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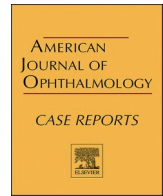
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A case of eyelid neuroma with recurrent ptosis[☆]

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ABSTRACT

Purpose: We report a rare case of eyelid neuroma, discovered nine years after external levator advancement, presenting with recalcitrant ocular foreign body sensation and pain, persistent corneal epithelial defect, followed by corneal scarring, and ptosis.

Observations: An 85-year-old man with a history of multiple skin cancers presented with left ptosis, epiphora and recalcitrant eye pain. Nine years prior to presentation, he underwent excision of melanoma in situ of the left forehead, followed by simultaneous forehead reconstruction and left external ptosis repair. At presentation, he had left ptosis and left superior corneal scarring. Eversion of the eyelid demonstrated the presence of a nodule at the superior border of the tarsus. The patient underwent simultaneous excisional biopsy of the lesion and posterior ptosis repair by Müller muscle conjunctival resection (MMCR). He experienced postoperative resolution of pain, ptosis and epiphora. Histopathologic examination demonstrated the presence of a foreign body granuloma alongside a neuroma.

Conclusions: This case highlights the importance of thorough eyelid exam in individuals with ocular surface disease. We review herein the pathophysiology and histopathology of eyelid neuroma.

1. Introduction

Neuromas typically present as solitary, firm, non-pigmented, dome-shaped nodules, most often affecting patients between 40 and 60 years old.¹ While neuromas frequently involve the face, eyelid neuromas are a rare entity. Traumatic neuromas are a subset of neuromas most commonly seen after surgical or traumatic transection of peripheral nerves. They have been described in the hand, orbit, nose, face, and foot.^{2–7} Traumatic neuromas within the orbit are typically rare and have been associated primarily with orbital surgery or enucleation.^{2,3} Traumatic neuromas of the eyelid are even less common, with few cases reported in the literature.⁸ Prompt identification of traumatic neuromas, especially in the eyelid, is particularly important as complete excision may prevent recurrence and ocular irritation.⁸

2. Case report

An 85-year-old man presented with a nine-year history of left eye pain, epiphora and left upper eyelid ptosis. He reported a past medical history of coronary artery disease and multiple skin cancers (including melanoma), and a past ocular history of bilateral laser in situ keratomileusis (LASIK), bilateral pseudophakia and left external ptosis repair by levator advancement nine years prior.

Six years prior to presentation, he had been evaluated by an outside clinic for a two-year history of a left eye irritation. He was found to have a non-healing left corneal epithelial defect. He was then treated with lubricating eye drops, amniotic membrane, bandage contact lens, neomycin-polymyxin-dexamethasone ointment, cenegermin (neurotrophic growth factor, NGF) ophthalmic solution, and oral antibiotics. The patient's discomfort was minimally relieved by the above therapeutic regimen.

[☆] We report herein a case of eyelid neuroma associated with suture granuloma, presenting as ptosis and recalcitrant eye pain. This report adheres to the ethical principles outlined in the declaration of Helsinki and is Health Insurance Portability and Accountability Act (HIPAA) compliant, and written patient consent was obtained for this report.

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At the time of presentation to our clinic, corrected visual acuity was 20/20 in the right eye and 20/30 in the left eye. External exam was notable for left upper lid ptosis, with MRD1 4.5 mm in the right eye and 0.5 mm in the left eye, 0 mm lagophthalmos bilaterally, and levator excursion 14 mm bilaterally (Fig. 1). Upon eversion of the left upper eyelid, a pale, indurated, 2.5 mm nodular mass was noted at the superior border of the tarsus (Fig. 2). Slit lamp exam of the right eye showed white and quiet conjunctiva and sclera, clear cornea, deep and quiet anterior chamber, unremarkable iris and posterior chamber intraocular lens. Slit lamp exam of the left eye revealed trace conjunctival injection, cornea with superior pannus and stromal scarring, deep and quiet anterior chamber, and unremarkable iris and posterior chamber intraocular lens.

