Dermatofibroma in a black tattoo: report of a case*

Dermatofibroma sob pigmento preto de tatuagem: relato de um caso

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Abstract: Tattooing has been associated with a variety of complications including inflammatory and granulomatous reactions, transmission of infections, and neoplasms. We report a case of a 24-year-old male who presented with a 2-month history of an erythematous nodule involving a newly made tattoo on the right leg. An excisional biopsy was performed and the histopathological evaluation was consistent with dermatofibroma. Only three cases of dermatofibroma associated with tatooing were reported in litetature. We report an additional case and review the literature regarding cutaneous reactions to tattoos.
Keywords: Fibrosis; Histiocytoma, benign fibrous; Tattooing

Resumo: Tatuagens têm sido associadas com uma variedade de complicações incluindo reações inflamatórias e granulomatosas, transmissão de infecções e neoplasias. Relatamos um caso de homem com 24 anos de idade que apresentava há dois meses nódulo eritematoso sob pigmento preto de uma tatuagem na coxa direita. A biópsia excisional foi realizada e a avaliação histológica foi consistente com dermatofibroma. Apenas três casos da associação dermatofibroma e tatuagem foram relatados na literatura. Nós reportamos um caso adicional e revisamos a literatura sobre reações cutâneas em tatuagens.
Palavras-chave: Fibrose; Histiocitoma fibroso benigno; Tatuagem

INTRODUCTION

Cases of skin reactions to tattoos are being documented as tattoos become increasingly popular in today's society. The introduction of exogenous pigments into the dermis during tattooing may trigger cutaneous reactions with various histological patterns, including inflammatory and granulomatous reactions, transmission of infections and even neoplasms. Dermatofibroma (DF) is a common cutaneous fibrohistiocytic proliferation of unknown etiology. We report one case of DF that developed within a black tattoo. To date, only three cases of DF after tattooing have been reported.[1,2]

CASE REPORT

An otherwise healthy 24-year-old male presented with an erythematous nodule involving a tattoo on his right lower leg. The eruption began two months after the placement of black ink within a previously existing tattoo. He denied similar changes in previous tattoos. Clinical examination revealed an erythematous, freely movable nodule overlying a black pigment zone on the right lower leg, with slight tenderness on pressure (Figure 1).

Examination of the hematoxylin-eosin stained histological sections of an excisional biopsy revealed nodular dermal proliferation of fibroblast-like cells embedded

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in a dense collagen matrix. These cells displayed an irregular arrangement, but no cytological atypia. The overlying acanthotic epidermis showed basal hyperpigmentation. In addition, extracellular deposits of coarse black pigment were observed, particularly above the spindle-cell proliferation (Figures 2, 3 and 4).

DISCUSSION

Tattoos applied for cosmetic purposes are very popular in worldwide modern society. The introduction of exogenous pigments into the dermis during tattooing may trigger cutaneous reactions with various histological patterns including lichenoid, granulomatous, pseudolymphomatous, pseudoepitheliomatous hyper-

Figure 1: Erythematous nodule overlying a black pigment zone

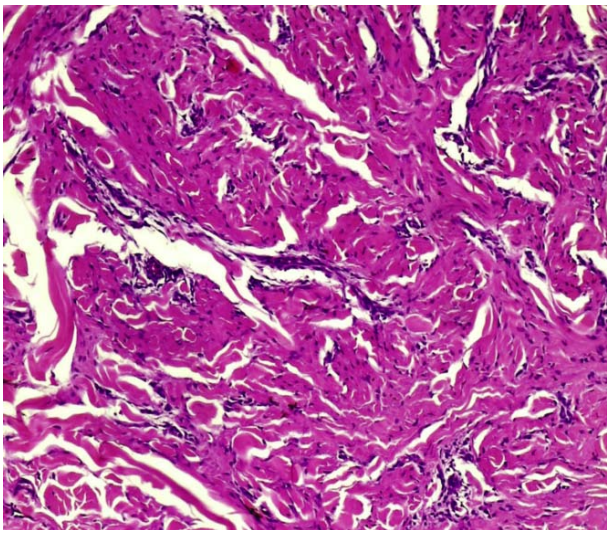

Figure 3: Collagen trapping by the dermal fibrohistiocytic infiltrate (HEx40)

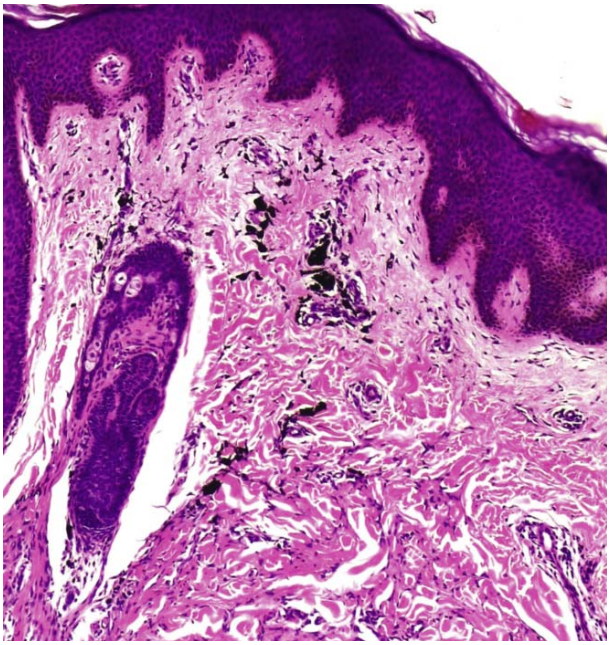

Figure 2: Acanthotic epithelium with basilar hyperpigmentation over a dermal spindle cell proliferation and extracellular deposits of black pigment material (HEx10)

