 2 preoperative axial view MRI demonstrating a $1.3 \times 0.9 \times 0.9$ cm well-marginated, homogeneously enhancing lesion at the left orbital apex. (B) External photo at post op week one showing complete ptosis of left upper eyelid. (C) External photo at post op week 6 showing normalization of eyelid position.



References

1. Orbital Schwannoma-Management and Clinical Outcomes. Ophthalmic Plastic and Reconstructive Surgery. 2020. Yong KL, Beckman TJ, Cranstoun M, Sullivan TJ.
2. Oculomotor Nerve Schwannoma: Case Series and Literature Review. Survey of Ophthalmology. 2021. Douglas VP, Flores C, Douglas KA, et al.
3. Pediatric Orbital Schwannoma Originating From the Oculomotor Nerve. Journal of Neurosurgery. Pediatrics. 2012. Nagashima H, Yamamoto K, Kawamura A, et al.

24 Retrospective Validation and Longitudinal Application of AI-Based Facial Image Analysis for Thyroid Eye Disease in a U.S. Cohort

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Introduction: Accurate and objective assessment of thyroid eye disease (TED) activity and severity is essential for clinical decision-making and treatment monitoring. Glandy CAS, EXO, and LID are artificial intelligence-based tools designed to evaluate Clinical Activity Score (CAS), proptosis, and eyelid morphology from standard frontal facial photographs. This study aimed to retrospectively validate these tools in a U.S. TED cohort and explore their utility for longitudinal monitoring in patients treated with teprotumumab.

Methods: In this retrospective validation study, facial images obtained during routine clinical care were analyzed and compared with same-day, in-person assessments performed by an oculoplastics-trained physician, serving as the clinical reference standard. Glandy CAS was evaluated using 370 images from 100 patients for active TED classification and CAS estimation. Glandy EXO was evaluated using 287 images from 83 patients (574 eyes) for proptosis measurement. Glandy LID was evaluated for eyelid position using 209 images from 76 patients for MRD1 and 187 images from 75 patients for MRD2. Agreement with clinical measurements was assessed using mean absolute error (MAE) and Pearson correlation coefficients. In addition, serial images from patients undergoing teprotumumab treatment were analyzed to assess the feasibility of mobile application-based longitudinal monitoring.

Results: For active TED classification, Glandy CAS achieved an accuracy of 82.7%, sensitivity of 82.3%, and specificity of 83.0%, with a mean absolute error of 1.10 for CAS estimation. Performance improved in non-gray-zone cases, with sensitivity of 91.6% for cases with CAS ≥ 3 and specificity of 88.5% for cases with CAS ≤ 2 . Glandy EXO demonstrated strong agreement with clinical exophthalmometry (MAE 1.44 mm; $r = 0.83$). Glandy LID showed high agreement with clinical eyelid measurements, with MRD1 MAE of 0.38 mm ($r = 0.95$) and MRD2 MAE of 0.43 mm ($r = 0.90$). Serial image analysis in patients treated with teprotumumab demonstrated that the platform could capture treatment-related changes in TED activity and structural features over time.

Conclusions: Glandy CAS, EXO, and LID demonstrated strong clinical performance for assessing TED activity, proptosis, and eyelid morphology from frontal facial photographs in a U.S. cohort. The results support the use of AI-based facial image analysis as an objective and accessible tool for TED evaluation. Its application to serial images from teprotumumab-treated patients further suggests potential value for longitudinal treatment monitoring in real-world clinical settings.

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References

1. Garrity JA, Bahn RS. Pathogenesis of graves ophthalmopathy: implications for prediction, prevention, and treatment. *Am J Ophthalmol*. 2006;142(1):147–53.
2. Taylor PN, Zhang L, Lee RWJ, et al. New insights into the pathogenesis and nonsurgical management of Graves orbitopathy. *Nat Rev Endocrinol*. 2020;16(2):104–16.
3. Rundle FF, Wilson CW. Development and course of exophthalmos and ophthalmoplegia in Graves' disease with special reference to the effect of thyroidectomy. *Clin Sci*. 1945;5(3-4):177–94.
4. Bahn RS. Graves' ophthalmopathy. *N Engl J Med*. 2010;362:726–38.
5. Bartley GB, Fatourehchi V, Kadrmash EF, et al. Clinical features of Graves' ophthalmopathy in an incidence cohort. *Am J Ophthalmol* 1996;121:284–90.
6. Smith TJ, Bahn RS, Gorman CA. Connective tissue, glycosaminoglycans, and diseases of the thyroid. *Endocr Rev*. 1989;10:366–91.
7. Moon JH, Shin K, Lee GM, et al. Machine learning-assisted system using digital facial images to predict the clinical activity score in thyroid-associated orbitopathy. *Sci Rep*. 2022;12(1):22085.
8. Shin K, Choung H, Lee MJ, et al. A Preliminary Evaluation of the Diagnostic Performance of a Smartphone-Based Machine Learning-Assisted System for Evaluation of Clinical Activity Score in Digital Images of Thyroid-Associated Orbitopathy. *Thyroid*. 2024;34(6):744–752.
9. Park J, Yoon JS, Kim N, et al. Deep Learning-Driven Exophthalmometry Through Facial Photographs in Thyroid Eye Disease. *Ophthalmol Sci*. 2025;100791.
10. Shin K, Yoon JS, Kim J, Park J, Park HY, Kim N, Lee MJ, Choung HK, Ko J, Moon JH. AI-based assessment of Clinical Activity Score and detection of active thyroid eye disease using facial images: validation of Glandy CAS. *BMJ Open Ophthalmol*. 2025 Sep 17;10(1)

25 Staged Management of Unilateral Congenital Fibrosis of the Extraocular Muscles with Enophthalmos and Ptosis: A Case Report

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Introduction: We describe the staged management and long-term outcomes of a child with a rare unilateral phenotype of congenital fibrosis of the extraocular muscles (CFEOM), who presented with ipsilateral ptosis and enophthalmos in the absence of clinically significant strabismus. This illustrates a surgical algorithm that differs from strabismus-first management typical in bilateral CFEOM.

Methods: This retrospective case report includes nine years of longitudinal follow-up at the University of Colorado. Data collection included best-corrected visual acuity (BCVA), cycloplegic refraction, margin reflex distance 1 (MRD1), ocular motility, orbital magnetic-resonance imaging (MRI), operative reports, and complications. Staged interventions included: (1) hyperopic spectacle correction for amblyopia; (2) a silicone rod frontalis sling via a standard three-brow-incision for progressive ptosis; (3) a porous polyethylene enophthalmic wedge implant placed subperiosteally along the posterior orbital floor and lateral wall for enophthalmos and facial asymmetry; and (4) frontalis sling revision with a PolyTetraFluoroEthylene sling. Outcomes are presented descriptively at defined time points.

Results: A male infant presented at nine months of age with right ptosis (MRD1 1.5 mm right eye [OD] vs. 5 mm left eye [OS]), a grade four supraduction deficit, and right enophthalmos without microphthalmos or nanophthalmos. Primary gaze was orthotropic. Cycloplegic refraction was +6.00 diopters OD / +4.00 diopters OS. Orbital MRI demonstrated T1 linear hypointensity in the fat posterior to the globe extending between the superior and inferior recti, suggestive of scar, and ipsilateral optic nerve hypoplasia. Vision in the right eye was un-central, steady, and unmaintained. Full time spectacle correction was prescribed but patch was deferred given his optic nerve hypoplasia and unknown visual potential. Right frontalis sling at age two cleared the visual axis. Mild resulting lagophthalmos was well managed with topical lubricating ointment. Frontalis activation was limited, but BCVA improved to 20/125 at age four (Figure 1). Computed tomography of the orbits at age 5 demonstrated right enophthalmos (Figure 2). An enophthalmic wedge implant at age five improved globe projection and facial asymmetry without inducing new motility restriction or diplopia. BCVA improved to 20/60 at age 6. Recurrent ptosis at age seven prompted a second frontalis sling with conservative correction to limit exposure risk.

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At the nine-year time point, the right lid position remained cosmetically acceptable with mild residual ptosis not occluding the visual axis. (Figure 3). There was no frank lagophthalmos; however, mild ocular-surface irritation persisted in the setting of an incomplete blink. This was conservatively managed with nightly erythromycin ointment and intermittent taping. BCVA has remained at 20/50. At the time of the current study no complications were noted, including significant corneal exposure or implant migration.

Conclusions: Unilateral CFEOM with enophthalmos is an underrecognized phenotype in which management focuses on maximizing visual potential and addressing facial asymmetry as the patient develops. A staged approach combining early amblyopia therapy, frontalis suspension with a deliberately conservative lid-height target to protect the cornea, and porous polyethylene orbital volume augmentation can achieve durable functional and cosmetic improvement. Families should be counseled regarding recurrent ptosis, corneal exposure, and the need for revisions.

Figure 1

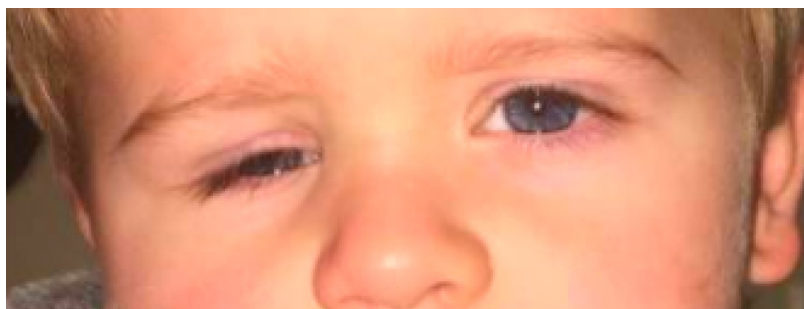
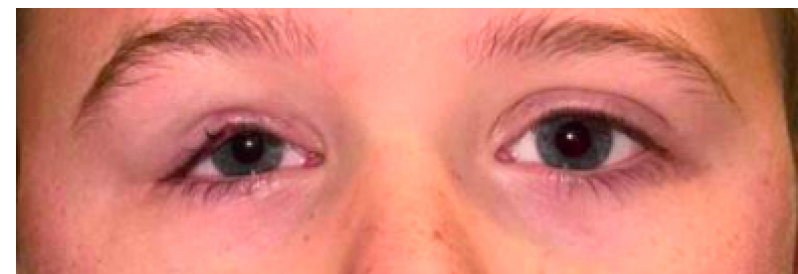


Figure 2



Figure 3



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References

1. Hertle RW, Katowitz JA, Young TL, Quinn GE, Farber MG. Congenital unilateral fibrosis, blepharoptosis, and enophthalmos syndrome. *Ophthalmology*. 1992;99(3):347–355.
2. Yazdani A, Traboulsi EI. Classification and surgical management of patients with familial and sporadic forms of congenital fibrosis of the extraocular muscles. *Ophthalmology*. 2004;111(5):1035–1042.
3. Whitman MC, Jurgens JA, Hunter DG, et al. Congenital Fibrosis of the Extraocular Muscles Overview. 2004 Apr 27 [Updated 2021 Aug 12]. In: Adam MP, Bick S, Mirzaa GM, et al., editors. *GeneReviews*® [Internet]. Seattle (WA): University of Washington, Seattle; 1993–2026. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK1348/>
4. Mravicic I, Lukacevic S, Biscevic A, Ahmedbegovic Pjano M, Ziga N, Tusek M. A treatment approach in congenital fibrosis of extraocular muscles. *Med Arch*. 2023;77(2):137–141.
5. Thomas MG, Maconachie GDE, Kuht HJ, et al. Optic nerve head and retinal abnormalities associated with congenital fibrosis of the extraocular muscles. *Int J Mol Sci*. 2021;22(5):2575.
6. Rubin PA, Bilyk JR, Shore JW. Orbital reconstruction using porous polyethylene sheets. *Ophthalmology*. 1994;101(10):1697–1708.
7. Yuksel Sukun E, Hamis Inal A, Ocak OB, Ozveren M, Gokyigit B. Congenital fibrosis of the extraocular muscles: a retrospective study of 76 patients. *Cureus*. 2024;16(6):e61909.

26 A Quantitative Model of Lifetime Corneal Radiant Exposure in Surgeons

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Introduction: Ophthalmologists and oculoplastic surgeons work under some of the highest artificial light intensities of any occupational setting, yet the cumulative corneal radiant exposure incurred over a surgical career has never been quantified. Surgical loupes and coaxial LED headlights are in widespread use across surgical subspecialties and may substantially compound baseline exposure to surgeons from overhead lighting. Understanding the magnitude of this occupational light burden is critical, as cumulative corneal irradiance may be implicated in the progression of age-related macular degeneration.

Our study aimed to develop a physics-based model of lifetime corneal radiant exposure in surgeons and to quantify how surgical loupe magnification and coaxial LED headlight use modify that exposure. The central clinical question is whether the optical equipment now routinely used across surgical specialties meaningfully amplifies an already substantial baseline exposure, and whether loupe selection represents a modifiable risk factor surgeons can act on at the time of purchase.

Methods: Our study is a quantitative modeling study. Corneal plane irradiance was calculated across three baseline scenarios (lower bound, midpoint, upper bound), defined by simultaneous variation of eight model parameters spanning light source characteristics, surgical field geometry, viewing angle, working distance, operating time, and career duration. Overhead surgical light illuminance values were drawn from specifications meeting international electrotechnical standards. Loupe working distances were obtained from manufacturer specifications for 2.5×, 3.5×, and 4.5× magnification systems; headlight illuminance values were taken from commercially available coaxial LED devices. A one-at-a-time sensitivity analysis identified dominant parameters. Primary outcomes were corneal plane irradiance (W/m²), daily radiant exposure (J/m²), and career radiant exposure (MJ/m²) over a 30-year career.

Results: At midpoint conditions, corneal irradiance was 0.815 W/m² and 30-year career radiant exposure was 61.6 MJ/m² (scenario range: 0.7 to 800.0 MJ/m²). Working distance was the most potent modifiable parameter. Loupes alone increased career exposure 1.4 to 2.8-fold relative to surgery without loupes. Adding a coaxial headlight compounded this further; a 4.5× loupe configuration (working distance 0.28 m) with a 100,000 lux headlight produced 393 MJ/m² over 30 years, 6.4 times the exposure without loupes or a headlight.

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Conclusions: Surgeons accumulate a substantial and previously unquantified occupational corneal light burden, amplified significantly by the loupes and headlights now regularly used across surgical specialties. Working distance, determined at the time of loupe purchase, is the highest-impact modifiable variable. Our model enables surgeons to make informed decisions about loupe selection with corneal exposure as an explicit consideration alongside optical and ergonomic factors.

Figure 1

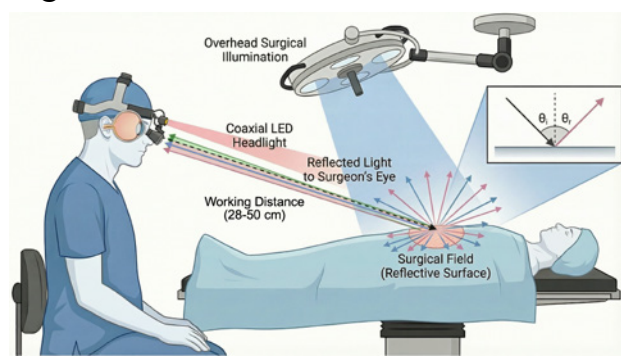


Figure 2

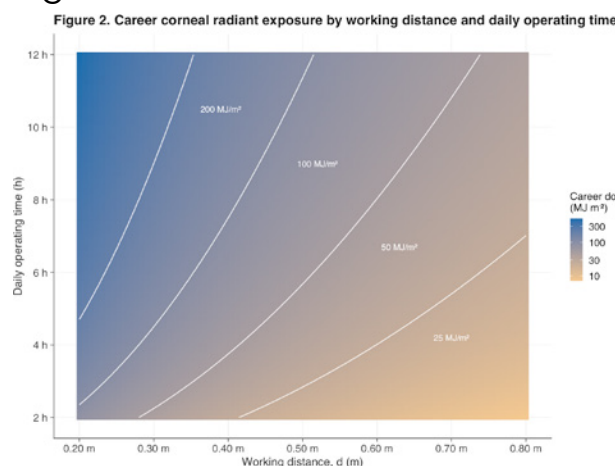


Figure 3

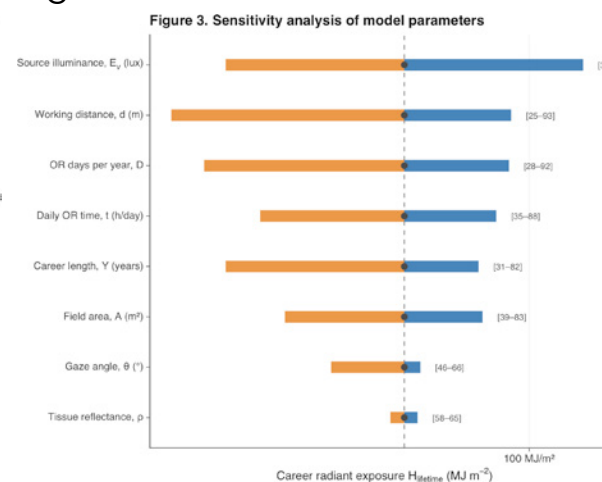
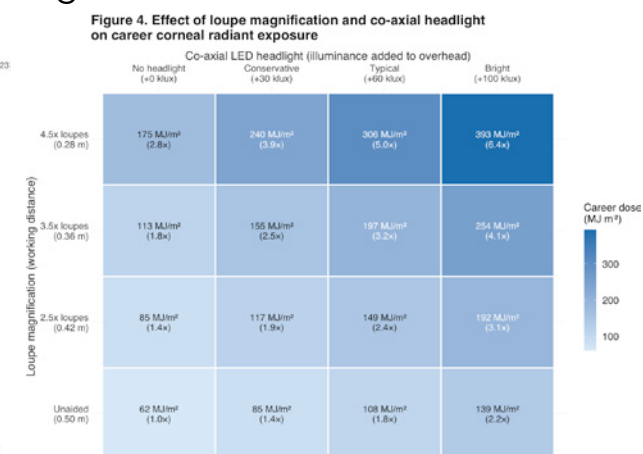


Figure 4



References

1. Medical electrical equipment – Part 2-41: Particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis. IEC 60601-2-41:2021. Published September 2021. Accessed March 21, 2026. <https://webstore.iec.ch/en/publication/62677>
2. Occupational Safety and Health Administration. Computer Workstations eTool: Workstation Environment. US Department of Labor, OSHA. Accessed March 22, 2026. <https://www.osha.gov/etools/computer-workstations/workstation-environment>
3. Wei C, Wu AY. Surgical loupe usage among oculoplastic surgeons in North America. *Can J Ophthalmol*. 2018;53(2):139-144. doi:10.1016/j.jcjo.2017.08.011
4. SurgiTel. Surgical LED Headlights – Product Specifications. SurgiTel; 2024. Accessed March 21, 2026. <https://www.surgitel.com/surgical-headlights/>
5. Seiler Medical. Surgical Loupes – Product Specifications. Seiler Medical; 2024. Accessed March 21, 2026. <https://www.seilermedical.com/products/sport-loupes/>
6. Carl Zeiss Meditec. EyeMag Medical Loupes – Magnification and Working Distance Specifications. ZEISS Medical Technology; 2024. Accessed March 21, 2026. <https://www.zeiss.com/meditec/en/products/zeiss-eyemag-medical-loupes.html>
7. HEINE Optotechnik. Tips for Choosing a Loupe-Headlight: Binocular Loupes and Illumination. HEINE Optotechnik; 2024. Accessed March 21, 2026. https://www.heine.com/en_US/medical-specialties/loupes-and-lights/application-and-diagnostic-tips/tips-for-choosing-a-loupe-headlight/binocular-loupes-and-illumination
8. Fu K, Walmsley J, Abdelrahman M, Chan DSY. How much time do surgeons spend operating? *The Surgeon*. 2024;22(1):1-5. doi:10.1016/j.surge.2023.09.001
9. Bashkatov AN, Genina EA, Kochubey VI, Tuchin VV. Optical properties of human skin, subcutaneous and mucous tissues in the wavelength range from 400 to 2000 nm. *J Phys D Appl Phys*. 2005;38(15):2543-2555. doi:10.1088/0022-3727/38/15/004
10. Jarrett PM. Intraoperative magnification: Who uses it? *Microsurgery*. 2004;24(6):420-422. doi:10.1002/micr.20066

27 Are Patients with Anophthalmia at Risk for Adverse Psychosocial Outcomes? A National Matched Cohort Study

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Introduction: Anophthalmia has been associated with adverse psychosocial outcomes, including lower quality of life,¹ higher rates of anxiety and depression,² and increased somatization.³ These concerns are particularly relevant in oculoplastic surgery, where a dual focus on function and appearance is central to patient care.

To our knowledge, the existing literature consists of small or single-institution cohorts and lacks adjustment for sociodemographic factors.^{1–3} It thus remains unclear whether observed disparities are directly attributable to eye loss or instead reflect underlying structural determinants of health. We therefore aimed to evaluate whether anophthalmia independently contributes to psychosocial impairment in a diverse, national cohort.

Methods: We conducted a retrospective cohort study using the All of Us Research Program. Adults with anophthalmia were identified using diagnosis and procedure codes. Individuals with blindness or bilateral anophthalmia were excluded. Outcomes were compared to a random 1:4 control cohort and a 1:4 cohort matched on age, sex, race, ethnicity, education, employment, and insurance status using nearest-neighbor propensity score matching. Baseline characteristics were compared using Wilcoxon rank-sum testing for continuous and Fisher's exact testing for categorical variables. Psychosocial outcomes were social functioning, quality of life, and mental health, dichotomized from validated surveys and compared using Fisher's exact testing.

Results: Among 621,387 eligible adults, 226 individuals with anophthalmia were included and matched to 904 controls. Another random sample of 904 controls was also selected. Baseline characteristics that differed significantly between the random-control and anophthalmia groups included age (57 vs. 63 years; $p<0.001$), sex (34.7% vs. 54.9% male; $p<0.001$), race (39.4% vs. 54.3% White; $p<0.001$), education (70.5% vs. 54% >high school; $p<0.001$), employment (47.7% vs. 27.3% employed; $p<0.001$), and insurance (19.6% vs. 27.8% public; $p=0.023$; Figure 1). Matched controls were well-balanced on all demographic covariates. In random-control analyses, patients with anophthalmia more often reported impaired social roles (16.4% vs 11.0%, OR 1.59 [95% CI 1.03–2.43]) and poor quality of life (23.5% vs 13.8%, OR 1.91 [1.30–2.77]) compared to controls (Figure 2). Rates of poor mental health were similar across groups (19.9% vs 16.3%, OR 1.28 [0.86–1.88]). However, no differences were observed after matching: rates of impaired social roles (OR 0.85 [0.56–1.26]), poor quality of life (OR 1.02 [0.71–1.45]), and poor mental health (OR 0.75 [0.51–1.09]) were all similar between groups.

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Conclusions: In this national cohort, anophthalmia was not independently associated with any psychosocial disparities after sociodemographic adjustment. These findings challenge prior assumptions that anophthalmia independently drives psychosocial impairment, suggesting that disparities may instead reflect underlying social determinants or clinical factors (e.g., prosthesis status, cosmetic outcomes) rather than eye loss itself.

Table 1. Characteristics of patients with anophthalmia, random controls, and matched controls.

Characteristic	Level	Anophthal mia Group (N=228)	Random Controls (N=904)	p-value (Random vs. Anophthalmia)	Matched Controls (N=904)	p-value (Matched vs. Anophthalmia)
Age, median [IQR]		63 [53– 71]	57 [42– 70]	<0.001	62 [51– 70]	0.948
Sex	Male	124 (54.9%)	314 (34.7%)	<0.001	489 (54.1%)	0.912
	Female	96 (42.3%)	582 (64.4%)		393 (43.5%)	
	Not male, not female, prefer not to answer, or skipped	6 (2.6%)	8 (0.9%)		22 (2.4%)	
Race	White	89 (39.4%)	491 (54.3%)	<0.001	357 (39.5%)	0.621
	Black or African American	75 (33%)	162 (17.9%)		306 (33.6%)	
	None Indicated	45 (19.8%)	145 (16.0%)		190 (21.0%)	
	More than one population	7 (3.1%)	40 (4.4%)		22 (2.4%)	
	Asian	4 (1.8%)	30 (3.3%)		11 (1.2%)	
	Another single population	4 (1.8%)	17 (1.9%)		16 (1.8%)	
	None of these	1 (0.4%)	10 (1.1%)		2 (0.2%)	
	Skipped	1 (0.4%)	6 (0.7%)		0 (0.0%)	
	I prefer not to answer	0 (0.0%)	3 (0.3%)		0 (0.0%)	
	Not Hispanic or Latino	171 (75.7%)	711 (78.7%)		690 (76.3%)	
Ethnicity	Hispanic or Latino	53 (23.3%)	174 (19.2%)	0.597	212 (23.5%)	0.281
	Prefer Not To Answer	0 (0.0%)	3 (0.3%)		0 (0.0%)	
	None Of These	1 (0.4%)	10 (1.1%)		2 (0.2%)	
	Skipped	1 (0.4%)	6 (0.7%)		0 (0.0%)	
Education	> high school	122 (54%)	637 (70.5%)	<0.001	472 (52.2%)	0.749
	≤ high school	92 (40.5%)	247 (27.3%)		390 (43.1%)	
	Other or Missing	12 (5.3%)	20 (2.2%)		42 (4.6%)	
Employment	Employed	62 (27.3%)	431 (47.7%)	<0.001	237 (26.2%)	0.736
	Other or Missing	164 (72.6%)	473 (52.3%)		667 (73.8%)	
Insurance	Public	63 (27.8%)	177 (19.6%)	0.0231	259 (28.7%)	0.741
	Uninsured	14 (5.2%)	75 (8.3%)		45 (5.0%)	
	Other or Missing	149 (65.9%)	652 (72.1%)		600 (66.4%)	

Table 2. Psychosocial outcomes in random and matched controls.

Outcome	Anophthalmia, n/N (%)	Controls, n/N (%)	OR (95% CI)	p-value
Random 1:4 cohort				
Impaired social roles	37/226 (16.4%)	99/904 (11.0%)	1.59 (1.03– 2.43)	0.03
Poor quality of life	53/226 (23.5%)	125/904 (13.8%)	1.91 (1.30– 2.77)	0.005
Poor mental health	45/226 (19.9%)	147/904 (16.3%)	1.28 (0.86– 1.88)	0.198
Matched 1:4 cohort				
Impaired social roles	37/226 (16.4%)	170/904 (18.8%)	0.85 (0.56– 1.26)	0.442
Poor quality of life	53/226 (23.5%)	209/904 (23.1%)	1.02 (0.71– 1.45)	0.930
Poor mental health	45/226 (19.9%)	224/904 (24.8%)	0.75 (0.51– 1.09)	0.138

References

- Ahn JM, Lee SY, Yoon JS. Health-Related Quality of Life and Emotional Status of Anophthalmic Patients in Korea. Am J Ophthalmol. 2010;149(6):1005-1011.e1.
- Ye J, Lou L, Jin K, et al. Vision-Related Quality of Life and Appearance Concerns Are Associated with Anxiety and Depression after Eye Enucleation: A Cross-Sectional Study. PLOS ONE. 2015;10(8):e0136460.
- Wang KJ, Li SS, Wang HY. Psychological symptoms in anophthalmic patients wearing ocular prosthesis and related factors. Medicine (Baltimore). 2020;99(29):e21338.

28 Disparities in Opioid Prescribing Patterns Following Violent vs. Nonviolent Ocular Trauma

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Introduction: Ocular and periocular trauma represent a significant portion of emergency ophthalmic care and often require involvement from oculoplastic surgeons. Adequate pain control is a key component of management, yet studies in broader surgical populations suggest that opioid prescribing is not uniform across patients. In particular, individuals injured through assault may receive different analgesic care than those with accidental injuries, despite often presenting with greater injury severity. These differences have been linked to factors such as stigma and implicit bias tied to the mechanism of injury.

Understanding these patterns within ophthalmology is important for developing more equitable care pathways. Prior work in general trauma populations has shown that patients injured by assault receive less opioid analgesia than expected relative to their injury burden.¹ Whether similar disparities exist in ocular trauma has not been well studied. In addition, the role of sociodemographic factors—including race, insurance status, and social vulnerability—remains unclear in this setting. We therefore used a large, multicenter database to evaluate how injury mechanism and patient characteristics are associated with opioid prescribing in ocular trauma.

Methods: We conducted a retrospective cohort study using the Epic Cosmos multicenter electronic health record database, identifying patients with ocular trauma from 2016 to 2025. Patients were categorized as having sustained violent or accidental injuries based on ICD-10-CM external cause and injury codes. Primary outcomes included opioid receipt during hospitalization and at discharge, analgesic intensity measured in morphine milligram equivalents (MMEs), and duration of discharge prescriptions. Adjusted odds ratios (aORs) for opioid receipt were estimated using multivariable logistic regression. Analgesic intensity and prescription duration were analyzed using generalized linear models and negative binomial regression, respectively. All models adjusted for potential confounders to isolate the independent effect of injury mechanism, including age, sex, race, insurance type, Social Vulnerability Index (SVI), injury severity (major vs. non-major), surgical intervention, and substance use history.

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Results: Of 370,567 patients, 26,160 (7.1%) were victims of violent trauma. Assault victims had a significantly higher prevalence of major ocular injury compared to accidental victims (37.6% vs. 8.6%, $p < 0.001$). While assault victims had higher odds of inpatient opioid receipt (aOR: 1.71, 95% CI: 1.65–1.77), this association attenuated significantly at discharge (aOR: 1.33, 95% CI: 1.27–1.39). Covariate analysis demonstrated persistent racial disparities independent of injury severity or surgical status. Compared to White patients, Hispanic (aOR: 0.72, 95% CI: 0.69–0.75) and Asian (aOR: 0.61, 95% CI: 0.56–0.67) patients had significantly lower odds of receiving opioids. Conversely, higher SVI was an independent predictor of increased opioid receipt (aOR: 1.20 per 0.1 increase).

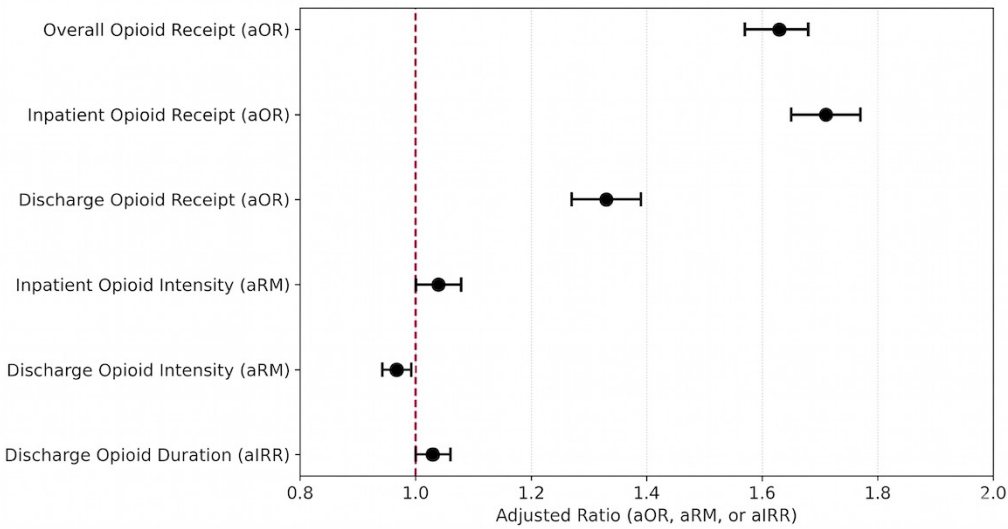
Conclusions: A significant gap exists between clinical severity and longitudinal analgesic prioritization for victims of violent ocular trauma. Furthermore, sociodemographic factors independently drive prescribing patterns regardless of objective injury burden. These findings highlight a critical need for oculoplastic specialists to implement standardized, severity-based analgesic protocols to mitigate systemic bias and ensure equitable care across diverse trauma.

Table 1: Comparison of baseline characteristics between violent and accidental ocular trauma cohorts

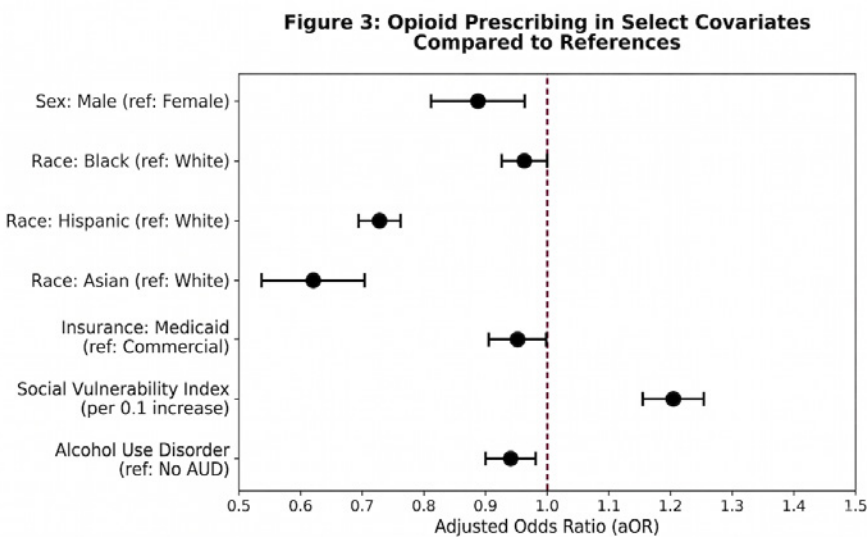
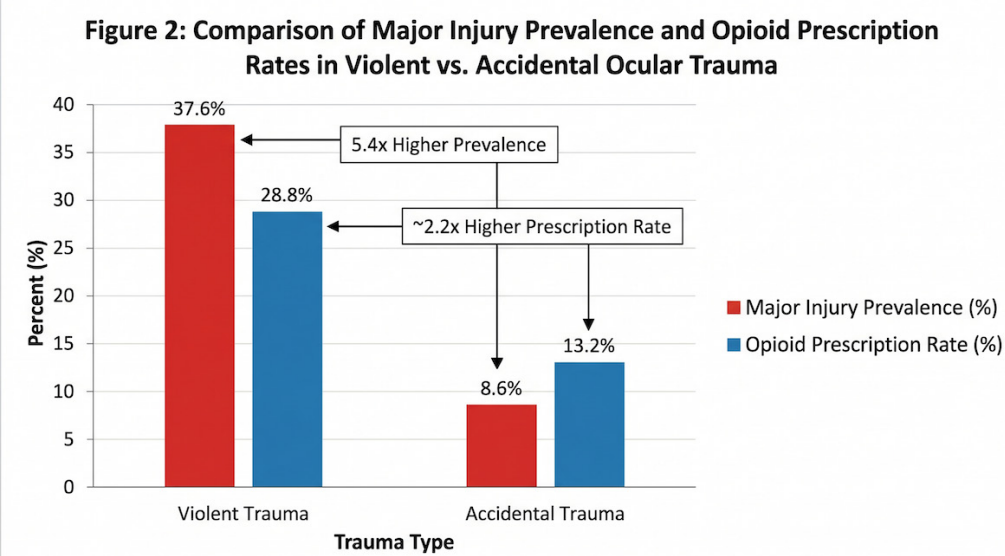
Characteristic	Violent Trauma (n = 26,160)	Accidental Trauma (n = 344,407)	p-value
Age, Median (IQR)	33 (25, 43)	38 (28, 51)	< 0.001
Sex, No. (%)			< 0.001
Female	11,065 (42.3%)	155,737 (45.2%)	
Male	15,095 (57.7%)	188,670 (54.8%)	
Race/Ethnicity, No. (%)			< 0.001
White	7,069 (27.0%)	157,817 (45.8%)	
Black or African American	10,591 (40.5%)	65,777 (19.1%)	
Hispanic	2,753 (10.5%)	39,878 (11.6%)	
Asian	210 (0.8%)	5,828 (1.7%)	
American Indian or Alaska Native	139 (0.5%)	1,007 (0.3%)	
Native Hawaiian or Pacific Islander	57 (0.2%)	532 (0.2%)	
Other Race	3,357 (12.8%)	38,266 (11.1%)	
Unknown Race	1,984 (7.6%)	35,302 (10.2%)	
Insurance Type, No. (%)			< 0.001
Commercial	5,148 (19.7%)	133,815 (38.9%)	
Medicaid	10,241 (39.1%)	81,164 (23.6%)	
Medicare	1,346 (5.1%)	18,054 (5.2%)	
Other/None	9,425 (36.0%)	111,374 (32.3%)	
Social Vulnerability Index, Median (IQR)	0.83 (0.59, 0.94)	0.67 (0.38, 0.88)	< 0.001
Ocular Surgery, No. (%)	1,083 (4.1%)	5,442 (1.6%)	< 0.001
Injury Severity, No. (%)			< 0.001
Major	9,836 (37.6%)	29,718 (8.6%)	
Minor	16,324 (62.4%)	314,689 (91.4%)	
Alcohol Use Disorder (AUD), No. (%)	4,684 (17.9%)	25,346 (7.4%)	< 0.001
Tobacco Use Disorder, No. (%)	10,931 (41.8%)	94,533 (27.4%)	< 0.001
Other Substance Use Disorder (SUD), No. (%)	5,108 (19.5%)	27,033 (7.8%)	< 0.001
Major Psychiatric Disorder, No. (%)	7,505 (28.7%)	74,261 (21.6%)	< 0.001

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Figure 1: Opioid Prescribing in Violent vs. Accidental Ocular Trauma (Adjusted for Injury Severity, Surgery, and Demographics)



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References

1. Smith SM, et al. Opioid Prescribing Disparity in Traumatically Injured Patients. *J Am Coll Surg*. 2025;240(6):915-925.

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29 National Patterns of Eye Protection Device–Associated Injuries Treated in U.S. Emergency Departments

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Introduction: Eye protection devices (EPDs) are ubiquitous across sports, industry, interventional medicine, and military operations and prevent a substantial proportion of ocular trauma when worn appropriately. Despite this benefit, the same devices have been implicated in injuries through device failure, improper fit, or hazardous exposures that exceed device capacity.

The existing evidence on device-associated ocular injury is largely built from case reports and single-institution series^{1,2}. These observations, while valuable, do not aggregate into a population-level picture of how and to whom EPD-associated injuries occur, particularly in comparison to broader eye injury trends.

A national, sustained-horizon view of EPD-related injuries is needed to inform device design, prevention messaging, and policy. The objective of this study was to compare trends in the demographic and clinical distribution of EPD-related and non-EPD-related eye injury ED visits in the United States between 2015 and 2024.

Methods: The National Electronic Injury Surveillance System (NEISS) was queried for emergency department (ED) visits between January 2015 and December 2024 that involved eye trauma (Consumer Product Safety Commission code BDYPT 77 – EYEBALL) with EPDs (Consumer Product Safety Commission product code 1607) and without EPDs. Age, sex, race, disposition, and diagnosis were extracted. Independent t-tests and chi-square tests compared characteristics between the two groups. A negative binomial regression compared the trend in injury occurrence rate between EPD-related and non-EPD-related injuries.

