

Tattoo Pigment within Regional Lymph Nodes Mimicking Cutaneous Melanoma Metastasis

Dear Editor,

The diagnosis of malignant melanoma accounts for 1-2% of all cancer diagnoses, around 4% of all malignant skin diseases, and 80% of all skin cancer deaths (1). The prognosis depends on several factors including tumor size, Clark level, Breslow thickness, location, ulceration, and presence of metastases. Detection of lymph node metastasis is initially accomplished by clinical examination and by operative evaluation for occult metastasis using sentinel lymph node biopsy (SLNB) when indicated (2). Lymph nodes (LN) with melanoma metastasis may appear normal in early stages, but eventually they become dark, firm, and enlarged (3).

In 2017, a 32-year-old female patient was referred to our ward by a dermatologist following a biopsy excision of a nevus under her right breast that tested positive for a cutaneous melanoma grade T2aNx with a Breslow thickness of 1.9 mm, with no sign of ulceration and no history of previous illnesses or chronic diseases. Based on the American Joint Committee on Cancer (AJCC) guidelines, wide excision with a sentinel lymph node (SLN) biopsy was indicated (4). The patient was injected with 0.4 mL CiTc 99m Nanocoll in all four quadrants around the primary scar. A 2 cm wide elliptical excision was performed circumferentially around the scar and to the depth of the muscular fascia of the thorax. With the aid of a gamma probe, a single radioisotope positive lymph node was located in the ipsilateral axilla, but 5 dark pigmented



Figure 1. Darkly colored lymph node within the adipose tissue.

lymph nodes situated behind the SLN were visualized during manual dissection and thought to be consistent with metastatic disease (Figure 1). Due to this new finding, an excisional biopsy of all pigmented nodes was performed. Histology of the excised skin did not demonstrate any further cancerous cells.

The size of the SLN was 15 mm, and immunohistochemistry for Melan A was negative for metastatic melanoma. Histological analysis of the darkly pigmented nodes was negative for metastatic melanoma as the pigment was demonstrated to originate from the dermal tattoo on the patient's back that had been removed by dermabrasion 3 years before melanoma development (Figure 2, Figure 3).

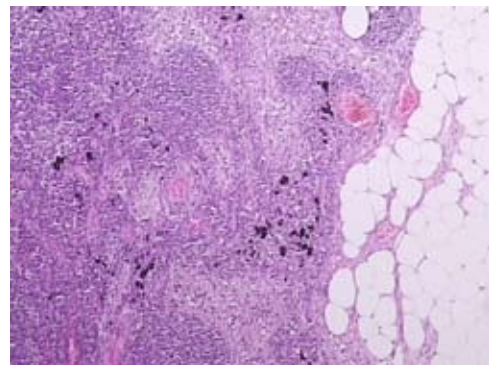


Figure 2. Histopathology demonstrated tattoo pigment within the regional lymph nodes (hematoxylin and eosin $\times 10$).

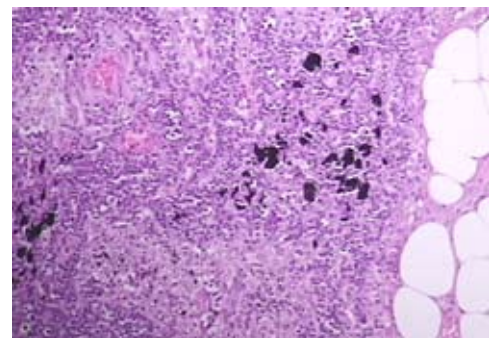


Figure 3. Histopathology demonstrated tattoo pigment within the regional lymph nodes (hematoxylin and eosin $\times 40$).

Dermal tattooing results in initial sloughing of the overlying epidermis, variable dermal inflammation, and gradual assimilation of pigment into macrophages. Much of the pigment is rapidly carried into regional draining LN, which was shown in 2010 on a SKH-1a mouse model, and causes lymphadenopathy which is thought to be a result of local inflammation (6). Importantly, even after removal of the offending cutaneous tattoo the tattoo pigment can persist in draining or distant nodes visible to the naked eye (7). In such cases, LN can mimic metastatic malignant melanoma and may prompt the surgeon to proceed with radical lymph node dissection which may not be necessary.

Despite clear guidelines for melanoma treatment in the general population, there are several questions that need to be addressed: firstly, how should a physician approach a patient with unknown history of tattoo removal, a diagnosis of melanoma, and intra-operative darkly pigmented lymph nodes? Secondly, due to the lack of scientific data and treatment protocol, if the SLN is normally colored while other regional nodes are darkly pigmented, what should the treatment plan entail?

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