Visual field testing demonstrated a superior scotoma in the left eye. The scotoma resolved after taping the upper eyelid. Neosynephrine test was performed with an improvement in MRD1 from 2.5 mm to 4 mm. Given the eyelid elevation response to Neosynephrine and location of lesion at the conjunctiva and superior tarsal border, accessible via posterior ptosis surgery, the decision was made to perform lesion excisional biopsy and left upper eyelid Müller muscle conjunctival resection (MMCR) simultaneously. The left upper eyelid was everted over a Desmarres retractor and a granulomatous foreign body was noted at the superior tarsal border, surrounded by scar tissue. The granuloma and scar tissue were excised sharply using Westcott scissors. Attention was then turned to the ptosis repair; 10 mm of the muller muscle and conjunctiva was incarcerated in a Putterman clamp, resected and the ends were sutured with a running 6-0 plain gut suture. This suture was buried in a temporal conjunctival incision. A bandage contact lens was placed.

Histopathologic examination of the left upper eyelid lesion demonstrated a small focus of chronic granulomatous inflammation with foreign body giant cells. Given that the initial ptosis surgery nine years prior used Mersilene suture (a polyester), the suture material was likely lost during histopathologic processing, as polyesters are not resistant to Xylene used during tissue fixation. Elsewhere in the specimen, there was a fairly well circumscribed nodule lined by fascicles of benign spindle cells with long tapered nuclei and somewhat fibrillar, eosinophilic cytoplasm, consistent with neuroma (Fig. 3).

On postoperative day 8, following removal of the bandage contact lens, the patient reported nearly complete resolution of pain and discomfort. External exam was notable for improved left upper eyelid position, with MRD OU 4 mm (Fig. 4). The remainder of the postoperative course was uneventful. At final follow up 3 months after initial presentation, the patient experienced complete resolution of pain and foreign body sensation, with no evidence of ptosis, corneal breakdown or recurrent lesion of the upper eyelid tarsal conjunctiva.

3. Discussion

We report a case of neuroma and foreign body granuloma of the left upper eyelid manifesting as ptosis, pain, foreign body sensation and corneal breakdown. Given that his only previous eyelid surgery was external levator advancement with Mersilene (polyester) suture nine



Fig. 1. Front facing preoperative external photo demonstrating asymmetric ptosis of the left upper eyelid (white arrow) with MRD1 of 2.5mm.

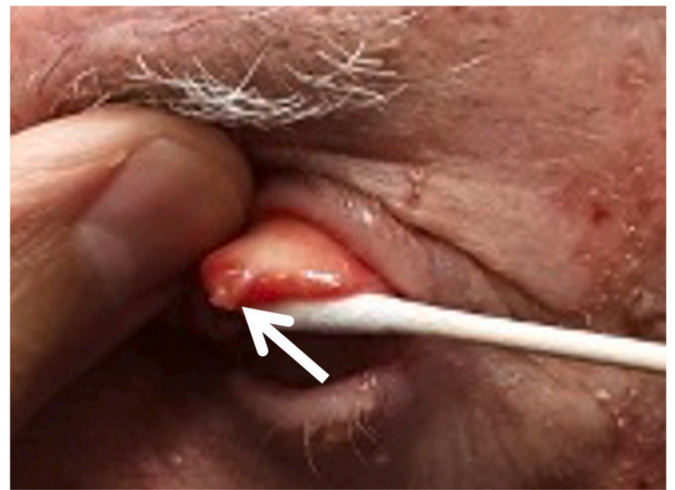


Fig. 2. External photo of left upper eyelid conjunctival lesion at the superior tarsal border demonstrated on eversion of the eyelid (white arrow) without any residual suture visualized.