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Results: A total of 990 EPD-related and 45,831 non-EPD-related eye injury ED visits were identified. EPD injuries increased by 65.5% while non-EPD injuries increased by 17.6% from 2015 to 2024, a significantly faster rate ($P=0.02$). Males accounted for significantly more EPD-related cases than non-EPD-related cases (91.2% vs 65.6%, $P<0.0001$). Minors (age 0-17) comprised a significantly greater proportion of non-EPD eye traumas than EPD eye traumas (38.2% vs. 6.8%, $P<0.0001$). The most common diagnoses in both groups were foreign body and contusions. The proportion of EPD injuries that were treated and released was significantly greater than non-EPD injuries (97.2% vs. 93.7%, $P=0.0003$).

Conclusions: EPD-related eye injuries have increased at a significantly greater rate than general eye injuries from 2015 to 2024. This trend may coincide with increased overall EPD use due to stricter workplace enforcement or improved EPD use documentation by medical staff. Improved workplace policies and public education on proper protective eyewear use and re-evaluation of eyewear design may be warranted to reduce preventable ocular morbidity over the next decade.

References

1. Massera R, Hamilton A, Fung AT, Maloof A. Globe rupture despite correctly worn American standard-approved eye protective device. *Clin Exp Ophthalmol*. 2015;43(5):487-488.
2. Jain V, Natarajan S, Shome D, Gadgil D. Spectacle-induced ocular trauma: an unusual mechanism. *Cornea*. 2007;26(1):109-110.

30 Ocular Trauma and Incident Anxiety and Depression: A Propensity Score-Matched Survival Analysis Using the All of Us Research Program

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Introduction: Loss of vision or loss of an eye in the setting of trauma may have detrimental effects on patients' mental health and quality of life.¹ *The All of Us* Research Program, created by the National Institutes of Health in 2018, aims to collect data from one million adults across the United States, prioritizing enrollment of underrepresented minorities. Previous work using this database analyzed social determinants associated with loss of an eye but did not address anxiety, depression, or other presentations of ocular trauma.² This study leverages this diverse nationwide database to determine whether ocular trauma is independently associated with incident anxiety and/or depression, after adjustment for confounders and exclusion of pre-existing psychiatric diagnoses. Quantifying this risk may help inform screening and referral pathways for patients presenting with ocular injury.

Methods: A retrospective cohort study using propensity score matching with data from the All of Us Research Program was conducted. Those with conditions relating to ocular trauma were identified based on a predetermined set of SNOMED codes associated with ocular trauma, adapted from prior literature.³ Ocular trauma cases were identified by the earliest recorded ocular trauma-related diagnosis or procedure (index date). Matched controls inherited the index date of their corresponding case. A nearest-neighbor propensity score matching with a 1:3 ratio was performed using age, sex, race, ethnicity, employment status, annual household income, highest education level, health insurance status, and area deprivation index. Subjects with anxiety or depression diagnosed before the date of ocular trauma and those with no follow-up time were excluded. The primary outcome was the incidence of anxiety and/or depression. Univariate and multivariable Cox proportional hazards models were conducted. Cumulative incidence over a ten-year period was conducted using a Kaplan-Meier curve.

Results: Our study evaluated a total of 8,066 cases and 21,177 matched controls. Incident anxiety and/or depression occurred in 2,579 (32.0%) cases versus 3,371 (15.9%) controls (univariate HR 2.52, 95% CI 2.40–2.65, $p < 0.001$). Ten-year cumulative incidence was 33.5% (95% CI 32.2–34.8) in the ocular trauma group versus 14.4% (13.9–15.0) in controls, with a difference evident within the first year (6.9% vs 1.7%). Within the multivariable model, ocular trauma remained strongly associated with incident anxiety and/or depression (adjusted HR 2.56,

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95% CI 2.44–2.70, $p<0.001$). Female sex (adjusted HR 1.46), Non-Hispanic Black patients (adjusted HR 1.22), unemployment (adjusted HR 1.20), and lower household income (adjusted HR 2.06 for $< \$25,000$ compared to $\geq \$150,000$) were additional independent risk factors.

Conclusions: In a large, sociodemographically diverse United States cohort, ocular trauma was associated with a two-fold increased risk of anxiety and/or depression that remained evident throughout the follow-up period. These findings support proactive mental health screening and referral as part of the longitudinal care of patients with ocular trauma, particularly among women, non-Hispanic Black patients, and those with lower socioeconomic resources.

Table 1: Baseline characteristics of propensity score-matched ocular trauma cases and controls from the *All of Us* Research Program.

	No Ocular Trauma (N=21,177)	Ocular Trauma (N=8,066)	SMD
Age in year (mean (SD))	61.3 (15.9)	61.3 (16.2)	0.001
Sex at Birth = Male (%)	10610 (50.1)	4005 (49.7)	0.009
Race-Ethnicity (%)			0.024
Hispanic or Latino	2383 (11.3)	927 (11.5)	
Non-His Asian	410 (1.9)	171 (2.1)	
Non-His Black	3211 (15.2)	1270 (15.7)	
Non-His White	15173 (71.6)	5698 (70.6)	
Current Employment = Employed for wages or self-employed (%)	10226 (48.3)	3818 (47.3)	0.019
Income (%)			0.067
<25,000	4795 (22.6)	1922 (23.8)	
25,000-49,999	3464 (16.4)	1408 (17.5)	
50,000-74,999	2994 (14.1)	1183 (14.7)	
75,000-99,999	2401 (11.3)	933 (11.6)	
100,000-149,999	3527 (16.7)	1258 (15.6)	
$\geq 150,000$	3996 (18.9)	1362 (16.9)	
Highest Education level (%)			0.064
Less than a high school degree or equivalent	1102 (5.2)	451 (5.6)	
Twelve Or GED	3327 (15.7)	1347 (16.7)	
College One to Three	5096 (24.1)	2086 (25.9)	
College graduate or advanced degree	11652 (55.0)	4182 (51.8)	
Insurance = Has Coverage (%)	21105 (99.7)	8037 (99.6)	0.003
Private	8625 (40.7)	3200 (39.7)	
Medicaid	3084 (14.6)	1278 (15.8)	
Other Public	5170 (24.4)	1926 (23.9)	
Multiple	4226 (20.0)	1633 (20.2)	
Deprivation index (mean (SD))	0.31 (0.06)	0.31 (0.06)	0.006

SMD: Standardized Mean Difference.

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Table 2: Incidence of depression/anxiety and Cox proportional hazards results by ocular trauma status.

Group	Number	Event (%)	Median follow-up	HR (95% CI)	P-value
No ocular trauma	21,177	3,371(15.9%)	7.8 yrs	Reference	—
Ocular trauma	8,066	2,579 (2.0%)	6.5 yrs	2.52 (2.40, 2.65)	<0.001

HR = hazard ratio; CI = confidence interval.

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Figure 1: Kaplan-Meier Curve: Incident anxiety and/or depression by ocular trauma status up to 10 years of follow-up.

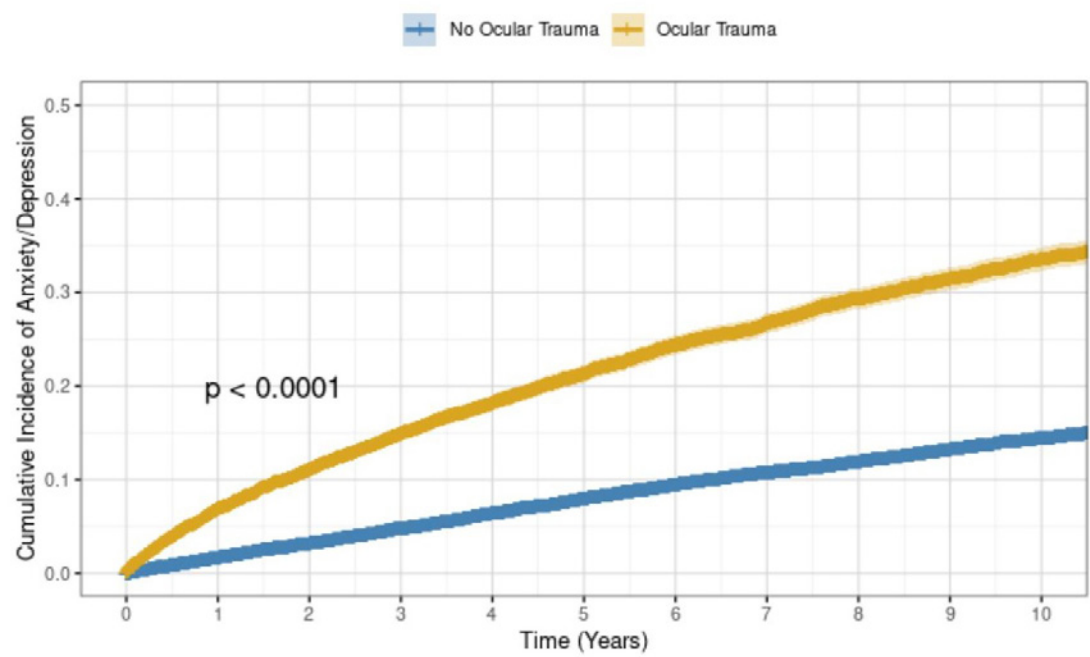


Table 3: Multivariable Cox proportional hazards analysis of risk factors for incident depression and/or anxiety.

Variable	N	Events (%)	Adjusted HR (95% CI)	P-value
Ocular trauma				
No ocular trauma	21,177	3,371 (15.9%)	Ref	—
Ocular trauma	8,066	2,579 (32.0%)	2.56 (2.44, 2.70)	< 0.001
Age (per 10-year increase)				
	29,243	5,950 (20.3%)	0.88 (0.87, 0.90)	< 0.001
Sex at birth				
Male	14,615	2,462 (16.8%)	Ref	—
Female	14,628	3,488 (23.8%)	1.46 (1.38, 1.54)	< 0.001
Race/ethnicity				
Non-Hispanic White	20,871	4,286 (20.5%)	Ref	—
Hispanic or Latino	3,310	706 (21.3%)	0.78 (0.56, 1.08)	0.07
Non-Hispanic Asian	581	63 (10.8%)	0.78 (0.60, 1.02)	0.10
Non-Hispanic Black	4,481	895 (20.0%)	1.22 (1.10, 1.34)	< 0.001
Employment status				
Employed for wages or self-employed	14,044	2,684 (19.1%)	Ref	—
Not currently employed for wages	15,199	3,266 (21.5%)	1.20 (1.13, 1.28)	< 0.001
Annual household income				
≥ \$150,000	5,358	754 (14.1%)	Ref	—
\$100,000–149,999	4,785	806 (16.8%)	1.05 (0.95, 1.17)	0.33
\$75,000–99,999	3,334	636 (19.1%)	1.18 (1.05, 1.31)	0.004
\$50,000–74,999	4,177	848 (20.3%)	1.25 (1.13, 1.39)	< 0.001
\$25,000–49,999	4,872	1,091 (22.4%)	1.46 (1.32, 1.62)	< 0.001
< \$25,000	6,717	1,815 (27.0%)	2.06 (1.87, 2.30)	< 0.001
Highest education level				
Less than high school degree or equivalent	1,553	397 (25.6%)	Ref	—
High school diploma or GED	4,674	1,132 (24.2%)	0.97 (0.86, 1.09)	0.60
College (one to three years)	7,182	1,653 (23.0%)	0.97 (0.86, 1.10)	0.66
College graduate or advanced degree	15,834	2,768 (17.5%)	0.97 (0.85, 1.10)	0.60
Health insurance				
Has coverage	29,142	5,941 (20.4%)	Ref	—
No coverage	101	9 (8.9%)	0.47 (0.25, 0.88)	0.02
Area deprivation index	29,243	5,950 (20.3%)	0.44 (0.27, 0.72)	0.001

HR = hazard ratio; CI = confidence interval.

References

- Ye J, Lou L, Jin K, et al. Vision-Related Quality of Life and Appearance Concerns Are Associated with Anxiety and Depression after Eye Enucleation: A Cross-Sectional Study. *PLoS One*. 2015;10(8):e0136460. doi:10.1371/journal.pone.0136460
- Chan AX, Radha Saseendrakumar B, Ozzello DJ, et al. Social determinants associated with loss of an eye in the United States using the All of Us nationwide database. *Orbit*. 2022;41(6):739–744. doi:10.1080/01676830.2021.2012205
- Kim S, Wang PR, Lopez R, et al. Characterization of ophthalmic presentations to emergency departments in the United States: 2010–2018. *Am J Emerg Med*. 2022;54:279–286. doi:10.1016/j.ajem.2022.02.024

31 Oculofacial Plastic Surgeons in Leadership Roles in Academic Ophthalmology

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Introduction: Oculofacial plastic surgeons represent a minority of academic ophthalmology faculty. In 2019, oculofacial plastics comprised approximately 8% of full-time academic ophthalmology faculty,¹ and prior cross-sectional analyses reported 7.1% prevalence among sitting department chairs and residency program directors (PDs), analyzed separately.^{2,3} The authors examined whether oculofacial plastic surgeons accounted for a higher-than-expected proportion of recent chair, interim chair, and PD appointments from 2015 to 2025, and characterized their contemporaneous representation in other leadership roles.

Methods: A de novo national leadership registry of all ACGME-accredited ophthalmology residency programs was constructed using publicly available data sources, capturing both current leadership roles and historical leadership appointments.⁴ Faculty webpages were systematically reviewed by two independent reviewers to identify administrative and clinical leadership roles including chairs, vice chairs (VCs), PDs, and VA ophthalmology leaders. Research and endowed titles were excluded. For each role, prevalence was calculated separately by role and restricted to programs with clearly identified role holders (e.g., departments with a listed chair or interim chair), excluding programs without distinct departmental leadership structures. Chair and interim chair and PD transitions from 2015 to 2025 were compiled from institutional announcements and biographies. Leaders were classified by subspecialty. Analyses were performed at the appointment level for transitions and at the role-holder level for cross-sectional role counts; individuals were deduplicated within each role category. To understand recent appointments, those occurring from 2020–2025 were selected a priori for comparison with an expected baseline of 7.1% using binomial models. For vice chair and VA estimates, analyses were restricted to entries with recorded subspecialty.

Results: Within this national registry, oculofacial plastics comprised 13 of 126 (10.3%) current chairs and 15 of 126 (11.9%) current PDs. Among VCs with subspecialty data available, 6 of 106 (5.7%) were oculofacial plastics; among VA leaders, 4 of 42 (9.5%, Figure 1). From 2020 to 2025, oculofacial plastics accounted for 6 of 29 (20.7%) new chair, interim chair, or PD appointments (4 chairs, 2 PDs), approximately threefold higher than the 7.1% benchmark ($p = 0.015$; 95% CI, 9.8%–38.4%, Figure 2 & 3).

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Conclusions: In this national analysis, oculofacial plastics comprised a larger share of recent chair, interim chair, and program director appointments than would be expected based on workforce benchmarks and prior cross-sectional data, suggesting disproportionate recent representation in leadership appointments. Whether this translates into a sustained increase in the proportion of sitting chairs will depend on tenure and turnover dynamics, and warrants further study of how workforce trends, career preferences, and institutional hiring practices influence leadership selection in academic ophthalmology. To note, chair and Program Director appointments likely follow selection pathways and public announcements that differ from those of vice chairs and VA leaders; accordingly, these cross-sectional estimates should be interpreted as descriptive and not as reflecting a shared promotion trajectory, suggesting that leadership roles in ophthalmology emerge from heterogeneous pipelines.

Figure 1

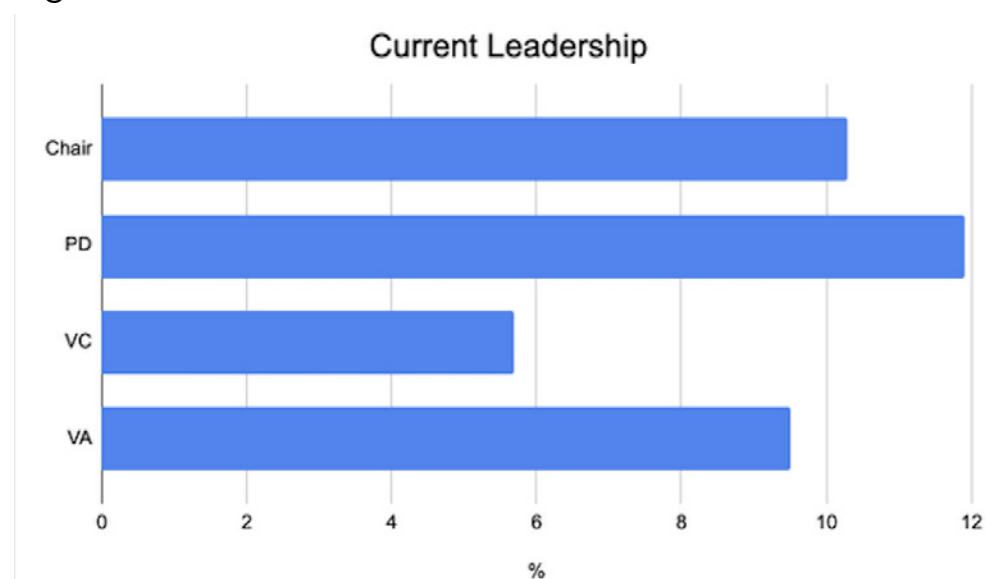


Figure 1. Bar chart illustrating the proportion of individuals with oculofacial plastic surgery training among current academic leadership positions, including department chairs, residency program directors (PDs), vice chairs (VCs), and Veterans Affairs (VA) leadership roles. Percentages are calculated relative to the total number of individuals in each role based on a cross-sectional analysis of ACGME-accredited ophthalmology programs. Across all leadership categories, oculoplastics representation remains modest and approximates or slightly exceeds previously reported workforce proportions (~7–8%), with variability observed by role. These findings provide a contemporary snapshot of subspecialty distribution within established leadership positions.

Figure 2

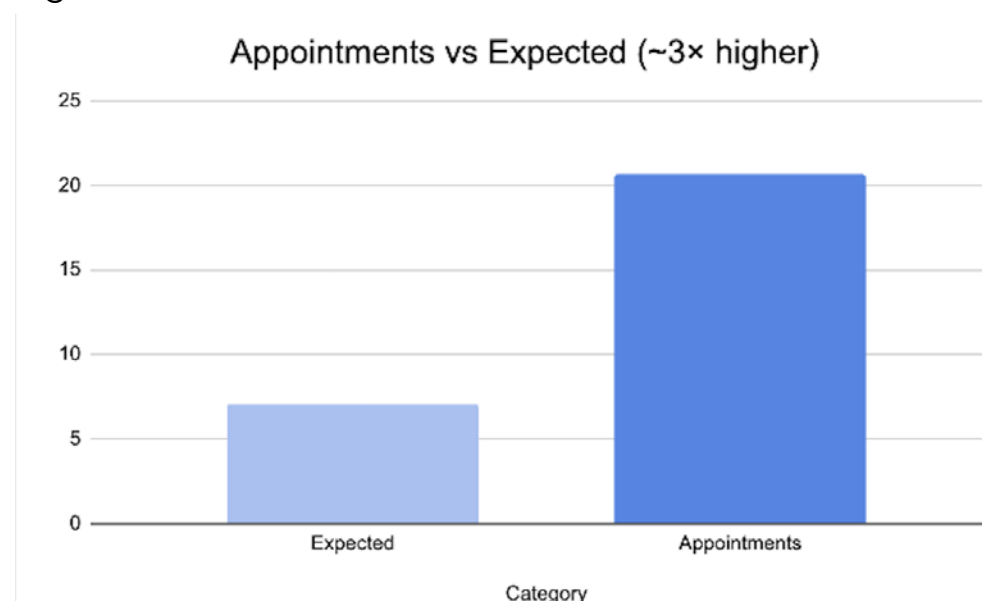


Figure 2. Comparison of observed oculoplastics representation among newly appointed academic ophthalmology leaders (2020–2025) versus expected representation based on estimated workforce composition (~7–8%). The observed proportion of recent appointments attributable to oculofacial plastic surgeons (20.7%) substantially exceeds the expected baseline, representing approximately a threefold enrichment. Expected values were derived from prior literature describing subspecialty distribution within academic ophthalmology. This figure highlights a disproportionate representation of oculoplastics-trained individuals among recent leadership selections.

Figure 3

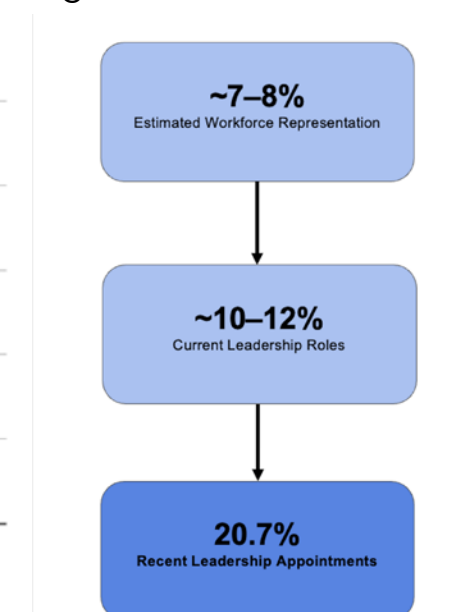


Figure 3. Conceptual pipeline illustrating the progression of oculoplastics representation from baseline workforce composition (~7–8%) to current leadership roles (~10–12%) and recent leadership appointments (20.7%) within academic ophthalmology. The stepwise increase demonstrates a marked enrichment of oculofacial plastic surgeons in newly appointed leadership positions relative to both workforce estimates and the current leadership landscape. This pattern suggests a potential shift in leadership selection trends over time, with oculoplastics-trained individuals accounting for a disproportionately large share of recent appointments.

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References

1. Chiang MF, Boland MV, Brewer A, et al. Specialization and distribution of the ophthalmology workforce in the United States. *Ophthalmology*. 2020;127(8):1011-1019.
2. Dotan G, Qureshi HM, Gatton DD. Chairs of United States academic ophthalmology departments: a descriptive analysis and trends. *Am J Ophthalmol*. 2018;196:26-33.
3. Kloosterboer A, Yannuzzi NA, Gedde SJ, Sridhar J. Residency program directors of United States ophthalmology programs: a cross-sectional study. *Am J Ophthalmol*. 2020;209:71-76.
4. Accreditation Council for Graduate Medical Education. ACGME accredited ophthalmology residency programs. Accreditation Council for Graduate Medical Education website. Accessed May 6, 2026. <https://www.acgme.org>

32 Oculoplastics Video Content on TikTok and YouTube Shorts

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Introduction: TikTok and YouTube are two of the most used social media platforms.¹ Video content, a primary feature of both platforms, is a readily accessible medium for patients to acquire information relating to health topics. We aim to compare oculoplastics-related video content between TikTok and YouTube Shorts.

Methods: Fourteen oculoplastic procedures across three categories (cosmetic nonsurgical; cosmetic surgical; functional) were queried on TikTok and YouTube Shorts (see Table 1). The top 10 videos for each hashtag on each platform were included in the study and the following data was collected: content creator type (ophthalmologist, other physician, non-physician providers, aestheticians, patients, influencers, and other laypersons), content purpose (patient experience, educational to the public, live procedure/surgery, self-promotional, humor, and other), and content quality (as measured via 3 scoring systems). The modified DISCERN (m-DISCERN), Global Quality Scale (GQS), and Journal of the American Medical Association (JAMA) scoring tools are validated assessments of video content quality for health-related topics; each score assesses for reliability, flow and usefulness, and transparency and credibility, respectively.²⁻⁴ To track viewer engagement, the number of views, likes, and comments were collected, and an engagement rate was calculated by $((\text{likes} + \text{comments})/\text{views})$. Chi-square, Fisher Exact, and Wilcoxon Rank Sum tests were used to compare platforms.

Results: 280 videos (140 TikTok, 140 YouTube Shorts) were included. There was a statistically significant association between both platforms with respect to the sub-categories below ($p < 0.001$ for all; see Table 1).

- **Viewer Engagement:** Mean engagement rate on TikTok (0.79, SD = 8.17) was higher than YouTube Shorts (0.02, SD = 0.01).
- **Creator Type:** 33.6% of TikTok video creators were influencers, compared to 10.7% on YouTube Shorts. 20.7% of TikTok video creators were physicians, compared to 42.1% on YouTube Shorts. Of physician-created content, 2.1% were created by oculoplastic surgeons on TikTok, compared to 25.7% on YouTube Shorts.
- **Content Category:** Videos describing patient experiences made up 59.3% of TikTok and 15.7% of YouTube Shorts content. Educational videos comprised 15.7% of TikTok and 42.1% of YouTube Shorts content.
- **Educational Quality (as measured by m-DISCERN, GQS, and JAMA scores):** Mean scores on TikTok were 1.15 (SD = 0.54) for m-DISCERN, 1.36 (SD = 0.73) for GQS, and 1.06 (SD = 0.25) for JAMA. Mean scores on YouTube Shorts were 1.56 (SD = 0.78) for m-DISCERN, 1.71 (SD = 0.84) for GQS, and 1.25 (SD = 0.51) for JAMA.

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Conclusions: The majority of existing studies on social media video content on TikTok or YouTube are unrelated to ophthalmology, with only one study specifically assessing oculoplastics.⁵⁻⁸ We similarly found that video content quality scores on both platforms were most frequently poor to moderate quality.⁵⁻⁶ By comparing both TikTok and YouTube Shorts, our study expands on previous findings that noted pediatric ophthalmology and oculoplastic videos on TikTok are higher quality when created by ophthalmology providers.⁷⁻⁸ Overall, we identified statistically significant variations in oculoplastic surgery videos on TikTok compared to Youtube Shorts – specifically related to viewer engagement, content category, and creator type.

This study demonstrates an opportunity for oculoplastic surgeons to create accurate, educational content on social media platforms. Further research should address gaps in the quality and visibility of oculoplastic-surgeon posted content, particularly toward target audiences.

Table 1

Hashtags			TikTok (n=140)	YouTube Shorts (n=140)
Nonsurgical terms (n=4)	Cosmetic surgery terms (n=5)	Functional surgery terms (n=5)		
1. #facialBotox 2. #facialfiller 3. #chemicalpeel 4. #laser skin	5. #upperblepharoplasty 6. #lowerblepharoplasty 7. #doubleeyelidsurgery 8. #browlift 9. #facialfatgraft	10. #ptosisurgery 11. #thyroidectomyeyesurgery 12. #eyelidskincaucersurgery 13. #orbitalfracturesurgery 14. #earductsurgery		
Engagement Rate (mean) ^{*1}			0.79 (SD = 8.17)	0.02 (SD = 0.01)
Creator Type (%) ^{*2}	Physicians		20.7	42.1
	Physicians - Oculoplastics		2.1	25.7
	Influencer		33.6	10.7
	Non-physician providers		2.9	2.1
	Aestheticians		4.3	7.1
	Patients		32.1	1.4
	Other (i.e., laypersons)		2.1	7.9
Content Type (%) ^{*3}	Educational		15.7	42.1
	Self-promotional		15.7	24.3
	Patient experience		59.3	15.7
	Live procedure		5	14.3
	Humor		2.1	2.9
	Other		2.1	0.7
Educational Quality Score (mean) ^{*1}	m-DISCERN		1.15 (SD = 0.54)	1.56 (SD = 0.78)
	GQS		1.36 (SD = 0.73)	1.71 (SD = 0.84)
	JAMA		1.06 (SD = 0.25)	1.25 (SD = 0.51)

*p<0.001
1. Wilcoxon rank sum test
2. Pearson's Chi-squared test
3. Fisher's Exact Test for Count Data with simulated p-value (based on 2000 replicates)

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References

1. Americans' Social Media Use 2025. Pew Research Center. Updated November 20, 2025. Accessed April 8, 2026. <https://www.pewresearch.org/internet/2025/11/20/americans-social-media-use-2025/>
2. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. *J Epidemiol Community Health*. 1999;53(2):105-111. doi:10.1136/jech.53.2.105
3. Bernard A, Langille M, Hughes S, Rose C, Leddin D, Veldhuyzen van Zanten S. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. *Am J Gastroenterol* 2007 Sep;102(9):2070-2077.
4. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: Caveant lector et viewor--Let the reader and viewer beware. *JAMA*. 1997;277(15):1244-1245.
5. Borkhetaria RK, Devireddy N, Cannon N, Soni A, Ely AL. An Analysis of Pediatric Ophthalmology Content on TikTok. *J Pediatr Ophthalmol Strabismus*. 2024;61(2):90-97. doi:10.3928/01913913-20230627-01
6. Cheng T, Wang F, Barmettler A. #Oculoplastics: An Analysis of TikTok's Top Oculoplastics Content. *Ophthalmic Plast Reconstr Surg*. 2022;38(5):452-457. doi:10.1097/IOP.0000000000002158
7. Ward B, Ward M, Nichaporuck A, Alaeddin I, Paskhover B. Assessment of YouTube as an Informative Resource on Facial Plastic Surgery Procedures. *JAMA Facial Plast Surg*. 2019;21(1):75-76. doi:10.1001/jamafacial.2018.0822
8. Bolac R, Ozturk Y, Yildiz E. Assessment of the Quality and Reliability of YouTube Videos on Fuchs Endothelial Corneal Dystrophy. *Beyoglu Eye J*. 2022;7(2):134-139. Published 2022 May 27. doi:10.14744/bej.2022.90277

1 Post Upper Blepharoplasty Fold Reconstruction – An Anatomic Description

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Introduction: Descriptions of surgical correction for unsatisfactory double-fold surgery date to the early 2000s.¹ Shorr et al. introduced free fat grafting (“pearl fat”) for post-blepharoplasty deep sulcus deformities.² Free fat grafting restored volume, but the resulting fold was stiff and irregular. Steinsapir and Kim later described the Post-Upper Blepharoplasty Syndrome, characterized by upper eyelid ptosis, hollow sulcus, high or absent crease, eyelash ptosis, redundant platform skin, and compensatory brow elevation.³ (Figure 1) This study provides additional detail on upper eyelid fold reconstruction for patients with over-resected blepharoplasty.

Methods: Between May 2021 and May 2025, 60 patients underwent upper eyelid fold reconstruction, including 54 bilateral and 6 unilateral cases. The cohort included 13 men (22%; mean age 39 ± 8.4 years) and 47 women (78%; mean age 47 ± 11.4 years). Preoperative evaluation included records review, patient history, photography, slit-lamp examination, dry eye testing, and measurements of levator function, MRD1, marginal crease distance, and palpebral fissure dimensions. Crease adhesion was assessed during upgaze, and digital globe pressure through the lower eyelid evaluated mobility and volume of the preaponeurotic fat.

Surgery was deferred for at least 6 months after the unsatisfactory blepharoplasty and performed under monitored anesthesia care. A new crease was incised 6–7 mm above the lash margin. Because of skin deficiency, prior high creases were not excised. Instead, a conservative 2–3 mm skin-only excision with removal of a strip of orbicularis created a pretarsal window. (Figure 2)

Suborbicularis dissection proceeded superiorly beyond the prior incision to release adhesions and prevent formation of a secondary crease. (Figure 3) In cases with prior septostomy, dense septal scarring was encountered. Careful dissection identified intact septum and mobilized the preaponeurotic fat from adhesions to the septum, levator, and orbital rim while preserving vascularity.

Septolevator fusion was frequently displaced superiorly, contributing to crease elevation. The septum was opened approximately 10 mm above the apparent fusion. The posterior levator capsule often remained attached to the tarsus while anterior levator fibers retracted superiorly. High-temperature cautery released the posterior capsule from the tarsus; additional dissection toward Whitnall’s ligament was performed in the sublevator plane above the peripheral tarsal arcade. A double-armed 6-0 polyester suture was passed partial-thickness through the tarsus, (Figure 4) full-thickness through the levator, and temporarily tied. With patient cooperation, lid height and contour were assessed in the sitting position before final fixation. Excess levator was trimmed.

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An anchor blepharoplasty technique created a defined crease with three horizontal mattress sutures passed through eyelid platform skin, orbicularis, and distal levator. Mobilized preaponeurotic fat was secured inferiorly to the crease using interrupted 6-0 gut sutures for fold volume (Figure 5, arrow) and the skin was run closed.

Results: All patients achieved crease lowering and fold formation. Three patients had insufficient preaponeurotic fat for optimal volume restoration; two were treated with hyaluronic acid filler. One patient required ptosis revision, and two underwent correction of postoperative retraction. Prolonged edema was common.

Conclusions: This anatomically based approach provides a consistent method for restoring the upper eyelid fold in patients with over-resected blepharoplasty.

Figure 1



Figure 2

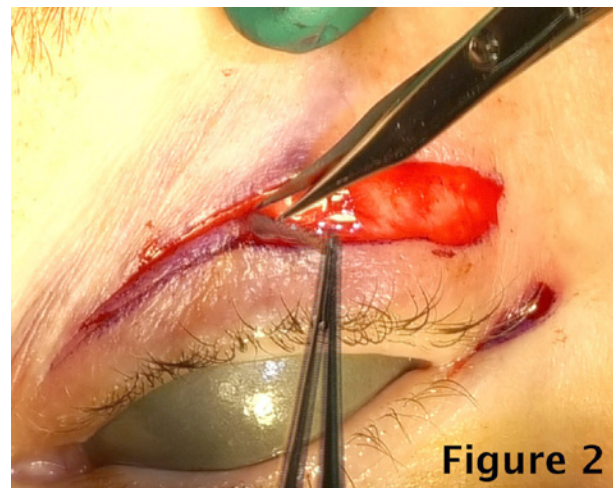
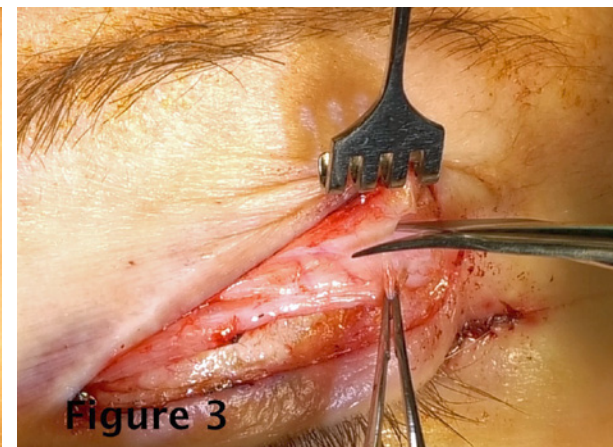


Figure 3



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Figure 4

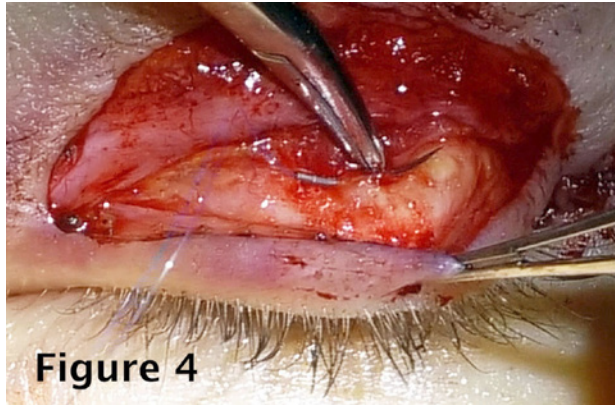
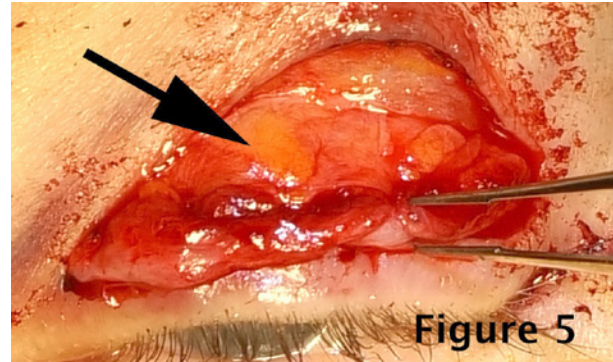


Figure 5



References

1. Kim YW, Park HJ, Kim S. Secondary correction of unsatisfactory blepharoplasty: removing multilaminated septal structures and grafting of preaponeurotic fat. *Plast Reconstr Surg*. 2000 Nov;106(6):1399-404
2. Shorr, Norman, Jonathan D. Christenbury, and Robert A. Goldberg. "Free Autogenous "Pearl Fat" Grafts to the Eyelids." *Ophthalmic Plastic & Reconstructive Surgery* 1988; 4:37-40.
3. Steinsapir KD, Kim YD. Pathology Of "Post-Upper Blepharoplasty Syndrome": Implications For Upper Eyelid Reconstruction. *Clin Ophthalmol*. 2019 Oct 17;13:2035-2042.

2 Treatment Options for Postoperative and Post-Traumatic Periorcular Chemosis: A Narrative Review

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Introduction: Periorcular chemosis, a conjunctival edema caused by subconjunctival fluid accumulation, is a common complication following blepharoplasty and periorbital trauma. Its reported incidence after lower eyelid blepharoplasty ranges from 11.5% to 26.3%.^{1,2} Most cases resolve spontaneously, but some persist, causing foreign body sensation, epiphora, corneal exposure, and patient distress.

Management options include conservative, pharmacologic, and surgical approaches; however, treatment algorithms vary, and consensus on best practices remains limited. This review attempts to synthesize the current evidence on treatment options for postoperative and post-traumatic periorcular chemosis.

Methods: A literature search of PubMed and Cochrane was conducted in April 2026 using terms combining chemosis with blepharoplasty, eyelid surgery, canthopexy, ocular trauma, and treatment-related terms. Eligible studies enrolled human patients with postoperative or post-traumatic periorcular chemosis and reported resolution, complications, or treatment escalation. Editorials, commentaries, animal studies, and studies where chemosis was an incidental finding without treatment data were excluded. Expert reviews describing treatment protocols not reported elsewhere were included. Reference lists were hand-searched for additional studies.

Results: 16 studies met inclusion criteria: 4 reviews, 7 retrospective case series, 1 systematic review of randomized controlled trials, 2 cohort studies, and 2 case reports. Conservative management with topical lubricants, cold compresses, head elevation, and pressure patching were first-line. In a retrospective cohort of 892 patients, all chemosis cases eventually resolved with a median of 14 days and mean of 26 days, though which specific conservative modality drove resolution was not reported. Topical corticosteroids were described as the next escalation step, with fluorometholone 0.1% preferred initially and prednisolone 1% for refractory cases. This escalation sequence was described across three expert reviews but was not evaluated as an isolated intervention. Topical decongestants such as phenylephrine 2.5% reduced conjunctival injection but were associated with rebound with prolonged use in two expert reviews that lacked quantitative outcome data. The following procedural options were identified: Perilimbal needle manipulation achieved improvement in chemosis outcomes in three cases. High-frequency radiowave electrosurgery resolved chemosis in 11 of 12 eyes (91.7%) within one week with no recurrences at six months. Snip conjunctivoplasty produced near-complete resolution in 15

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reported cases within one week. Limbal peritomy conjunctivoplasty resolved persistent chemosis in all three patients studied, though one required a second procedure. Subconjunctival tetracycline 2% injection achieved complete resolution in two of three patients. Eyelid malposition-driven chemosis was treated with surgical anatomic correction.

