



Papillary conjunctivitis presenting months after permanent eyebrow tattooing

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ABSTRACT

Purpose: To present a case of tattoo side effects not limited to the tattoo site and rise an alarm regarding using non-FDA-approved products.

Observations: A 30-year-old female presented with bilateral ocular pain, dryness, and itching. The ocular exam showed bilateral injection and edema of the superior palpebral and bulbar conjunctiva. Several 1–2 mm dark pigmented lesions and papillae coursing along the upper palpebral conjunctival lid margin and 5 mm above the margin were found in both eyes. The ocular surface was dry with diffuse superficial punctate keratitis. The biopsy report showed granular foreign material in the dermis. SOX-10 and MART-1 immunostaining highlighted melanocyte distribution and the sample was diagnosed as exogenous pigment consistent with tattoo ink by the pathologist. On further investigation following the pathology report, the patient stated that she got bilateral permanent eyebrow tattoos 4 months before presentation in a country other than the United States, and she was not aware about the standards of the ink used, nor the certification of the person performing the tattoo. The patient denied any type of tattoo or manipulation on the eyes or orbit, including sclera or conjunctivae.

Conclusions: Importance: The complications of periorbital tattooing are not limited to the point tattoo location and can potentially spread to the nearby segments. It is notable that there is no FDA approved tattoo ink available, even with a certified tattoo artist performing the tattoo, the risks of inflammation, infection, and other side effects are still present.

1. Introduction

Permanent augmentation of the eyes and eyebrows has been in practice for thousands of years, the origin of which is thought to be ancient Egypt. Currently, tattooing is among the most common cosmetic procedures on the body, especially in industrial countries.^{1–3} Eyebrow tattooing not only is widely used as a cosmetic procedure but also can be implemented in inherited and acquired hair growth abnormalities. Several methods have been described for tattooing, including microblading, micropigmentation, Ombre powder fill, hybrid brows, and microshading.¹

Although the procedure is deemed to be safe by many, it poses the risk of multiple complications including inflammatory and allergic reactions, hyperkeratosis, ulceration and necrosis, local granulomatous pigment foreign body reactions, and infection.^{4,5} These complications are mostly described locally, and limited data is available in the field of ophthalmology regarding the effect of near-ocular tattooing on the eyes and globe structures.

In this report, we present a case of severe pigment-induced papillary

inflammation of the eyelids months after receiving permanent eyebrow tattoos, without doing any tattoo or intervention on the sclera or conjunctivae.

2. Report of a case

A 30-year-old female presented to the office with chief complaints of bilateral ocular pain, dryness, and itching. The patient stated that her symptoms started with mild itching a few weeks before presentation, and gradually progressed to ocular dryness, swelling and pain bilaterally. She initially could not present any precipitating factors and did not mention any manipulation of the eyes or orbit. Upon presentation to the office, visual acuity (VA) was 20/20 in both eyes, extraocular muscle movements (EOM) were intact, and direct light reflex in both eyes were normal. Slit-lamp biomicroscopy examination demonstrated bilateral injection and edema of the superior palpebral and bulbar conjunctiva, along with severe papillary reaction and significant erythema. Several 1–2 mm dark pigmented lesions and papillae coursing along the upper palpebral conjunctival lid margin and 5 mm above the margin were

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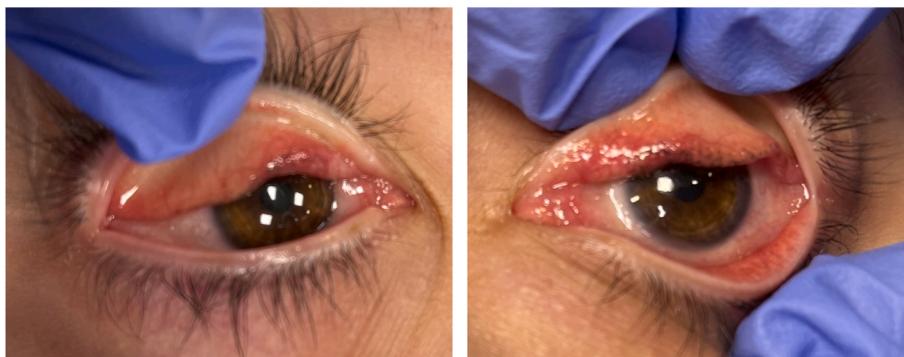


Fig. 1. The patient on presentation. Note the pigmented lesions along with papillary reaction and erythema of the conjunctiva bilaterally.



Fig. 2. The patient underwent bilateral palpebral conjunctival excision and biopsy. Pre-op images are presenting bilateral eyelid eversion and after injecting lidocaine and epinephrine into the bulbar conjunctivae, demonstrating the pigmented lesions.