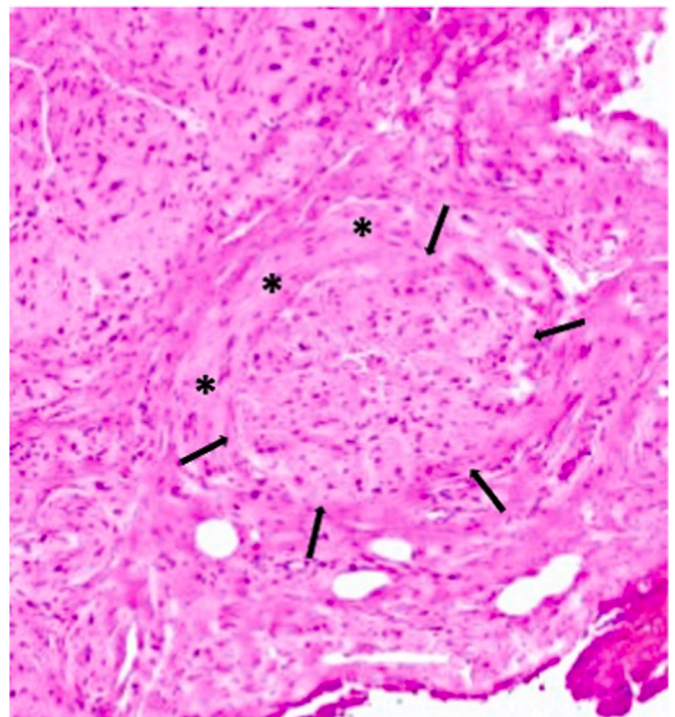


Fig. 3. Histopathology of left upper lid lesion demonstrating fairly well circumscribed nodules (outlined by black arrows) lined by fascicles of benign spindle cells with long tapered nuclei and somewhat fibrillar, eosinophilic cytoplasm (asterisks), consistent with neuroma.

years prior to presentation, we presume that the foreign body granuloma was a suture granuloma. It is an open question as to whether this granuloma stimulated the growth of the neuroma, or whether nearby nerve transection during the external levator surgery stimulated growth of the neuroma.

Although a benign growth, eyelid neuromas can cause significant discomfort. They may be associated with neuropathic pain from the lesion itself (triggered by blinking or eye movement) or, in the case of a lesion of the palpebral conjunctiva, they may be associated with foreign body sensation from contact with the cornea. Though the exact cause of eyelid neuroma is unknown, eyelid neuromas are classically thought to



Fig. 4. Postoperative photo demonstrating symmetric lid height without recurrence of ptosis or palpebral conjunctival growth (white arrow).

be related to injury or inflammation of the nerve, as traumatic neuromas are common tumors following surgery or transection of almost any peripheral nerve. Few reports exist describing traumatic neuromas of the eyelid.^{2,3,8,9} Most reports of traumatic neuromas in the orbit follow enucleation or optic or ciliary nerve transection, with presentation of slowly enlarging mass and increasing discomfort.^{3,8} Traumatic neuromas after blunt injury have also been described with presentation of persistent progressive eyelid swelling with etiologies ranging from microtrauma secondary to chronic swim goggle use² to remote blunt injury from being struck in the periorbital region with a hard object.⁸

Given the rarity eyelid neuroma, the lesion must be differentiated histologically from other masses on the differential including neurofibroma, schwannoma, leiomyoma.⁹ Schwannomas and neurofibromas of the eyelid occur more frequently than neuromas.¹⁰ Traumatic neuromas differ from other peripheral nerve tumors in that neuromas represent a disorganized reparative proliferation of all nerve elements (axons, Schwann cells, and fibroblasts).⁸ Schwannomas, which may present clinically similar to traumatic neuromas, differ from neuromas in that they fail to exhibit neurofilaments except in a peripherally located compressed nerve of origin, and are usually encapsulated with palisading and myxoid areas of Schwann's cells.^{8,10,11} In the present case, the histopathology demonstrated disorganized proliferation of spindle cells with long tapered nuclei more specific to neuroma.