Conclusions: According to the literature, a spectrum of conservative, pharmacologic, and surgical treatments exists for periocular chemosis. These include lubricants, pressure patching, topical corticosteroids, topical decongestants, perilimbal needle manipulation, radiowave electrosurgery, snip conjunctivoplasty, limbal peritomy conjunctivoplasty, subconjunctival tetracycline injection, and surgical correction of lid malposition. Importantly, the literature is limited to small retrospective series without standardized outcome measures, with no prospective, controlled studies.

Figure 1. PRISMA Flow Diagram for Study Selection.

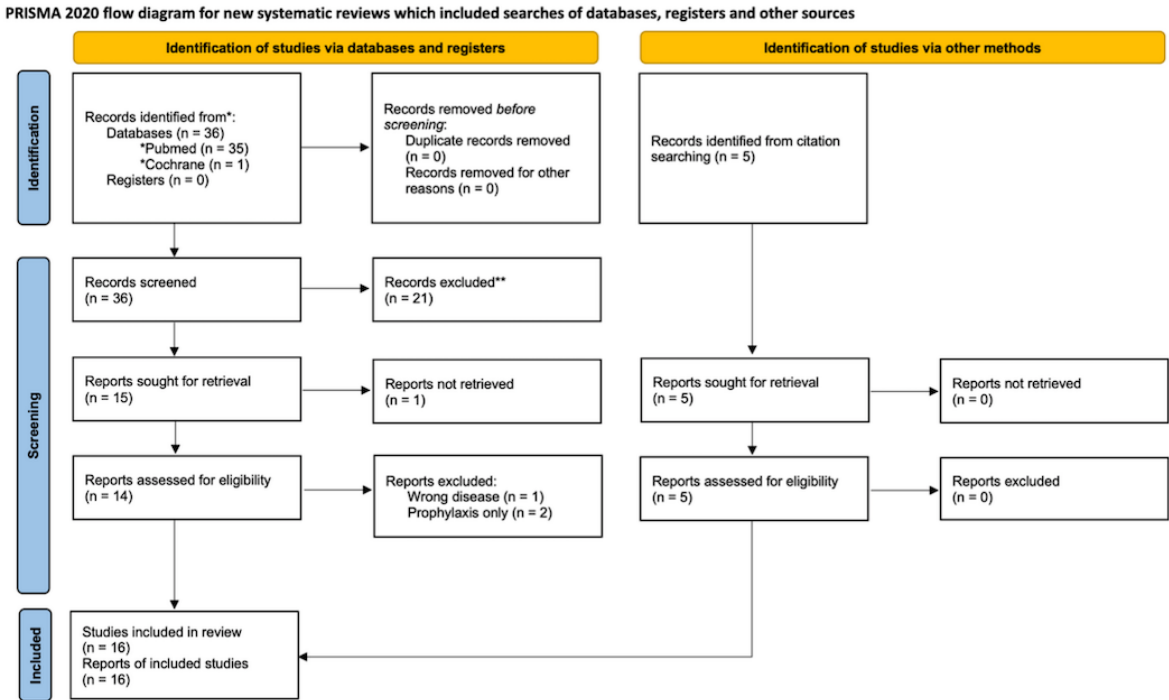


Table 1: Summary of Treatment Modalities for Periocular Chemosis

Type	Intervention	Improvement Rate	Patients (Studies)	Certainty (GRADE)
Conservative	Conservative measures (lubricants, steroids, patching)	Not quantified	~1,100 (6)	Very Low
Pharmacologic	Subconjunctival tetracycline 2%	67%	3 (1)	Very Low
Procedural – minimally invasive	Perilimbal needle manipulation	100%	3 (1)	Very Low
	Radiowave electrosurgery	91.7%	12 (1)	Very Low
	Snip conjunctivoplasty	100%	~15 (2)	Very Low
Procedural – surgical	Limbal peritomy	100%	3 (1)	Very Low
	Sutureless conjunctival excision	100%	2 (1)	Very Low
	Conjunctival drainage + tarsorrhaphy	100%	5 (1)	Very Low
	Canthal anchoring	100%	~5 (2)	Very Low

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References

1. Weinfeld AB, Burke R, Codner MA. The comprehensive management of chemosis following cosmetic lower blepharoplasty. *Plast Reconstr Surg*. 2008;122(2):579-586.
2. Prischmann J, Sufyan A, Ting JY, Ruffin C, Perkins SW. Dry eye symptoms and chemosis following blepharoplasty: a 10 year retrospective review of 892 cases in a single surgeon series. *JAMA Facial Plast Surg*. 2013;15(1):39-46.
3. McCord CD, Kreymerman P, Nahai F, Walrath JD. Management of postblepharoplasty chemosis. *Aesthet Surg J*. 2013;33(5):654-661.
4. Ni Dhubhghaill S, Faris C. The management of chemosis after blepharoplasty. *Facial Plast Surg*. 2023;39(1):53-56.
5. Cheng JH, Lu DW. Perilimbal needle manipulation of conjunctival chemosis after cosmetic lower eyelid blepharoplasty. *Ophthal Plast Reconstr Surg*. 2007;23(2):167-169.
6. Woo KI, Choi CY. High frequency radiowave electrosurgery for persistent conjunctival chemosis following cosmetic blepharoplasty. *Plast Reconstr Surg*. 2014;134(1):89e-96e.
7. Jones YJ, Georgescu D, McCann JD, Anderson RL. Snip conjunctivoplasty for postoperative conjunctival chemosis. *Arch Facial Plast Surg*. 2010;12(2):103-105.
8. Thakker MM, Tarbet KJ, Sires BS. Postoperative chemosis after cosmetic eyelid surgery: surgical management with conjunctivoplasty. *Arch Facial Plast Surg*. 2005;7(3):185-188.
9. Moesen I, Mombaerts I. Subconjunctival injection of tetracycline 2% for chronic bulbar chemosis after transcutaneous four-eyelid blepharoplasty. *Ophthal Plast Reconstr Surg*. 2008;24(3):219-220.
10. Enzer YR, Shorr N. Medical and surgical management of chemosis after blepharoplasty. *Ophthal Plast Reconstr Surg*. 1994;10(1):57-63.
11. Lee CC, Lai YW, Huang SH, et al. Resolving conjunctival prolapse following severe blepharoptosis correction: a simple sutureless direct excision technique and systematic review. *Aesthet Surg J*. 2024;44(5):NP327-NP338.
12. Alamoudi A, Albishry AM, Alnabihi AN, et al. Interventions for reducing bleeding and swelling in eyelid and periorbital surgeries: a systematic review of randomized controlled trials. *Orbit*. 2025;44(6):913-927.
13. Hamawy AH, Farkas JP, Fagien S, Rohrich RJ. Preventing and managing dry eyes after periorbital surgery: a retrospective review. *Plast Reconstr Surg*. 2009;123(1):353-359.
14. Pacella SJ, Codner MA. Minor complications after blepharoplasty: dry eyes, chemosis, granulomas, ptosis, and scleral show. *Plast Reconstr Surg*. 2010;125(2):709-718.
15. Morax S, Touitou V. Complications of blepharoplasty. *Orbit*. 2006;25(4):303-318.
16. Thrishulamurthy CJ, Ahmed HS, Eswaran V, Venkataswamy SB. Outcomes of globe repositioning procedures in patients with globe luxation: a retrospective case series. *Indian J Ophthalmol*. 2025;73(2):233-237.

3 Histologic Characterization of Resected Tissue in Müller's Muscle–Conjunctival Resection and Its Correlation with Intraoperative Measurements

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Introduction: Muller's muscle–conjunctival resection (MMCR) has demonstrated longstanding efficacy for ptosis correction.¹ However, the exact mechanism of efficacy remains unclear. Many believe that the amount of tissue and muscle resection correlates with the degree of eyelid elevation, but findings regarding this relationship are mixed.^{2–5} The persistent controversy suggests additional factors may influence procedural efficacy, and call into question the need for titrated tissue resection vs. a standard resection approach.

Prior studies examining both histologic studies on both cadavers and patients undergoing MMCR are limited.^{5,6} This study aims to further explore this relationship and elucidate the histological basis for technique efficacy as well as to clarify the relationship between intraoperative measurements and the histologic features of the resected tissue.

Methods: This is a nonrandomized cross-sectional observational study including patients undergoing MMCR by a single surgeon. Intraoperative targets were documented by the surgeon. After resection, tissues were stretched on cardboard, fixed in 10% buffered formaldehyde, and processed routinely. Processed tissue was sectioned transversely along the long axis in 2–3 mm segments and paraffin-embedded. Five-micrometer-thick hematoxylin-eosin sections at 3 levels, 0.5 mm apart, sampling ~75% of the tissue were prepared on 24 of 30 specimens, scanned with whole-slide digital scanning system and displayed and analyzed with digital pathology viewer imaging software for all histological measurements. All measurements were performed by a single, blinded ocular pathologist. The aggregate cross-sectional total tissue area, aggregate cross-sectional Muller's muscle (MM) area, and the percentage of MM as defined by ratio of aggregate cross-sectional MM area to total aggregate cross-sectional tissue area were all measured. Clinical outcomes using pre and post-operative marginal reflex distance (MRD 1) were recorded for all patients.

Correlations between intraoperative measurements, aggregate cross-sectional MM area and percentage of MM were evaluated using Pearson correlation coefficients. Correlations were assessed using two-tailed tests, and statistical significance was defined as $p < 0.05$.

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Results: Analysis of 24 eyes demonstrated a weak, positive, and non-significant correlation between total tissue area with total MM area (Pearson $r = 0.23$, $p = 0.26$). The data also demonstrated that the intraoperative measurements and total MM area had a weak, negative and non-significant correlation (Pearson $r = -0.25$, $p = 0.23$). Finally, there was a weak, negative, and non-significant correlation between intraoperative measurement and total percentage of MM (Pearson $r = -0.24$, $p = 0.25$). All patients achieved post-operative target MRD 1, no patients required surgical revision.

Conclusions: The weak, nonsignificant correlations observed suggest intraoperative measurements do not reliably predict the MM amount in the resected tissue. While there was a trend towards greater tissue area having a larger amount of MM, this did not meet statistical significance. Neither MM area nor percentage correlated with the resection amount, therefore, larger intraoperative resections do not reliably yield more MM resection. Surgeons should consider that factors beyond resection amount may contribute to eyelid elevation in MMCR. These findings also suggest titrated tissue resection may not be necessary to achieve the desired amount of ptosis correction, as no patients required surgical revision despite the lack of correlations with intraoperative measurements.

Figure 1

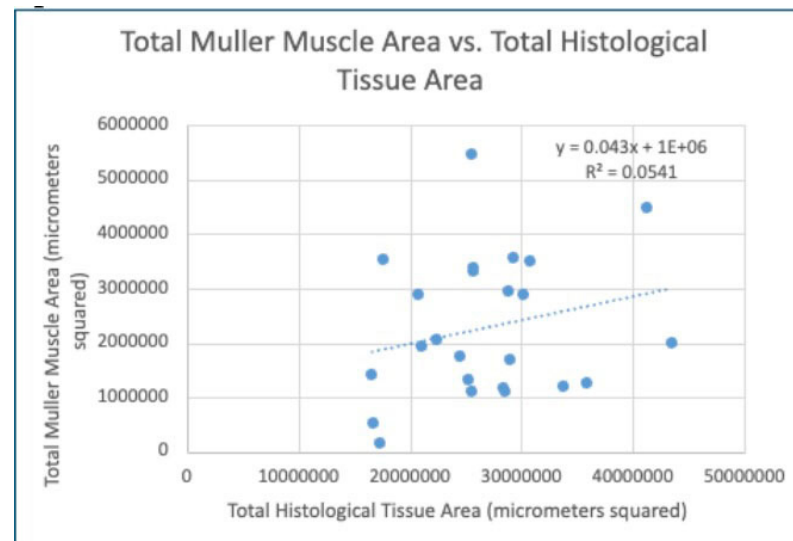


Figure 2

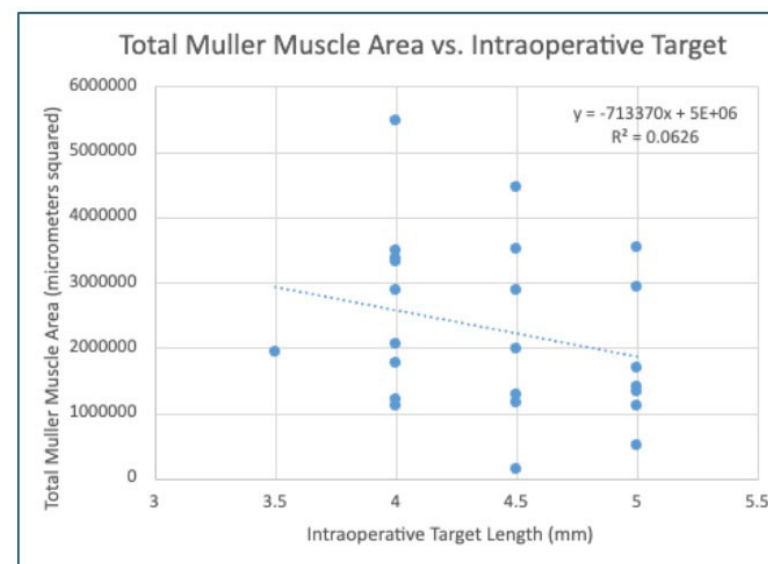
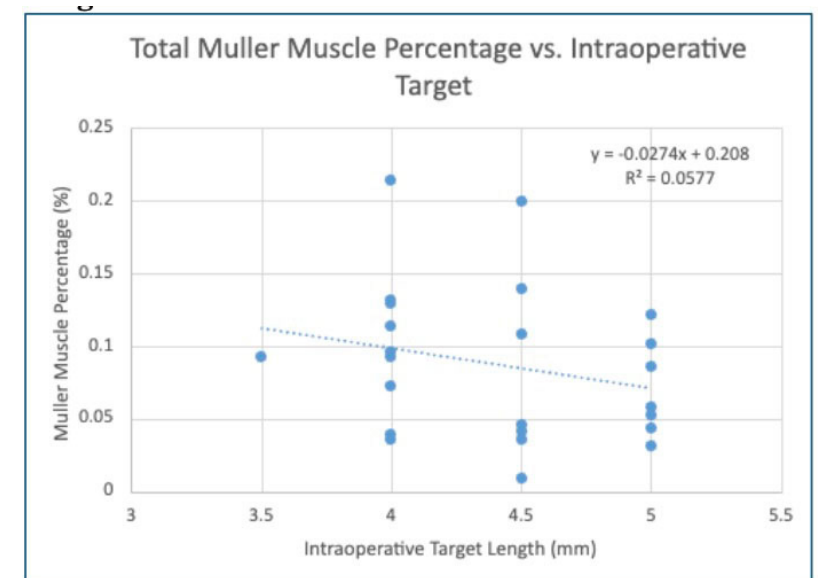


Figure 3



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References

1. Putterman AM, Urist MJ. Müller's muscle-conjunctiva resection. Technique for treatment of blepharoptosis. *Arch Ophthalmol*. 1975;93(8):619-623. doi:10.1001/archophth.1975.01010020595007
2. Dresner SC. Further modifications of the Müller's muscle-conjunctival resection procedure for blepharoptosis. *Ophthalmic Plast Reconstr Surg*. 1991;7(2):114-122. doi:10.1097/00002341-199106000-00005
3. Perry JD, Kadakia A, Foster JA. A new algorithm for ptosis repair using conjunctival Müllerectomy with or without tarsectomy. *Ophthalmic Plast Reconstr Surg*. 2002;18(6):426-429. doi:10.1097/00002341-200211000-00007
4. Dryden SC, Rho JE, Fowler SC, et al. Postoperative Clinical Outcomes Using Standard Variables Following Levator-Müllerectomy Advancement Blepharoptosis Surgery. *J Craniofac Surg*. 2021;32(6):e554-e556. doi:10.1097/SCS.00000000000007554
5. Morris CL, Morris WR, Fleming JC. A histological analysis of the Müllerectomy: redefining its mechanism in ptosis repair. *Plast Reconstr Surg*. 2011;127(6):2333-2341. doi:10.1097/PRS.0b013e318213a0cc
6. Zauberman NA, Koval T, Kinori M, Matani A, Rosner M, Ben-Simon GJ. Müller's muscle-conjunctival resection for upper eyelid ptosis: correlation between amount of resected tissue and outcome. *Br J Ophthalmol*. 2013;97(4):408-411. doi:10.1136/bjophthalmol-2012-302541

4 Postoperative Granulomas Following Lower Eyelid Blepharoplasty: A Survey of ASOPRS Surgeons

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Introduction: Postoperative granulomas are increasingly recognized as a clinically significant complication following lower eyelid blepharoplasty, yet their incidence, risk factors, clinical presentation, and optimal management remain poorly understood.

Methods: A cross-sectional survey regarding practice patterns and surgeon experience with postoperative granulomas after lower blepharoplasty was distributed to ASOPRS-trained oculoplastic surgeons. Descriptive statistics were used to summarize responses, and selected associations were evaluated with chi-square or Fisher's exact testing.

Results: Of 169 survey entries received, 142 completed responses were included. Overall, 77 respondents (54.2%) reported encountering postoperative granulomas. Respondents represented 33 states, most commonly California (14.1%), Florida (10.9%), New York (10.9%), and Texas (8.6%). Most practiced in private practice (71.8%) and had been in practice for more than 11 years (75.3%), including 52.1% with >20 years of experience. Routine transconjunctival approaches, including without fat transposition (45.1%) and with fat transposition (39.4%), predominated, representing 84.5% of respondents.

Estimated incidence was most commonly reported as less than 1% (53.2%) or 1–5% (36.4%), with a mean of 2.2 cases per surgeon in the past year (range 1–20). Granulomas most often developed 2–6 weeks postoperatively (71.4%), and recurrence after treatment was most commonly reported rare (61.0%), though 27.3% reported recurrence sometimes. Frequently suspected contributors included increased fat manipulation (35.1%), prior facial filler or fat grafting (23.4%), suture-related reaction (23.4%), and postoperative ointment use (15.6%). Free-text responses additionally identified heavy electrosurgical cautery of fat pads and unsutured transconjunctival wounds as recurring suspected contributors not captured in structured responses. Most respondents did not routinely culture lesions; positive cultures showed *Staphylococcus* species (4) and polymicrobial flora (5) predominating, with atypical mycobacteria (3), *Corynebacterium* (3), and *Nocardia* (1) less frequently identified.

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Surgeons who frequently operated on patients with prior hyaluronic acid (HA) filler exposure reported significantly higher granuloma encounter rates than those who rarely did or operated only after filler dissolution (91.3% vs 39.5–53.2%; $p<0.001$). Overall, 45.5% of respondents reported an increase in granuloma incidence since the COVID era,¹ and 55.8% reported modifying practice. Surgeons who modified practice were significantly more likely to report a COVID-era increase (77.1% vs 38.1%; $p=0.001$). Common practice modifications included saline or antibiotic irrigation (37.2%), reduction or elimination of postoperative ointment (34.9%), and changes in suture material or fat handling technique (37.2%). Private practice surgeons were significantly more likely to modify practice than those in academic settings (62.7% vs 25.0%; $p=0.025$).

Conclusions: Postoperative granulomas following lower eyelid blepharoplasty are uncommon but clinically meaningful, with over half of surveyed ASOPRS surgeons reporting direct experience. Prior HA filler exposure, COVID-era temporal trends, geographic variation, and surgical technique were frequently implicated contributing factors. These findings highlight a multifactorial etiology and support future research into these associations.

Figure 1

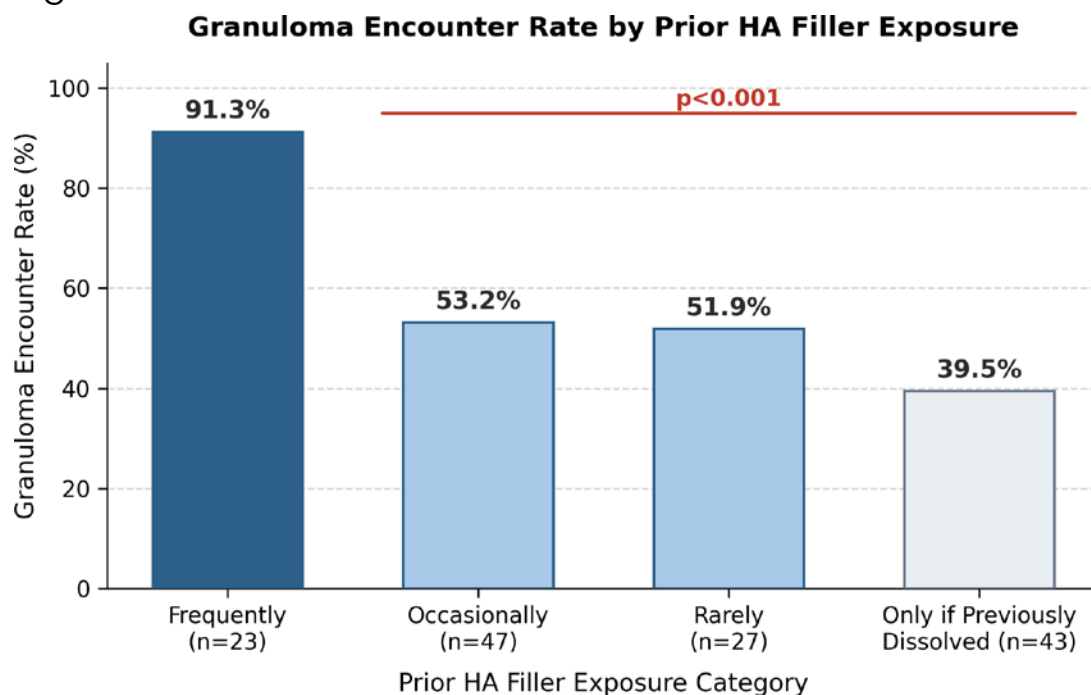
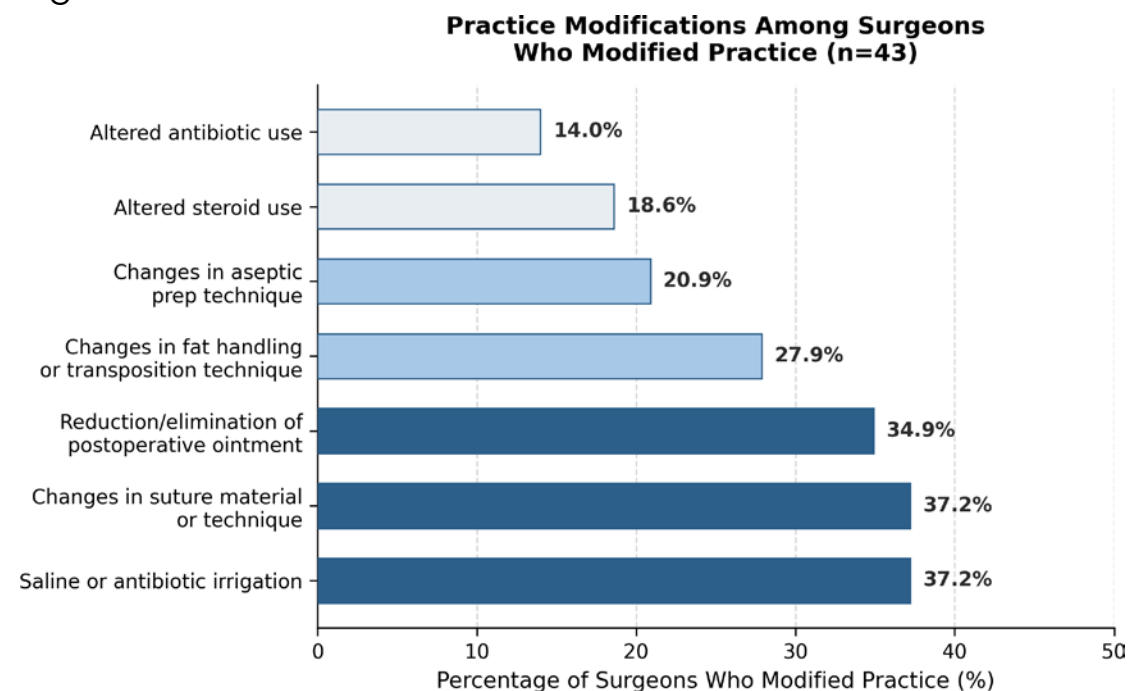


Figure 2



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Figure 3

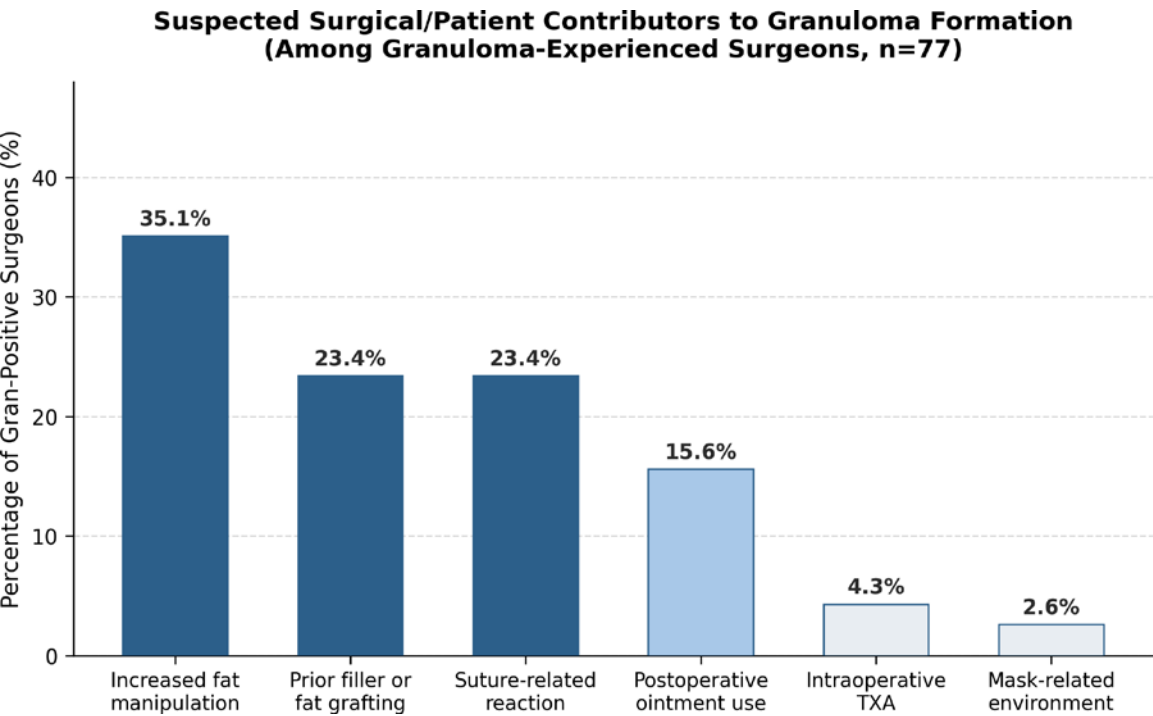
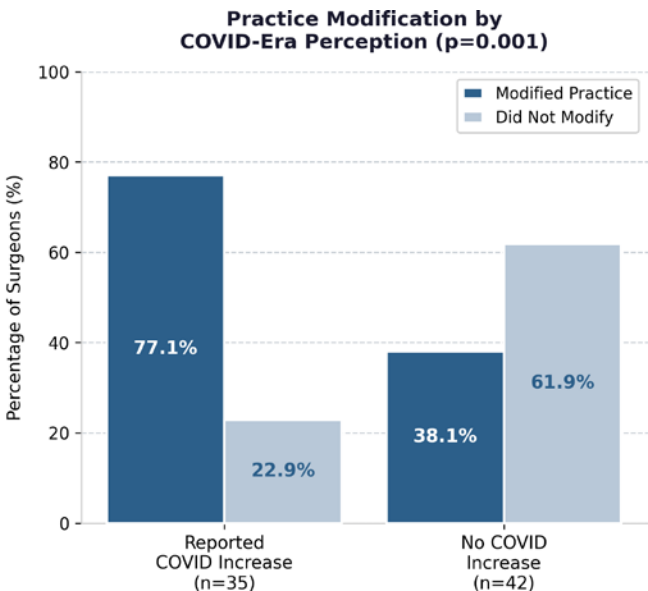
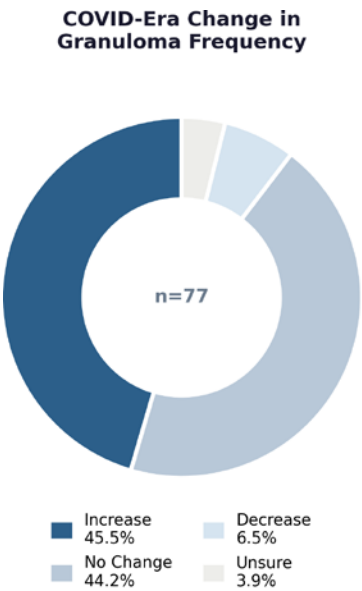


Figure 4



References

1. Griffin S, Butterfield S, Silkiss RZ. Association between the COVID-19 pandemic and granuloma formation following lower blepharoplasty. Am J Ophthalmol Case Rep. 2024 Nov 5;36:102219. doi: 10.1016/j.ajoc.2024.102219.
2. Pacella S.J., Codner M.A. Minor complications after blepharoplasty: dry eyes, chemosis, granulomas, ptosis, and scleral show. Plast Reconstr Surg. 2010;125:709–718. doi: 10.1097/PRS.0b013e3181c830c7.
3. Belinsky I, Patel P, Charles NC, Lisman RD. Ointment Granulomas Following Sutureless Transconjunctival Blepharoplasty: Diagnosis and Management. Ophthalmic Plast Reconstr Surg. 2015 Jul-Aug;31(4):282–6. doi: 10.1097/IOP.0000000000000296.
4. Fryer RH, Reinke KR. Pyogenic granuloma: a complication of transconjunctival incisions. Plast Reconstr Surg. 2000 Apr;105(4):1565–6. doi: 10.1097/00006534-200004040-00056.

5 Psychiatric Morbidity of Blepharospasm, Hemifacial Spasm, and Meige Syndrome and Associations with Botulinum Toxin Treatment

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Introduction: Benign essential blepharospasm (BEB), hemifacial spasm (HFS), and Meige syndrome are chronic facial dystonias routinely managed by oculoplastic surgeons, with botulinum toxin chemodenervation as the mainstay treatment. Patients commonly experience anxiety and depression due to uncontrollable spasms, yet the psychiatric burden across subtypes, and whether chemodenervation is associated with measurable risk reduction, remain poorly understood.

Prior studies have shown associations between facial dystonias and psychiatric conditions using single-center data, including psychiatric improvement after botulinum toxin treatment. Understanding these associations on a broader scale could help inform screening and treatment guidelines to improve patient quality of life. This study uses real-world, multi-center data to evaluate psychiatric risks after new diagnoses of facial dystonias and understand treatment effects of chemodenervation.

Methods: We conducted a retrospective cohort study using the TriNetX Global Collaborative Network, a federated network of 173 healthcare organizations and >190 million patients. The primary analysis compared adults with BEB, HFS, or Meige syndrome with the general population who had an ophthalmology encounter and lack these diagnoses, pooled and per subtype. Secondary analyses compared patients receiving botulinum toxin within 1 year of diagnosis with those not receiving it. All comparisons used 1:1 propensity score matching on demographic, socioeconomic, and comorbidity covariates. The primary outcomes were new diagnoses of depression, anxiety, substance use disorders, stress/adjustment disorders, and new prescriptions of antidepressants and anxiolytics within 1 year. Hazard ratios (HR) with 95% CIs were calculated.

Results: The primary analysis yielded 93,051 matched pairs in the pooled cohort, 41,479 in BEB, 27,550 in HFS, and 14,595 in Meige. Facial dystonias were associated with elevated anxiety (HR 1.34, 1.27-1.41), antidepressant (HR 1.25, 1.19-1.31), and anxiolytic (HR 1.60, 1.52-1.67) risk. Meige carried the greatest burden across outcomes (anxiety HR 1.48; anxiolytics HR 2.06). BEB was associated with decreased risk of depression (HR 0.88) and substance use disorders (HR 0.71). In secondary analyses, chemodenervation was associated with lower psychiatric risk in pooled (anxiolytics HR 0.64; antidepressants HR 0.81), HFS (anxiolytics HR 0.42; anxiety HR 0.63), and Meige (anxiolytics HR 0.65; depression HR 0.74) subgroups. BEB subgroups did not differ in psychiatric outcomes when treated with botulinum toxin.

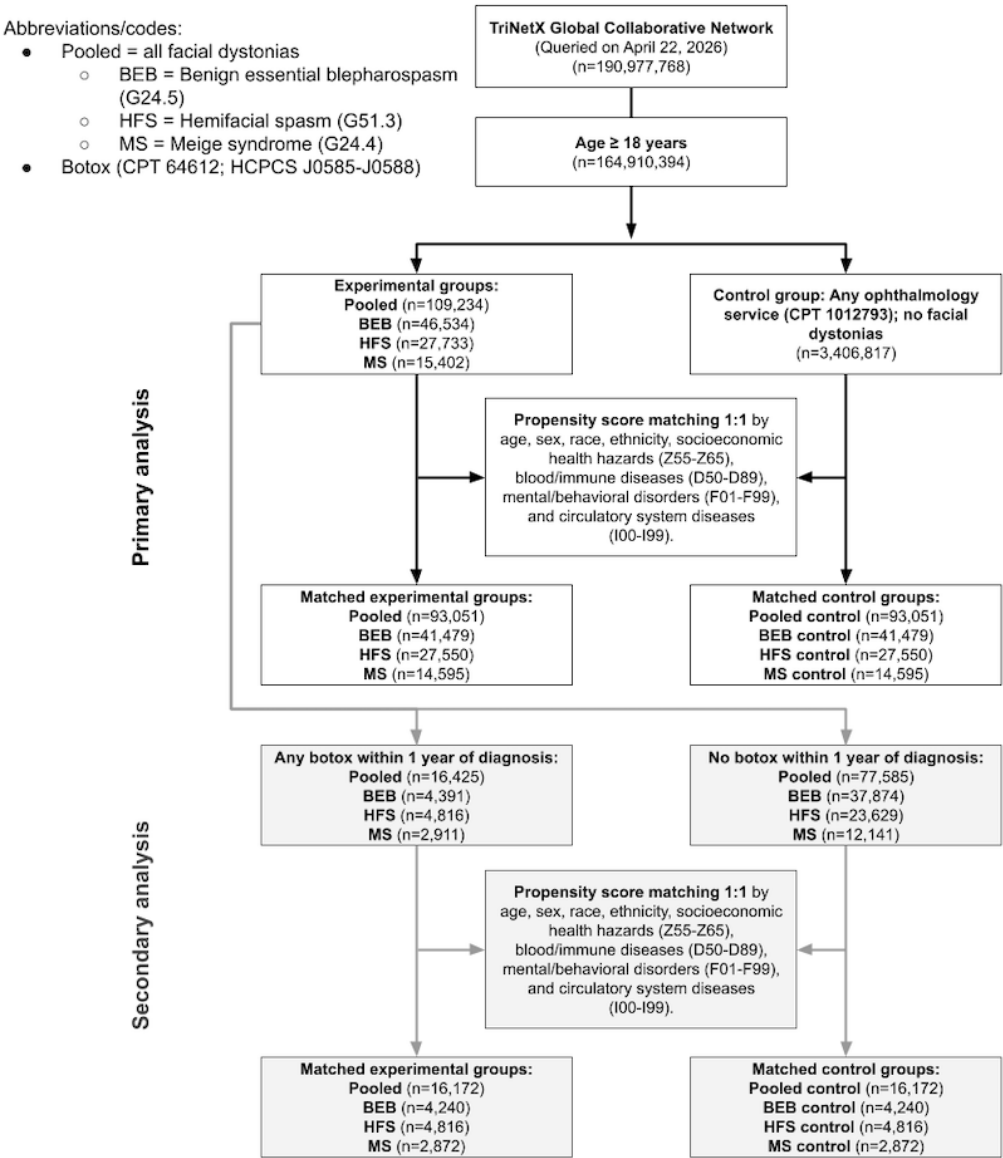
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Conclusions: Adults with facial dystonias, especially Meige syndrome, carry higher 1-year risk of anxiety and psychotropic medication use than matched patients. Chemodenervation within 1 year of diagnosis is associated with lower psychiatric risk across most subtypes. The reasons for decreased psychiatric morbidity observed in BEB are unclear and warrant further investigation. Clinicians should consider routine anxiety screening and discuss potential mental health benefits alongside motor improvement when counseling treatment-eligible patients.

