

Sarcoidosis presenting as tattoo granuloma inadvertently treated with laser therapy

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A patient presenting with nodules in his tattoos was referred for laser treatment, following which there was a diagnosis of cutaneous and pulmonary sarcoidosis.

Nodular change involving several different tattoo colours is characteristic of sarcoidosis.

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Case report

A 34-year-old previously well army officer was referred to a plastic surgeon for cosmetic removal of professional tattoos performed in 1984 on both upper arms. During the previous 2 years non-itchy nodules had developed in a tattoo on the right arm. The nodules were initially confined to the red pigment but subsequently involved the green, brown and blue colours of the tattoo.

The plastic surgeon advised referral to a laser clinic, where a test area using the Neodymium:YAG laser was carried out on a nodular area of the tattoo. This treatment led to 'inadvertent damage, with fluid squirting out from the nodule'. Further laser treatment was abandoned and a dermatological opinion was sought.

On examination, there were multiple firm, palpable, small, non-tender scattered nodules affecting all the colours of the tattoo on the right arm (Figure 1). The tattoo on his left arm showed no nodularity. There were no other physical signs on examination and the patient was otherwise asymptomatic.

Case Report



Figure 1
Granuloma overlying tattoo on right arm.

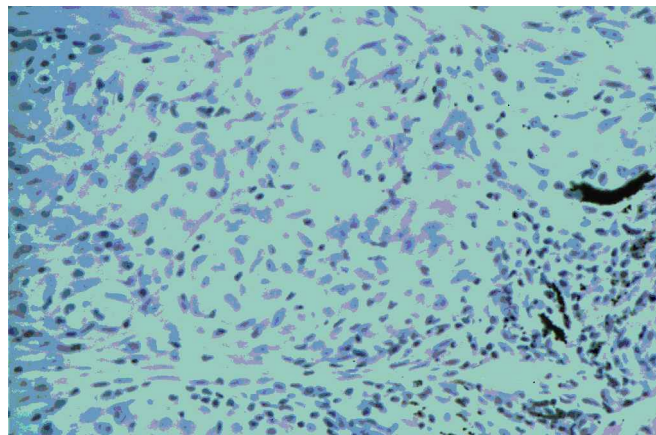


Figure 2
Granulomatous change on histology.

Histopathology of a tattoo nodule revealed non-caseating epithelioid granulomas consistent with sarcoidosis. There was evidence of dermal tattoo pigmentation both in the tissues and macrophages (Figure 2). Chest X-ray revealed bilateral hilar lymphadenopathy. Pulmonary function tests, ESR, full blood count, urea and creatinine, calcium and ACE levels and an abdominal ultrasound were all normal.

Discussion

Laser treatment is commonly used for removal of tattoo pigment. Laser physicians should be aware of the potential complications of tattooing, including the uncommon presentation of sarcoidosis. Sarcoidosis may present to the dermatologist or laser physician with granulomas either in scar tissue or in tattoos. Recognition of this phenomenon avoids unnecessary complications of inadvertent laser treatment and should also prompt investigations for systemic sarcoidosis.

Granulomas not associated with sarcoidosis and confined to just one coloured area of a professional tattoo are relatively common, but nodular change involving several different colours in a tattoo is diagnostic of sarcoidosis.¹

The first report of a sarcoidal reaction in a tattoo was by Madden in 1939² and this change was purely cutaneous without any evidence of systemic involvement. There was no mention of specific pigment colour and the granuloma was presumed to be a local reaction to the pigment. Patch testing to mercury was positive. Similar reactions localizing to green and red tattoos³ were postulated to represent a localized granulomatous hypersensitivity to the pigment.

Hypersensitivity was also postulated in three patients who had sarcoid reactions confined to the blue colours of the tattoo associated with bilateral uveitis.⁴ These patients had a positive reaction to cobalt. The uveitis improved after excision of the tattoos. Furthermore, a granuloma-

tous hypersensitivity reaction was seen in a patient who developed nodules in the red pigments associated with uveitis, pulmonary involvement and lymphadenopathy.⁵ Fragments of red tattoo granules were demonstrated with electron microscopy of the lung biopsy. Moreover, Lubeck and Epstein⁶ described a 52-year-old man with granulomata affecting the red, green and blue pigments with signs of systemic sarcoidosis such as iritis, pulmonary involvement, arthritis and bony lesions.

It is recognized that sarcoidosis may be associated with the Koebner phenomenon. For instance, scar sarcoid may develop in longstanding tribal marks as in West Africa.⁷ Furthermore, sarcoid granulomas have been reported to occur in venipuncture sites⁸ and granulomatous infiltration of long-standing scars is a recognized clinical feature of sarcoidosis.⁹

In most patients there is a delay of months or years between acquiring the tattoo and the development of the granulomata. Weidman¹⁰ described a sarcoidal reaction developing in tattoos performed 45 years earlier in a patient who presented with nodules in blue and red colours with pulmonary involvement. Interestingly, both the skin and chest X-ray changes disappeared spontaneously within 4 months.

There are many potential complications associated with tattooing, ranging from local inflammation to systemic infections. Sarcoidal granulomatous reaction occurring in tattoos, albeit a rare complication, is nevertheless an important phenomenon. The precise aetiology is unknown. Perhaps sarcoid granulomatous change in a tattoo represents a local inflammatory reaction to pigment or a hypersensitivity reaction.¹¹ It may also be a specific manifestation of cutaneous sarcoidosis exhibiting features of koebnerization.

Regardless of the mechanism, patients who present with nodules in their tattoos and, in particular, when more than one colour is involved, should have a comprehensive examination and investigation to exclude sarcoidosis. Laser physicians recognizing such a phenomenon can avoid subjecting patients to inappropriate laser treatment.

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