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Persistent perpendicular pigmentation: a peculiar but specific type of persistent nevus

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Abstract

Persistent nevi are commonly encountered in clinical and dermatopathology practice. Although they may mimic melanoma on clinical presentation as well as microscopic review, they behave in a benign fashion and are not associated with more aggressive behavior than the original nevus. Persistent nevi may exhibit asymmetry and irregular features that prompt concern for melanoma. However, the relative circumscription and restriction of pigment to the surgical scar provides a valuable clue to diagnosis. Some persistent nevi may have a linear pattern when they are confined to a widening scar. In this situation, the pigment spreads along the lines of skin tension (Langer lines). This unique pattern can be easily identified and should be a reassuring finding. We present a case of persistent nevus with a striking perpendicular pigmentation confined to the scar; the clinical and histologic features of persistent nevi are reviewed.

Keywords: persistent nevus, recurrent melanoma, Langer lines

Introduction

Recurrent melanocytic nevus after partial surgical removal may exhibit unusual clinical and histopathologic features. Sometimes these lesions can mimic melanoma. Drs. Kornberg and Ackerman were the first to report this phenomenon and used the term "pseudomelanoma" [1]. Most recent literature refers to this phenomenon as a "recurrent" or "persistent" nevus. The term persistent nevus is preferred by many because it avoids confusion with the term recurrent melanoma, which is sometimes used synonymously with metastatic melanoma [2].

Clinical information and correlation with initial biopsy material is essential. Shave biopsy is commonly associated with persistence of nevi. Distortion by widening scars can play an important role in orienting persistent nevi along skin tension lines (Langer lines).

Case Synopsis

A 46-year-old man presented for evaluation of a deeply pigmented lesion on the upper back. He reported that he had a lesion excised from the left upper back approximately 10 years previously, and since that time he had noticed a pigmented lesion on the left upper back in the same area of the previous procedure. The area had not bled or been painful. On examination, striking pigmentation was noted within an atrophic scar. The lesion on the back revealed a heavily, but evenly, pigmented band perpendicular to the scar but parallel to the Langer tension lines (**Figure 1**). The original histologic material was not available for review. The area was re-excised and showed proliferation of melanocytes overlying the scar. Melanocytes were uniform in size and had nuclei of similar size to those of the surrounding keratinocytes (**Figure 2**). Abundant

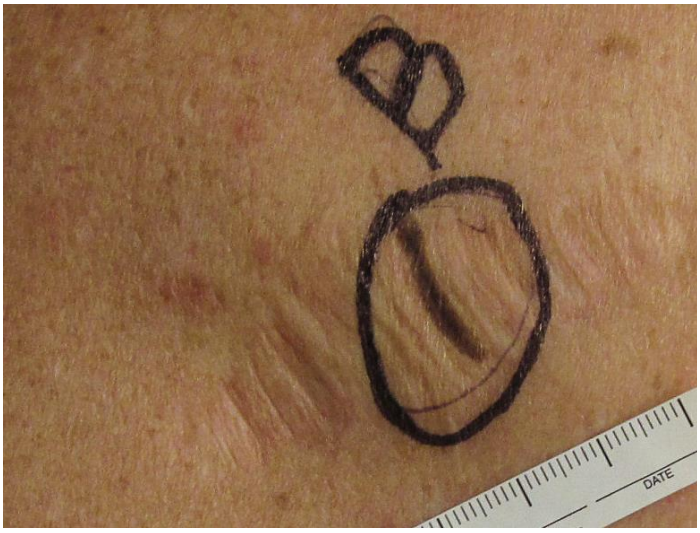

Figure 1. *The lesion on the back reveals a heavily, but evenly, pigmented band perpendicular to the scar but parallel to the Langer tension lines. Scale in centimeters.*

melanin was noted in the keratinizing layer and along the dermal-epidermal junction, but pagetoid spread of atypical melanocytes was not identified. Thickened eosiniophilic collagen bundles were noted in the dermis and there was a loss of cutaneous appendages consistent with mature scar. Numerous melanophages were noted around the superficial vascular plexus. The melanocytic proliferation and pigment were limited to areas overlying scar (**Figure 3**). Since the second excision, the area has healed well without further difficulty or pigmentation after nearly two years' follow up.

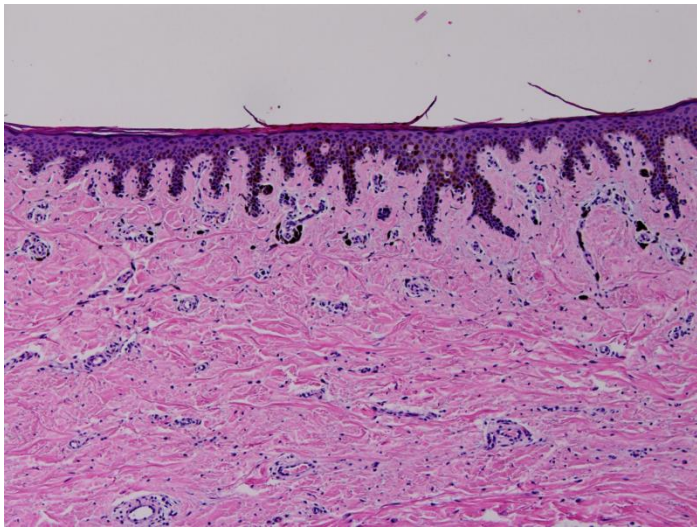

Figure 2. *The biopsy reveals proliferation of melanocytes overlying scar. Melanophages are noted in the dermis (H&E, 100×).*