Figure 1: Flowchart of cohort selection for primary and secondary analyses



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Figure 2: Risk of psychiatric outcomes in patients with facial dystonias compared to propensity score-matched controls from the general population

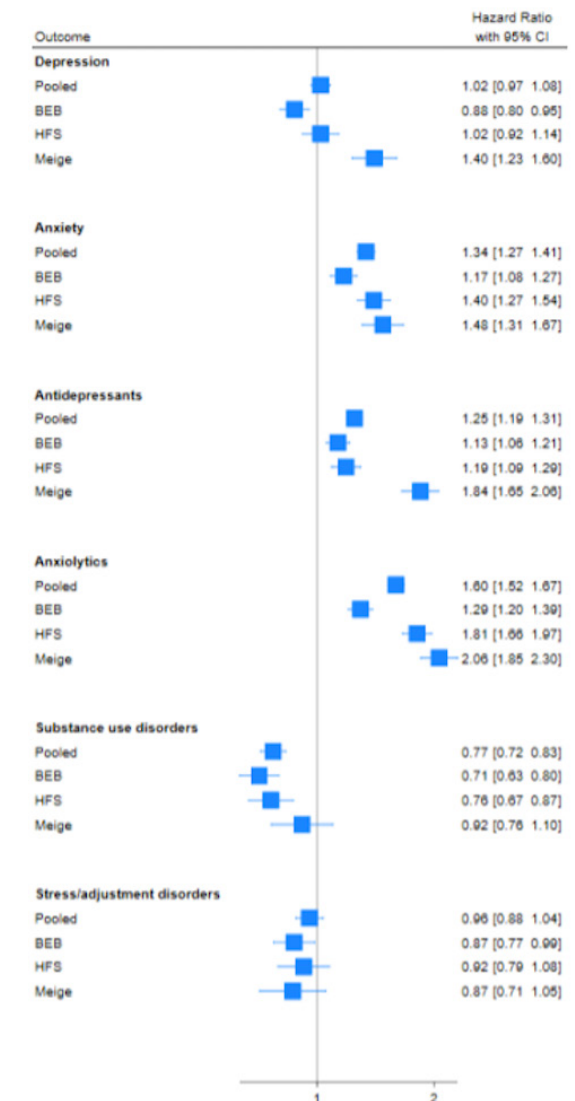
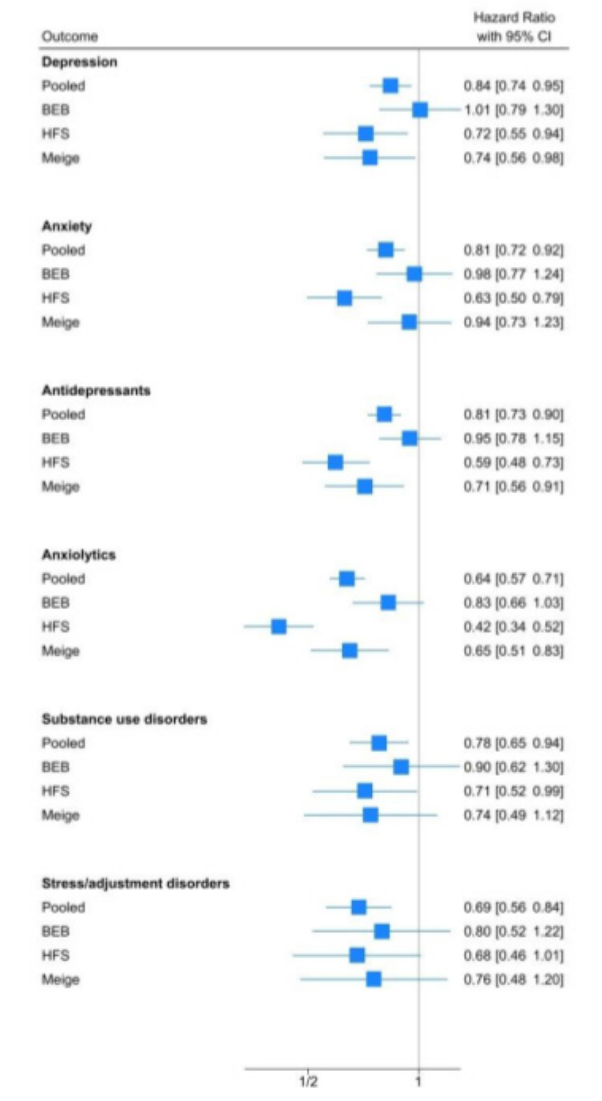


Figure 3: Risk of psychiatric outcomes in patients with facial dystonias who receive chemodenervation within 1 year of diagnosis compared to those without



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References

1. Dong, H., Fan, S., Luo, Y. & Peng, B. Botulinum toxin relieves anxiety and depression in patients with hemifacial spasm and blepharospasm. *Neuropsychiatric Disease and Treatment* 15, 33–36 (2018).
2. Berman, B. D. *et al.* Psychiatric associations of adult-onset focal dystonia phenotypes. *J Neurol Neurosurg Psychiatry* 88, 595–602 (2017).
3. Müller, J. *et al.* The impact of blepharospasm and cervical dystonia on health-related quality of life and depression. *J Neurol* 249, 842–846 (2002).

6 Retained Foreign Body Materials Following Tissue Manipulation with Cotton-Tipped Applicators in Lower Blepharoplasty: A Cadaver Study

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Introduction: Retained non-biologic foreign body materials can provoke granulomatous inflammation or infection in the periorbital area following blepharoplasty. Documented causes of foreign body reaction following blepharoplasty include residue from surgical gloves, face makeup, sutures, ophthalmic ointments, and liquified fat.¹ Cotton-tipped applicators are routinely used during blepharoplasty for tissue manipulation, fat pad management, and hemostasis.² No study has specifically evaluated potential residual foreign body material after manipulation of peri-orbital fat tissues with cotton-tipped applicators during lower blepharoplasty. In this study, histopathological evaluation of orbital fat and connective tissue was performed to detect residual foreign material following manipulation with wooden- and plastic-handled cotton-tipped applicators during lower blepharoplasty.

Methods: Bilateral lower blepharoplasty was performed on a fresh human cadaver, and cotton-tipped applicators were used to assist with the dissection of orbital fat pads. On one side (left), plastic-handled cotton-tipped applicators were used; on the other side (right), wooden-tipped applicators were used for dissection (Figure 1). At the end of the procedure, tissue adjacent to the dissection planes was excised. The samples were preserved in alcohol-based formalin and stained with hematoxylin and eosin (H&E) for histopathological analysis. The slides were reviewed by a board-certified pathologist using brightfield and polarized microscopy, primarily to evaluate for the presence of foreign body materials in excised tissues. The pathologist was blind to the type of cotton-tipped applicator used for each sample.

Results: Reviewing the H&E-stained samples with brightfield and polarized microscopy revealed rare filamentous materials in both samples, which could be attributed to the cotton filaments; however, several needle-shaped polarized foreign body materials were found in the sample manipulated with a wood-handled cotton-tipped applicator (Figure 2A and 2B), while similar materials were not detected in the sample manipulated with a plastic-handled cotton-tipped applicator (Figure 2C and 2D). The needle-shaped polarized materials seen in the sample manipulated with the wooden-handled applicators, could be attributed to wooden splinters from the handle.

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Conclusions: This study showed potential remnants of organic foreign body material after using wooden-handled cotton-tipped applicators for tissue manipulation during periocular surgery, while filamentous material from the cotton was observed in both samples. While wooden-handled applicators are cheaper, biodegradable, and sturdier, enabling easier control during delicate maneuvers, they may leave wood splinters in the periorbital fat, thereby increasing the risk of granuloma formation.³

Figure 1

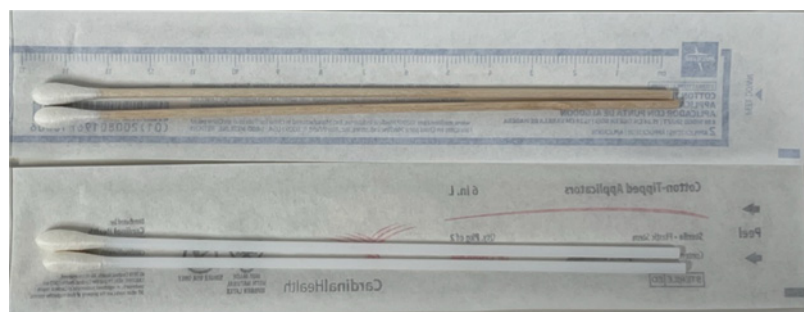


Figure 1. Wooden-handled (Top) and plastic-handled (Bottom) cotton-tipped applicators used in this study.

Figure 2

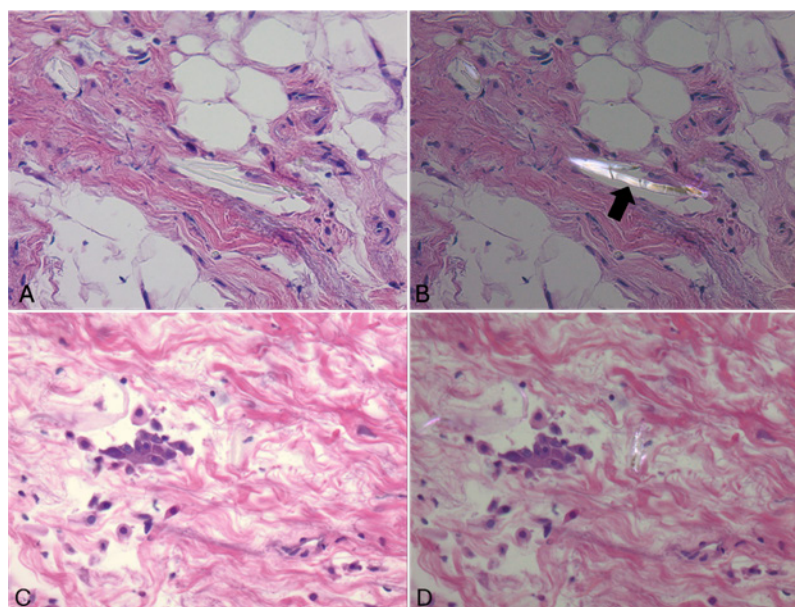


Figure 2. (A) Brightfield and (B) polarized microscopy of orbital fat and connective tissue adjacent to the excised material, manipulated with a wooden-handled cotton-tipped applicator. Needle-shaped polarizable material (arrow) and rare filamentous-appearing polarizable material were detected in this sample. (C) Brightfield and (D) polarized microscopy of orbital fat and connective tissue adjacent to the excised material, manipulated with a plastic-handled cotton-tipped applicator. Polarized light reveals rare, filamentous, polarizable materials. H&E staining, 40 $\times$.

References

1. Pacella SJ, Codner MA. Minor complications after blepharoplasty: dry eyes, chemosis, granulomas, ptosis, and scleral show. *Plast Reconstr Surg.* 2010;125(2):709-18.
2. Thaller VT. The Cotton Bud as an Aid to Suturing. *Ophthalmic Plast Reconstr Surg.* 2021;37(3S):S114-S6.
3. El Bouchti I, Ait Essi F, Abkari I, Latifi M, El Hassani S. Foreign body granuloma: a diagnosis not to forget. *Case Rep Orthop.* 2012;2012:439836.

7 Tensile Strength of Periosteal Flap Versus Periosteal Bite for Lateral Canthal Fixation: A Cadaveric Study

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Introduction: Reconstruction of the lateral canthal angle is indicated in a variety of pathologic processes and can be performed in a variety of ways. Proper reconstruction is important both for function and cosmesis. Whether performing a lateral tarsal strip (LTS), lateral canthoplasty, or another technique, firm fixation to the periosteum of the lateral orbit is essential. Even with seemingly good fixation, this attachment can fail. This commonly occurs due to periosteal fixation failure, commonly called “cheese-wiring,” wherein the taut suture pulls or rips through the periosteum. One potential mechanism to reduce the likelihood of periosteal fixation failure is raising a periosteal flap to pass the fixation suture through to provide a more substantial fixation base with less risk of inadvertent suture pull-through down the line. A flap that partially overlaps tarsus also provides a broader area of appositional wound healing. This study seeks to provide proof of concept in comparing the tensile strength of a simple periosteal suture pass (or “bite”) to that of a periosteal flap from the lateral orbital rim for lateral canthal fixation in cadaveric specimens.

Methods: Seven formaldehyde-fixated cadaveric head specimens (four male, three female) were hemisected and careful dissection was performed to expose the lateral orbital rim. Within each specimen, one hemisection had a 10x15 mm periosteal flap developed for fixation (Figure 1) and the other hemisection did not. Using a previously-published technique for periosteal strength testing, the two sides were compared. On the hemisection without the periosteal flap, a 2-0 nylon monofilament suture was passed inside the lateral orbital rim at the level of the upper border of the pupil and tied into a 3 cm loop (Figure 2). The loop was then pulled away using a tensometer (Soonkoda 100 N Digital Force Gauge/Dynamometer) and the breaking strength was measured in newtons (N). On the hemisection with the periosteal flap, a suture was passed through the base of the periosteal flap, similarly tied in a loop, and the breaking strength measured. This was performed on all seven heads in the same manner.

Results: Using a paired t-test to compare the tensile strength of the periosteal flap to the periosteal bite within each specimen (Table), the periosteal flap had an average tensile strength 8.4 N stronger than the periosteal bite (SD: 4.11 N, 95% CI 4.6 N – 12.2 N, $p < 0.01$). Within each subject, the periosteal flap was stronger (Figure 3).

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Conclusions: In a cadaveric model, a lateral orbit periosteal flap has greater tensile strength than a standard suture pass through the lateral orbital periosteum and therefore may provide greater strength for lateral canthus fixation in reconstruction via LTS or canthoplasty. Future studies will focus on translation of this cadaveric pilot study to clinical practice comparing the two fixation strategies.

Figure 1

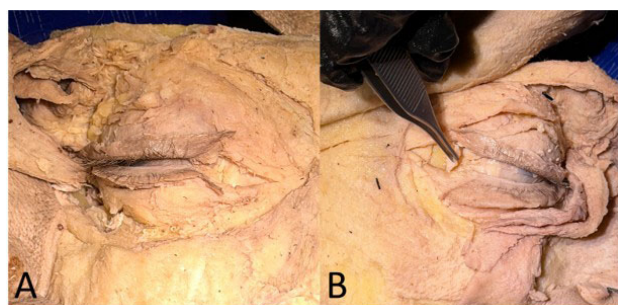


Figure 2



Figure 3

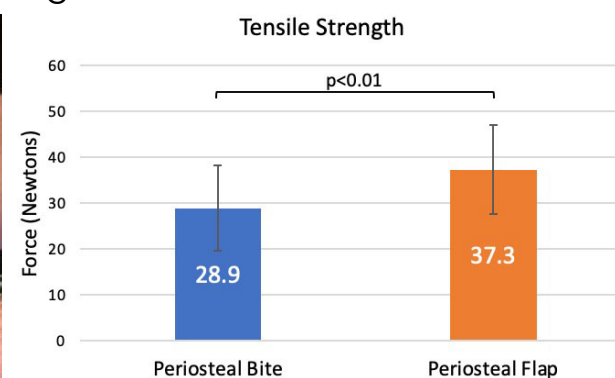
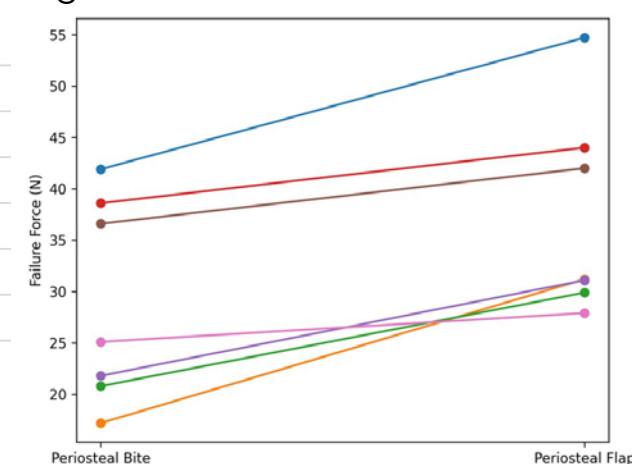


Figure 4



References

1. Lemke BN, Sires BS, Dortzbach RK. A tarsal strip-periosteal flap technique for lateral canthal fixation. *Ophthalmic Surg Lasers*. 1999 Mar;30(3):232-6.
2. Hwang K, Kim HJ, Han SH, Kim KY, Park JJ, Kim SK. Where to fix in rejuvenation surgeries?: tensile strength of the periosteum. *J Craniofac Surg*. 2015 Jan;26(1):248-50.
3. Cho YK, Suh BI, Park KM. The Effective Fixation Level for Cosmetic Lateral Canthoplasty. *J Craniofac Surg*. 2019 Jun;30(4):e362-e365.
4. Leone CR Jr. Periosteal flap for lower eyelid reconstruction. *Am J Ophthalmol*. 1992 Oct 15;114(4):513-4.
5. Game J, Morlet N. Lateral canthal fixation using an oblique vertically orientated asymmetric periosteal transposition flap. *Clin Exp Ophthalmol*. 2007 Apr;35(3):204-

8 The Effect of Müller–Muscle–Conjunctival–Resection vs. White Line Advancement on Dry Eye Syndrome

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Introduction: MMCR involves posterior lamellar resection that includes Müller’s muscle and conjunctiva, while WLA is an approach that advances the aponeurotic “white line” without disturbing significantly the conjunctiva or Müller’s muscle. These differences may have implications for postoperative ocular surface. Therefore, the purpose of this current study is to compare the effects of Müller-muscle conjunctival resection(MMCR) and white-line advancement(WLA) on objective dry eye disease(DED).

Methods: Fifty adult patients with aponeurotic ptosis were enrolled prospectively and divided into two surgical groups: MMCR(n=25) and WLA(n=25). Objective DED measurements including tear break-up time(TBUT), Schirmer test, punctate epithelial erosions (PEE), and lissamine green staining were performed preoperatively and 90 days postoperatively. Margin reflex distance 1(MRD1) was also recorded.

Results: MMCR resulted in significant postoperative reductions in Schirmer scores($p=0.01$) and TBUT($p<0.01$), with increased PEE($p<0.01$). WLA showed significant reductions in TBUT($p=0.037$) and increased PEE($p=0.028$), with a trend toward increased lissamine staining($p=0.054$). MRD1 improved significantly in both groups. Between group comparison demonstrated no significant differences in Δ TBUT or Δ lissamine staining, and only a trend toward greater PEE worsening in the MMCR group($p=0.058$). Significant correlations were observed between Δ MRD1 and Δ TBUT in the MMCR group($r=-0.54$, $p=0.020$), and between Δ MRD1 and Δ PEE in the WLA group($r=0.47$, $p=0.029$).

Conclusions: Both MMCR and WLA are associated with postoperative worsening of objective DED parameters. Despite the conjunctival resection in MMCR, ocular surface deterioration was not significantly greater than after WLA. Preoperative screening for DED and patient counselling are essential before posterior approach ptosis surgery.

9 Trends in Oxymetazoline Use and Müller Muscle–Conjunctival Resection for Ptosis in the United States

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Introduction: Acquired eyelid ptosis is a common condition with functional and cosmetic implications, traditionally managed surgically with procedures such as Müller muscle–conjunctival resection (MMCR). The approval of oxymetazoline hydrochloride ophthalmic solution 0.1% introduced a non-surgical pharmacologic option, offering a potential alternative for select patients.^{1,2} However, its impact on surgical utilization patterns at a population level remains unclear. The aim of this study was to evaluate national trends in the use of oxymetazoline hydrochloride ophthalmic solution 0.1% and its association with MMCR utilization in the United States following its approval.

Methods: We performed a retrospective trend analysis using the TriNetX US Collaborative Network. Adults aged ≥ 20 years with eyelid ptosis (ICD-10-CM H02.4) between 2016 and 2025 were included. Annual incidence proportions of MMCR (CPT 67908) and oxymetazoline hydrochloride ophthalmic solution 0.1% (RxNorm 7812) were calculated. Calendar year was modeled continuously with a post-2020 indicator in a linear regression to estimate pre-trend and level change and observed MMCR rates were compared with counterfactual projections from pre-2020 data.

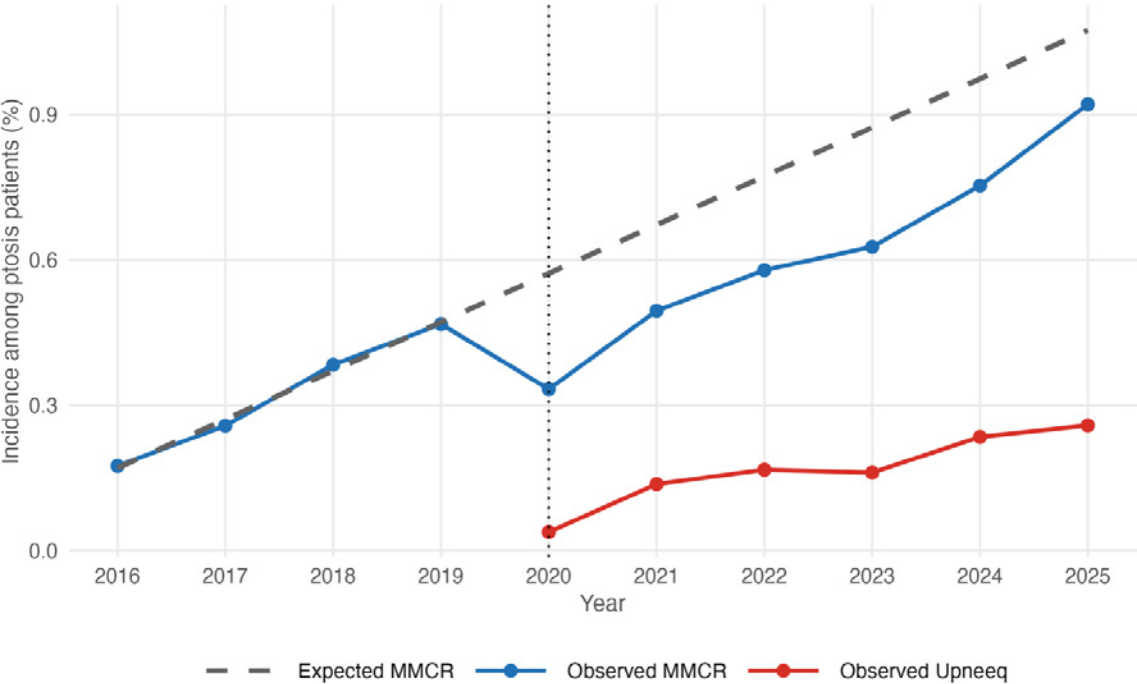
Results: A total of 206,047 adults with ptosis were included; 6,585 underwent MMCR and 1,052 received oxymetazoline hydrochloride ophthalmic solution 0.1%. The incidence proportion of ptosis increased substantially over time, from 0.14% in 2016 to 0.85% in 2025, representing an approximately sixfold increase. Oxymetazoline hydrochloride ophthalmic solution 0.1% utilization rose from 0.01% in 2016 to 0.23% in 2025. MMCR incidence increased from 0.17% in 2016 to 0.47% in 2019, and from 0.33% in 2020 to 0.92% in 2025. Prior to 2020, MMCR use demonstrated a significant upward trend ($\beta = 0.11\%$ per year; $P < 0.001$). Following oxymetazoline hydrochloride ophthalmic solution 0.1% introduction (Figure 1), there was a significant immediate decrease in MMCR incidence ($\beta = -0.23\%$; $P < 0.001$), consistent with a disruption of the prior trend.

Conclusions: Following its introduction, oxymetazoline hydrochloride ophthalmic solution 0.1% use increased steadily and was associated with a reduction in MMCR utilization, suggesting partial substitution of surgical management with pharmacologic therapy. However, the continued rise in MMCR incidence over time indicates that oxymetazoline hydrochloride ophthalmic solution 0.1% has not replaced surgical intervention but rather expanded the overall treatment landscape for ptosis.

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Figure 1



References

1. Shoji MK, Markatia Z, Ameli K, Bayaraa M, Clauss KD, Ugradar S, Lee WW. The effects of topical oxymetazoline on eyelid position, eye redness, and patient-reported eye appearance: A randomized controlled trial. *J Plast Reconstr Aesthet Surg*. 2023 May;80:66-74. doi: 10.1016/j.bjps.2023.02.006. Epub 2023 Feb 9. PMID: 36996503.
2. Slonim CB, Foster S, Jaros M, Kannarr SR, Korenfeld MS, Smyth-Medina R, Wirta DL. Association of Oxymetazoline Hydrochloride, 0.1%, Solution Administration With Visual Field in Acquired Ptosis: A Pooled Analysis of 2 Randomized Clinical Trials. *JAMA Ophthalmol*. 2020 Nov 1;138(11):1168-1175. doi: 10.1001/jamaophthalmol.2020.3812. PMID: 33001144; PMCID: PMC7530825.

10 Cutaneous Melanoma and Risk of Uveal Melanoma: A Real-World Retrospective Cohort Study

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Introduction: Cutaneous melanoma (CM) and uveal melanoma (UM) both arise from melanocytes but differ in genetic drivers and disease progression. The relationship between CM and UM remains incompletely understood, in part due to the rarity of UM and limited cohort sizes in prior studies. This study aimed to determine whether patients with CM have an increased risk of developing UM compared with patients with keratinocyte carcinoma (KC), selected to partially account for ultraviolet-related risk.

Methods: A retrospective cohort study was conducted using a large global electronic health record database. Adults diagnosed with CM or melanoma in situ (MIS) without a history of KC were compared to patients with KC and no history of CM or MIS. The primary outcome was the incidence of malignant neoplasms of the choroid or ciliary body over a 10-year follow-up period. Patients with metastatic disease were excluded to minimize misclassification of choroidal metastases as UM. Propensity score matching (1:1) was performed to balance demographic and clinical characteristics between cohorts.

Results: The CM cohort included 73,388 patients and the KC cohort 168,196 patients. After propensity score matching, each cohort included 66,993 patients with well-balanced baseline characteristics. Uveal melanoma occurred in 79 patients (0.12%) in the CM cohort compared with 17 patients (0.02%) in the KC cohort, corresponding to a significantly increased risk (HR 4.63, 95% CI 2.74–7.83; p=0.003).

Conclusions: Cutaneous melanoma is associated with a significantly increased risk of subsequent uveal melanoma compared with keratinocyte carcinoma. These findings suggest a potential shared susceptibility and support consideration of ophthalmic surveillance in patients with CM. Further studies are needed to clarify underlying mechanisms and inform risk-based screening strategies.

11 Risk Factors and Incidence of Lower Eyelid Ectropion Following Maxillectomy for Malignancy

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Introduction: Maxillectomy is commonly performed during surgical management of maxilla involving-malignancies. While oncologic outcomes are often the primary objective, the procedure carries a known risk of ophthalmic complications, particularly lower eyelid malposition. Ectropion is among the most reported sequelae, with rates exceeding 50% in some series. Ectropion can lead to exposure keratopathy, chronic epiphora, and reduced quality of life, frequently necessitating secondary corrective surgery. Despite its clinical burden, the operative and patient-level factors contributing to lower eyelid ectropion following maxillectomy remain incompletely defined. This study aimed to determine the incidence of lower eyelid ectropion after maxillectomy with reconstruction and to identify associated demographic, oncologic, and operative risk factors.

Methods: Retrospective, single-institution cohort study of 69 patients who underwent maxillectomy for malignancy with reconstruction over a 5-year period (12/1/2020–12/1/2025). Patients who underwent orbital exenteration were excluded. Demographic, oncologic, and operative variables were compared between patients with and without lower eyelid ectropion using Wilcoxon rank-sum and Fisher's exact tests.

Results: Of the 69 patients, 11 (15.9%) developed lower eyelid ectropion following maxillectomy with reconstruction. Eyelid-involving incisions (ex: Weber-Fergusson, etc.) were significantly more common in the ectropion group compared to the non-ectropion group (54.5% vs. 19.0%, $p = 0.03$). Positive surgical margins were strongly associated with the development of ectropion (54.5% vs. 3.5%, $p = 0.001$). Male sex was also significantly associated with ectropion (90.9% vs. 55.2%, $p = 0.04$). Age did not differ significantly between groups (64.5 vs. 64.0 years, $p = 0.94$). Radiation dose, maxillectomy type, laterality, reconstruction method, skull base involvement, and rhinectomy were not significantly associated with lower eyelid ectropion development.

Conclusions: Lower eyelid ectropion occurred in 15.9% of patients following maxillectomy with reconstruction. Eyelid-involving incisions and positive surgical margins were the factors most strongly associated with ectropion. To our knowledge, the association between positive surgical margins and ectropion following maxillectomy for malignancy has not been previously reported. Positive margins may reflect the need for more extensive resection, wound healing impairment from adjuvant therapy, or cicatricial changes related to

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residual disease. These findings support meticulous intraoperative margin assessment and eyelid-sparing incision design as strategies to reduce postoperative eyelid malposition. Identification of these risk factors may help guide reconstructive planning and improve functional and aesthetic outcomes in patients undergoing maxillectomy.

Figure 1

Variable	Statistic	Total Population
Age at Maxillectomy	N	69
	Mean (SD)	64.1 (13.5)
	Min, Median, Max	25.0, 67.0, 84.0
Sex	N (%)	
Male		42 (60.9)
Female		27 (39.1)
Race	N (%)	
White		55 (79.7)
Black/African American		5 (7.2)
Asian		4 (5.8)
Hispanic		1 (1.4)
Not reported		4 (5.8)
Type of Maxillectomy	N (%)	
Infrastructural		44 (63.8)
Medial		3 (4.3)
Subtotal		13 (18.8)
Total		9 (13.0)
Laterality of Maxillectomy	N (%)	
Right		35 (50.7)
Left		34 (49.3)
Post-operative Ectropion	N (%)	
Yes		11 (15.9)
No		58 (84.1)

Figure 2

Variable	Statistic	Ectropion		P-value*
		Yes	No	
Sex	N (%)			0.040
Male		10 (90.9)	32 (55.2)	
Female		1 (9.1)	26 (44.8)	
Incision Type	N (%)			0.034
Eyelid involving		6 (54.5)	11 (19.0)	
Not eyelid involving		4 (36.4)	43 (74.1)	
Unspecified		1 (9.1)	4 (6.9)	
Margins	N (%)			<0.001
Positive		6 (54.5)	2 (3.5)	
Negative		5 (45.5)	46 (79.3)	
Other		0	10 (17.2)	

*P-values for continuous variables based on Wilcoxon rank sum test.

P-values for categorical variables based on Fisher's exact test.

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References

1. Kee TE, Joo CW, Lee WS, et al. Maxillectomy and its ophthalmic implications: A comprehensive analysis over 20 years. *Heliyon*. 2024;10(19):e38861. doi:10.1016/j.heliyon.2024.e38861
2. Sweeney AR, Walker B, Bhrany AD, Chang SH, Jian-Amadi A. Ophthalmic Changes Following Maxillectomy With or Without Postoperative Radiation Therapy. *Journal of Craniofacial Surgery*. 2019;30(5):1448–1451. doi:10.1097/SCS.00000000000005437
3. Cordeiro PG, Chen CM. A 15-Year Review of Midface Reconstruction after Total and Subtotal Maxillectomy: Part II. Technical Modifications to Maximize Aesthetic and Functional Outcomes. *Plastic and Reconstructive Surgery*. 2012;129(1):139–147. doi:10.1097/PRS.0b013e318221dc60
4. Cordeiro PG, Santamaria E. A Classification System and Algorithm for Reconstruction of Maxillectomy and Midfacial Defects: *Plastic & Reconstructive Surgery*. 2000;105(7):2331–2346. doi:10.1097/00006534-200006000-00004

12 Acellular Intact Fish Skin Grafts for Immediate Reconstruction of the Exenterated Socket

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Introduction: Acellular intact fish skin grafts (FSGs) were developed to promote and accelerate healing in chronic wounds and received FDA approval for diabetic foot ulcers in 2014. The preserved omega-3 polyunsaturated fatty acids and intact extracellular matrix architecture of FSGs are thought to accelerate granulation and support neovascularization. Although their use in the periocular region has been limited, FSGs have demonstrated utility in traumatic orbital floor fracture repair and periocular skin defect reconstruction.

Reconstruction of the exenterated socket remains a clinical challenge, with the primary goals of promoting wound healing, minimizing complications, and facilitating prosthetic rehabilitation. Current reconstructive approaches include spontaneous granulation, split-thickness and full-thickness skin grafts, regional myocutaneous flaps, free flaps, dermis fat grafts, acellular dermal allografts, and artificial dermis. While each approach has demonstrated efficacy, they vary in complexity, healing time, and cost of allografts.

In this case series, the authors describe the early outcomes of the first reported application of FSGs in the immediate reconstruction of exenterated sockets.

Methods: This is a surgical case series.

Results: Two patients underwent orbital exenteration with immediate FSG reconstruction of the exenterated socket. Patient A, a 79-year-old male, underwent exenteration for conjunctival squamous cell carcinoma. Patient B, an 84-year-old female, underwent exenteration for conjunctival melanoma with orbital extension.

Patient A presented 12 days postoperatively with a well-granulated socket. A small defect was noted along the medial orbital wall at the site of prior medial wall biopsies.

Patient B presented 48 days postoperatively with a fully granulated socket, apart from a small fistula into the lacrimal sac fossa.

No infections or other early complications occurred in either patient. Both patients reported minimal postoperative pain. Postoperative socket care consisted solely of packing changes and application of topical erythromycin ointment.

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Conclusions: Although follow-up was limited in this series, both patients demonstrated excellent socket granulation within a relatively short postoperative period, rendering the sockets suitable for prosthetic fitting. FSGs may provide a viable, rapidly healing alternative to existing reconstructive options for lining exenterated sockets with the advantages of technical simplicity, no donor-site morbidity, and minimal postoperative care requirements. Further studies with larger cohorts and longer follow-up are warranted.

Figure 1



Figure 2



Figure 3



Figure 4



References

1. Dardari D, Piaggese A, Potier L, et al. Intact Fish Skin Graft to Treat Deep Diabetic Foot Ulcers. *NEJM Evid.* 2024;3(12):EVIDoa2400171. doi:10.1056/EVIDoa2400171
2. Steinberger EE, Vogt AZ, Tan JF. Skin and Bone: Intact Fish Skin to Reconstruct Traumatic Orbital Floor and Wall Defects. *Ophthalmic Plast Reconstr Surg.* 2024;40(3):e78-e80. doi:10.1097/IOP.0000000000002594
3. Wang D, Maliakkal J, Sadat O, Codrea V, Nguyen J. Acellular Fish Skin Grafts for Treatment of Periocular Skin Defects. *Ophthalmic Plast Reconstr Surg.* 2024;40(6):681-684. doi:10.1097/IOP.0000000000002699
4. Shott M, Wang D, Nguyen J. Case Report: Eyelid reconstruction using intact fish skin xenograft following periorbital necrotizing fasciitis. *Front Ophthalmol (Lausanne).* 2025;5:1589771. Published 2025 May 22. doi:10.3389/fopht.2025.1589771
5. Thermoziér S, Cheng OT, Beaulieu R. Acellular Fish Skin Xenograft for Eyelid Reconstruction in Burns, Necrotizing Fasciitis, and Trauma. *Ophthalmic Plast Reconstr Surg.* Published online December 4, 2025. doi:10.1097/IOP.0000000000003140

13 Characterization of Orbital Volumetric Changes with Teprotumumab as Predictors of Response to Treatment

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Introduction: Judicious patient selection for teprotumumab in the treatment of thyroid eye disease is important given costs and regression possibilities. This study sought to analyze volumetric and signal intensity measurements in MRIs before and after treatment with teprotumumab and their correlation with proptosis response in patients with TED.

Methods: 24 orbits from 12 patients treated with a complete course of teprotumumab were included in the study. Inclusion criteria included MRI orbits done prior to and following treatment with teprotumumab, each within a 6-month period of treatment. Patients were excluded if they had received prior teprotumumab or undergone decompression during the relevant study period. Radiographic measurements were obtained by two masked observers using medical image segmentation software. Measurements included orbit volume, extraocular muscle volumes for the superior rectus, medial rectus, inferior rectus, lateral rectus, and superior oblique, and intraocular structures. Signal intensity measurements of orbital fat and extraocular muscles were obtained as well. The fat-to-EOM ratio was calculated. Analysis was performed with statistical analysis software. Linear mixed models were used with orbital volume as a covariate, where appropriate, to assess differences in means for radiographic measurements before and after treatment with teprotumumab, and to assess for predictors correlating with proptosis response.

Results: The study included 48 orbital scans, consisting of pre- and post- MRI scans of 24 orbits from 12 patients. 17 orbits exhibited proptosis response defined as ≥ 2 mm reduction in proptosis, and 6 were non-responsive to teprotumumab. There was a significant difference in the total extraocular muscle volume ($p < 0.001$). Specifically, there was an average volume change after teprotumumab (expressed as post/pre): MR: 82% (p -value 0.008), IR: 67% ($p = 0.002$), SR: 92% ($p = 0.089$), LR: 82% ($p = 0.277$). The fat-to-EOM ratio was also significantly increased after treatment ($p = 0.002$), likely reflecting decreased EOM volume. Medial rectus volume at presentation correlated with the magnitude of proptosis response ($p = 0.028$, fixed effects coefficient 0.376).

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Conclusions: There was a significant change in EOM volume pre- and post- teprotumumab treatment. Medial rectus volume at presentation may be a predictor of proptosis response. Further investigation is warranted to understand the potential of radiographic measurements to characterize likelihood of teprotumumab response.

Figure 1

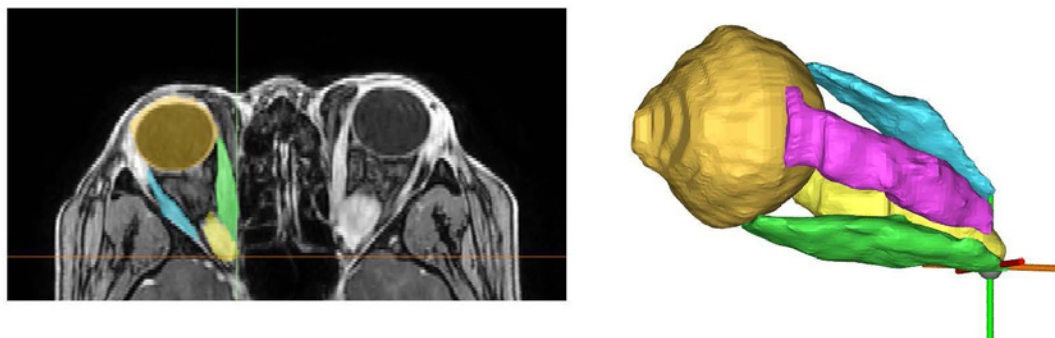


Figure 1. Example of volumetric measurements obtained.

References

1. Ugradar S, Patel-Jain A, Douglas RS, et al. Teprotumumab reduces extraocular muscle and orbital fat volume in thyroid eye disease. *British Journal of Ophthalmology*. 2022;106(2):165–171.
2. Ting M, Ozzello DJ, Topilow NJ, et al. Differential effects of teprotumumab treatment based on fat-to-muscle ratio in patients with thyroid eye disease. *Orbit*. 2023;42(4):418–425. doi:10.1080/01676830.2022.2122515.
3. Kahaly GJ, Subramanian PS, Smith TJ, et al. Long-term efficacy of teprotumumab in thyroid eye disease: follow-up outcomes in three clinical trials. *Thyroid*. 2024;34(7).
4. Reshef ER, et al. Reduction in extraocular muscle cross-sectional area and correlation with motility and diplopia following teprotumumab for thyroid eye disease. *Ophthalmic Plast Reconstr Surg*. 2023;39(5):433–439. doi:10.1097/IOP.0000000000002337.
5. Rosenblatt TR, Chiou CA, Yoon MK, et al. Proptosis regression after teprotumumab treatment for thyroid eye disease. *Ophthalmic Plast Reconstr Surg*. 2023.
6. Ting MAJ, Topilow NJ, Ediriwickrema LS, Yoon JS, Liu CY, Korn BS, Kikkawa DO. A comparison of proptosis reduction with teprotumumab versus surgical decompression based on fat-to-muscle ratio in thyroid eye disease. *Orbit*. 2024;43(2):222–230. doi:10.1080/01676830.2023.2282509. PMID:37978819

14 Clinical Activity Score Correlation with Quality of Life for Patients With Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) is an inflammatory orbitopathy that manifests in signs and symptoms of orbital congestion, inflammation and fibrosis. These physical manifestations, along with their psychological impact, can substantially reduce patients' health-related quality of life.¹ The Clinical Activity Score (CAS) is commonly used to assess disease severity and guide management.² The Graves' Ophthalmopathy Quality of Life (GO-QOL) questionnaire has been widely validated as a disease-specific measure.³ Studies have demonstrated an inverse correlation between CAS and GO-QOL scores.⁴⁻⁶ However, despite its broad use in research and clinical care, CAS is highly subjective and qualitative. The disease burden from TED is hard to capture through a clinical exam. We hypothesized that CAS is a poor surrogate for patient-perceived functional impairment and overall well-being.

