A RARE CASE OF PSEUDOEPITHELIOMATOUS HYPERPLASIA OF THE SKIN ARISING IN A TATTOO SITE


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Abstract

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Literature analysis on prevalence and clinical manifestations of adverse reactions to tattoo inks has been performed. A clinical case of a rare tattoo complication, i.e., pseudoepitheliomatous hyperplasia caused by red tattoo ink, has been described.

Introduction

The number of persons with pigmentation due to injection of coloring agents into the skin (tattoos) has increased significantly during the last decades. The results of epidemiological studies suggest that about 26% of the USA population and 10% of people in Europe have tattoos, which are especially popular with teenagers and young adults. At the same time, with the increasing popularity of this phenomenon, adverse reactions to tattoo inks are currently being observed in 2–30% of cases (1-4).

The reported adverse reactions to tattoo inks have multiformal clinical manifestations. Acute inflammatory, eczematous, granulomatous, lichenoid and pseudolymphomatous reactions have been reported by various authors. Apart from that, cases of infections (viral, bacterial, and fungal etiology), Koebner phenomenon (mostly in patients with a history of psoriasis, vitiligo, and lichen planus), photosensitivity of the skin, pseudoepitheliomatous hyperplasia and skin neoplasms, as well as hypertrophic and keloid scar formation have been described (1, 5-10).

Upon application of tattoo ink, skin adverse reactions may be caused by ink of any color. It is observed that white, black, green, blue, and yellow inks rarely cause allergic reactions, while red inks are the most reactive in this regard, due to inclusions of various metals, i.e. aluminium, iron, silicon, titanium, calcium, mercury, cadmium, as well as organic azo colorants (5, 11-16).

Skin adverse events due to red tattoo ink may be represented by allergic contact dermatitis or lichenoid and pseudolymphomatous reactions (4, 8).
In terms of diagnosis and treatment, a rare tattoo complication in the form of pseudoeipitheliomatous hyperplasia is of particular interest. The literature describes single cases of this reaction to red tattoo ink only (9). Pseudoeipitheliomatous hyperplasia was reported for the first time by M.B. Sulzberger (17) in 1937 and described by H.I. Goldberg in 1959 (18), as multiple verrucous papules forming exclusively in the area of red tattoo ink. A few more cases of pseudoeipitheliomatous hyperplasia were described later, where the authors reported various ways of adverse reaction development from the moment of ink application, lasting from four days to 12 months, with the process localization on forearms, back, and lower limbs (9, 10, 19–21). The trigger effect of solar radiation on pseudoeipitheliomatous hyperplasia development was observed (20, 22, 23).

Histopathological examination of the skin biopsy sample taken from a lesion shows epidermal and infundibular hyperplasia, signs of epidermal vacuolization and dyskeratosis, lymphocytic and histiocytic dermal infiltration with red pigment granules more rarely – local areas of dermoepidermal junction damage (9).

The literature describes single positive results of pseudoeipitheliomatous hyperplasia treatment with intrareslational injections or topical application of glucocorticosteroids, when using laser techniques and surgical removal of a lesion (6, 8, 9).

The case study of pseudoeipitheliomatous hyperplasia in a female patient is presented below.

A 46 year old patient requested consultation to the clinic of Ural Research Institute for Dermatovenereology and Immunopathology with complaints of skin rash and severe itching in the area of a color tattoo on the left lower leg. According to the patient, she had been sick for three months; tenderness, severe itching, and skin oozing appeared during the first day upon tattooing of the left lower leg, in the area of red tattoo ink. The patient did not seek the advice of a dermatologist; she took H1-antihistamines and applied topical glucocorticosteroids at her own discretion. No significant improvement was observed in the course of treatment.

Anamnesis vitae and occupational history of the patient are unremarkable. There are no skin diseases and oncopathology in family history. The patient has a history of allergy to washing powder, manifesting itself as allergic rhinitis and urticaria. No abnormalities in systems and organs detected during general examination. Lymph nodes are not enlarged, soft, nontender and movable on palpation. Bowel and bladder functions are normal.

Local status. The skin process is limited and localized in the area of red tattoo ink on the left lower leg. It is represented by skin infiltration of various density, multiple irregularly shaped scarlet papules with infiltrated edges going outside the tattoo contours. A dense prominent round-shaped node, up to 8–9 cm in diameter, with rough, bosedilated surface, partially covered with serous crust, is observed in the upper red fragment of the tattoo (Fig. 1). The skin outside the lesion is of normal color. Visible mucous membranes are unchanged. Hair and nail plates are unchanged. Red dermographism was present.

Laboratory data. Complete blood count: Hb 146 g/L, RBC 4.92 × 10¹²/L, PLT 267 × 10⁹/L, WBC 6.7 × 10⁹/L, NEU 4.2 × 10⁹/L, LYM 1.8 × 10⁹/L, EOS 0.2 × 10⁹/L, BAS 0.1 × 10⁹/L, MON 0.4 × 10⁹/L; ESR 12 mm/h. Urinalysis, hepatogram, and immunogram are unremarkable. Serological Treponema pallidum test is negative. Antibodies to HIV, hepatitis B and C are not detected.

Pathomorphological study of the skin biopsy sample taken from the area of red tattoo ink on the left lower leg (under the patient’s informed consent to skin biopsy): inhomogeneous epidermal and infundibular hyperplasia, pronounced hyper- and parakeratosis, focal serous infiltration of the epidermis with formation of vesicles in the corneal layer are observed. Hair follicle orifices are dilated and filled with parakeratotic debris. Focal lymphocytic infiltration, sclerosis, vasodilation, and massive red pigment deposits are observed in the papillary dermis. Mitoses, necroses, and signs of cell abnormalities are not detected (Figures 2 and 3). Conclusion: morphological changes correspond to “tattoo-associated” pseudoeipitheliomatous hyperplasia.

Based on the medical history, clinical findings and results of the pathomorphological study of the patient’s skin biopsy sample, the final diagnosis of pseudoeipitheliomatous hyperplasia of left lower leg skin caused by red tattoo ink was set.

Due to the 14 day-long topical corticosteroid therapy with Fucicort cream (betamethasone and
Patient P., 46 years old. Massive red pigment deposits in the papillary dermis, vasodilatation and lymphocytic dermal infiltration, vacuolization of a substantial proportion of keratinocytes. Histopathological examination of the skin biopsy sample. Hematoxylin and eosin staining. 200x magnification

The patient achieved positive dynamics of the skin process in the form of disappearance of pain and itching, reduction of hyperemia and infiltration of papules in the area of the red tattoo ink.

Conclusion

This case suggests that the development of adverse reactions to tattoos is unpredictable, so awareness of possible development of various complications, especially when using red ink, should be promoted among patients.

Conflicts of interest: none declared.

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Patients’ consent obtained.

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