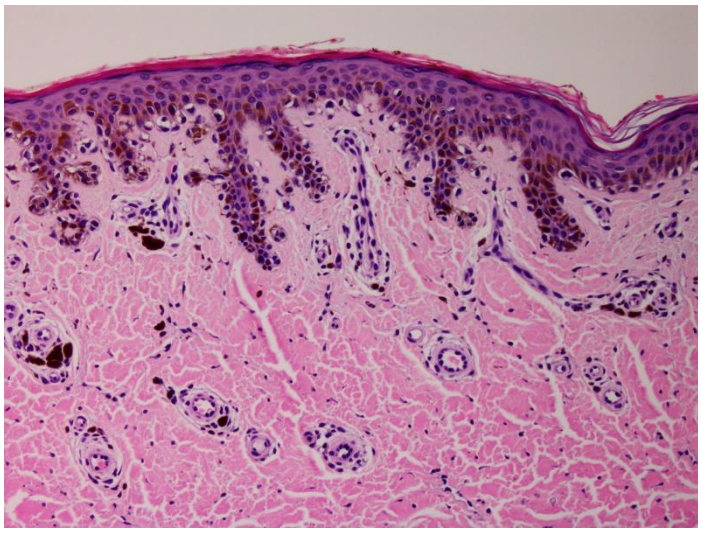

Figure 3. *Melanocytes are uniform in size and have nuclei of similar size to those of the surrounding keratinocytes. Full-thickness pagetoid spread of atypical melanocytes is not identified, nor are abnormal mitotic figures noted (H&E, 200×).*

Case Discussion

Nevi are often removed by shave biopsy technique and when the margins are involved with nevus cells, pigment may return. Although the average time for a persistent nevus to develop is estimated to be about 10 months, the interval may vary [3]. Incomplete history may make accurate diagnosis more difficult and many patients may not recall a prior procedure. The characteristic histologic findings can allow for diagnosis of persistent nevus (**Table 1**) sometimes even in the absence of a history of prior procedure [4, 5].

Table 1. *Histologic Features of Persistent Nevi [4]*

Lentiginous and junctional proliferation of melanocytes
Focal upward migration of single melanocytes
Sharp circumscription
Absence of lateral spread beyond dermal scar
Occasional mature nevus deep to the dermal scar
Melanophages in the papillary dermis

An important clinical feature of the persistent nevus is that the melanocytic proliferation is confined to scar [6]. Dermoscopic examination of persistent nevi typically reveals radial lines, symmetry, and centrifugal growth pattern whereas a "chaotic and noncontinuous growth pattern, and pigmentation beyond the scar's edge" are more commonly seen in recurrent melanomas [7]. Pigmentation beyond a

scar's edge was identified as the most important dermoscopic feature of recurrent melanoma. [7]. Dermoscopic examination of reactive pigmentation seen in persistent nevi at a surgery site lacks pigment globules and demonstrates streaks and a regular network of pigmentation, whereas eccentric hyperpigmentation at the periphery was more commonly demonstrated in recurrent melanoma [7, 8].

Microscopic examination of persistent nevi may also create diagnostic difficulties and histologic grading of persistent nevi may not correlate with the atypia of the original biopsy [3]. Proliferation of melanocytes at the epidermodermal junction is common in neoplastic and reactive processes, thus elucidating the difference between wound healing and melanocytic hyperplasia may be difficult. A review of 722 re-excised scars of benign and malignant lesions showed 59 lesions demonstrating melanocytic hyperplasia. Histopathology demonstrated variable numbers of increased melanocytes arranged as solitary units without formation of junctional nests but minimal atypia. No melanocytes were noted in the cornified layer and typical findings of scars were observed in papillary and reticular dermis [9].

When reinterpreting re-excision margins, immunohistochemical studies may be helpful. Persistent nevi exhibit a maturation pattern with HMB-45/Melan A/pmel 17 staining and do not usually exhibit a high proliferative index with Ki-67/MKI67 staining [10, 11]. However, clinical history and clinical presentation may be more useful in deciphering benign and malignant recurrence.

Conclusion

Most primary excisions are oriented in such a way that wounds remain within the skin tension lines. When an excision is not oriented along the skin tension lines, the scar may gradually widen over time. This phenomenon is associated with the striking linear pattern of persistent nevus noted in our patient but may also occur in de novo nevi which illustrates the importance for the novice surgeon to follow resting skin tension lines. When clinicians are encountering a persistent pigmented lesion that is confined to a surgical scar, a persistent nevus should be favored. Benign features that may defer aggressive therapy include radial lines and symmetry, short interval to reappearance of the pigment after initial excision and benign prior histology. Other considerations may include young age at presentation, absent history of prior malignant lesions, and minimal history of excessive sunburn. Despite the benign behavior of persistent nevi, many experts recommend that a conservative yet complete excision be performed to ensure complete histologic evaluation [11].

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