Methods: This cross-sectional study included TED patients who completed a survey assessing their condition's impact on overall QoL, daily activity performance, perception of appearance, ocular pain/pressure, and pain with eye movement, rated on a 0–10 scale (0=low, 10=very high burden). 300 surveys were collected from a single oculoplastic/orbital surgery practice between April 2024 and June 2025. Incomplete surveys and those from patients <18y/o were excluded. CAS was obtained by the examining clinician. Statistical analyses were performed to calculate correlation between CAS and patient reported survey ratings, using Pearson, Pearson with log, Spearman and Kendall's Tau.

Results: Of 300 surveys, 236 met inclusion criteria, representing 152 patients. The weakest correlation with CAS was observed for patient-reported ability to perform daily activities (Pearson $r=0.38$, Graph 1) (Pearson with log=0.35) (Spearman=0.38) (Kendall's Tau=0.29, CI 95% [0.20, 0.39], $p<0.05$). Correlations between CAS and both overall QoL (Pearson $r=0.45$, Graph 2) (Pearson log=0.37) (Spearman=0.45) (Kendall's Tau=0.34, CI 95% [0.24, 0.43], $p<0.05$) and perceived appearance (Pearson $r=0.45$, Graph 3) (Pearson with log=0.39) (Spearman=0.45) (Kendall's Tau=0.34, CI 95% [0.24, 0.43], $p<0.05$) were weak to moderate. The strongest correlation, although still only moderate, was observed between CAS and total survey score (Pearson $r=0.53$, Graph 4) (Pearson with log=0.46) (Spearman=0.52) (Kendall's Tau=0.39, CI 95% [0.29, 0.48], $p<0.05$).

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Conclusions: CAS demonstrates a weak to moderate positive correlation with patient-reported QoL, functional capacity, and perception of appearance. This suggests that CAS fails to capture the multidimensional impact of TED on patients. Many patients with low CAS still suffer significant reduction in QoL, while some with higher CAS perceive a lower disease burden than clinically suspected. The former group would be more motivated to undergo treatment, while the latter group would be understandably reluctant despite their CAS being high. We propose that patient-reported outcome measures be incorporated into standard clinical assessments of TED patients, to optimize patient-centered management and improve quality of care.

References

1. Bahmani-Kashkouli M, Pakdel F, Astaraki A, Hashemi M, Honarbakhsh Y, Mirarmandehi B, Jam S. Quality of life in patients with thyroid eye disease. *J Ophthalmic Vis Res*. 2009 Jul;4(3):164–8. PMID: 23198067; PMCID: PMC3498563.
2. Mourits MP, Koornneef L, Wiersinga WM, Prummel MF, Berghout A, van der Gaag R. Clinical criteria for the assessment of disease activity in Graves' Ophthalmopathy: A novel approach. *Br J Ophthalmol*. 1989;73:639–44. doi: 10.1136/bjo.73.8.639.
3. Wiersinga WM. Quality of life in Graves' ophthalmopathy. *Best Pract Res Clin Endocrinol Metab*. 2012 Jun;26(3):359–70. doi: 10.1016/j.beem.2011.11.001. PMID: 22632371.
4. Virdee S, Moledina M, Lee V. "Real-Life" Utility of the Graves' Ophthalmopathy–Quality of Life in a Multidisciplinary Thyroid Eye Disease Service. *Ophthalmic Plast Reconstr Surg*. 2025 Nov–Dec 01;41(6):688–700. doi: 10.1097/IOP.0000000000002950. Epub 2025 Apr 16. PMID: 40237557; PMCID: PMC12582625.
5. Villagelin D, Romaldini J, Andrade J, Santos R, Milkos A, Teixeira PFDS, Ward LS. Evaluation of Quality of Life in the Brazilian Graves' Disease Population: Focus on Mild and Moderate Graves' Orbitopathy Patients. *Front Endocrinol (Lausanne)*. 2019 Apr 4;10:192. doi: 10.3389/fendo.2019.00192. PMID: 31024443; PMCID: PMC6460048.
6. Smith TJ, Cockerham K, Barretto N, Hirst A, Oliver L, Enstone A, Brandolini G, Taylor SD, Holt RJ. Bridging and Validation of the Specific Graves Ophthalmopathy Quality of Life Questionnaire With Health State Utility Values. *Endocr Pract*. 2024 May;30(5):470–475. doi: 10.1016/j.eprac.2024.02.002. Epub 2024 Feb 8. PMID: 38341128.

15 Evolving Microbiology of Orbital Cellulitis Among Children in the United States

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Introduction: Orbital cellulitis is a potentially blinding and life-threatening condition that commonly affects children. Recent studies around the world have demonstrated evolving microbiological profiles of orbital cellulitis around the time of the COVID-19 pandemic. There has also been variability in recommendations regarding the need for empiric coverage of MRSA. Whether there has been a recent shift in the microbiological profile of orbital cellulitis, including rates of MRSA, has not been well studied on a national level in the United States. The purpose of this study is to evaluate the evolving microbiological profile, etiologies, and epidemiological characteristics of orbital cellulitis infections of the pediatric and young adult population to help inform clinical care including appropriate empiric antibiotic treatment.

Methods: A retrospective database cohort study was done using the Healthcare Cost and Utilization Project Kids' Inpatient Database (HCUP KID) from years 2016, 2019, and 2022, each of which includes data of hospitalizations of patients younger than 21 years old from over 4,000 hospitals nationwide to estimate national healthcare trends. Cases were identified using ICD-10 codes for orbital cellulitis, and organisms were identified using ICD-10 codes for infectious agents. Results were analyzed using Stata Basic Edition.

Results: There were 6,435 cases of hospitalization due to orbital cellulitis reported in the HCUP KID database in 2016, 2019, and 2022. Using the HCUP weighting method to generate national estimates, the incidence of orbital cellulitis hospitalizations in people younger than 21 years old increased from 29.6 per 1,000 in 2016 to 42.1 per 1,000 in 2022. The mean age was 8.12 ± 5.13 . The majority of cases were in males (65.0%). Most patients were White (50.95%), while others were Black (20.83%), Hispanic (18.26%), and Asian or Pacific Islander (3.11%). Common additional diagnoses recorded include sinusitis (71.02%), osteomyelitis (15.66%), and asthma (11.22%). Infectious organisms were reported in 1,297 cases. In 2016, the most common organisms were *Staphylococcus spp.* (47.84%). In 2019 and 2022, the most common organisms were *Streptococcus spp.* (44.27% and 47.43% respectively). The proportion of *Staphylococcus* and *Streptococcus* coinfections increased significantly while the proportion of *Staphylococcus spp.* infections decreased significantly over the three time periods ($p=0.005$). The percentage of cases with reported MRSA did not differ significantly between the three time periods, ranging from 12.19% to 14.43%. Bacterial organisms were the most common across all years. The proportion of bacterial and fungal organisms did not differ significantly across the three time periods.

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Conclusions: This study suggests that in the US, across 2016, 2019, and 2022, there has been an increase in pediatric and young adult hospitalizations due to orbital cellulitis, with cases predominantly affecting males. Consistent with previous literature, the majority of cases in our retrospective cohort were due to underlying complications of sinusitis. In terms of microbiology, this study demonstrates that the most common causative organisms of orbital cellulitis among youth nationwide are shifting from *Staphylococcus spp.* to *Streptococcus spp.*, including an increase in *Staphylococcus* and *Streptococcus* coinfections. Additionally, MRSA accounted for a nontrivial proportion of cases. These findings can help inform empiric antibiotic treatment in pediatric cases of orbital cellulitis.

References

1. Tsao YT, Tsai YJ, Chen CY, Chu YC, Tsai YS, Liao YL. Impact of the COVID-19 Pandemic on Microbial Profiles and Clinical Outcomes in Orbital and Preseptal Cellulitis. *Microorganisms*. 2024;12(11):2262. doi:10.3390/microorganisms12112262
2. Schein Y, Lin LY, Revere K, et al. Microbial patterns and culture utility in orbital cellulitis. *Journal of American Association for Pediatric Ophthalmology and Strabismus*. 2023;27(4):200.e1–200.e6. doi:10.1016/j.jaapos.2023.05.010
3. Joseph J, Karolia R, Sharma S, Choudhary H, Naik MN. Microbiological profile and antibiotic susceptibility trends in orbital cellulitis in India: an analysis over 15 years. *Orbit*. 2022;41(6):726–732. doi:10.1080/01676830.2021.2002368
4. Cirks BT, Claunch KM, DePerrior S, Poitras B, Adams DJ. Microbiology and Epidemiology of Orbital Cellulitis in Pediatric and Young Adult Patients. *Military Medicine*. 2025;190(3–4):e593–e600. doi:10.1093/milmed/usae394

16 Impact of Preoperative Depression on Postoperative Complications Following Orbital Decompression Surgery

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Introduction: Depression has been linked to worse postoperative outcomes across multiple surgical specialties, likely due to associated systemic inflammation, lower pain thresholds, and reduced adherence to medical recommendations.^{1,2} The link between depression and postoperative outcomes remains underexplored in oculoplastic surgery. It is essential to consider patient-specific risk factors to optimize surgical outcomes in orbital decompression surgery.³ This study investigates whether a preoperative diagnosis of depression is associated with increased postoperative complications following orbital decompression.

Methods: Data were extracted from the TriNetX Research Network (TNX), a federated health research database comprising de-identified medical records from approximately 144 million patients from 110 healthcare organizations. We identified patients aged 18–89 who underwent orbital decompression (CPT: 67414 or 67445). Patients were stratified based on the presence of a depression diagnosis (ICD-10: F32, F33, F34.1) within three years prior to surgery. Propensity score matching (1:1, greedy nearest-neighbor) was performed to control demographic and comorbid factors including age, sex, race, obesity, diabetes mellitus, hypertension, heart failure, asthma, chronic obstructive pulmonary disease, sleep apnea, thyrotoxicosis, chronic kidney disease, nicotine dependence, and alcohol disorders. Six-month postoperative outcomes were explored, including blindness and low vision, diplopia, strabismus, hemorrhage, postprocedural pain, and reoperation. Reoperation was defined as a second instance of CPT: 67414 or 67445 $\geq$ 1 month following the index event. Hazard ratios were calculated for each outcome, excluding patients who had outcomes prior to index. All analyses were performed within TNX on March 29, 2026. A two-sided p-value <0.05 was considered statistically significant. See Figure 1 for an inclusion flowchart.

Results: The initial cohorts comprised 245,166 patients without depression, and 16,730 patients with depression. Following propensity score matching, both cohorts were matched at 16,545 patients and all baseline characteristics were well balanced (standardized mean differences <0.10) (Table 1). Patients with depression had significantly higher risk of reoperation (14.9% vs 11.5%; Hazard Ratio [HR] 1.29, 95% CI 1.22–1.37; log-rank $p<0.0001$), and postprocedural pain (5.1% vs 4.0%; HR 1.26, 95% CI 1.13–1.40; log-rank $p<0.0001$). There were no significant differences in the risk of blindness or low vision (0.42% vs 0.32%; HR 1.29, 95% CI 0.90–1.84; log-rank $p=0.17$), diplopia (0.38% vs 0.37%; HR 1.00,

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95% CI 0.70-1.43; log-rank p=0.99), strabismus (0.35% vs 0.38%; HR 0.90, 95% CI 0.63-1.29; log-rank p=0.57), or hemorrhage (0.44% vs 0.44%; HR 0.97, 95% CI 0.70-1.35; log-rank p=0.85) between cohorts.

Conclusions: Preoperative depression is associated with significantly increased risk of reoperation and postprocedural pain in patients undergoing orbital decompression. These findings suggest that mental health status may represent an independent perioperative risk factor, highlighting a potential role for targeted perioperative optimization and counseling in this patient population. Further research is needed to explore underlying mechanisms and potential interventions to improve outcomes.

Figure 1

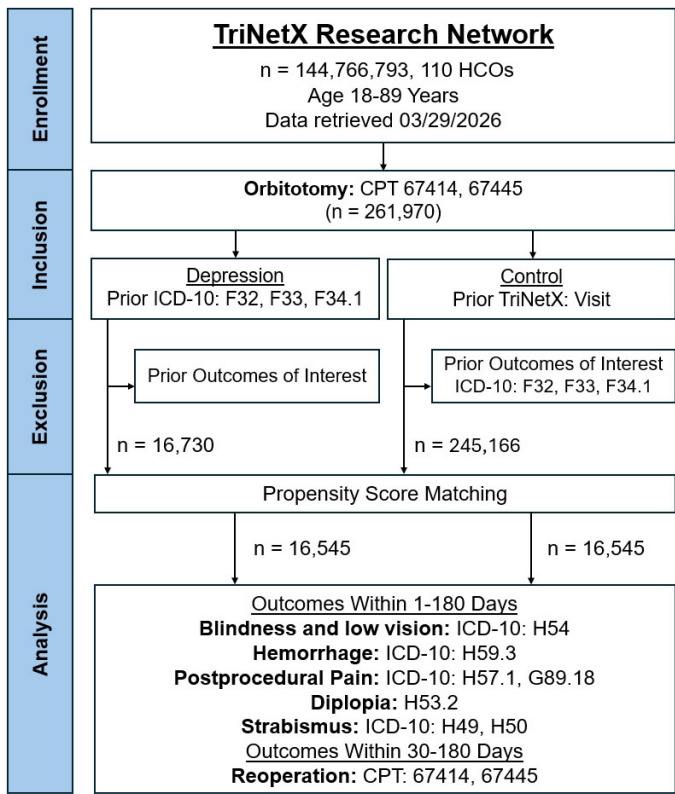


Figure 2

Variable	Depression (N = 16,545)	Control (N = 16,545)	Standardized Mean Difference
Age, mean ± SD (years)	54.6 ± 15.5	55.0 ± 15.7	0.026
Female	10,703 (64.7%)	10,519 (63.6%)	0.023
Male	5,841 (35.3%)	6,024 (36.4%)	0.023
White	9,110 (55.1%)	9,092 (55.0%)	0.002
Black or African American	2,119 (12.8%)	2,188 (13.2%)	0.012
Asian	631 (3.8%)	617 (3.7%)	0.004
Hispanic or Latino	2,634 (15.9%)	2,580 (15.6%)	0.009
Not Hispanic or Latino	13,860 (83.8%)	13,904 (84.0%)	0.007
Essential hypertension	7,328 (44.3%)	7,672 (46.4%)	0.042
Heart failure	1,479 (8.9%)	1,421 (8.6%)	0.012
Asthma	2,306 (13.9%)	2,249 (13.6%)	0.010
Chronic obstructive pulmonary disease	1,118 (6.8%)	999 (6.0%)	0.029
Sleep apnea	1,799 (10.9%)	1,663 (10.1%)	0.027
Hyperthyroidism	476 (2.9%)	473 (2.9%)	0.001
Overweight or obesity	3,229 (19.5%)	3,380 (20.4%)	0.023
Diabetes mellitus	3,491 (21.1%)	3,503 (21.2%)	0.002
Chronic kidney disease	1,705 (10.3%)	1,639 (9.9%)	0.013
Nicotine dependence	1,845 (11.2%)	1,663 (10.1%)	0.036
Alcohol-related disorders	993 (6.0%)	837 (5.1%)	0.041
Ambulatory visit	15,064 (91.0%)	14,955 (90.4%)	0.023
Emergency visit	5,793 (35.0%)	5,596 (33.8%)	0.025
Inpatient encounter	9,791 (59.2%)	10,020 (60.6%)	0.028

References

1. Geoffrion R, Koenig NA, Zheng M, et al. Preoperative Depression and Anxiety Impact on Inpatient Surgery Outcomes: A Prospective Cohort Study. *Ann Surg Open*. 2021;2(1):e049. Published 2021 Mar 16. doi:10.1097/AS9.0000000000000049

2. Ghoneim MM, O'Hara MW. Depression and postoperative complications: an overview. *BMC Surg*. 2016;16:5. Published 2016 Feb 2. doi:10.1186/s12893-016-0120-y

3. Goldberg RA, Gout T. Orbital Decompression: Conceptual Approach for Orbital Volume Expansion. *Ophthalmic Plast Reconstr Surg*. 2023;39(6S):S105-S111. doi:10.1097/IOP.0000000000000255

17 Insurance Status and Rurality Influence Referral Pathways of Oculofacial Emergencies Presenting to a Level I Trauma Center

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Introduction: Emergency ophthalmic conditions, including oculofacial emergencies such as orbital fractures and periorbital trauma, frequently require subspecialty care. Level I trauma centers serve as regional referral hubs for emergency specialist care unavailable in surrounding communities. Patients can arrive directly, transfer from outside hospital (OSH) emergency departments (ED), or be referred from outpatient clinics.

Previous studies have shown that insurance status is associated with increased likelihood of ophthalmic consultation for oculofacial and ocular trauma.¹ Rurality is further associated with poorer access to specialized care.² This study examines the influence of insurance status and rurality on the referral pathways of patients presenting with emergent oculofacial and ocular complaints to a Level I trauma center.

Methods: This retrospective, cross-sectional study included patients who received ophthalmology consultation in a Level I trauma center's ED in 2024. Patients were categorized by insurance status (Medicare, Medicaid, private, uninsured, or other) and rurality. Rurality was assigned via NCHS urban-rural classification scheme (Table 1). NCHS categories 1 and 2 (n=19) and patients residing in the same county as the study center (n=203) were excluded. Primary outcome was referral pathway: direct walk-in, OSH ED transfer, or outpatient clinic referral. Chi-square and Cramer's V assessed associations between referral pathway and both insurance status and rurality.

Results: Of 767 patients identified, 545 comprised the final cohort. Orbital fractures (n=71) and eyelid lacerations (n=49) were the most frequently diagnosed injuries. Insurance status was significantly associated with referral pathway ($\chi^2(8) = 32.82$, $p < 0.001$; Cramer's V = 0.174). Medicaid-insured patients were most commonly transferred directly from an OSH ED (53.2%) compared to Medicare-insured patients (35.2%) and private-insured patients (30.0%). Medicare-insured patients were most commonly referred from clinics (34.0%) relative to Medicaid-insured (12.8%) and private-insured patients (29.8%). Only 17 uninsured patients were included; 12 (70.6%) arrived via OSH transfer.

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Rurality also significantly influenced referral pathway ($\chi^2(6) = 13.928$, $p=0.0351$; Cramer's $V = 0.113$). Transfer from an OSH ED was the most common referral pathway from medium metropolitan (category 3) (44.3%) and noncore rural (category 6) (40.4%) counties. Patients from small metropolitan (category 4) and micropolitan (category 5) counties were more frequently referred from clinics (30.3% and 35.5%) than medium metropolitans and noncore rural counties (21.7% and 22.1%).

Conclusions: Both insurance status and rurality influenced the referral pathways of oculofacial and ocular complaints to a Level I trauma center. The majority of Medicaid-insured patients arrived via OSH ED transfer. Medicare-insured patients were most likely to present from a clinic. Possible explanations include disease acuity, pre-established outpatient relationships, and transportation availability. The most urban and most rural populations studied relied most heavily on ED-to-ED transfer, though differing mechanisms may account for this shared pattern. Further studies are indicated to examine the relationship between insurance, rurality, and referral pathway in patients with emergent oculofacial and ocular complaints.

Figure 1

NCHS Classification	Description	Metropolitan/Population Criteria
1	Large central metropolitan area	Counties in metropolitan areas of 1 million population that: - Contain the entire population or largest central principal city of in the metropolitan area. - Are entirely contained in the largest principal city of the metropolitan area - Contain at least 250,000 population
2	Large fringe metropolitan area	Counties in metropolitan areas of 1 million population that do not meet the criteria for large central metro
3	Medium metropolitan area	Counties in metropolitan areas of 250,000 to 999,999 population
4	Small metropolitan area	Counties in metropolitan areas of 50,000 to 249,999 population
5	Micropolitan area	Counties in micropolitan areas of 10,000 to 49,999 population
6	Noncore	Counties in areas that do not have a population cluster of 10,000 or more.

NCHS categories 1 and 2 not included in study due to likelihood that patients in these categories were traveling at time of presentation. The closest category 1 and category 2 counties are 223 and 166 miles from study center, respectively.

Figure 2

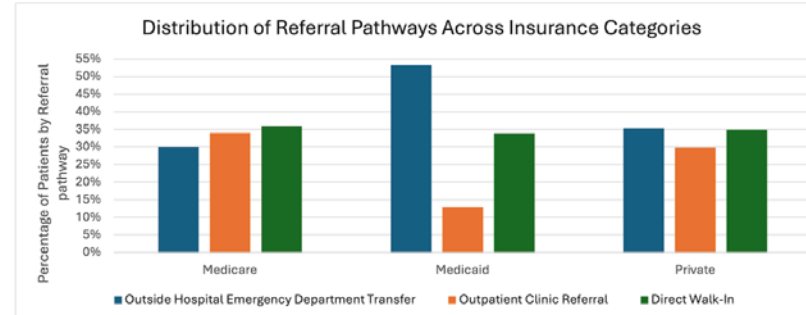
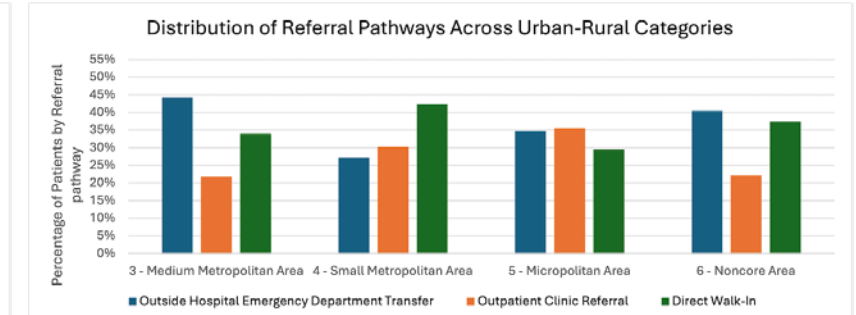


Figure 3



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Figure 4

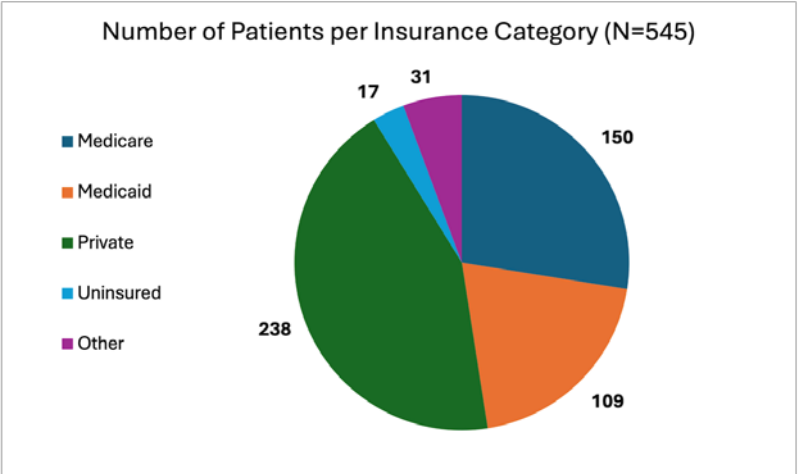
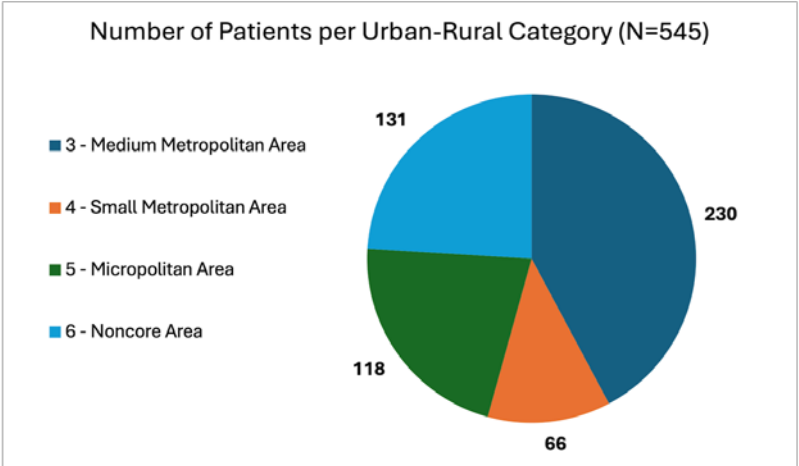


Figure 5



References

1. Gervasio et al. Demographic and socioeconomic disparities in receipt of ophthalmology consultation for facial trauma. *BMJ Open Ophthalmol.* 2023; 8(1):e001259

2. Elam et al. Disparities in Vision Health and Eye Care. *Ophthalmology*, 2022; 129, e89–e113

18 Opioid Exposure Following Orbitotomy and the Evolution of Substance Use Risk: A Multicenter Cohort Study

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Introduction: Opioid analgesics are commonly prescribed following orbital surgery; however, their temporal association with substance use disorders remains incompletely characterized. While prior studies have evaluated short- or long-term outcomes independently, the evolution of risk over time has not been well defined. This study aimed to assess the association between perioperative opioid exposure and the development of opioid- and other substance-related disorders across multiple follow-up intervals.

Methods: A retrospective multicenter cohort study was conducted using a large global electronic health record database. Adults undergoing orbitotomy were identified using standardized procedural codes (e.g., CPT 67413, 67414, 67445), encompassing both decompressive and lesion-directed approaches. Patients were stratified based on perioperative opioid exposure, and those with prior opioid use were excluded. Propensity score matching (1:1) was performed to balance demographic and clinical characteristics, yielding well-matched cohorts of approximately 99,000 patients each. Outcomes included opioid-related disorders, opioid poisoning, long-term opioid use, and alcohol-related disorders. Time-to-event analyses were conducted using Cox proportional hazards models across three predefined follow-up periods: 1, 3, and 5 years.

Results: At 1-year follow-up, opioid exposure was associated with increased risks of opioid-related disorder (HR 1.88, $p=0.029$), opioid poisoning (HR 4.52, $p<0.001$), and long-term opioid use (HR 6.17, $p<0.001$), with no significant increase in alcohol-related disorders (HR 1.15, $p=0.236$).

At extended follow-up (3 and 5 years), the elevated risk of opioid-related disorders persisted, with consistently higher hazard ratios observed in the opioid-exposed cohort. Additional increases in alcohol- and other substance-related disorders were observed over longer follow-up durations, suggesting a broader pattern of substance use vulnerability over time.

Conclusions: Perioperative opioid exposure following orbitotomy is associated with an early increase in opioid-related adverse outcomes that persists and evolves over time. These findings underscore the importance of procedure-specific prescribing strategies and early risk mitigation in patients undergoing orbital surgery.

19 Periorbital Intraosseous Hemangioma: A Case Series and A Novel Surgical Approach

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Introduction: Periorbital intraosseous hemangioma (PIH) is a rare, benign vascular tumor of bone that most commonly presents with progressive deformity or pain¹. Due to its slow-growing nature and involvement of adjacent structures, management is often guided by both functional and cosmetic considerations. The standard treatment described in the literature is complete en bloc resection with reconstruction, particularly for lesions causing significant deformity or symptoms². However, given the benign nature of PIH, less invasive approaches that achieve symptom relief and positive cosmetic outcomes may be preferable in select cases. This study describes the largest reported single-surgeon case series of periorbital intraosseous hemangioma to evaluate a conservative surgical approach involving drilling and contouring of these lesions.

Methods: A retrospective case series was performed of all patients diagnosed with PIH and treated by a single surgeon between 2002 and 2025. Demographic data, presenting symptoms, imaging findings, lesion characteristics, surgical technique, and postoperative outcomes were analyzed. Surgical management consisted of a conservative approach focused on reduction of the lesion via drilling rather than complete excision. Primary outcome measures included resolution of pain as well as improvement in cosmetic appearance based on clinical evaluation and patient satisfaction.

Results: Six patients (5 female, 1 male) were identified, with a mean age of 57 years (range 28–82). Presenting symptoms included pain in 1 patient, noticeable external deformity in 4 patients, and both pain and deformity in 1 patient. All patients underwent surgical management consisting of lesion drilling to eliminate visible protuberance and remove the expanded painful cortical bone, rather than en bloc resection. Pre- and postoperative CT imaging demonstrated effective reduction of bony prominence following lesion drilling, providing symptom improvement without the need for en bloc resection of the orbital and facial bones. Pain was relieved in all patients and, aesthetically, patient satisfaction was high. No major intraoperative or postoperative complications were noted in this series and there were no recurrences observed over the follow-up period.

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Conclusions: Periorbital intraosseous hemangioma is a rare, benign vascular tumor of bone that can present with progressive deformity and/or pain. Conservative management of PIH using a drilling technique resulted in pain relief and favorable cosmetic outcomes while avoiding en bloc resection and complex reconstruction. These findings suggest that contouring of the lesion may be a safe and effective alternative in select patients, particularly when complete excision would require extensive surgery.

Figure 1

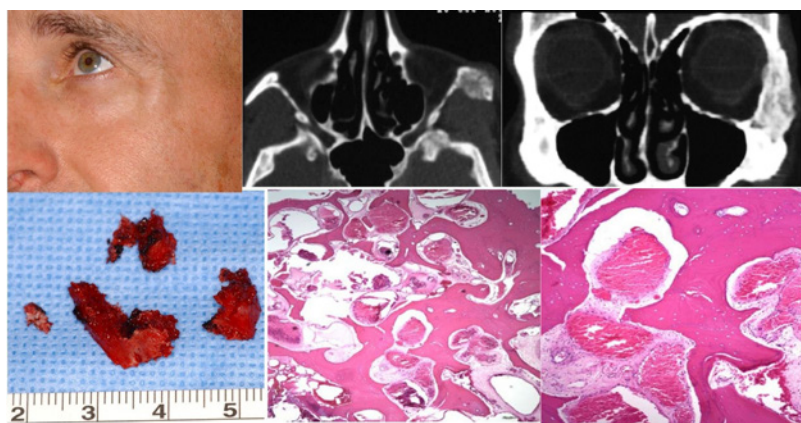


Figure 2

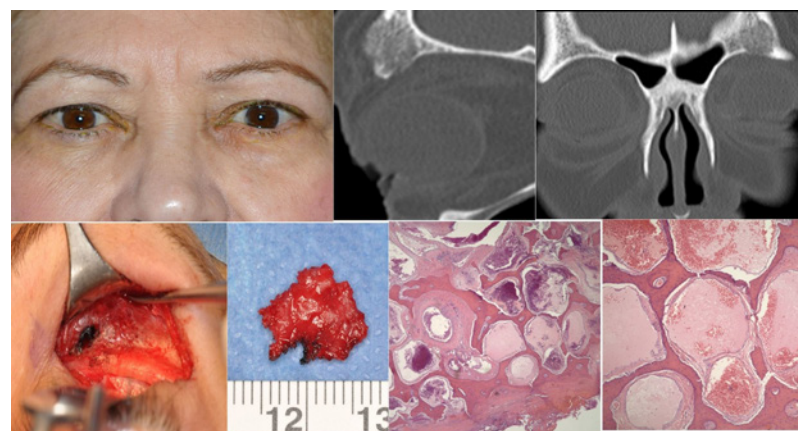
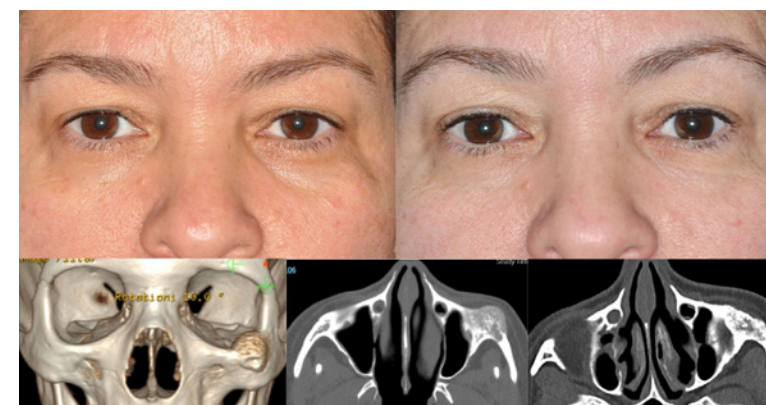


Figure 3



References

1. Gupta T, Rose GE, Manisali M, Minhas P, Uddin JM, Verity DH. Cranio-orbital primary intraosseous haemangioma. *Eye (Lond)*. 2013 Nov;27(11):1320–3. doi: 10.1038/eye.2013.162. Epub 2013 Aug 30. PMID: 23989119; PMCID: PMC3831123.
2. Kim HS, Kim WS, Kim HK, Bae TH. Removal of intraosseous hemangioma in frontal bone under direct vision through a small incision. *Arch Craniofac Surg*. 2021 Feb;22(1):52–55. doi: 10.7181/acfs.2020.00661. Epub 2021 Feb 20. PMID: 33714253; PMCID: PMC7968979.

20 Periorbital Trauma from Winter Sports: Clinical Spectrum and Outcomes of Ski and Snowboard-Related Oculoplastic Injuries

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Introduction: Skiing and snowboarding are popular winter sports with recognized risk of injury. While current literature focuses on orthopedic sequelae, orbital injuries do occur.¹ These injuries are often reported as a small subset of larger sports-related eye injury cohorts and remain poorly characterized.² To our knowledge, this is the first study to evaluate ski- and snowboard-specific orbital trauma, clinical features, and management at a tertiary care center.

Methods: This retrospective cohort study included patients presenting to a tertiary care center in New England from January 1, 2016, to April 30, 2025, with ski- or snowboard-related periorbital trauma, including fractures, foreign bodies, and lacerations. Isolated intraocular injuries were excluded. Patient data including demographics, injury mechanism, clinical features, management, and outcomes were extracted by chart review. Descriptive statistics were performed.

Results: A total of 32 patients were identified, of whom 53% were male with a median age of 43.3 years (IQR 22.3, 62.5). Most injuries occurred while skiing (n=27, 84.4%) (Table 1). Falls (n=16, 50%) and collision (n=7, 21.9%) were the most common mechanisms of injury. Among patients with available data, the majority were wearing a helmet (n=12, 92.3%) and goggles (n=11, 91.7%).

At presentation, diplopia (n=15, 51.7%) and restriction of extraocular movements (n=13, 41.9%) were common (Table 2). Enophthalmos was observed in many patients (n=15, 57.7%), although only 11.5% (n=3) demonstrated greater than 2mm of displacement relative to the fellow eye.

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An orbital fracture was present in all patients (Table 2). Most had a single wall orbital fracture (n=23, 71.9%), while 28.1% (n=9) had multiple walls involved. Fractures most frequently involved the orbital floor (n=31, 96.9%) and less commonly the medial wall (isolated n=1; combined n=6, 21.9%) and zygomaticomaxillary complex (n=4, 12.5%). Associated craniofacial injuries included orbital foreign body (n=1), orbital compartment syndrome (n=1), facial lacerations (n=6), nasal bone fractures (n=3), and brain injury (n=4). Ten patients (31.3%) had concurrent ocular injuries, including subconjunctival hemorrhage (n=5), ocular surface injury (n=2), retina pathology (n=4), and open globe (n=1).

Most patients were initially evaluated at an outside hospital (84.4%) (Table 3) with direct referral (40.6%) or secondary referral (59.4%) to oculoplastics. Orbital fractures were managed primarily with observation (n=23, 71.9%) and less commonly with surgery (n=9, 28.1%). Other primary interventions included laceration repair (n=4, 12.5%), canthotomy and cantholysis (n=1, 3.1%), globe exploration (n=1, 3.1%), orbital foreign body removal (n=1, 3.1%), and nasal fracture repair (n=2, 6.3%).

Persistent diplopia was the most common secondary complication (n=5, 16.7%) (Table 4). A minority of patients required secondary intervention, including orbital fracture revision with a patient-specific implant (n=3, 10%) and ptosis repair (n=2, 6.7%). Mean presenting visual acuity was 0.175 logMar (~20/30) and remained stable. Resolution of symptoms occurred in most cases (82.8%).

Conclusions: Ski- and snowboard-related periorbital trauma is most frequently associated with orbital fractures. Providers should maintain a high index of suspicion even in individuals wearing protective equipment. Concurrent ocular pathology was common. Although most outcomes were favorable, few patients experienced functional sequelae, supporting the utility of oculoplastics referral for surgical evaluation.