Interestingly, a small focus of chronic granuloma was also noted in the specimen. This granuloma is presumably related to previous suture material (i.e. 'suture granuloma'). This granuloma had evidence of surrounding a foreign body, even though no foreign body was observed on histopathologic sections. Given this finding at the site of previous ptosis surgery, we believe the most likely etiology of the neuroma is residual suture leading to chronic granulomatous inflammation which damaged surrounding tissue, including a hypothetical nearby peripheral nerve, and triggered the formation of a neuroma. In this case, the prior surgeon had used 6-0 Mersilene (polyester) suture to reattach the levator to the tarsus during previous external levator advancement. Mersilene is a nonabsorbable, braided, synthetic sterile surgical suture composed of a member of the polyester family, polyethylene terephthalate. It is not resistant to Xylene used in histopathologic processing and thus was not observed on histopathologic sections. Though Mersilene is known to be relatively reactive,¹² when it is compared to nylon suture, also commonly used for levator advancement, Mersilene may have better long-term survival.¹³ Owing to its resistance to degradation, Mersilene has been associated with a relatively high rate of late granuloma formation, even years after placement.¹⁴⁻¹⁶

When there are no conspicuous findings on clinical examination, orbital and eyelid foreign bodies may remain undetected. Serious complications caused by retained foreign bodies in the orbit have been reported such as abscess, infections, granuloma, etc.¹⁷⁻¹⁹ Multiple case reports have also chronicled the effects of occult foreign body of the eyelid, including recurrent eyelid ecchymosis,²⁰ eyelid nodules,⁹ and ptosis.¹⁹ We have found no cases of eyelid neuroma in the literature that have been associated with suture granuloma following ptosis surgery.

Another unique feature of this case is the presentation of neuroma with associated recurrent ptosis. This patient had a prior history of involutional ptosis treated by external levator advancement. We believe recurrence of ptosis was due to insufficient initial repair, or due to chronic inflammation of the ocular surface causing recurrence of involutional ptosis, or due to both.²¹ Unilateral neurogenic blepharoptosis has been reported secondary to eyelid trauma²² and retained foreign body.¹⁹ Similarly, traumatic neuroma with persistent ptosis has also been previously described in a young male after blunt injury to the orbit, and was thought to be secondary to swelling from the neuroma causing impaired levator function.⁸ Although it is unclear whether the recurrent ptosis was secondary to traumatic neuroma, or residual suture forming a foreign body reaction, this case serves as a reminder of the complications that may occur years after surgery. Recurrent ptosis, foreign body sensation, superior corneal epithelial defect, linear (vertical) corneal staining might all be indicative of retained upper eyelid foreign body,^{19,23} as observed in the present case.

While outcomes data on management of eyelid neuromas are limited, treatment options classically include surgical excision, steroid injection, or serial observation if the tumor is small and asymptomatic.^{1,24,25} In this case, the patient presented with ptosis and persistent ocular irritation, thought to be secondary to the neuroma causing mechanical irritation on the cornea. This presentation led to more extensive management with excision of the lesion with simultaneous internal ptosis repair. At time of final follow up (3 months postoperatively), the patient experienced complete resolution of symptoms and improvement in ptosis with no signs of recurrence.

4. Conclusions

Overall, this case reinforces the importance of maintaining a low threshold for evertting the eyelid in patients with foreign body sensation and eye pain associated with ptosis. In patients with previous eyelid surgery, there ought to be a high index of suspicion for retained foreign bodies, even in cases where the surgery was performed years prior.

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Proprietary interest statement

All authors report no conflicts of interest, financial or otherwise. The authors alone are responsible for the content and writing of the paper.

Consent/acknowledgements

This study adhered to the tenets of the Declaration of Helsinki and was performed in accordance with the Health Insurance Portability and Accountability Act. The study was approved by the Institutional Review Board at the University of California, Los Angeles. Written patient consent was obtained for this report.

Patient consent

- Consent to publish the case report was obtained.

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Authorship

All authors attest that they meet the current ICMJE criteria for

Authorship.

Appendices

None.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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