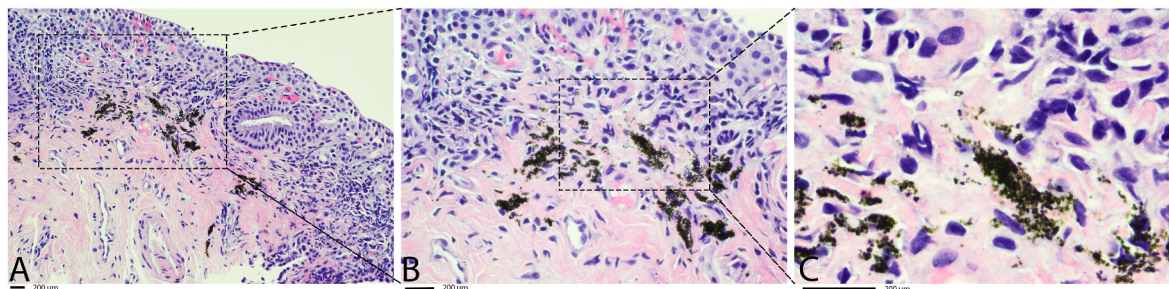


Fig. 3. Pathology slides on the biopsied lesions. Note the dark granular foreign material, inflammation and small areas of fibrosis and granulation.

found in both eyes (Fig. 1). The ocular surface was dry with diffuse superficial punctate keratitis (SPK). The sclera was intact with no pigmentation and the anterior chamber was clear with no cells and flare. Dilated fundus exam was unremarkable.

The patient was scheduled for surgical intervention (bilateral palpebral conjunctival excision and biopsy). The patient underwent surgical excision of the papillae with biopsy one week after the presentation (Fig. 2). A 15 blade was used to perform a complete excision of the lesions on the superior palpebral conjunctivae and a sample was sent to pathology for further examination. The superior palpebral lid margins were then repaired using 6-0 plain gut sutures due to the depth and width of the lesions. Following the surgery, the patient received ofloxacin 0.3% TID and prednisone acetate 1% TID for 10 days as well as erythromycin 0.5% ophthalmic ointment nightly. A contact lens was placed after the surgery and removed one week after the surgery.

The patient was followed up closely. Five-day post-op exam showed promising healing, with minimal pain. Twelve days post-op exam showed complete healing of the lesion, with no residual pigments remaining. Inflammation resolved completely and the patient did not feel any dryness, itching, or ocular pain.

The pathology results of the biopsy showed granular foreign material

in the dermis (Fig. 3). SOX-10 and MART-1 immunostaining (with appropriate control) highlighted melanocyte distribution and the sample was diagnosed as exogenous pigment consistent with tattoo ink by the pathologist.

On further investigation following the pathology report, the patient stated that she got bilateral permanent eyebrow tattoos 4 months before presentation, and she was not aware about the standards of the ink used, nor the certification of the person performing the tattoo. The patient mentioned her symptoms started about 1 month after getting the tattoo. The patient denied any type of tattoo or manipulation on the eyes or orbit, including sclera or conjunctivae.

3. Discussion

Facial appearance continues to be an important aspect for humans of all genders and ages, and the eyebrows remain among the main components in achieving the desired appearance. The current most common methods of permanent makeup tattoos are microblading and micropigmentation, which provide a more natural outcome compared with traditional methods of tattooing.⁶ While the outcomes are similar, the two methods are very different. Microblading utilizes an instrument that

creates small microsized incisions that deposit pigment into the newly created cuts.⁶ The other technique, micropigmentation, uses a technique similar to traditional tattooing but in a microscale.⁶ Both of these methods have been associated with inflammatory complications.⁶

Following the procedure, histologically the tattoo pigments are seen in upper and mid dermis. With time, the pigments can be detected in the perivascular macrophages and fibroblasts, as well as between the collagen bundles.⁷ Subsequently, an inflammatory response often occurs in the skin, while subcutaneous tissue involvement can only be seen in severe cases.⁷ Ophthalmic literature has reported several complications associated with periocular tattooing. Allergic granulomatous reactions have been reported as a known complication of blepharopigmentation (eyelid and eyeliner tattooing), resulting in dermatitis, allergic blepharitis, and tear film instability.⁸ Pigment deposition into the conjunctiva and the superficial cornea have also been reported as complications of blepharopigmentation.⁹ These consequences have been mainly described at the local site of tattoo in the literature, and limited reports are available in the field of ophthalmology regarding the ocular and orbital response to eyebrow and facial tattooing. One study focusing on the eyelid complications of eyebrow tattooing reported that upper eyelid soft tissue was thicker in the eyes of the patients with eyebrow tattoos compared to those without.¹ In line with our findings in this case report, other findings were edema-congestion, chronic inflammation and dermal fibrosis.¹ Surgical complications including severe inflammatory reaction following upper eyelid blepharoplasty were also found to be more common among the patients with eyebrow tattooing.¹ Considering the anatomy of the orbit and eyelids, eyebrows, and surrounding tissue, there is a wide intertwined lymphatic network in that area which could potentially predispose to the migration of the macrophages containing pigments from the eyebrow to the palpebral conjunctivae, ultimately resulting in the inflammatory picture described in this case.

A differential diagnosis for the presentation of pigments on the palpebral conjunctiva is pigmentation and inflammation due to heavy, prolonged mascara use. It is well known that mascara use can potentially cause palpebral inflammation and pigmented lesions.^{10,11} It is important to note that the presented patient did not routinely use mascara. The depth of the pigments, as seen during the surgery and in pathology report, are not typical for the lesions resulting from mascara use. However, this remains as the main differential diagnosis of this condition.

In summary, our report is in line with the conclusion that the complications of periorbital tattooing are not limited to the point tattoo location and can potentially spread to the nearby segments. It is noteworthy that the pigments used in the aforementioned tattoo were not FDA approved. FDA has not approved any inks for injection into skin. However, there are certified tattoo artists who have been trained for a “safer practice”, although there is no approved standard certification for such “safer practice”. It is notable that even with a certified tattoo artist

performing the tattoo, the risks of inflammation, infection, and other side effects are still present.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

The authors have no financial disclosures related to this study.

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