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Table 1. Demographics and Injury Characteristics of Patients with Ski- and Snowboard-Related Periorbital Trauma

Demographics	
Age, median years (IQR), years	43.3 (22.3, 62.5)
Sex, male (%)	17 (53.1%)
Race, white (%)	24 (74.9%)
Snowsport, n (%)	
Ski	27 (84.4%)
Snowboarding	5 (15.6%)
Mechanism of Injury, n (%)	
Fall	16 (50%)
Collision	7 (21.9%)
Trick-related	3 (9.4%)
Ski pole	1 (3.1%)
Unspecified	5 (15.6%)
Protective Equipment, n/N (%)	
Helmet worn at time of injury	12/13 (92.3%)
<i>Data unavailable</i>	19
Goggles worn at time of injury	11/12 (91.7%)
<i>Data unavailable</i>	20

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Table 2. Trauma Burden and Clinical Features of Patients with Ski- and Snowboard-Related Periorbital Injuries

Orbital Fractures, n (%)	
Orbital fracture present	32 (100%)
Single orbital wall involved	23 (71.9%)
Multiple orbital walls involved	9 (28.1%)
Orbital Fracture Characteristics, n (%)	
Location	
Orbital floor	31 (96.9%)
Medial wall	7 (21.9%)
Zygomaticomaxillary complex (ZMC)	4 (12.5%)
Laterality	
Left	18 (56.3%)
Right	14 (43.7%)
Ocular and Periocular Findings at Presentation, n/N (%)	
Diplopia present	15/29 (51.7%)
<i>Data unavailable</i>	3
Extraocular movement restriction	13/31 (41.9%)
<i>Data unavailable</i>	1
Enophthalmos, any amount	15/26 (57.7%)
Enophthalmos, >2mm	3/26 (11.5%)
<i>Data unavailable</i>	6
Concurrent Ocular Injuries, n (%)	
Any ocular injury present	10 (31.3%)
Subconjunctival hemorrhage	5 (15.6%)
Ocular surface pathology (<i>abrasion, laceration</i>)	2 (6.3%)
Retinal pathology (<i>commotio, hole, tear</i>)	4 (12.5%)
Open globe	1 (3.1%)
Concurrent Face and Head Injuries, n (%)	
Orbital foreign body	1 (3.1%)
Orbital compartment syndrome	1 (3.1%)
Facial laceration	6 (18.6%)
Nasal bone fracture	3 (13%)
Brain injury (<i>concussion, intracranial hemorrhage</i>)	4 (12.5%)
Systemic Trauma, n (%)	
Additional systemic injuries	2 (6.3%)

Percentages for fracture location exceed 100% due to multiple fractures sites present in some patients

ORBITAL DISEASE

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Table 3. Management and Initial Surgical Intervention in Patients with Ski- and Snowboard-Related Periorbital Injuries

Initial Evaluation Location, n (%)	
Outside hospital	27 (84.4%)
Local ophthalmologist	1 (3.1%)
Massachusetts Eye and Ear Infirmary / Massachusetts General Brigham	4 (12.5%)
Referral Pattern to Oculoplastics, n (%)	
Direct referral	13 (40.6%)
Secondary referral	19 (59.4%)
Hospital Admission, n/N (%)	
Overnight hospital admission	3/30 (10%)
Orbital Fracture Management, n (%)	
Observation	23 (71.9%)
Surgical Repair	9 (28.1%)
Other Surgical Interventions, n (%)	
Orbital foreign body removal	1 (3.1%)
Facial laceration repair	4 (12.5%)
Lateral canthotomy and cantholysis	1 (3.1%)
Globe exploration and repair	1 (3.1%)
Nasal fracture repair	2 (6.3%)

Percentages for surgical interventions are calculated using the full cohort (N=32); some patients may have undergone more than one procedure

Table 4. Secondary Complications, Interventions, and Visual Outcomes in Patients with Ski- and Snowboard-Related Periorbital Injuries

Secondary Complications, n/N (%)	
Persistent diplopia	5 (16.7%)
Cranial nerve VII palsy	2 (6.7%)
Facial numbness	2 (6.7%)
Ptosis	2 (6.7%)
Retinal detachment	1 (3.3%)
Keloid formation	1 (3.3%)
Data unavailable	2
Secondary Interventions, n (%)	
Orbital fracture revision	3 (10%)
Strabismus surgery	1 (3.3%)
Ptosis repair	2 (6.7%)
Retinal surgery	1 (3.3%)
Data unavailable	2
Visual Acuity Outcomes, logMAR (Snellen equivalent)	
Presenting visual acuity, mean	0.175 (~ 20/30)
Data unavailable	5
Final visual acuity, mean	0.165 (~ 20/30)
Data unavailable	5
Mean change in visual acuity, logMAR	-0.01
Data unavailable	10
Symptom Resolution, n/N (%)	
Resolution of patient-reported symptoms	24/29 (82.8%)
Data unavailable	3

References

1. Weinstein S, Khodaei M, VanBaak K. Common Skiing and Snowboarding Injuries. *Curr Sports Med Rep*. Nov 2019;18(11):394–400. doi:10.1249/jsr.0000000000000651

2. Bineshfar N, Shields C, Davila N, McLaughlin SA, Pradeep T, Lee WW. The Epidemiology of Sports-Related Orbital Fractures in the United States. *Ophthalmology*. Nov 2025;132(11):1224–1230. doi:10.1016/j.opht.2025.06.016

21 Radiomic Differentiation of Orbital Cavernous Venous Malformations and Schwannomas for Noninvasive Diagnosis and Preoperative Planning

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Introduction: Primary orbital tumors are relatively uncommon but clinically significant, with a potential to cause optic nerve compression and extraocular muscle displacement. Among benign orbital tumors, orbital cavernous venous malformations (OCVMs) account for approximately 5–10% of lesions, while schwannomas represent approximately 1%.

Accurate preoperative differentiation between OCVMs and schwannomas remains challenging using conventional imaging, as these lesions often demonstrate overlapping radiographic characteristics on MRI. As a result, surgical intervention with biopsy is required to obtain a definitive diagnosis, exposing patients to operative risks that may be avoidable with improved noninvasive diagnostic tools. Reliable preoperative diagnosis is critical for surgical planning, risk stratification, and patient counseling.

Radiomics is an emerging imaging analysis approach that extracts quantitative features from standard imaging modalities, enabling detection of patterns not appreciable through qualitative interpretation alone. In oncology and neuroradiology, radiomic methods have demonstrated utility in tumor classification, grading, and outcome prediction. However, their application to orbital lesions remains limited.

Preliminary work from our group has identified statistically significant differences in radiomic features—particularly texture heterogeneity and intensity-based metrics—between OCVMs and schwannomas. These findings suggest that radiomic analysis may provide a noninvasive method to improve diagnostic accuracy in orbital tumors

Methods: Patients from a single, quaternary academic institution with pathologically confirmed OCVMs and schwannomas with orbital MRI were retrospectively identified using a query of the electronic medical record (EMR) using text terms of interest “cavernous venous malformation,” “orbital hemangioma,” and “orbital schwannoma.” Patients were excluded if they had infantile capillary hemangiomas, lesions outside the orbit, no additional documented clinical encounters, or history of tumor resection without imaging or pathology report available. All lesions were manually segmented in 3D Slicer using thresholding techniques and slice-by-slice contouring in the axial plane, with careful exclusion of adjacent orbital fat, extraocular muscles, and neurovascular structures. Radiomic feature extraction

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was performed generating shape, intensity, and texture features. Statistical comparisons between lesion types were performed using appropriate parametric or nonparametric tests based on feature distribution.

Results: A total of 28 lesions (20 OCVMs and 8 schwannomas) met inclusion criteria and were included in the analysis. Multiple radiomic features demonstrated statistically significant differences between groups, particularly those reflecting intralesional heterogeneity. OCVMs exhibited more homogeneous signal characteristics, whereas schwannomas demonstrated greater internal complexity and variability. Classification models achieved an area under the curve of 0.706, demonstrating moderated discriminatory performance.

Conclusions: Radiomic profiling of orbital lesions using standardized segmentation enables reliable differentiation of OCVMs and schwannomas. These findings support the use of radiomics as a noninvasive adjunct to conventional imaging. Radiomic profiling demonstrates the potential to improve diagnostic confidence and inform preoperative decision-making in patients with orbital tumors.

References

1. Shields JA, Shields CL, Scartozzi R. Survey of 1264 patients with orbital tumors and simulating lesions: The 2002 Montgomery Lecture, part 1. *Ophthalmology*. 2004 May;111(5):997-1008. doi: 10.1016/j.ophtha.2003.01.002. PMID: 15121380.
2. Yap, U.J., Chung, S.R., Lee, J.H. et al. Clinicoradiologic differences between orbital schwannoma and cavernous venous malformation: a retrospective comparative case series. *Sci Rep* 15, 39743 (2025). <https://doi.org/10.1038/s41598-025-05345-x>
3. Gillies RJ, Kinahan PE, Hricak H. Radiomics: Images Are More than Pictures, They Are Data. *Radiology*. 2016;278(2):563-577. doi:10.1148/radiol.2015151169
4. Lambin P, Rios-Velazquez E, Leijenaar R, et al. Radiomics: Extracting more information from medical images using advanced feature analysis. *Eur J Cancer*. 2012;48(4):441-446. doi:10.1016/j.ejca.2011.11.036
5. Tailor TD, Gupta D, Dalley RW, Keene CD, Anzai Y. Orbital neoplasms in adults: clinical, radiologic, and pathologic review. *Radiographics*. 2013;33(6):1739-1758. doi:10.1148/rg.336135502

22 Risk Factors for Loss of Eye in Orbital Cellulitis with Ocular and Periocular Co-Infection: A Case-Controlled Study

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Introduction: Orbital cellulitis (OC) is a vision- and life-threatening infection that rarely can be associated with concurrent ocular or periocular co-infections. A recent retrospective study examining OC outcomes by underlying etiology found that OC secondary to endophthalmitis was associated with significantly worse visual outcomes and prolonged hospitalization.¹ Existing literature, mainly limited to isolated case reports and case series, supports the severity of concurrent infections.^{2,3} To the best of the authors' knowledge, there is no published study assessing the management and outcomes of concurrent OC and ocular or periocular infection. Herein, the authors aimed to characterize patients with co-infections and identify clinical factors associated with surgical loss of eye (LOE from evisceration or enucleation).

Methods: A retrospective study was conducted at two tertiary care centers. Patients with OC were identified using diagnosis billing codes. Inclusion criteria consisted of OC confirmed on radiography and at least one concurrent ocular or periocular infection. Patients were categorized into two cohorts—LOE and preserved eye—based on whether they underwent enucleation or evisceration for definitive treatment. Demographic and clinical variables, including OC risk factors, presenting exam findings, and infection characteristics, were collected. Medical and surgical interventions were recorded. Categorical variables were analyzed using Fisher's exact test, while continuous or ordinal variables were analyzed using the Mann-Whitney U test. A *p*-value threshold of 0.05 was used to indicate statistical significance.

Results: Forty-six OC patients with co-infection met inclusion criteria. The LOE cohort consisted of 11 patients (23.91%) while the preserved eye cohort included 35 patients (76.09%). The most common co-infections were endophthalmitis (14, 30.43%) and dacryocystitis (10, 21.74%). Demographics and ophthalmic comorbidities did not differ significantly between the two groups. Immunosuppression was significantly associated with increased risk of LOE (54.55% vs 14.29%, *p* = 0.013). Clinical markers of severe infection, including relative afferent pupillary defect (RAPD, 63.64% vs 25.71%, *p* = 0.032) and intraocular pressure (IOP) >21 mmHg (54.55% vs 14.29%, *p* = 0.013), were also associated with LOE. Co-infection type and OC with or without abscess were not significantly associated with eye preservation, though endophthalmitis demonstrated a trend toward LOE (54.55% vs 22.86%, *p* = 0.065). Surgical intervention was more likely in the

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LOE group (90.91% vs 28.57%, $p = 0.022$). Length of stay and time to follow-up were longer among patients with LOE but did not reach statistical significance. Readmission within 30 days was significantly higher in the LOE group (27.27% vs 2.86%, $p = 0.037$).

Conclusions: Immunosuppression, presence of RAPD, and elevated IOP may be associated with increased risk of LOE in OC with co-infection. Interestingly, co-infection type and OC severity, as defined by abscess formation, may not impact eye preservation. Endophthalmitis as an additional predictor of infection severity and LOE risk warrants further assessment. Orbital cellulitis with ocular or peri-ocular co-infection may represent a severe condition with high risk of LOE even with aggressive surgical management. Further research on optimizing infection control and sequelae may help improve outcomes.

References

1. Chen YK, Tu HP, Chen IH. Clinical characteristics and prognosis of adult orbital cellulitis in a tertiary general hospital. *Sci Rep*. 2025 Jul 1;15(1):20585.
2. Davies BW, Fante RG. Concurrent Endophthalmitis and Orbital Cellulitis From Metastatic Klebsiella pneumonia Liver Abscess. *Ophthalmic Plast Reconstr Surg*. 2016 Sep-Oct;32(5):e118-9.
3. Abdelkader MFSO, Elshafei AMK, Nassar MM, Abu Elela MA, Abdallah RMA. Combined endophthalmitis and orbital cellulitis in patients with corona virus disease (COVID-19). *J Ophthalmic Inflamm Infect*. 2021 Sep 15;11(1):27.

23 Sheath-Guided Deep Orbital Triamcinolone Injection (SG-DOTI) for Diplopia in Thyroid Eye Disease: A Case Series of Four Patients

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Introduction: Diplopia from extraocular muscle (EOM) inflammation in thyroid eye disease (TED) often persists despite systemic corticosteroid therapy and significantly impairs quality of life.^{1),2)} Sheath-guided deep orbital triamcinolone injection (SG-DOTI) is a previously reported technique evolved from a deep orbital injection method³⁾, first applied to a case of dysthyroid optic neuropathy in 2024.⁴⁾ A single case of steroid pulse-resistant TED with marked diplopia improvement after SG-DOTI has been previously presented. Here we report a case series of four patients to evaluate the consistency of response and the occurrence of injection-related complications across a wide range of disease duration and inflammatory severity, including its use as a first-line option in patients without prior steroid pulse therapy.

Methods: This was a retrospective case series of four consecutive female patients with Graves' disease and TED-associated diplopia treated with SG-DOTI. Risks and alternatives, including systemic steroid pulse therapy, were discussed; three patients elected SG-DOTI as a first-line treatment. SG-DOTI was performed transcutaneously following a previously published technique.³⁾ After topical lidocaine/prilocaine cream, the orbital septum was punctured at four sites (medial/lateral aspects of upper and lower eyelids) using a 24-gauge needle with outer sheath, and a 27-gauge cannula was advanced to deliver 40 mg triamcinolone acetonide (1 mL) per eye (10 mg per site, standard 4-point approach). For predominant inferior rectus inflammation, the dose was concentrated at the two inferior sites (20 mg each, 2-point variant). Sessions were repeated approximately monthly. Outcomes were assessed using Hess area ratio (HAR%), binocular single vision fields, orbital MRI (short tau inversion recovery: STIR), and adverse events.

Results: Patient characteristics and outcomes are summarized in Figure 1. Ages ranged from 40 to 67 years; disease duration ranged from 3 months to 5 years 9 months. One patient had received seven prior intravenous methylprednisolone pulse courses (cumulative 14 g) without sustained benefit; three were treated with SG-DOTI as first-line therapy. The predominantly affected muscle was the inferior rectus in all cases. HAR% improved in all four patients: from 69.4% to 96.7% in Case 1, and to 100% in Cases 2, 3, and 4 (baseline: 90.2%, 88.6%, and 96.7%, respectively; representative data for Case 2 are shown in Figure 2), resulting in an expanded binocular single vision field. Orbital MRI demonstrated reduction of EOM inflammation in every case (representative images from Case 2 are shown in

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Figure 3). Two patients underwent orbital fat decompression for proptosis approximately five months after SG-DOTI. No injection-related complications – including elevated intraocular pressure, hemorrhage, infection, or globe injury – were observed.

Conclusions: SG-DOTI demonstrated consistent efficacy in resolving diplopia across a broad clinical spectrum of TED, from acute first-line cases to chronic, pulse-resistant disease. These preliminary findings suggest that SG-DOTI may be a promising and inexpensive alternative to systemic corticosteroids. Furthermore, in contrast to high-cost biologics such as teprotumumab, SG-DOTI provides a minimally invasive, globally accessible treatment option, particularly valuable in resource-limited settings.

Figure 1

Case	Age/Sex	Duration	Prior pulse	Predominant muscle	Sessions	HAR% (pre → post)	Decompression
1	40/F	2y4m	Yes	Right IR	2	69.4 → 96.7%	Yes
2	54/F	5y9m	No	Bilateral IR (L>R)	4	90.2 → 100%	Yes
3	44/F	1y	No	Bilateral IR (R>L)	4	88.6 → 100%	No
4	67/F	3m	No	Bilateral IR	2	96.7 → 100%	No

Figure 2

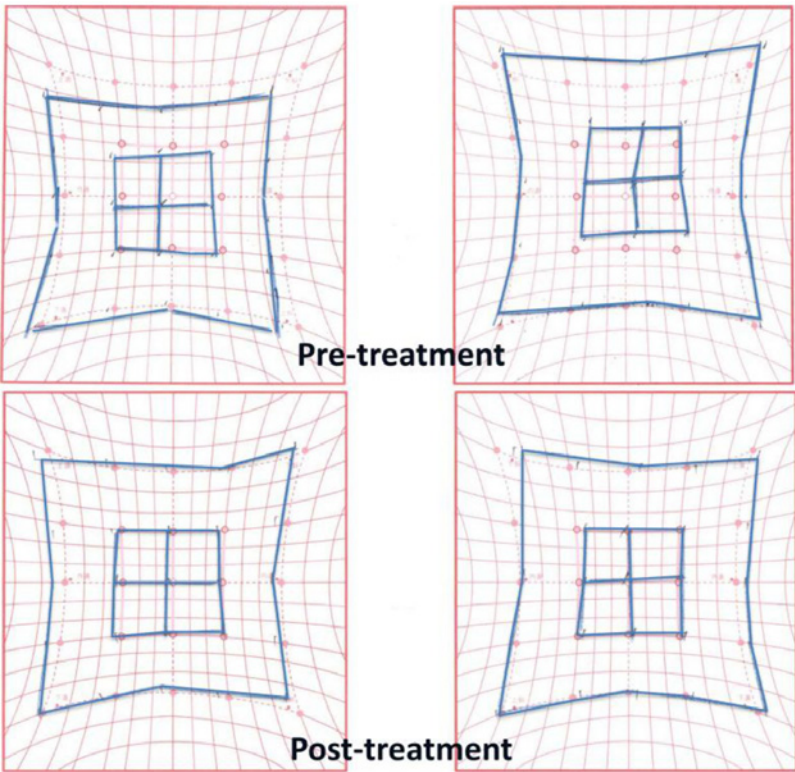
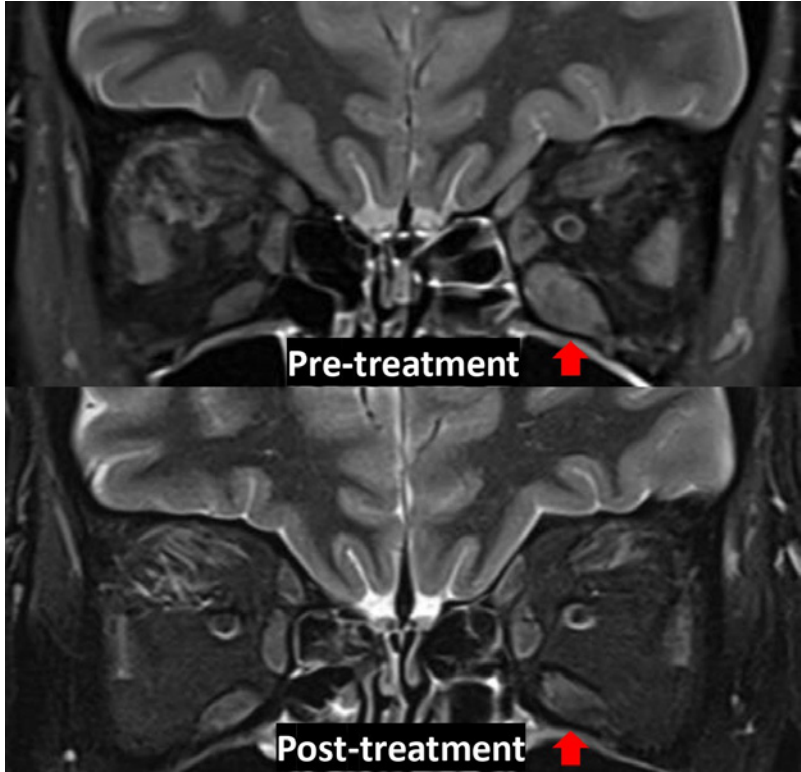


Figure 3



References
1. Cockerham KP, Chan SS. Thyroid Eye Disease. *Neurol Clin*;28:729–755,2010.
2. Johnson BT, Jameyfield E, Aakalu VK. Optic neuropathy and diplopia from thyroid eye disease: Update on pathophysiology and treatment. *Curr Opin Neurol*;34:116–121,2021.
3. Yamana Y, Kashima T, Mimura M. Efficacy and Systemic Effects of a Single Deep Orbital Triamcinolone Injection for Thyroid Eye Disease. *Clin Ophthalmol*;18:2567–2574,2024.
4. Yamana Y, Kashima T. Dysthyroid Optic Neuropathy Dramatically Improved by Sheath-Guided Triamcinolone Orbital Injection: A Case Report. *Cureus*;16(9):e70437,2024.

24 Social Determinants of Health and Disparities in Teprotumumab Treatment Patterns in Thyroid Eye Disease: A Large-Scale IRIS Registry® Analysis

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Introduction: Social determinants of health, including demographic, socioeconomic, insurance, and geographic factors, may influence treatment access and surgical management in thyroid eye disease (TED), yet these relationships remain incompletely characterized at the population level. This study evaluated associations between social determinants of health and TED teprotumumab utilization and TED-related surgery in a large IRIS Registry cohort.

Methods: A retrospective cohort study was conducted using the AAO IRIS Registry. Patients with TED were identified using ICD-9, ICD-10, and registry-specific diagnostic and observation codes. Inclusion required at least 1 year of IRIS data before the TED index date and at least 1 year of follow-up. Patients younger than 18 years and those with prior orbital decompression, strabismus surgery, or eyelid retraction repair were excluded. Social determinants examined included race, ethnicity, area-level median income, urban versus rural residence, insurance type, and geographic region. Outcomes included documented teprotumumab exposure, and post-index orbital decompression, strabismus surgery, and eyelid surgery. Associations were assessed using bivariate analyses and multivariable logistic regression.

Results: A total of 82,276 patients with TED available in the IRIS registry database met study criteria. 5,559 patients (6.76%) received teprotumumab. Orbital decompression, strabismus surgery, and eyelid surgery were performed in 0.56%, 1.11%, and 2.15% of TED patients, respectively.

Teprotumumab utilization differed significantly across all seven SDOH and geographic stratifiers ($p \leq 0.01$). In adjusted analysis, urban residence was associated with higher odds of teprotumumab treatment (OR 1.22, 95% CI 1.02–1.46, $p=0.03$), while Black/African American and unknown race were associated with lower odds compared with Asian race (OR 0.64, 95% CI 0.45–0.91, $p=0.01$ and OR 0.54, 95% CI 0.38–0.77, $p<0.01$ respectively). Regional variation was pronounced, with lower utilization in the Northeast (OR 0.49, $p<0.01$) and higher utilization in the South (OR 1.34, $p<0.01$) and West (OR 1.20, $p=0.03$) compared with the Midwest.

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Surgical outcomes also varied significantly by SDOH. Orbital decompression was less likely among patients living in the Northeast (OR 0.11), and more likely among non-Hispanic patients (OR 1.34). Strabismus surgery was less likely among female (OR 0.79), urban (OR 0.77) and Black/African American (OR 0.57) patients, and more likely among non-Hispanic (OR 1.24), South-region (OR 1.23) and West-region patients (OR 1.42). Eyelid surgery was less likely among Black/African American (OR 0.75) and Medicare-insured patients (OR 0.41) but more likely among female (OR 1.41), non-Hispanic (OR 1.16), South-region (OR 1.21) and West-region patients (OR 1.13).

Conclusions: In this large registry-based cohort, race, urban/rural status, insurance type, and geographic region were independently associated with variation in teprotumumab utilization and surgical management. These findings suggest meaningful disparities in access to TED evaluation and treatment across patient populations and support targeted efforts to address regional, racial, and insurance-based gaps in equitable TED care.

References

1. Douglas RS, Kahaly GJ, Patel A, Sile S, Thompson EHZ, Perdok R, Fleming JC, Fowler BT, Marcocci C, Marinò M, Antonelli A, Dailey R, Harris GJ, Eckstein A, Schiffman J, Tang R, Nelson C, Salvi M, Wester S, Sherman JW, Vescio T, Holt RJ, Smith TJ. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020 Jan 23;382(4):341-352. doi: 10.1056/NEJMoa1910434.
2. Wang D, Marous C, Celiker P, Deng W, Kristoferson E, Elsayed A, Shinder R, Hodgson N. The association of race with thyroid eye disease presentation and outcomes. *Front Ophthalmol (Lausanne)*. 2024 Jan 23;3:1309850. doi: 10.3389/fopht.2023.1309850.
3. Vargason CW, Chelnis JG, Barahimi BI, Mawn LA. Socioeconomic Disparities in the Presentation and Treatment of Graves' Disease and Thyroid Eye Disease. *Semin Ophthalmol*. 2016;31(4):409-14. doi: 10.1080/08820538.2016.1185322. Epub 2016 Jul 6.
4. Tamhankar MA, Raza S, Brutsaert E, Urdániz E, Vainilovich Y, Heyes A, Gildea L, Sales-Sanz M. The burden of illness in thyroid eye disease: current state of the evidence. *Front Ophthalmol (Lausanne)*. 2025 Apr 17;5:1565762. doi: 10.3389/fopht.2025.1565762.

25 Teprotumumab Clinical Outcomes in Thyroid Eye Disease are Independent of Baseline Thyroid Function

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Introduction: Teprotumumab has demonstrated efficacy in treating thyroid eye disease (TED), improving clinical outcomes such as proptosis and diplopia. However, initial clinical trials primarily enrolled euthyroid or mildly hypo/hyperthyroid patients.¹ While one study enrolled patients who were hypothyroid at diagnosis, all became euthyroid prior to treatment.² Therefore, teprotumumab's efficacy in patients with active thyroid dysfunction remains uncharacterized. This study assesses the impact of baseline thyroid function on clinical outcomes of teprotumumab for TED.

Methods: A retrospective analysis evaluated all patients at a tertiary eye center who completed at least 4 infusions of teprotumumab and underwent baseline thyroid function testing. Thyroid stimulating hormone (TSH), free thyroxine (FT4), and thyroid stimulating immunoglobulin (TSI) were recorded at the time point closest to starting teprotumumab. Patients were categorized by FT4 control (within 50% of normal limits versus >50% deviation) and by thyroid status based on concurrent TSH and FT4 levels (euthyroid, subclinical hyperthyroid, overt hyperthyroid, hypothyroid). Primary outcomes included changes in clinical activity score (CAS), diplopia (Gorman score), and proptosis (exophthalmometry) measured at first post-treatment and most recent follow-up visits. Secondary outcomes included the need for additional treatment courses. Associations were evaluated via nonparametric testing and mixed-effects linear regression accounting for inter-eye correlation.

Results: The cohort included 179 patients. Median time from date of thyroid function testing to initiation of teprotumumab was 1.81 months (interquartile range: 0.66 – 3.88). Baseline thyroid status included 38.5% (n=69) euthyroid, 19.6% (n=35) subclinical hyperthyroid, 11.2% (n=20) overt hyperthyroid, and 8.9% (n=16) hypothyroid. The remaining 21.8% (n=39) fell outside of standard diagnostic categories due to atypical laboratory patterns. Baseline FT4 was elevated in 13.9% and suppressed in 7.9%. However, accommodating a 50% deviation from normal limits to align with original clinical trial inclusion criteria resulted in 94.0% categorized as controlled and 6.0% as uncontrolled FT4. TSI was elevated in 94.6% of the cohort.

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Significant improvements in CAS, diplopia, and proptosis were observed across all baseline thyroid function groups and TSI subgroups (all $p < 0.05$). Baseline FT4 control, thyroid status group, and TSI elevation showed no significant association with changes in CAS, diplopia, or proptosis at any timepoint (all $p > 0.05$). Additionally, continuous analysis with Spearman correlation confirmed no significant association between magnitude of FT4 or TSI deviation from normal with clinical outcomes (all $p > 0.05$). None of these baseline thyroid function measures were significantly associated with the need for a second course of treatment (all $p > 0.05$).

Conclusions: In this real-world cohort, over 60% of patients demonstrated baseline thyroid dysfunction, most commonly subclinical hyperthyroidism, prior to initiation of teprotumumab. However, patients achieved robust, comparable improvements in CAS, diplopia, and proptosis regardless of baseline FT4 levels, overall thyroid status, or antibody burden. These findings suggest that teprotumumab remains an effective treatment for thyroid eye disease regardless of severity of initial systemic endocrine dysregulation. Further studies may help to elucidate the utility of teprotumumab in cases where biochemical control of thyroid function may not be achieved prior to treatment.

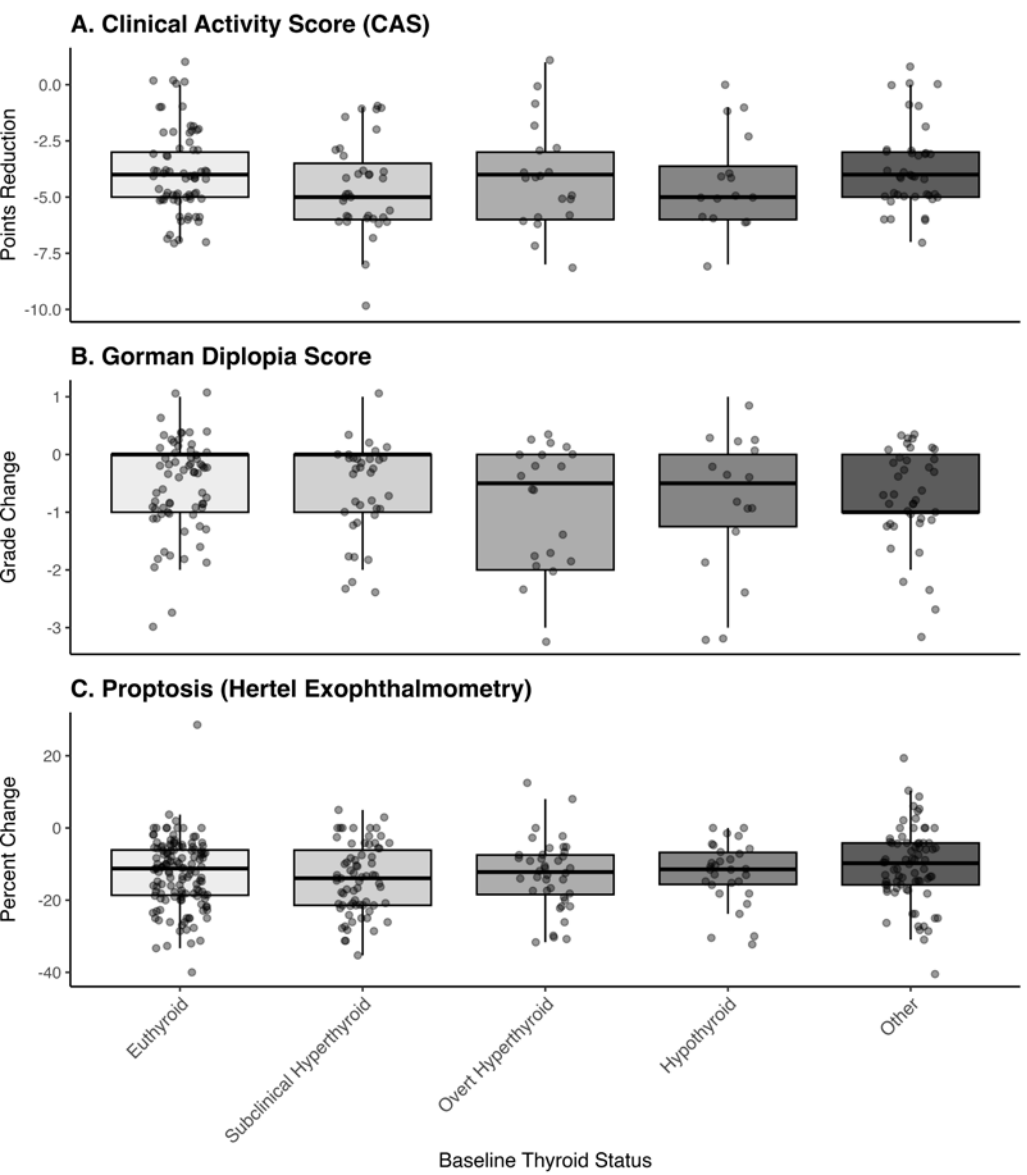
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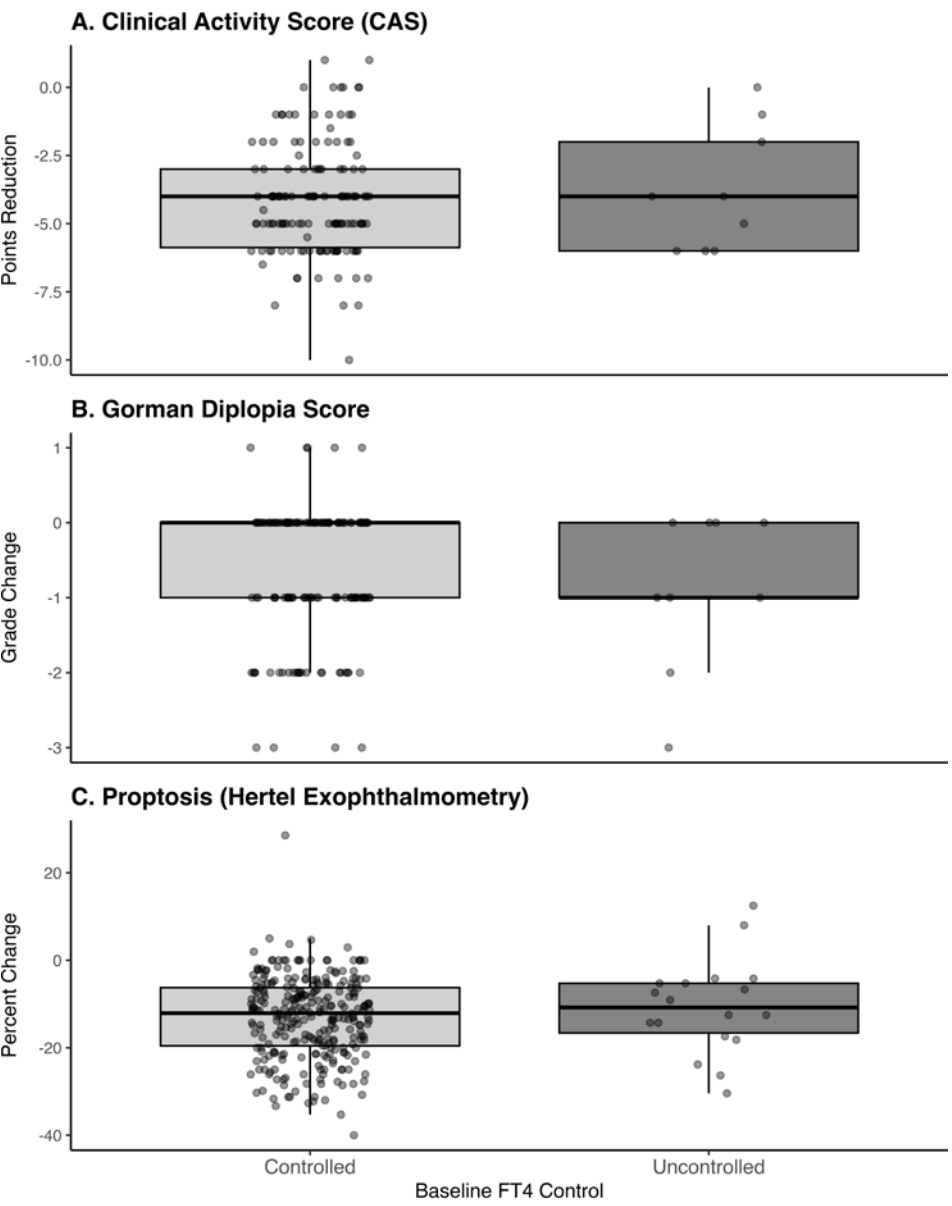
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Figure 1. Clinical outcomes after teprotumumab stratified by baseline thyroid status



Cohorts are defined as euthyroid (TSH and FT4 within normal limits [WNL]), hypothyroid (TSH elevated, FT4 WNL or low), subclinical hyperthyroid (TSH low, FT4 WNL), overt hyperthyroid (TSH low, FT4 elevated), or other (all other combinations of TSH and FT4).

Figure 2. Clinical outcomes after teprotumumab stratified by baseline FT4 control



Controlled FT4: normal or < 50% above/below normal limits. Uncontrolled FT4: > 50% above/below normal limits.

References

1. Douglas RS, Kahaly GJ, Patel A, et al. Teprotumumab for the Treatment of Active Thyroid Eye Disease. *N Engl J Med*. 2020;382(4):341-352. doi:10.1056/NEJMoa1910434
2. Ugradar S, Parunakian E, Malkhasyan E, et al. Teprotumumab for thyroid eye disease in patients with hypothyroid/euthyroid state: a multicenter case series. *Graefes Arch Clin Exp Ophthalmol*. 2025;263(1):225-230. doi:10.1007/s00417-024-06599-3

26 The Effect of Concomitant Orbital Fractures on Patients Presenting with Traumatic Ocular Injuries

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Introduction: It has previously been hypothesized that the presence of orbital fractures in the acute traumatic setting can have a protective effect on the eyeball itself due to the de-compressive effect. However, there have been no large scale studies to investigate this claim. The purpose of this study is to evaluate the effect of concomitant orbital fractures and globe injury.

Methods: A retrospective study was conducted using the Trinetx database. The case group included patients who had both an orbital contusion injury, or an open globe injury and an orbital fracture. This group was compared against a demographically matched control group of patients who had an orbital contusion or open globe injury without orbital fractures. Pair t-test was used for statistical analysis.

Results: 16,549 patients presented with an ocular contusion injury as well as an orbital fracture. These patients were matched against 16,549 patients who had identical demographic parameters but who presented with an ocular contusion injury without orbital fractures. The patients with an orbital fracture as well as a ocular contusion injury had a significantly higher risk of regmatogenous retinal detachment and a higher need for evisceration or enucleation following the injury. There was no significant difference in patients' rate of glaucoma or globe rupture between the two groups.

2,345 patients presented with an open globe injury and a concomitant orbital fracture. These patients were matched to 2,345 patients who presented with an open globe injury without an orbital fracture. The rate of need for an enucleation or evisceration was significantly higher in patients with an orbital fracture (8.8% vs 3.75%, $p < 0.0001$). There was a significantly higher rate of loss of vision (10.1% vs 6.4%; $p < 0.0001$) and blindness (9.2% vs 5.5%; $P < 0.0001$) in the group with orbital fractures. Interestingly, there were lower rates of glaucoma in patients with orbital fractures (0.8% vs 1.6%; $p < 0.019$). The rates of diplopia in patients with open globe injury who also had orbital fractures was higher. (3.2% vs 1.37%; $p < 0.0001$). Rates of endophthalmitis between the two groups was not significant. Optic atrophy was higher in patients who also had orbital fractures (6.7% vs 3.5%, $p < 0.0001$).

Conclusions: Orbital fractures are predictors of poor outcomes following severe ocular injury. While there may be some decompressive effect, understanding the sequela that can occur in patients with open globe injuries is vital to being able to appropriately treat them. Further beneficial studies include evaluating if there are ways to manage concurrent open globe injuries and orbital fractures that could reduce the risk of poor outcomes following repair.