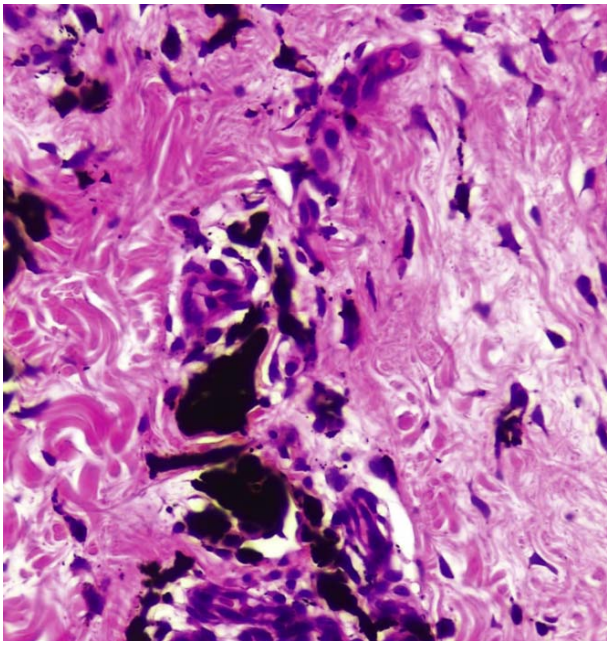

Figure 4: Extracellular deposits of black pigment

plasia and eczematous.[2,3] In addition, there have been reports of infectious diseases such as leprosy, tuberculosis cutis, syphilis, hepatitis, mycobacteriosis and warts associated with inoculation during tattooing.[4] Benign and malignant tumors, such as seborrheic keratosis, epidermal cysts, keratoacanthoma, melanoma, basal cell carcinoma and squamous cell carcinoma may also arise in tattoos.[5] Red pigments are the most common cause of delayed tattoo reaction. Mercury in red mercuric sulfide (cinnabar) has been well documented as the cause of allergic reactions. Less commonly, several reports have documented reactions to other colors in tattoo pigments, including purple, green, yellow and black.[6] DF is a common cutaneous nodule of so far disputed etiology that occurs more often in women, frequently developing on the extremities (mostly the lower legs). It usually presents with no symptoms although pruritus and tenderness are not uncommon. The overlying epidermis is usually acanthotic and may show basal hyperpigmentation. The tumor is centered in the mid dermis, presents no capsule, and blends peripherally with the surrounding tissue. Whorling fascicles are formed by spindle cell proliferation with characteristic excessive collagen deposition. In the periphery, the spindle cells characteristically wrap around normal collagen bundles. Positive immunohistochemical results with antibodies against factor XIIIa are usually found. Transforming growth factor-beta (TGF-beta) signaling might be a trigger of the fibrosis seen in dermatofibromas.[7]

Historically attributed to some traumatic insult to the skin, the cause of DF is still unknown. Whether DF is a true neoplasm or a reactive process induced by mechanical stimuli remains nuclear.[7] The arguments raised in support of a reactive process include the presence of inflammatory cells, development of fibrosis in older lesions of DF and the association of DF with trauma recorded in 20% of all cases.[8] Reports have been published on DF occurring after nipple-piercing, insect bite and on a vaccination scar.[8,9] Others believe that dermatofibroma is a benign neoplastic process, with evidence of clonality in some DF found by cytogenetic studies.[10]

To date, only three cases of DF have been reported after tattooing.[1,2] The link between DF and tattoos is supported by the chronology between tattooing and the development of DF in all cases, as the skin was free of any lesion before tattooing and DF has been reported to occur after trauma.[2,8] It can be hypothesized that the inflammation triggered by introducing exogenous pigments may have played a role in these cases of DF secondary to tattooing.[2]

Tattooing is a traumatizing act and triggers a non-specific inflammatory reaction as soon as the needle starts puncturing the skin. Moreover, tattoo pigments do not remain inert in the dermis: non-specific macrophage activation and discrete inflammatory changes are observed years after tattooing as an attempt to degrade the foreign material. The lesion is assumed to start as a response to injury with the initial granulation tissue eventually replaced by fibrosis and DF possibly represents a model of a local fibrotic process.[7] In summary, we present one new case of association between DF and a tattoo. To our knowledge, this is the fourth report of this association. DF should be considered in the clinical differential diagnosis of lesions occurring in tattoos. Further investigations are needed to clarify the nature of this association. ❑

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