

the organs in question, as suggested by Cormane et al. (1979), a cross reactivity of such antibodies with substrates taken from internal organs, such as oesophagus and kidney for example, has not been tested in our case; this might have revealed a possible visceral involvement before its clinical signs have become apparent.

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Granulomatous Reaction in a Red Tattoo

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Abstract. A granulomatous reaction developed in the red part of a professionally executed tattoo. The reaction

appeared a few weeks after tattooing. A patch test for mercuric bichloride proved negative. The localization to the red part of the tattoo implies a specific reaction to an unknown antigen, and that the reaction may denote a localized delayed hypersensitivity.

Key words: Tattoo; Granulomatous reaction; Localized delayed hypersensitivity

The practice of tattooing is age-old and has flourished in modern civilizations among certain groups such as sailors and members of the armed forces. The tattoos are executed by professional tattooists by introducing pigmented particles into the dermis by means of an electric needle. The pigments used are in most cases mercuric sulphide (red colour), cobaltous aluminate (light blue), chromic oxide (green), cadmium sulphide (yellow), iron oxide (brown) and carbon (blue-black). All tattoos are followed by an acute inflammatory reaction which subsides within 3 weeks (7). Late or persistent reactions occur, but seem to be rare, considering the large number of tattoos performed.

This paper reports a case of granulomatous reaction in a red tattoo.

CASE REPORT

A 17-year-old marine had been tattooed by a professional tattooist on the left forearm 4½ months before attending this clinic. The tattooing was followed by the usual acute inflammatory reaction which subsided within a few weeks. Shortly after the inflammatory reaction had subsided, he developed small, slightly itching nodules in the red parts of the tattoo. He was otherwise well and sought advice because he considered the tattoo cosmetically unacceptable.

On inspection, a professional tattoo with red, green and blue colours was seen on the left forearm. All the red parts were elevated, with thickened and slightly scaling nodules (Fig. 1). A punch biopsy was made and histological examination showed the epidermis to be slightly hyperkeratotic. In the dermis there were areas heavily infiltrated with inflammatory cells, mostly lymphocytes and histiocytes. Some parts of the tissue showed granuloma-like infiltrates of lymphocytes and histiocytes. No epithelioid or foreign body types of giant cells were seen. Tiny pigment particles were seen, both intra- and extracellularly. In addition slight fibrosis was found in the dermis. The tattoo was excised surgically and the defect covered with a split-skin graft. A standard patch test series of the ICDRG (International Contact Dermatitis Research Group, AI-test), which includes mercuric bichloride 1:500 proved negative. The patient refused further investigations.



Fig. 1. Elevated, scaling, granulomatous nodules in the red part of the tattoo.

DISCUSSION

Late or persistent granulomatous reactions in tattoos seem to be rare. Cutaneous sensitivity to the pigments used for tattooing has been reported in red (2, 7) and green tattoos (6). In 1933 Ballin (2) described a patient who had been tattooed years previously and who suddenly developed itching and swelling of the red parts of the tattoo. A patch test with mercuric chloride 1:1000 was positive. A similar case was reported by Madden (7) in 1939. In his patient the reaction in the red part of the tattoo persisted from the date of tattooing and 7 years later elevated nodules were seen in the red parts. A patch test with 1:1000 mercuric chloride proved positive. Allergic tattoo granulomas were reported by Ravits (8) in a patient tattooed with mercuric sulphide (cinnabar) for the purpose of locating and marking his hinge axis when studying the patient's bite and other dental corrective measures. The patient's patch test proved positive to various mercuric compounds, including mercuric bichloride. Persistent reactions in a red tattoo without demonstrable allergy to mercuric bichloride have been reported by Abel et al. (1).

In our patient the clinical and histological findings in the tattoo were similar to those previously de-

scribed by others. However, we were not able to demonstrate any allergy to mercury by means of patch testing with mercuric bichloride 1:500, and the patient refused further patch testing and other investigations such as intradermal testing with mercuric compounds. The localization of the reaction to the red parts of the tattoo implies however, a specific response to an unknown antigen and the reaction may be a localized delayed hypersensitivity, a condition described by Winkelmann & Harris (10). Schmidt & Christensen (9) described granulomas in red tattoos made from a red dye different from cinnabar. In their cases patch tests with the dye were negative. Lichenoid reactions in red tattoos have been reported by Clarke & Black (5) and Winkelmann & Harris (10). One of the patients described by Clarke & Black (5) showed a positive patch test to mercuric compounds, while the other patient had negative patch test results. According to the literature, however, allergy to the pigments used for tattooing seems to be the most common cause of persistent or late inflammatory or granulomatous reactions (2, 3, 4, 7, 8).

In summary, late or persistent reactions in tattoos are rare. In most cases of such reactions it is possible to demonstrate an allergy to the pigments used for the tattooing. In rare cases, however, no allergy is found.

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