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Figure 1

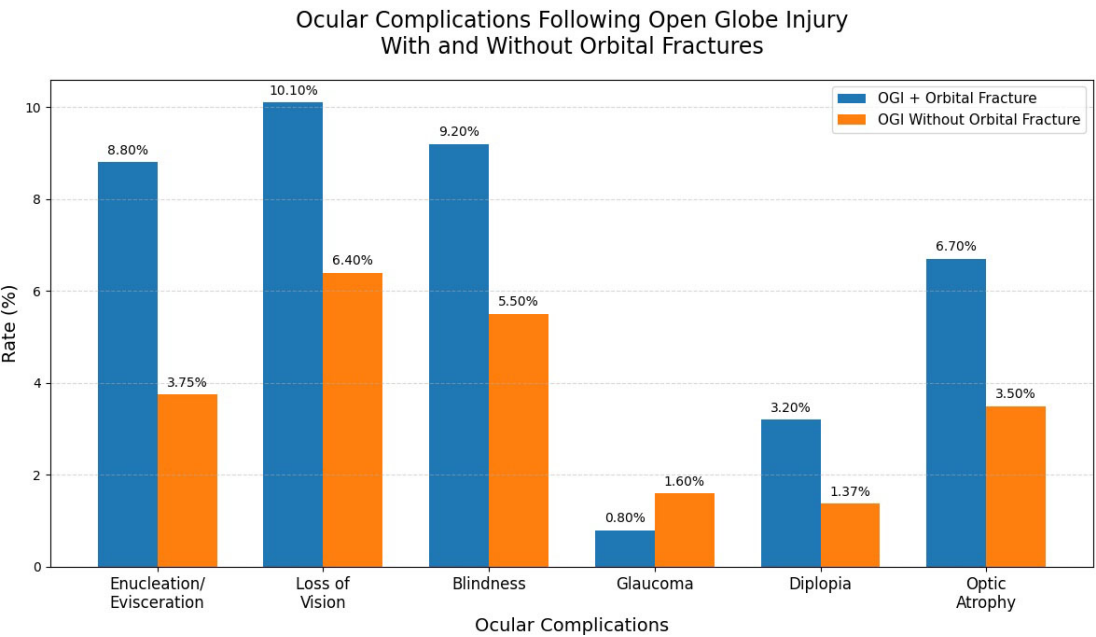
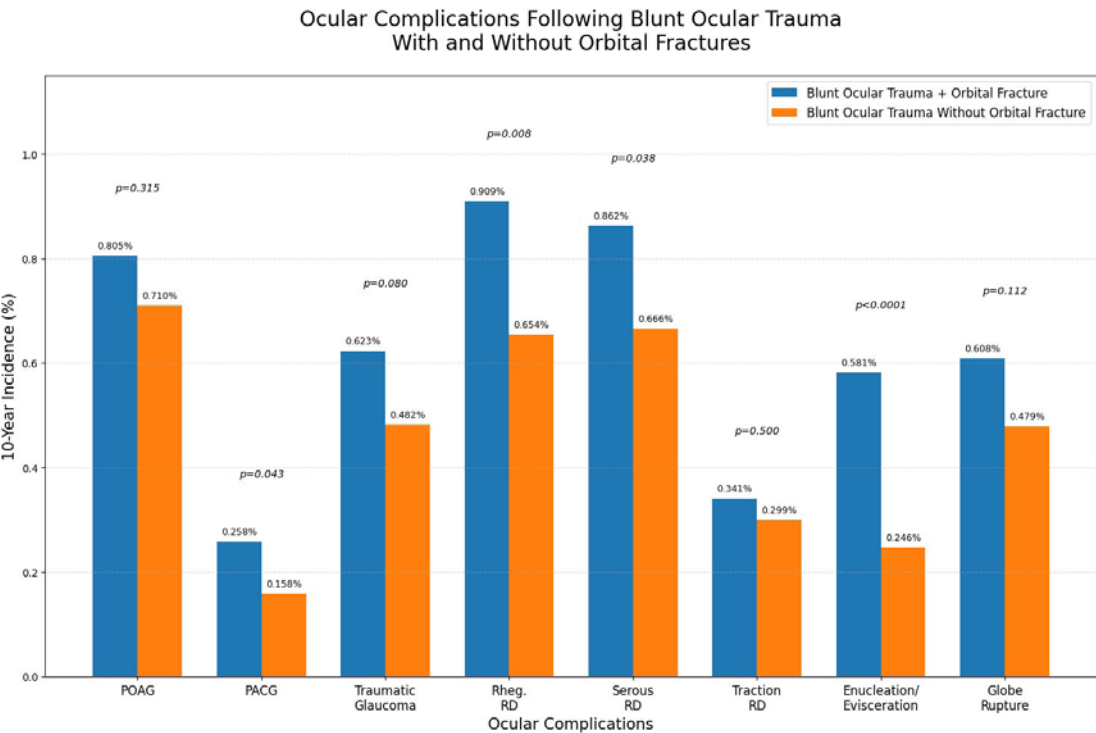


Figure 2



References

1. Terrill SB, You H, Eiseman H, Rauser ME. Review of Ocular Injuries in Patients with Orbital Wall Fractures: A 5-Year Retrospective Analysis. Clin Ophthalmol. 2020 Sep 24;14:2837-2842. doi: 10.2147/OPTH.S274567. PMID: 33061268; PMCID: PMC7522316.
2. Rossin EJ, Szytko C, Giese I, Hall N, Gardiner MF, Lorch A. Factors Associated With Increased Risk of Serious Ocular Injury in the Setting of Orbital Fracture. JAMA Ophthalmol. 2021;139(1):77-83. doi:10.1001/jamaophthalmol.2020.5108
3. Noh H, Chung JK, Woo KI, Kim YD. Occurrence of ocular injury and orbital fracture in orbital blunt trauma patients at tertiary care center emergency room. Graefes Arch Clin Exp Ophthalmol. 2021 Jan;259(1):165-171. doi: 10.1007/s00417-020-04786-6. Epub 2020 Jun 8. PMID: 32514771.
4. Narjus-Sterba M, Puolakkainen T, Kokko L, Thorén H, Snäll J. Occurrence and outcomes of retrobulbar haematoma in 2149 orbital fracture patients. Oral Maxillofac Surg. 2025 Jul 10;29(1):134. doi: 10.1007/s10006-025-01427-2. PMID: 40637913; PMCID: PMC12245962.

27 The Effect of Temporal Artery Biopsy Results on the Treatment of Suspected Giant Cell Arteritis

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Introduction: Giant Cell Arteritis (GCA) is an inflammatory vasculitis that can affect medium and large arteries predominantly in the head and neck. Inflammatory vascular occlusions and tissue ischemia in the head and neck result in the various classical presenting signs and symptoms of GCA, including headache, scalp tenderness, jaw claudication, and visual obscurations or loss. More severe disease may result in disabling or lethal complications, such as irreversible vision loss, myocardial infarction, cerebrovascular accident, or aortic aneurysm. Therefore, it is crucial to consider GCA in patients over 50 years old who present with these symptoms.^{1,2} Temporal artery biopsy (TAB) is commonly used to analyze arterial tissue for granulomatous vasculitis, which is highly specific for GCA. Initiation of treatment prior to TAB is also common practice considering potential consequences of progressive disease.^{1,3-6} However, previous studies have questioned the necessity of TAB in the diagnosis and management of GCA. In some studies, most patients underwent TAB despite already meeting the American College of Rheumatology criteria to clinically diagnose GCA, leading to unnecessary biopsies.^{1,3} Moreover, the low sensitivity and negative predictive value leads many patients to complete a full regimen of immunosuppressive treatment despite a negative biopsy result, raising questions about TAB as a valuable diagnostic tool. This study investigates the real-world utility of the results of TAB when formulating treatment plans for patients with suspected GCA.

Methods: Retrospective chart review of all patients undergoing TAB through a single health system from 2013 – 2022. All patients included underwent TAB and were subsequently managed by affiliated physicians for a minimum of three months post-biopsy. Patients were categorized based on positive or negative TAB results. Further stratification was performed to separate those who continued therapy from those who tapered or stopped therapy by three-months follow-up post TAB.

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Results: 1029 charts were reviewed, and 448 patients were included. 85.5% of patients were on immunosuppression at the time of TAB. 18.0% of patients (95% CI: 17.9% – 18.2%) had biopsy results indicative of active or healed arterial inflammation (positive), while 82% (95% CI: 81.8% – 82.1%) had negative biopsy results. Among the patients with positive biopsies, 97.5% continued therapy while 2.5% discontinued therapy within three months. In contrast, among patients with negative biopsies, 23.4% continued therapy and 76.6% discontinued therapy within three months (Figure 1). About half of the patients who discontinued treatment did so within one month of TAB, regardless of biopsy result (Figure 2). Some baseline medical comorbidities (Figure 3) and demographic characteristics (Figure 4) were significantly associated with continuation of therapy after a negative TAB.

Conclusions: A substantial proportion of TABs provide useful information for clinical decision making. However, a still-substantial proportion of negative biopsies – nearly one in four – are discounted, and aggressive treatment is continued for presumed GCA despite the result. This finding reinforces similar data from smaller prior studies.^{5,6} As such, it would be prudent to identify factors that may influence a practitioner to make treatment decisions independent of biopsy results. These factors may reduce the clinical value of this invasive diagnostic procedure.

Figure 1

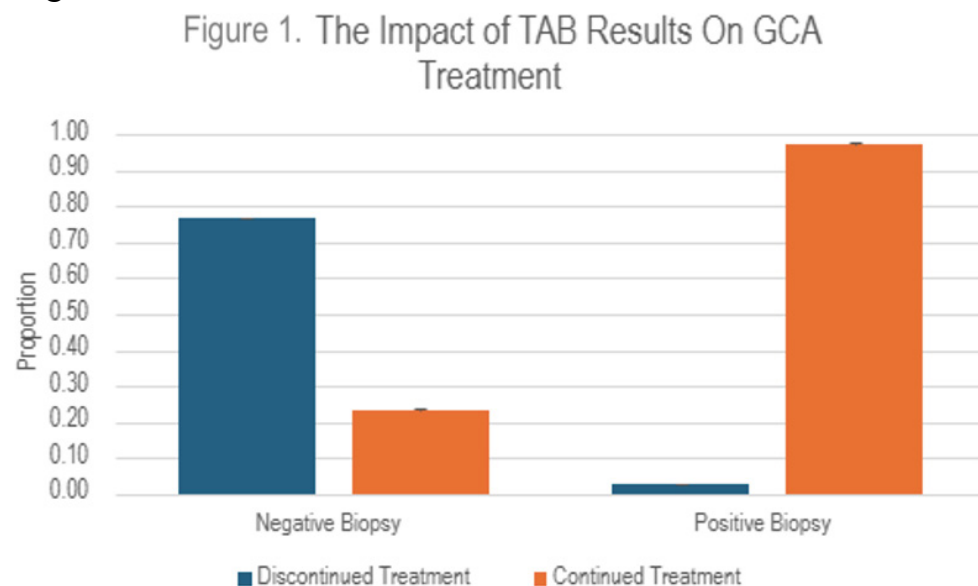
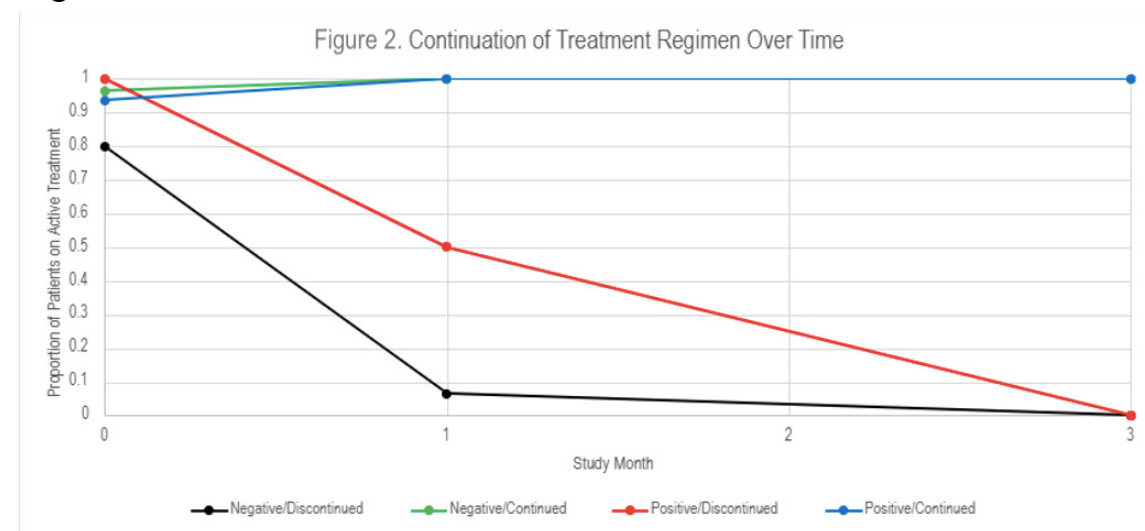


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Figure 3

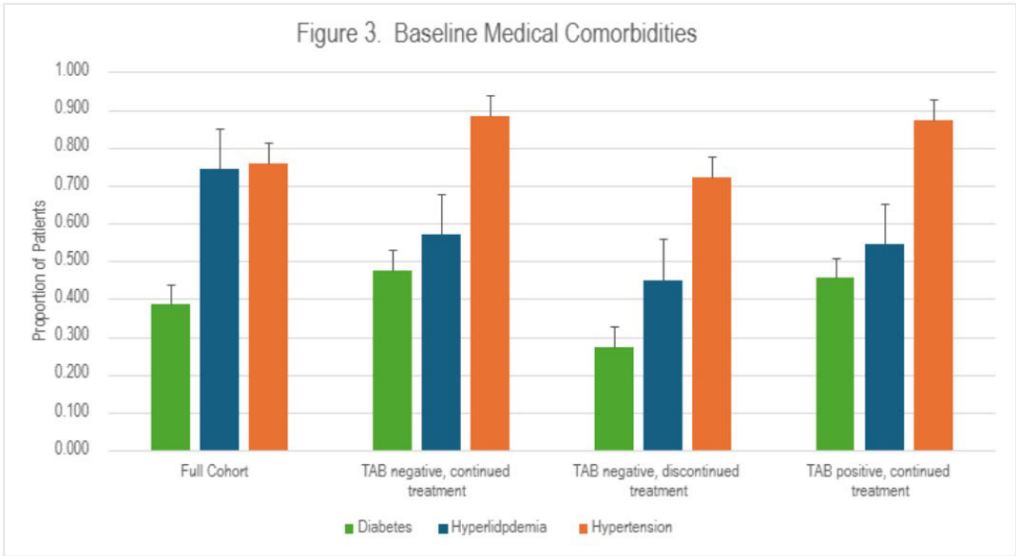


Figure 4

Study Group	N	Proportion Non-Hispanic White	Proportion African American	Proportion Hispanic	Proportion Asian
Full Cohort	448	0.654+/-0.0450	0.259+/-0.0415	0.074+/-0.0254	0.013+/-0.012
TAB negative, continued treatment	86	0.484+/-0.110	*0.512+/-0.110	0.0120+/-0.0314	0+0.021
TAB negative, discontinued treatment	281	0.708+/-0.056	0.203+/-0.0480	0.0330+/-0.0225	0.0160+/-0.161
TAB positive, continued treatment	79	0.709+/-0.105	0.228+/-0.0975	0.0560+/-0.0605	0.0130+/-0.034

References

1. Davies CG, May DJ. The role of temporal artery biopsies in giant cell arteritis. Ann R Coll Surg Engl. 2011 Jan;93(1):4-5.

2. Hunder GG, Bloch DA, Michel BA, Stevens MB, Arend WP, et al. The American College of Rheumatology 1990 criteria for the classification of giant cell arteritis. Arthritis Rheum. 1990;33:1122-8.

3. Ameer MA, Vaqar S, Khazaeni B. Giant Cell Arteritis (Temporal Arteritis) [Updated 2024 May 2]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan.

4. Younge BR, Cook Jr BE, Bartley GB, Hodge DO, Hunder GG. Initiation of glucocorticoid therapy: before or after temporal artery biopsy? Mayo Clin Proc. 2004;79:483-91.

5. Bowling K, Rait J, Atkinson J, Srinivas G. Temporal artery biopsy in the diagnosis of giant cell arteritis: Does the end justify the means? Ann Med Surg (Lond). 2017 Jun 15;20:1-5.

6. J. Lenton, R. Donnelly, J.R. Nash, Does temporal artery biopsy influence the management of temporal arteritis?, QJM: An International Journal of Medicine, 2006 Jan; 99 (1); 33-6

28 The Use of Hypochlorous Acid in Necrotizing Sinus Disease

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Introduction: Hypochlorous acid has recently been reported in the treatment of periorbital necrotizing fasciitis.¹⁻² Because it is an uncharged molecule, hypochlorous acid can penetrate negatively charged microbial cell walls in a way that sodium hypochlorite cannot.³⁻⁴ In addition, hypochlorous acid differs from sodium hypochlorite because it is not cytotoxic to healthy tissue.⁴⁻⁶ In fact, it is one of the reactive oxygen species naturally produced by an uncorrupted immune system.⁷

Given its successful use in periorbital necrotizing fasciitis, we hypothesized that hypochlorous acid could also be used in the treatment of necrotizing infections of the sinuses. The purpose of this case series is to report cases of necrotizing sinus infections treated with hypochlorous acid, which may inform future studies evaluating its effectiveness.

Methods: This case series presents three cases of necrotizing sinusitis treated with hypochlorous acid.

Results: Case 1: An 82-year-old male with a 2-year history of chronic pseudomonal rhinosinusitis and history of 4 sinus surgeries presented to the ED with necrotizing sinusitis and necrotizing orbital cellulitis (Figure 1). The patient was taken to the OR for biopsy, debridement, hypochlorous acid irrigation, and placement of catheters through the inferior orbit, maxillary sinus, and nose (Figure 2). After the surgery, 10mL hypochlorous acid flushes were started q6h. Two days later, a second washout with catheter placement and hypochlorous acid irrigation was performed, followed by 5 mL of hypochlorous acid irrigation bid. Over the next three days, his condition improved, the catheters were removed, and the patient was discharged with resolution of disease (Figure 3).

Case 2: A 62-year-old female presented with an infection involving the left orbit, cavernous sinus, frontal sinus, and ethmoid sinus. Imaging and biopsy showed invasive fungal sinusitis and orbital cellulitis. A catheter was surgically placed in the posterior medial orbit with the tip in the ethmoid sinus, and 10 mL of hypochlorous acid and amphotericin were each flushed through the catheter. The patient was discharged and self-administered 10 mL hypochlorous acid and amphotericin flushes daily for the next 3 weeks. Repeat imaging then showed a significant decrease in the orbital and sinus disease, which subsequently resolved.

Case 3: A 73-year-old male presented with necrotizing fungal cellulitis and sinusitis involving the left maxillary sinus, ethmoid sinus, and orbit. The patient was taken to the OR for debridement, washout, and catheter placement in orbit and ethmoid sinus. The patient

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subsequently received 2mL of hypochlorous acid and amphotericin flushes each q12h for 4 days. A second washout, removal of catheter, and placement of two catheters in the pterygopalatine fossa, ethmoid sinus, and sphenoid sinus was performed. The patient then received 6 mL of hypochlorous acid, amphotericin, and vancomycin flushes each q12h for 5 days. His condition improved, and the catheters were removed 5 days later. The patient was discharged 6 days after catheter removal with resolution of disease.

Conclusions: Hypochlorous acid was well tolerated by patients in three cases of necrotizing sinusitis and may have contributed to their recovery. Further research studies are warranted into its effectiveness in necrotizing sinus disease.

Figure 1

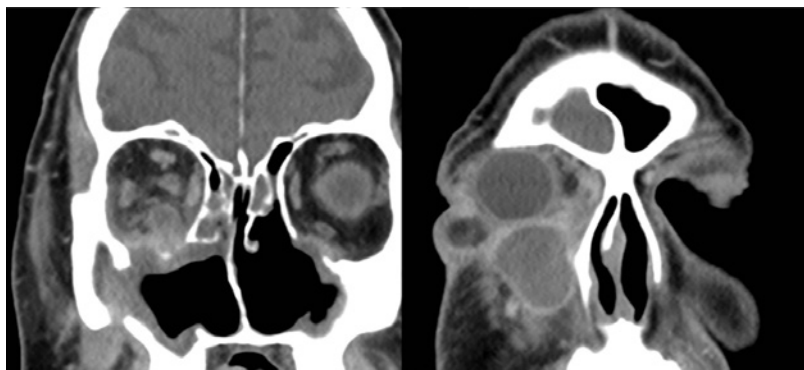


Figure 2



Figure 3



References

1. Siktberg J, Mawn LA. The Use of Hypochlorous Acid in the Treatment of Periorbital Necrotizing Fasciitis. *Ophthalmic Plast Reconstr Surg*. Published online September 24, 2025. doi:10.1097/IOP.0000000000003061
2. Jordan DR, Kanda P. Hypochlorous Acid as an Adjunctive Treatment for Periocular Necrotizing Fasciitis. *Ophthalmic Plast Reconstr Surg*. Published online December 31, 2025. doi:10.1097/IOP.0000000000003170
3. Crew JR, Varilla R, Allandale Rocas Iii T, Abdul Rani S, Debabov D. Treatment of Acute Necrotizing Fasciitis Using Negative Pressure Wound Therapy and Adjunctive NeutroPhase Irrigation Under the Foam. *Wounds*. 2013;25(10):272-277.
4. Crew J, Varilla R, Rocas TA, et al. NeutroPhase® in chronic non-healing wounds. *Int J Burns Trauma*. 2012;2(3):126-134.
5. Crew JR, Thibodeaux KT, Speyrer MS, et al. Flow-through Instillation of Hypochlorous Acid in the Treatment of Necrotizing Fasciitis. *Wounds*. 2016;28(2):40-47.
6. Kim HJ, Lee JG, Kang JW, et al. Effects of a low concentration hypochlorous Acid nasal irrigation solution on bacteria, fungi, and virus. *Laryngoscope*. 2008;118(10):1862-1867.
7. Henningham A, Döhrmann S, Nizet V, et al. Mechanisms of group A Streptococcus resistance to reactive oxygen species. *FEMS Microbiol Rev*. 2015;39:488-508.

29 Timing of Intravenous Glucocorticoids in Orbital Cellulitis

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Introduction: Orbital cellulitis is a potentially vision and life-threatening infection characterized by inflammatory edema within the orbit. First-line therapy includes broad-spectrum intravenous antibiotics. Intravenous glucocorticoids have been proposed as adjunctive therapy to reduce orbital inflammation with prior studies demonstrating shorter hospital stays in patients receiving intravenous glucocorticoids, suggesting potential benefit.^{1,2}

The optimal timing of corticosteroid initiation in orbital cellulitis remains unclear.³ This study investigates whether the timing of intravenous glucocorticoids is associated with differences in clinical outcomes in patients with orbital cellulitis.

Methods: This is a retrospective cohort study using the TriNetX Research Network (TNX), which contains aggregated, de-identified medical records of over 144 million patients across 110 healthcare organizations. Patients diagnosed with orbital cellulitis (ICD-10: H05.01) were identified and stratified based on whether intravenous glucocorticoids were administered within 0-1 days of diagnosis or within 2-7 days of diagnosis. Nearest-neighbor propensity score matching with a 30-day lookback window was performed on demographics, cardiometabolic risk factors, sinus involvement, antibiotic use, markers of cellulitis severity, and healthcare utilization. Outcomes of interest included evisceration, enucleation or exenteration, intracranial extension of infection, sepsis, intensive care unit admission, escalation to orbitotomy or surgical sinus endoscopy, optic neuropathy, and mortality. Outcomes were assessed from 1 to 30 days following orbital cellulitis diagnosis. Patients with any outcome of interest in the three months prior to diagnosis were excluded. Hazard ratios were calculated within TNX on March 3, 2026. See Figure 1 for an inclusion flowchart.

Results: A total of 47,775 patients with orbital cellulitis were identified. Following propensity score matching, each cohort contained 1,272 patients and baseline characteristics were well balanced (all standardized mean differences <0.10) (Table 1). Compared with early glucocorticoid administration (day 0-1), delayed administration (day 2-7) was associated with a higher risk of removal procedures of eye contents (3.4% vs 1.3%; hazard ratio [HR] 2.51, 95% CI 1.43-4.40; log-rank p=0.001). Delayed administration was also associated with higher rates of escalation to orbitotomy or surgical sinus endoscopy (23.7% vs 13.6%; HR 1.75, 95% CI 1.45-2.11; log-rank p<0.0001). There were no significant differences between delayed versus early administration for intracranial extension (7.1% vs 7.2%; HR 0.97, 95% CI 0.72-

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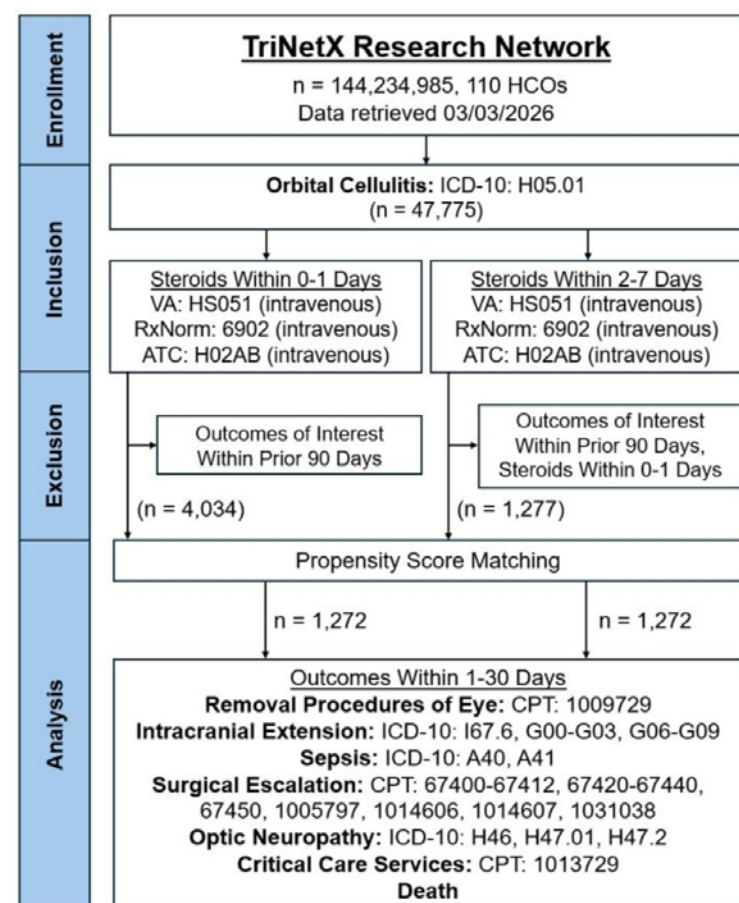
ORBITAL DISEASE

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1.29), sepsis (6.4% vs 5.0%; HR 1.26, 95% CI 0.91-1.76), intensive care unit admission (7.2% vs 6.1%; HR 1.15, 95% CI 0.85-1.56), optic neuropathy (2.3% vs 2.0%; HR 1.15, 95% CI 0.67-1.96), or mortality (2.8% vs 2.4%; HR 1.10, 95% CI 0.68-1.79).

Conclusions: In a propensity-matched, multi-institutional cohort, delayed intravenous glucocorticoid administration was associated with higher risks of eye removal procedures and surgical escalation compared with early administration, while rates of intracranial extension, sepsis, intensive care use, optic neuropathy, and mortality were similar between groups. These findings suggest that, among patients selected to receive systemic steroids for orbital cellulitis, earlier initiation may be associated with less severe downstream clinical course. Although matching incorporated inflammatory markers and sinusitis diagnoses as proxies for disease severity, variation in corticosteroid regimens across centers and unmeasured factors such as abscess characteristics, microbiology, and baseline disease severity may introduce residual confounding factors. Prospective studies are indicated to determine causality.

Figure 1



(continued)

Figure 2

Variable	Steroids Day 2-7	Steroids Day 0-1	Standardized Mean Difference
Age, mean ± SD (years)	39.3 ± 25.8	39.5 ± 25.3	0.009
Male	724 (56.9%)	711 (55.9%)	0.021
White	785 (61.7%)	757 (59.5%)	0.045
Black or African American	227 (17.8%)	250 (19.7%)	0.046
Asian	72 (5.7%)	64 (5.0%)	0.028
Hispanic or Latino	145 (11.4%)	152 (11.9%)	0.017
Type 2 diabetes mellitus	203 (16.0%)	214 (16.8%)	0.023
Overweight or obesity	130 (10.2%)	124 (9.7%)	0.016
Alcohol-related disorders	36 (2.8%)	29 (2.3%)	0.035
Nicotine dependence	212 (16.7%)	210 (16.5%)	0.004
Essential hypertension	360 (28.3%)	364 (28.6%)	0.007
Ischemic heart disease	109 (8.6%)	99 (7.8%)	0.029
Obstructive sleep apnea	46 (3.6%)	46 (3.6%)	<0.001
Socioeconomic/psychosocial risk factors	66 (5.2%)	64 (5.0%)	0.007
Chronic kidney disease	108 (8.5%)	100 (7.9%)	0.023
Acute maxillary sinusitis	121 (9.5%)	117 (9.2%)	0.011
Acute frontal sinusitis	59 (4.6%)	58 (4.6%)	0.004
Acute ethmoidal sinusitis	96 (7.5%)	93 (7.3%)	0.009
Acute sphenoidal sinusitis	21 (1.7%)	19 (1.5%)	0.013
Acute pansinusitis	87 (6.8%)	99 (7.8%)	0.036
Other acute sinusitis	35 (2.8%)	31 (2.4%)	0.020
Chronic maxillary sinusitis	111 (8.7%)	99 (7.8%)	0.034
Chronic frontal sinusitis	46 (3.6%)	44 (3.5%)	0.009
Chronic ethmoidal sinusitis	89 (7.0%)	76 (6.0%)	0.042
Chronic sphenoidal sinusitis	25 (2.0%)	20 (1.6%)	0.030
Chronic pansinusitis	94 (7.4%)	107 (8.4%)	0.038
Other chronic sinusitis	41 (3.2%)	49 (3.9%)	0.034
Periorbital cellulitis	523 (41.1%)	518 (40.7%)	0.008
CT orbit imaging	330 (25.9%)	334 (26.3%)	0.007
MRI orbit imaging	59 (4.6%)	58 (4.6%)	0.004
Immunosuppressant use	28 (2.2%)	30 (2.4%)	0.011
Ampicillin	228 (17.9%)	215 (16.9%)	0.027
Ceftriaxone	261 (20.5%)	258 (20.3%)	0.006
Piperacillin	150 (11.8%)	157 (12.3%)	0.017
Vancomycin	502 (39.5%)	510 (40.1%)	0.013
Clindamycin	165 (13.0%)	157 (12.3%)	0.019
Leukocyte count, mean ± SD (×10 ³ /μL)	11.8 ± 10.5	12.3 ± 6.7	0.052
C-reactive protein, mean ± SD (mg/L)	82.2 ± 75.6	88.0 ± 87.2	0.070
Emergency visit	435 (34.2%)	439 (34.5%)	0.007
Ambulatory visit	818 (64.3%)	805 (63.3%)	0.021
Inpatient encounter	976 (76.7%)	970 (76.3%)	0.011

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References

1. Chen L, Silverman N, Wu A, Shinder R. Intravenous Steroids With Antibiotics on Admission for Children With Orbital Cellulitis. *Ophthalmic Plast Reconstr Surg*. 2018;34(3):205–208. doi:10.1097/IOP.0000000000000910
2. Pushker N, Tejawani LK, Bajaj MS, Khurana S, Velpandian T, Chandra M. Role of oral corticosteroids in orbital cellulitis. *Am J Ophthalmol*. 2013;156(1):178–183.e1. doi:10.1016/j.ajo.2013.01.031
3. Kim BY, Bae JH. Role of systemic corticosteroids in orbital cellulitis: a meta-analysis and literature review. *Braz J Otorhinolaryngol*. 2022;88(2):257–262. doi:10.1016/j.bjorl.2021.02.003

30 Trends and Safety Outcomes of Transorbital Neurosurgery: A 15-Year Propensity Score-Matched Analysis

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Introduction: Transorbital neurosurgical approaches provide minimally invasive yet effective surgical access to anterior and middle cranial fossa lesions. Access to the skull base via the orbit allows for smaller incisions with decreased wound-healing time and postoperative care and can avoid extended brain retraction intraoperatively. Given these advantages and ongoing advancements in surgical techniques, transorbital approaches are increasingly being undertaken by multidisciplinary teams consisting of both neurosurgeons and oculoplastic surgeons.

Most published outcomes for transorbital neurosurgery come from single-center data, and little is known about downstream ophthalmic morbidity such as diplopia or optic neuropathy. This study aims to use multi-center, real-world data to compare outcomes between patients undergoing traditional craniotomy approaches to the anterior or middle cranial fossa versus transorbital approaches.

Methods: We conducted a retrospective cohort study using the TriNetX US Collaborative Network, federated research network of 67 healthcare organizations and >115 million patients. Inclusion criteria were adults aged ≥18 years with a relevant intracranial diagnosis (e.g., central nervous system neoplasms, cerebral aneurysm) with record of an anterior or middle cranial fossa surgery identified via Current Procedural Terminology (CPT) codes. The transorbital cohort was defined as having a concurrent orbitotomy CPT code on the same day as skull base surgery; the control cohort was defined as not having a concurrent orbitotomy. Propensity score matching balanced age, sex, race/ethnicity, intracranial diagnosis, and prior eye surgery. Outcomes were measured at 1 year and included diplopia, ptosis, optic neuropathy/vision loss, cerebrospinal fluid (CSF) leak, meningitis, all-cause mortality, inpatient readmission, and reoperation; we also performed sensitivity analyses of outcomes at 90 days. Risk ratios and hazard ratios were calculated with 95% confidence intervals.

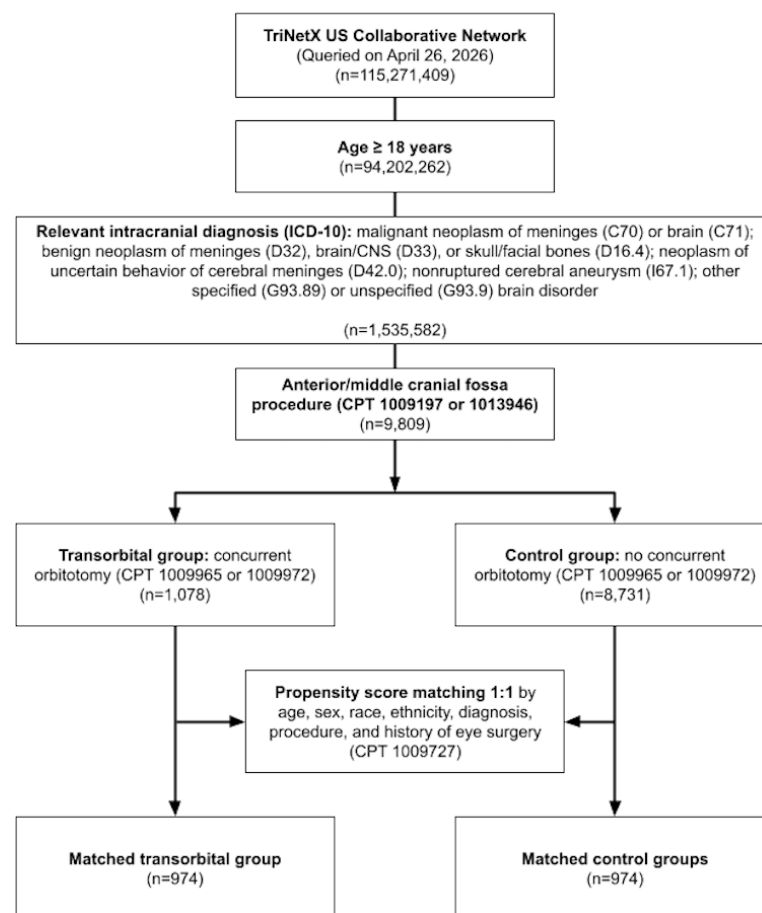
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Results: From 2010–2025, 1,078 patients had anterior/middle cranial fossa surgery with transorbital access, while 8,731 had a traditional craniotomy approach; propensity score matching yielded 974 pairs. At 1 year, no significant differences were observed for diplopia (RR 0.91, 95% CI 0.61–1.38), ptosis (0.79, 0.50–1.27), optic neuropathy/vision loss (1.24, 0.85–1.82), CSF leak (0.89, 0.53–1.51), meningitis (0.82, 0.45–1.52), all-cause mortality (0.93, 0.66–1.30), or reoperation (1.39, 0.88–2.18). Readmission rate was lower in the orbitotomy cohort (0.66, 0.56–0.77). The 90-day sensitivity analyses were consistent with results at 1 year.

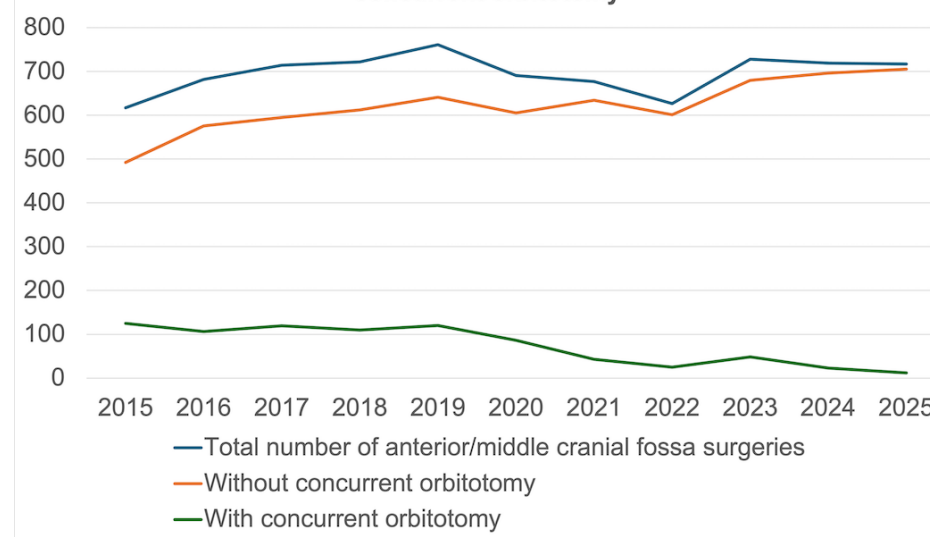
Conclusions: Transorbital access for anterior/middle cranial fossa skull base surgery is not associated with increased morbidity at 90 days or 1 year. The lower readmission rate suggests reduced overall postoperative morbidity, although residual confounding by surgical candidacy cannot be excluded. These findings highlight transorbital neurosurgery as a safe, minimally invasive surgical corridor and support the role of oculoplastic surgeons as collaborators for the of care patients with complex skull base lesions.

