

Malignant melanoma in a tattoo: case report and review of the literature

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Tattooing is a fairly widespread practice worldwide, despite the trauma it entails and the potentially toxic pigments it employs. Several benign and malignant lesions have been described in relation to tattoos, including verrucae, granulomas, basal cell and squamous cell carcinoma. Overall, only 10 cases of malignant melanoma in tattoos are reported in the English literature. We describe a malignant melanoma that developed on a nevus on which a tattoo had been made. The possible pathogenetic relationship between malignant melanoma and tattoos is also discussed. *Melanoma Res* 16:375–376 © 2006 Lippincott Williams & Wilkins.

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Introduction

Tattooing is a fairly widespread practice worldwide, despite the trauma it entails and the potentially toxic pigments it employs. Allergic reactions as well as benign and malignant lesions have been described in relation to tattoos, including verrucae, granulomas, basal cell and squamous cell carcinoma [1]. Overall, only 10 cases of malignant melanoma in tattoos are reported in the English literature. We describe one that developed on a nevus on which a tattoo had been made.

Case report

A 36-year-old Caucasian man presented to our clinic with a 1–1.5 cm brown-black lesion within a large dark-blue tattoo on the left scapular region (Fig. 1). The lesion was painless and had a smooth surface and irregular borders. The tattoo had been made 10 years previously and encompassed a small melanocytic nevus that the patient remembered seeing for many years. Over the previous year, the lesion had doubled in size and changed from a round shape to one with notched and irregular borders. In the previous month, it had become increasingly itchy, although without bleeding or ulceration. The patient had a history of outdoor recreational and occupational ultraviolet exposure but denied ever sustaining sunburns in the affected area. Family history was negative for melanoma or atypical nevus syndrome, and the patient was otherwise fit and healthy. No axillary, inguinal or other lymphadenopathy was noted. Dermoscopic examination showed an atypical pigment network, irregular globules, regression structures and greyish blue areas (Fig. 2). The excisional biopsy showed the lesion to be a Clark level III malignant melanoma with a Breslow

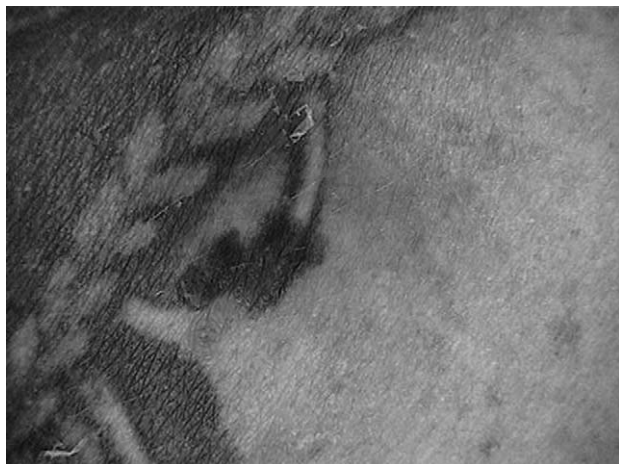
thickness of 0.3 mm. Blood chemistry, electroencephalogram, chest X-rays, and liver and lymph node ultrasound were normal. A second excision with 1 cm free margin was carried out.

Literature review

The rising incidence of melanoma in the last few decades has led researchers to focus on risk factors; however, tattoos are not considered as risk factors and very few cases of melanoma in a tattoo are described in the literature.

The first reported case of malignant melanoma in a tattoo (made with indelible pencil on the forehead of a 9-year-old boy) dates from 1938 [2]. In 1969, Kirsch [3] described a right arm malignant melanoma with an axillary metastasis 27 years after tattooing. Another man, aged 55 years, noted a lesion in a mercury–cadmium pigment tattoo made on the arm about 5 years previously [4]. In two further cases, the lesion arose at the sites of tattoos marking radiotherapy fields [5]. One patient developed a Clark level III malignant melanoma on a tattoo on the border of the left tangential chest wall field 2 years after radiation therapy for metastatic breast cancer, and a man developed two separate metastatic melanoma nodules at the tattoo sites after radiation therapy for Hodgkin's disease. Lee [6] described a primary melanoma in a blue tattoo of the anterior chest wall in a young man. Three cases in young adults (aged 36, 47 and 44 years, respectively) involved the back (Breslow thickness of 1.15 mm), abdomen (0.75 mm) and forearm (0.9 mm) [1,7,8]. The latest reported case regards a superficially spreading malignant melanoma

Fig. 1



Malignant melanoma in a dark-blue tattoo on the scapular region.

Fig. 2



Dermoscopic features: atypical pigment network, irregular dots/globules, regression structures and greyish blue areas.

(depth 0.92mm) on a large left scapular tattoo in a 26-year-old man [9].

The pathogenesis of melanomas developing at tattoo sites is unknown. Those occurring in radiotherapy tattoos may be explained by co-carcinogenic effects of Indian marking ink and radiation [5]. The mercury-cadmium dye used for marking radiotherapy fields elicits a photo-allergic reaction due to the red pigment that has been suggested to be a factor in melanoma development [6]. Melanomas arising in decorative tattoos, given their extremely low incidence, are however more likely to be coincidental [8].

Obviously, the trauma involved in the making of a tattoo could also play a role, although recent studies do not seem to support an association between single or repeated trauma and melanoma formation [10]. A review of the literature showed that all the tattoos in which a melanoma arose were on ultraviolet exposed or intermittently exposed body areas, that is forehead, arm, trunk and back. Thus, exposure to ultraviolet and ionizing radiation can also reasonably contribute to the development of melanoma.

Finally, to avoid an erroneous initial diagnosis the possibility of the tattoo pigment migrating to regional nodes should be considered when the sentinel lymph node is clinically suspicious for melanoma [11].

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