Scleral tattoo–induced sarcoid reaction

A 31-year-old Afro-Caribbean woman presented with a 1-week history of bilateral upper and lower eyelid swelling with restriction of eye movements and reduced vision in the right eye. She had had scleral tattooing, subconjunctival injection of dye, performed 13 months earlier on the right side and 9 months earlier on left side, for cosmetic purposes. The subconjunctival dye was purple and green, respectively, and the procedure was performed in the United Kingdom.

The patient had presented on numerous occasions in the interim with pain and photophobia relating to chemosis and punctate epithelial erosions and inflamed, thickened conjunctiva. She had been managed with topical lubricants and topical steroids for ocular surface disease with limited effect. On systemic enquiry, she had developed bumps within long-standing cutaneous tattoos on her legs as well as nontender neck lumps that she had noticed concurrently with the onset of eyelid swelling. She otherwise felt well and denied fevers. There was no significant medical or family history.

On this presentation, her best-corrected visual acuity was 6/9.5 OD and 6/6 OS. There was no relative afferent pupillary defect, and colour vision was full in both eyes. Intraocular pressures (IOP) were 48 mm Hg OD and 18 mm Hg OS. There was bilateral upper and lower lid swelling with firm masses felt medially on the right upper lid and laterally on both lower lids (Fig. 1). The patient reported diplopia, and restriction of depression, elevation, abduction, and adduction was noted OD. There was a thickened appearance to the conjunctiva on both sides, and the corneas demonstrated mild punctate staining. There was no intraocular inflammation, optic disc swelling, or other fundal abnormalities. Systemic examination revealed significant bilateral cervical lymphadenopathy and nodular lesions on multiple tattoos.

Computed tomography of the brain and orbits demonstrated bilateral hyperdensities encompassing the preseptal tissues, lacrimal glands, and anterior orbits, predominantly affecting the right side (Fig. 2). Initial blood work-up revealed raised inflammatory markers with a C-reactive protein level of 32 mg/L and eosinophil sedimentation rate of 60 mm/h. Otherwise, blood tests were unremarkable, including a normal white cell count. The patient was commenced on intravenous antibiotics and oral acetazolamide to manage the raised IOP.

After 48 hours and limited improvement with systemic antibiotics, the patient proceeded to orbital and conjunctival biopsy. Histology demonstrated sarcoidal granulomatous reaction containing tattoo pigment without caseous necrosis involvement (**Supplementary Figs. 1** and **2**, available online). Results of skin biopsy of the leg tattoo reported florid granulomatous inflammation in keeping with a sarcoid-like granulomatous tattoo reaction. There was no evidence of dysplasia or malignancy, and both fungi and acid–fast bacilli stains were negative. Blood work-up to exclude infectious etiologies was negative, including VDRL, QuantiFERON, HIV, hepatitis B, and hepatitis C. Serum angiotensin-converting enzyme level was normal at 45 μg/L (reference range, 20–70 μg/L). Chest x-ray showed no evidence of mediastinal or hilar adenopathy.

The patient was commenced on a reducing course of oral prednisolone starting at 40 mg with a good initial response to anti-inflammatory treatment. Resolution of the eyelid swelling and masses was observed over several weeks, with completed resolution of dysmotility and normalization of IOP. The patient reported a return of eyelid swelling without recurrence of dysmotility and raised IOP when prednisolone was tapered to 20 mg, necessitating an increase back to 40 mg. A slower taper to 5 mg over 4 months achieved stability of the orbital disease, but her eyes remain uncomfortable and photophobic relating to ongoing ocular surface problems managed with lubricants and punctal plugging. A steroid-sparing agent may be employed in her long-term management plan.

This case is a rare presentation secondary to an uncommon but possibly increasingly used cosmetic procedure. Short- and intermediate-term complications of scleral tattooing have been reported previously, including inadvertent

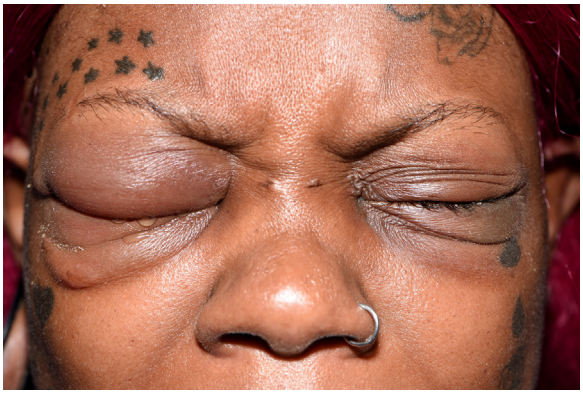

Fig. 1—Bilateral upper and lower eyelid swelling.

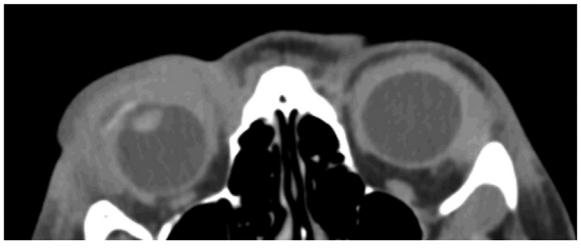

Fig. 2—Computed tomography of the brain and orbit showing bilateral hyperdensities encompassing preseptal tissue, lacrimal glands, and anterior orbit predominantly affecting the right side.

globe puncture with intravitreal dye injection,[1] immediate orbital cellulitis, posterior scleritis, and subepiscleral nodules.[2,3] This is the first case, to our knowledge, exploring a delayed and possibly long-term complication of scleral tattooing with systemic implications.

In this patient, marked sarcoid-like granulomatous changes arose in the periocular and anterior orbital tissues contaminated by scleral tattoo dye, along with concurrent more widely spread cutaneous changes consistent with sarcoidosis. The link between foreign-body granulomatous reaction caused by tattoo dye and sarcoidosis is unclear, but numerous reports have described features of systemic sarcoidosis precipitated by cutaneous tattooing.[1,4,5] In this case, we hypothesize that scleral tattooing caused localized sarcoid-like granulomatous inflammation and a possible systemic sarcoidosis reaction.

Current literature suggests that cases without inadvertent globe penetration tend to be managed with topical treatment,[3] but this report highlights that certain complications may require systemic medical management. Management of this complication may require long-term immunosuppressive therapy. As Rohl et al.[3] noted previously, excision of ink-containing tissue would pose a unique challenge if reactions persist. This is relevant in this case given the likelihood of such persistence and long-term immunosuppressive therapy for patients with this complication. This case contributes to the list of serious risks associated with this unique form of body modification. The Canadian Ophthalmological Society has published a position paper to ban the procedure,[6] and legislative movements have taken place in Ontario, Saskatchewan, and Oklahoma to make the procedure illegal.

Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jcjo.2022.07.014.

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Originally received Apr. 10, 2022. Final revision Jul. 6, 2022. Accepted Jul. 28, 2022.

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Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this correspondence article.