Figure 1: Flowchart of cohort selection



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Figure 2: Annual incidence of anterior/middle cranial fossa neurosurgery for relevant intracranial lesions with and without concurrent orbitotomy



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Figure 3: Baseline characteristics of cohorts with 1:1 propensity score matching

Characteristic	Before matching			After matching		
	Transorbital group (n=1,078)	Control group (n=8,731)	Std diff.	Transorbital group (n=974)	Control group (n=974)	Std diff.
DEMOGRAPHICS						
Age at index, mean ± SD	53.9 ± 17.4	53.5 ± 16.2	0.021	54.0 ± 17.3	54.5 ± 17.4	0.027
Female, %	54.7	57.1	0.048	54.7	55.3	0.012
White, %	49.4	70.5	0.442	54	56.7	0.054
Black or African American, %	11.3	14.7	0.101	12.4	11.8	0.019
Asian, %	5.6	4.5	0.052	5.3	5.1	0.009
Hispanic or Latino, %	10	7.4	0.091	9.9	9.1	0.025
Unknown race, %	31.6	5.5	0.713	26.1	24.4	0.038
DIAGNOSES						
Any neoplasm (C00-D49), %	92.5	79.7	0.376	92.3	92.8	0.02
Diseases of eye and adnexa (H00-H59), %	53.1	42.1	0.222	52.5	59	0.133
Malignant neoplasm of brain (C71), %	10.7	4.5	0.236	9	9.5	0.018
Benign meningioma (D32), %	33.6	30.7	0.062	34.5	35.5	0.022
PROCEDURES						
Anterior cranial fossa skull base procedures, %	13.6	9.3	0.136	11.9	9.3	0.083
Middle cranial fossa skull base procedures, %	2.6	3.8	0.069	2.5	2.1	0.028
Prior eye/adnexa surgery, %	31.1	4.4	0.746	25.7	27	0.03

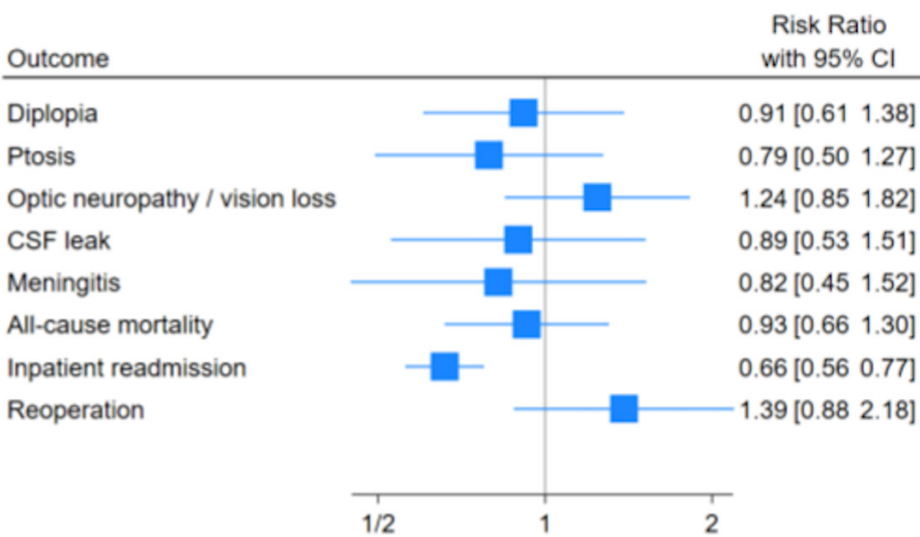
References

1. Abou-Al-Shaar, H. *et al.* Cranio-Orbital and Orbitocranial Approaches to Orbital and Intracranial Disease: Eye-Opening Approaches for Neurosurgeons. *Front Surg* 7, 1 (2020).

2. de Notaris, M. *et al.* The Transorbital Approach, A Game-Changer in Neurosurgery: A Guide to Safe and Reliable Surgery Based on Anatomical Principles. *Journal of Clinical Medicine* 12, 6484 (2023).

3. Moe, K. S., Bergeron, C. M. & Ellenbogen, R. G. Transorbital Neuroendoscopic Surgery. *Operative Neurosurgery* 67, ons16 (2010).

Figure 4: Adverse postoperative outcomes at 1 year for anterior/middle cranial fossa neurosurgery with transorbital vs. craniotomy approach



31 Factors Associated with Visual Acuity Outcomes in Pediatric Thyroid Eye Disease

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Introduction: Thyroid eye disease (TED) in children may impact visual quality through several distinct mechanisms. Vision-threatening etiologies such as compressive optic neuropathy or significant ocular misalignment secondary to orbital tissue expansion are generally less common in pediatric populations compared to adults.¹⁻³ Instead, deterioration of the ocular surface due to overexposure and concurrent inflammation is hypothesized to drive fluctuating or impaired vision in the pediatric population.¹ Understanding the predominant causes of visual changes and the course of visual acuity is essential for appropriate management in this distinct population. This study aimed to characterize longitudinal visual acuity outcomes in pediatric TED and to identify clinical and demographic factors which correlate with these different visual trajectories.

Methods: This study collected data from Texas Children's Hospital with all patients diagnosed with TED between 2013 and 2023. International Classification of Diseases, 9th and 10th Revision (ICD-9 & 10) codes were used to identify patients with autoimmune thyroid disease and ocular manifestations consistent with TED. Patients were then reviewed to identify those meeting diagnostic criteria for TED as outlined by Bartley and Gorman.⁴ Patients with only a single visit or inconsistent visual acuity recordings were excluded. The eye with worse visual acuity at initial presentation was designated as the study eye. Visual acuity outcomes were classified into three groups: Abnormal LogMAR improving to Normal (Abnormal → Normal), Normal LogMAR worsening to Abnormal (Normal → Abnormal), or No Change in LogMAR status. Clinical, demographic, and laboratory variables, including age at TED diagnosis, thyroid function tests (FT4, TSH), thyroid stimulating immunoglobulin (TSI), Clinical Activity Score (CAS), and ocular findings such as the difference in proptosis between eyes, were assessed for associations with these outcome groups using Kruskal-Wallis or Fisher's Exact tests.

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Results: Fifty-two patients met the inclusion criteria. Of these, nineteen (36.5%) experienced an improvement in visual acuity from abnormal to normal, seven (13.5%) had a worsening from normal to abnormal, and twenty-six (50.0%) showed no change in their visual acuity status category. A significant association was found between the initial difference in proptosis between the two eyes and visual acuity outcome groups (Kruskal-Wallis, $\chi^2=7.04$, $p=0.03$). Patients who experienced “No Change” in their visual acuity status had the highest mean difference in proptosis between eyes at the initial appointment, while those whose vision changed from “Normal → Abnormal” had the lowest mean difference. Other factors, including age at diagnosis, FT4, TSH, TSI levels, sex, race, ethnicity, CAS and family history of autoimmune disease, were not significantly associated with visual acuity outcomes. While not reaching statistical significance, longer referral times did trend towards worsening vision.

Conclusions: In this cohort of pediatric patients with TED, a greater initial difference in proptosis between eyes was significantly associated with the visual acuity outcome, with the largest differences seen in patients whose visual acuity category did not change. Beyond initial ocular asymmetry, most other evaluated clinical, demographic, and systemic factors did not emerge as significant predictors of either improvement or deterioration in visual acuity highlighting the need for further studies specifically in pediatric TED populations.

References

1. Chua MR, Tomlinson LA, Binenbaum G, Katowitz WR. Pediatric Thyroid Eye Disease: Clinical Characteristics and Orbital Decompression Outcomes. *Ophthalmic Plast Reconstr Surg*. 2018 Jul/Aug;34(4S Suppl 1):S52-S55. doi: 10.1097/IOP.0000000000001137. PMID: 29985836.
2. Holt H, Hunter DG, Smith J, Dagi LR. Pediatric Graves' ophthalmopathy: the pre- and postpubertal experience. *J AAPOS*. 2008 Aug;12(4):357-60. doi: 10.1016/j.jaapos.2007.12.011. Epub 2008 Mar 24. PMID: 18359653.
3. Goldstein SM, Katowitz WR, Moshang T, Katowitz JA. Pediatric thyroid-associated orbitopathy: the Children's Hospital of Philadelphia experience and literature review. *Thyroid*. 2008 Sep;18(9):997-9. doi: 10.1089/thy.2008.0014. PMID: 18713025.
4. Bartley GB, Gorman CA. Diagnostic criteria for Graves' ophthalmopathy. *Am J Ophthalmol*. 1995;119(6):792-795. doi:10.1016/S0002-9394(14)72787-4

32 How Botulinum Toxin Package Inserts Are Used in Practice: A Provider Survey and Observational Waste Analysis

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Introduction: Botulinum toxin printed package inserts are meant to give important information about dosing, administration, and safety. However these inserts are often discarded, and their practice utility remains uncertain. At the same time, there is an increasing focus on reducing unnecessary waste in healthcare, with focused subspecialty interventions. To this end, digital tools like QR codes to access updated online pages may offer product information in a more accessible and interactive format with less waste.

Currently there is limited data on how often package inserts are referenced, whether providers find them useful, and how much waste they create. This study aims to evaluate provider behavior and perceptions while measuring the amount of discarded package inserts in everyday clinical settings.

Methods: This study included a survey and an observational study. An anonymous electronic survey was sent to ASOPRS member physicians who give botulinum toxin in medical or cosmetic settings. The survey asked about how often they review package inserts, how closely they follow the instructions, their perceived clinical value, and their preferences for different ways to receive information. For the observational study, four practices gathered discarded package inserts during regular medication preparation over a 6–8 week collection period. Inserts were weighed using standard protocols. Measurements included the total weight of discarded inserts and the average weekly waste per practice.

Results: A total of 78 ASOPRS physicians completed the survey. Regular utilization of package inserts were low. Only 31% reported looking at inserts when using a new product, while 30% said they searched for the information online instead. Almost all respondents (96%) did not provide inserts to patients. The perceived value of package inserts was low, with 44% saying they had no value and 40% stating they had minimal value. In contrast, 51% believed that trying QR code access would be just as effective as paper inserts, and 29% thought it would be more effective. Additionally, 64% said they would be equally likely to review information through a QR code, while 22% would be

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more likely to do so. Figure 1 shows that providers would most often prefer digital content on dosing and administration guidance (48%), label updates (45%), and safety information (35%).

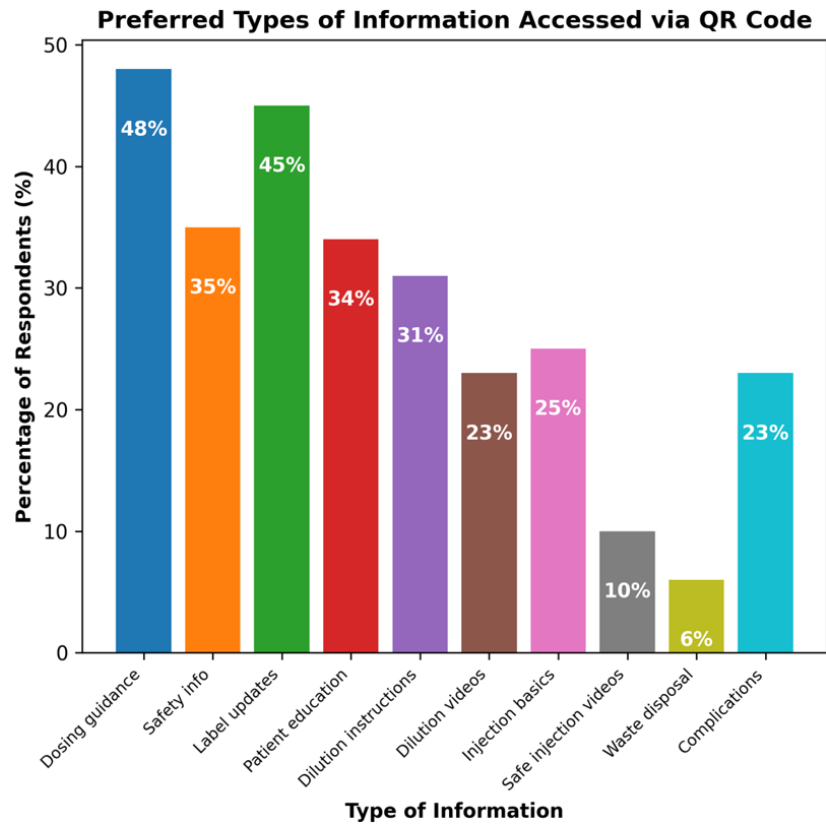
The observational analysis over the collection period showed a steady amount of package insert waste across four practices. The total waste measured across sites was 2,532.52 grams, which is approximately 2.4 kg of CO₂-equivalent emissions. Table 1 demonstrates total waste for each practice which included 282 grams over 6 weeks (47.0 g/week), 792.32 grams over 8 weeks (99.0 g/week), 1,244 grams over 8 weeks (155.5 g/week), and 214.2 grams over 7 weeks (30.6 g/week).

Conclusions: Botulinum toxin package inserts are rarely used in everyday clinical practice and are viewed as having limited clinical value, all while contributing to significant paper waste. Digital options such as QR codes are widely accepted and could be a more accessible and sustainable way to deliver product information.

Figure 1
Table 1. Observational Package Insert Waste by Practice

Practice	Weeks	Total Waste (g)	Average Weekly Waste (g/week)
Practice 1	6	282	47
Practice 2	8	792.32	99
Practice 3	8	1,244	155.5
Practice 4	7	214.2	30.6

Figure 2
Figure 1. Preferred Types of Information Access via QR Code



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PRACTICE MANAGEMENT, ETHICS, DIVERSITY, SOCIAL JUSTICE

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References

1. Mudie LI, Rachapudi S, Echaliier LE, et al. Oculofacial plastic surgeons' attitudes towards sustainability in surgery. *Orbit*. 2026;45(2):269-274.
2. Chang DF. Tackling the challenge of needless surgical waste in ophthalmology. *J Cataract Refract Surg*. 2023;49(4):333.
3. Pichler PP, Jaccard IS, Weisz U, Weisz H. International comparison of health care carbon footprints. *Environ Res Lett*. 2019;14(6):064004.
4. Palmer DJ, Robin AL, McCabe CM, Chang DF, Ophthalmic Instrument Cleaning and Sterilization Task Force. Reducing topical drug waste in ophthalmic surgery: multisociety position paper. *J Cataract Refract Surg*. 2022;48(9):1073-1077.

Preparing for an FDA Clinical Trial Audit

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Introduction: Food and Drug Administration (FDA) inspections of clinical investigators ensure human subjects protection and clinical trial data integrity. They can be routine, directed (for data concerns or application review), or for-cause (due to a complaint or safety issue). Many clinical investigators are unfamiliar with or unprepared for FDA clinical trial inspections. We provide an overview of the FDA clinical trial inspection process, as well as sample audit questions and responses, in order to prepare ophthalmologists for successful inspection and compliance maintenance.

Methods: FDA clinical trial inspections follow a typical timeline: pre-announcement (FDA may contact the site 1-5 days before arrival, though unannounced inspections can occur), opening meeting (inspector presents credentials and explains inspection scope and purpose), document review, Principal Investigator (PI) interview, staff interviews, facility tour, and closeout meeting (discussion of preliminary observations, Form 483 issued if observations found).

Results: Adherence to 21 CFR 312.60 is vital; it assigns PIs ultimate responsibility for protocol compliance, informed consent, subject safety, data accuracy, and adverse event reporting. Common deficiencies include consent violations, protocol deviations, inadequate records, and drug accountability failures. To assist with preparation for FDA inspection, we provide sample audit questions and mock responses (Figure 1). Questions include: "Describe your informed consent process." "How do you ensure the study is conducted according to protocol?" "Who can perform study activities? How do you document this?" "How do you determine, document, and report adverse events?" "How do you supervise study staff?"

Conclusions: Proactive preparation for FDA inspection, including gaining familiarity with the inspection process, staff training, and documentation review, is critical to achieving favorable inspection outcomes and maintaining trial compliance. While tasks can be delegated, responsibility cannot. The PI remains accountable for all trial aspects, including actions of all study personnel. Review of standard FDA audit questions and mock responses can assist in effective preparation.

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Figure 1. Example of a sample FDA audit question and response.

QUESTION

How do you determine and document adverse events?

SAMPLE RESPONSE

We systematically assess for adverse events at every study visit through direct questioning, physical examination, and laboratory results. For each AE, I personally assess or review the severity grading, relationship to study drug, and expectedness based on the Investigator's Brochure. All AEs are documented in source documents with onset date, description, severity, action taken, outcome, and causality assessment. Serious adverse events meeting regulatory criteria are reported within 24 hours to the sponsor through the designated safety reporting process and to the IRB per their requirements.

 Regulatory Reference: 21 CFR 312.64(b), ICH E6(R2) 4.11

Cryotherapy-Assisted Aesthetic Deep Neck Lift

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Introduction: Modern neck lifting has evolved to include structural reconstruction of the neck soft tissue in multiple planes. Addressing the subplatysmal contents including the digastric muscles, salivary glands, lymphatic tissues, and fat in addition to the platysma and subcutaneous fat and skin create long-lasting, beautiful results¹. The most concerning complication of deep neck surgery is hematoma, which can cause deformity or even death². As such, methods to reduce both intraoperative and postoperative bleeding are meaningful in both improving surgical efficiency and safety³. The ophthalmic cryoprobe has been used routinely for orbital and intraocular surgery. In this case series, the use of the cryoprobe in assisting with submandibular gland reduction in aesthetic deep neck lift is described for the first time.

Methods: All patients who underwent cryotherapy-assisted deep neck lifting by the author from October 2025 – January 2026 were included. Surgical technique was as follows. The submental incision was opened, and a limited subcutaneous dissection was performed. Subcutaneous fat was removed with a cannula if necessary. The platysma was opened centrally, and a subplatysmal dissection was carried past the submental triangle into the submandibular triangle. The anterior belly of the digastric muscle was resected and the submandibular gland was visualized. This was freed from its capsule with blunt dissection, assisted with the cryoprobe. The ptotic portion of the gland was then resected with a vessel-sealing device. If any subplatysmal fat was noted, this was then resected. The fascia over the hyoid was incised, and the platysma was then trimmed centrally and repaired with 2-0 polydioxanone sutures. If planned, the face-lift portion of the procedure was then completed.

Results: 15 consecutive patients were identified. Mean age was 63.7 years (range 32 – 78 years); 2 patients were male. Concomitant procedures included blepharoplasty (86%), deep-plane face lift (86%), fat transfer (86%), and laser resurfacing of the skin (60%). Mean follow-up for the treatment group was 3 months. No patients reported alopecia, wound infection, skin necrosis, or permanent sensory or motor nerve deficit. One patient (6%) reported temporary marginal mandibular branch dysfunction, which resolved spontaneously at 3 months postoperatively. Representative surgical results are shown in Figures 1-3, and surgical video is shown in Video 1. All patients in this limited case series were satisfied with their neck contours, and there were no bleeding complications either intra- or post-operatively.

Conclusions: Cryotherapy can be a helpful adjunct for safe submandibular gland reduction in aesthetic deep neck lifting.

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SURGICAL VIDEOS

AESTHETIC

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Figure 1. Representative pre- and post-operative month 6 photos of a 32-year-old woman who underwent cryotherapy-assisted deep neck lift and chin implant.



Figure 2. Representative pre- and post-operative month 3 photos of a 55-year-old woman who underwent upper/lower blepharoplasty, fat transfer, deep-plane face lift, and cryotherapy-assisted deep neck lift.



Figure 3. Representative pre- and post-operative month 6 photos of a 45-year-old woman who underwent cryotherapy-assisted deep neck lift.



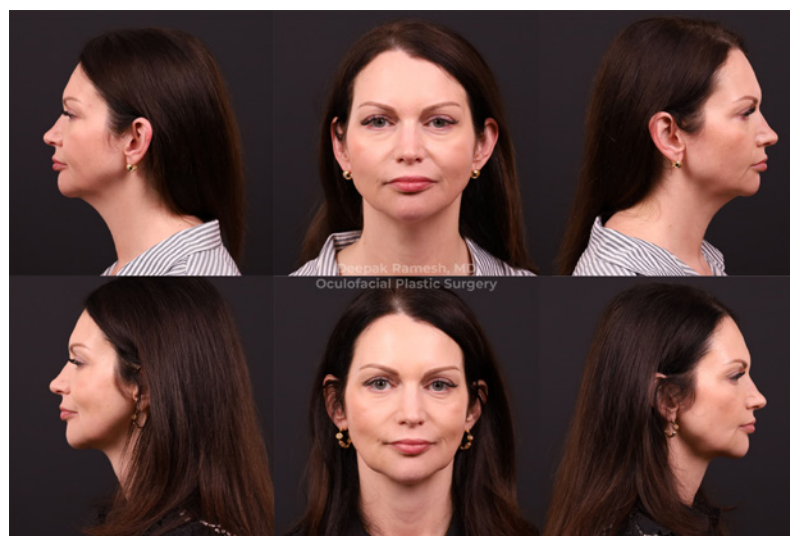
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Figure 4. Representative pre- and post-operative month 6 photos of a 32-year-old woman who underwent cryotherapy-assisted deep neck lift and chin implant.



Figure 5. Representative pre- and post-operative month 4 photos of a 49-year-old woman who underwent cryotherapy-assisted deep neck lift; of note, she was offered but declined face lift.



References

1. Singer DP, Sullivan PK. Cosmetic Submandibular Gland I : An Anatomic Evaluation and Surgical Approach to Submandibular Gland Resection for Facial Rejuvenation. Published online 2003:1150-1154. doi:10.1097/01.PRS.0000076507.50053.08
2. Mendelson BC. Submandibular Gland Reduction in. Published online 2015:463-471. doi:10.1097/PRS.0000000000001526
3. Morel SBA, Macias LH, Chopra R, Vorstenbosch J. Aesthetic Submandibular Gland Resection : A Review of Complication Incidence and Prevention. *Aesthet Surg J*. 2025;45(9):869-874. doi:10.1093/asj/sjaf096

Bony Tunnel Fixation in Endoscopic Brow Lift Surgery: A Reproducible Foreign Body Free Technique

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Introduction: Brow ptosis is a fundamental component of upper facial aging, and surgical correction remains a cornerstone of periocular rejuvenation. Multiple endoscopic brow lift fixation strategies have been described, including cortical bone screws, resorbable plates, resorbable fixation devices, and bone tunnels. Each carries trade-offs between cost, palpability, durability, and the risk of foreign-body complications including alopecia, infection, and migration.

Bony tunnel fixation, originally described in coronal and endoscopic brow surgery, achieves direct soft-tissue-to-bone fixation without permanent or absorbable foreign material. Despite long-standing description in the plastic surgery literature, a reproducible step-by-step demonstration with explicit drill positioning, suture management, and oculofacial outcome data has been lacking. This video presents a refined bony tunnel technique applied to a consecutive single-surgeon endoscopic brow lift series, providing oculofacial surgeons a low-cost, durable, foreign-body-free alternative to commercial fixation devices.

Methods: Single-surgeon retrospective video case series of 24 consecutive patients undergoing endoscopic brow lift with bony tunnel fixation between 2023–2025. The video demonstrates: subperiosteal endoscopic dissection, release of the arcus marginalis and lateral retaining ligaments, paired bony tunnel drilling at paramedian and lateral fixation points using a 2mm drill bit, suture passage with 4-0 polydioxanone suture (SH-1) in a horizontal mattress configuration, superior repositioning vector, and skin closure. Outcome measures included brow position (canthal-to-mid-pupil distance), revision rate, and complications.

Results: 24 patients (mean age 52 years; 78% female) underwent endoscopic brow lift with bony tunnel fixation (mean follow-up 8.3 months). Mean brow elevation was 3.2 mm with sustained position at 12 months. Complications included 8.3% transient frontal hypoesthesia (resolved by 8 weeks), zero cases of alopecia, hardware infection, palpable foreign body, or fixation failure requiring revision.

Conclusions: Bony tunnel fixation provides durable, low-cost, palpation-free fixation for endoscopic brow lift surgery while avoiding the tissue burden and cost of cortical screws, resorbable hardware, or resorbable fixation devices. The video demonstrates a reproducible step-by-step methodology with explicit drilling and suture-passage technique suitable for incorporation into oculofacial fellowship training and routine periocular rejuvenation practice.

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References

1. Knize DM. Plast Reconstr Surg. 2012;130(5):1120–32.
2. Berkowitz RL, et al. Plast Reconstr Surg. 2003;112(6):1764–1772.
3. Caplin DA, Perlyn CA. Mo Med. 2010;107(3):195–7.
4. Patel BC, Malhotra R. StatPearls. 2024.
5. Klassen AF, et al. Facial Plast Surg. 2010;26(4):303–9.

From the Mouth to the Eye

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Introduction: Our aim is to demonstrate a surgical approach for managing radiation-induced upper eyelid – corneal symblepharon with severe ocular motility limitation, persistent despite previous surgical repairs.

Methods: The procedure began with careful dissection of adhesions between the conjunctiva, cornea, and upper eyelid, achieving complete release of the eyelid from the ocular surface. Intraoperative anterior segment OCT was utilized throughout the procedure to ensure corneal integrity during symblepharon release. Following excision, the dimensions of the upper eyelid conjunctival defect were measured and reconstructed using a buccal mucosal graft harvested from the inner aspect of the lower lip. An amniotic membrane was then placed over the ocular surface to promote epithelial healing and prevent recurrence. A therapeutic contact lens and symblepharon ring were applied to maintain fornix depth, followed by a temporary tarsorrhaphy for ocular surface protection and postoperative support.

Results: At the last follow-up, the eyelid and ocular surface remained completely separated, with full preservation of the fornix and no recurrence of adhesions. This procedure enables future corneal reconstructive surgeries by restoring a functional ocular surface.

Conclusions: This case highlights the range of surgical tools available in oculoplastic reconstruction and underscores the critical role of the eyelid–ocular surface interface.

Posterior Approach to Involutional Entropion Repair: Surgical Options

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Introduction: This video presentation demonstrates how posterior repair of involutional entropion is individualized, depending upon each patient's anatomic findings.

Methods: Suture repair is generally used as a temporizing measure or in patients who are not ideal surgical candidates. An anterior approach is most frequently performed as secondary repair of recurrences in patients who had prior posterior surgery, or in individuals with horizontally tight lids. The posterior approach is utilized in most patients and will be demonstrated in the video.

Results: Lower eyelid retractor laxity, lateral canthal instability, and enophthalmos are primary etiologies of involutional entropion. Orbital fat prolapse and tarsal atrophy may play a role in selected patients.

A lateral canthotomy and cantholysis are performed. While patients with entropion typically do not have significant horizontal lid redundancy, a short tarsal strip can usually be created. A posterior incision is made across the lid, inferior to the tarsus, dividing conjunctiva and retractors. The orbital septum is opened. Redundant orbital fat can be reduced with bipolar cautery. The suborbicularis fascia is resected, exposing the posterior surface of the preseptal muscle. Attenuated remnants of the anterior retractors and septum are "cleaned" from the surface of the posterior retractors. The retractors are then fixated to the inferior tarsus and adjacent orbicularis with buried 6-0 polyglactin 910 sutures. In patients with a vertically short tarsus, the anterior and posterior lamella are fused by passing full thickness 6-0 chromic mattress sutures several millimeters below the conjunctival incision.

The tarsal strip is usually long enough to be fixated to the inner periosteum of the lateral rim with a mattress 5-0 polypropylene suture. To avoid the appearance of a tight, "drawn" lid, this suture is recessed when the strip is too short to easily reach the rim. Alternatively, short strips can be sutured to the intact upper tendon (6-0 polyglactin 910 suture). In the small number of patients with insufficient horizontal redundancy to create a strip, the canthotomy is directly closed.

If needed, lateral canthal stability can be enhanced by suturing the lateral edge of the retractors to the preperiosteal tissue (6-0 polyglactin 910 suture). This is particularly helpful if the tarsal strip is inadequate to reach the rim.

The canthal angle is approximated and orbicularis closed with deep 6-0 polyglactin 910 suture. The skin is sutured with 7-0 chromic.

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Conclusions: Involutional entropion is a multifactorial condition. Surgery is individualized depending upon each patient's anatomy and presumed anatomic etiologies. Primary goals are to reestablish lateral canthal stability, and fixation of the retractors to both the tarsus and orbicularis. Full thickness sutures, fat reduction, and lateral fixation of the retractors are considered in selected patients.

References

1. Custer PL. Observations on the etiology of involutional entropion. *Ophthalmic Plast Reconstr Surg* 2025; 41(4):365-371.
2. Custer PL, Huecker JB. Involutional entropion: demographics, presenting findings, surgical management. *Ophthalmic Plast Reconstr Surg* 2026 Jan 12. doi: 10.1097/IOP.0000000000003155.

Combined Endoscopic and Open Approach for En Bloc Resection of an Inverted Papilloma

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Introduction: The management of inverted papilloma (IP) involving the lacrimal apparatus and medial canthal soft tissues presents a significant surgical challenge. Neither endoscopic nor open techniques alone are optimal for complete excision due to poor access. This video demonstrates a multidisciplinary collaboration between rhinology and oculoplastic surgery to achieve an en bloc resection of an IP with involvement of the lacrimal sac and canaliculi.

Methods: A 63 year-old woman presented with a large, left-sided endonasal mass filling the anterior nasal cavity. Preoperative imaging confirmed an inverted papilloma involving the medial canthus and lacrimal complex. The procedure began with an endoscopic phase with image guidance. The rhinology team delineated the margins circumferentially and dissected the mass off the nasal bones and septal cartilage. The oculoplastic team then performed an open phase with excision of both eyelids lateral to the puncta. The lacrimal sac was elevated from the fossa, and the medial canthal tendon was disinserted to mobilize the sac and canalicular system. The tumor was then delivered en bloc through the nasal cavity.

Results: The integration of an open medial orbitotomy with endonasal endoscopic dissection provided 360-degree visualization of the tumor-bone interface. This dual-portal access allowed for the complete mobilization of the lacrimal system and the surrounding soft tissue, which are commonly sites of recurrence in purely endoscopic cases. With this approach, complete macroscopic resection was achieved while preserving the integrity of the orbital contents and the anterior skull base. Pathological margins were confirmed to be negative.

Conclusions: IPs involving the proximal lacrimal system require a surgical strategy that extends beyond the limits of the nasal cavity. The combined endoscopic and open approach for en bloc resection of the lacrimal drainage system is an effective technique for the management of tumors arising from and involving the lacrimal apparatus. It can aid in access and visualization for targeted en bloc removal of the portions of the apparatus involved based on the extent of the tumor.

Ocular Surface Reconstruction for Recurrent Pterygium and Symblepharon

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Introduction: Management of conjunctival scarring and symblepharon formation can be challenging. For recurrent and complex pterygia with symblepharon, motility restriction, or limited conjunctiva in the setting of multiple prior excision, extensive reconstruction may be necessary.

Methods: case report and video presentation

Results: We present a 49-year-old male with history of recurrent pterygia of the right eye with six prior excisions who underwent ocular surface reconstruction surgery. His prior excisions were completed with conjunctival autograft, mitomycin, and amniotic membrane graft. On exam, best corrected visual acuity was 20/20 with abduction and supraduction deficits. Slit lamp exam showed symblepharon of the upper lid to the superonasal limbus and of the lower lid to the fornix with a large 4.5mm nasal pterygium. Ocular surface reconstruction with a conjunctival autograft for bulbar reconstruction, palpebral buccal membrane graft, and amniotic membrane graft were recommended and performed.

The pterygium was first dissected free from the limbus and the symblepharon released (Video 1). This allowed for free forced ductions. Remaining scar tissue was excised. Reconstruction of the upper and lower palpebral conjunctiva of the medial canthus was performed using labial mucous membrane graft. The palpebral conjunctival defect was measured, and a graft designed in the labial mucosa. The peri-tarsal margin was closed with running buried, partial thickness sutures. The deep margins were secured with double armed full thickness 6-0 chromic gut sutures through the eyelid in the cardinal positions. Excess graft was trimmed. The bulbar conjunctiva reconstruction was performed utilizing a 12mm x 25mm free inferior bulbar conjunctival graft from the contralateral eye. The secondary defect was covered with amniotic membrane. The conjunctival graft was secured to the conjunctival edges, perilimbal tissue, and peripheral deep tissue with partial thickness scleral passes. A large amniotic membrane graft was folded over the reconstructed conjunctiva with partial coverage of the cornea. This was secured with multiple interrupted sutures and fibrin sealant. A temporary tarsorrhaphy and pressure patch were placed for one week. By post op week 1, motility was significantly improved, and secondary graft sites healing well.

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Conclusions: Ocular surface reconstruction for recurrent pterygium and symblepharon can be challenging. The surgical armamentarium includes conjunctival autograft for bulbar reconstruction, labial mucous membrane graft for palpebral defects, and amniotic membrane grafting for surgical site protection.

References

1. Kheirkhah A, Blanco G, Casas V, Hayashida Y, Raju VK, Tseng SC. Surgical strategies for fornix reconstruction based on symblepharon severity. *Am J Ophthalmol*. 2008 Aug;146(2):266–275. doi: 10.1016/j.ajo.2008.03.028. Epub 2008 Jun 2. PMID: 18514608.

Video Demonstration of Management of a Recurrent Orbital Arteriovenous Malformation with Intraosseous Sphenoid and Soft Tissue Involvement

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Introduction: Orbital arteriovenous malformations (AVMs) are rare, high-flow vascular lesions, and intraosseous orbital and skull base involvement is exceptionally uncommon.

Methods: This video demonstrates operative management of a recurrent left orbital and skull base AVM with an intraosseous nidus causing bony hyperostosis, proptosis, and diplopia.

Results: Treatment included partial preoperative ethylene-vinyl alcohol copolymer (EVOH) embolization to reduce arterial inflow and improve hemostasis prior to surgical excision. The gray-black ethylene-vinyl alcohol copolymer (EVOH) embolic agent cast penetrated complex vascular channels and helped outline feeder vessels and the nidus intraoperatively. A left transcranial skull base approach was then used to expose the AVM nidus embedded within the orbital roof, lesser wing of the sphenoid, and optic canal. Hyperostotic bone was drilled to access and resect the intraosseous component, with additional excision of associated orbital soft tissue vessels. Serial intraoperative angiography allowed real-time assessment of residual flow and guided progressive AVM excision.

Conclusions: This case highlights the diagnostic and surgical challenges of intraosseous orbital and skull base AVMs and demonstrates the value of multidisciplinary planning, preoperative embolization, and intraoperative angiography in achieving safe and effective surgical excision.

References

1. Warrier S, Prabhakaran VC, Valenzuela A, Sullivan TJ, Davis G, Selva D. Orbital arteriovenous malformations. Arch Ophthalmol. 2008 Dec;126(12):1669-75. doi: 10.1001/archophthalmol.2008.501.
2. Sulaiman II, Hashim MA, Ismail M. The Complexities of Orbital Arteriovenous Malformations: A Systematic Review of Clinical Features and Treatment Approaches. Cureus. 2024 Oct 12;16(10):e71323. doi: 10.7759/cureus.71323.
3. Theologie-Lygidakis N, Schoinohoriti O, Tzermpos F, Christopoulos P, Iatrou I. Management of Intraosseous Vascular Malformations of the Jaws in Children and Adolescents: Report of 6 Cases and Literature Review. J Oral Maxillofac Res. 2015 Jun 30;6(2):e5. doi: 10.5037/jomr.2015.6205.
4. Arat A, Cil BE, Vargel I, Turkbey B, Canyigit M, Peynircioglu B, Arat YO. Embolization of high-flow craniofacial vascular malformations with onyx. AJNR Am J Neuroradiol. 2007 Aug;28(7):1409-14. doi: 10.3174/ajnr.A0547.
5. Do YS, Park KB. Special Consideration for Intraosseous Arteriovenous Malformations. Semin Intervent Radiol. 2017 Sep;34(3):272-279. doi: 10.1055/s-0037-1605368. Epub 2017 Sep 11.

A Long Way from Home

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Introduction: A 63-year-old woman presented with a new, nonpainful right temporal swelling. Her medical history included uterine leiomyosarcoma treated 7 years earlier.

Methods: Imaging revealed a large lesion involving the greater wing of the sphenoid with extension into the posterior superolateral orbit and infratemporal fossa and suspected dural involvement; a biopsy confirmed metastatic leiomyosarcoma. Given the lesion's resistance to systemic therapy including chemotherapy and radiotherapy, a multidisciplinary team recommended surgical debulking.

Results: This video demonstrates the surgical approach used to access and resect the tumor achieving gross total resection. At 1-year follow-up, no recurrence was detected.

Conclusions: Surgical resection of orbital metastases can be appropriate in selected cases.

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Corneal Neurotization of Neurotrophic Cornea

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Introduction: Neurotrophic keratopathy remains a challenging condition, particularly when associated with facial nerve dysfunction and loss of corneal innervation. Conventional treatments often provide limited restoration of sensation. We present a corneal neurotization technique aimed at re-establishing corneal innervation using a contralateral donor nerve.

Methods: A 56-year-old patient with left eye neurotrophic and neuroparalytic keratopathy underwent corneal neurotization. The medial antebrachial cutaneous nerve was harvested as a graft. Through an upper eyelid crease incision, the intact supraorbital and supratrochlear nerves were identified and exposed. A subcutaneous tunnel was created, and the nerve graft was transferred to the affected eye. An end-to-side coaptation was performed by creating a small window in the recipient orbital nerve. A conjunctival peritomy allowed placement of the donor nerve bundles. The graft was passed through a superomedial eyelid tunnel and into the conjunctival space. Intrafascicular dissection was performed to divide the nerve into fine fascicles, which were distributed and secured around the limbus. Conjunctival closure was completed, and an amniotic membrane was placed over the ocular surface.

Results: The procedure was completed successfully with appropriate positioning of the nerve graft and fascicles around the limbus. At 3 months postoperatively, the corneal epithelium healed well with full coverage of the nerve endings. As expected at this early stage, corneal sensation had not yet returned, with reinnervation anticipated over the following months, typically around one year.

Conclusions: Corneal neurotization using a medial antebrachial cutaneous nerve graft and end-to-side coaptation to intact orbital nerves is a feasible and effective approach for restoring corneal innervation in patients with neurotrophic keratopathy.

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References

1. Dragnea DC, Krolo I, Koppen C, Faris C, Van den Bogerd B, Ní Dhubhghaill S. Corneal Neurotization-Indications, Surgical Techniques and Outcomes. *J Clin Med*. 2023 Mar 13;12(6):2214. doi: 10.3390/jcm12062214. PMID: 36983215; PMCID: PMC10059768.
2. Swanson MA, Swanson RD, Kotha VS, Cai Y, Clark R, Jin A, Kumar AR, Davidson EH. Corneal Neurotization: A Meta-analysis of Outcomes and Patient Selection Factors. *Ann Plast Surg*. 2022 Jun 1;88(6):687-694. doi: 10.1097/SAP.0000000000003117. Epub 2022 Apr 3. PMID: 35502965.
3. Saad S, Labani S, Goemaere I, Cuyaubere R, Borderie M, Borderie V, Benkhatar H, Bouheraoua N. Corneal neurotization in the management of neurotrophic keratopathy: A review of the literature. *J Fr Ophtalmol*. 2023 Jan;46(1):83-96. doi: 10.1016/j.jfo.2022.09.007. Epub 2022 Dec 5. PMID: 36473789.
4. Mudie LI, Yen MT. Techniques in Corneal Neurotization. *Atlas Oral Maxillofac Surg Clin North Am*. 2025 Mar;33(1):81-87. doi: 10.1016/j.cxom.2024.07.004. Epub 2024 Aug 10. PMID: 39929561.
5. Ziai K, Thomas S, Weller C, Lighthall JG. Corneal Neurotization in the Setting of Facial Paralysis: A Comprehensive Review of Surgical Techniques. *J Craniofac Surg*. 2021 Sep 1;32(6):2210-2214. doi: 10.1097/SCS.0000000000007590. PMID: 33654040.
6. Jowett N, Pineda R 2nd. Corneal and Facial Sensory Neurotization in Trigeminal Anesthesia. *Facial Plast Surg Clin North Am*. 2021 Aug;29(3):459-470. doi: 10.1016/j.fsc.2021.03.011. PMID: 34217450.