Blue Nevi: A Case Report and Review of the Literature

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Blue nevi can present clinically as blue, gray, brown, or black solitary nodules or plaques on the skin. Histologically, they represent collections of melanocytes and melanophages in the dermis. We present a case of a cellular blue nevus in a 55-year-old white man that presented as an enlarging blue-gray nodule on the right dorsal foot. These cases can be challenging both clinically and histologically because malignant melanoma or malignant transformation of a blue nevus should be considered. We review the various types of blue nevi and the literature.

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Case Report

A 55-year-old white man presented with a nodule on the right dorsal foot that had been present for approximately 20 years. The lesion had slowly grown during the past several years and it was painful when he was wearing shoes. The patient denied ulceration, drainage, or history of trauma to this area, and he had no similar lesions elsewhere. He was otherwise in good health.

Physical examination of the second distal metatarsal region of the right dorsal foot revealed a 30×25-mm dome-shaped, nonfluctuant, nontender, firm mobile nodule (Figure 1). Overlying the central portion of the nodule was an oval-shaped yellowish plaque with a central blue-gray area.

Two punch biopsy specimens were obtained. Histology revealed a highly cellular tumor filling the entire dermis with a pushing border at the base (Figure 2). There were rounded to spindle-shaped cells closely aggregated and arranged in nodules with significant pigment production (Figure 3). Near the surface of the lesion, there was extensive fibrosis and a few pigmented dendritic cells. Nuclear pleomorphism and occasional mitotic figures were noted. A diagnosis of cellular blue nevus was made. Complete excision was subsequently performed and the diagnosis of benign cellular blue nevus was confirmed.

Comment

Blue nevi are blue, gray, brown, or black solitary nodules or plaques that occur on the skin.[1] These lesions have been described in the literature for more than 75 years. The cellular blue nevus was first described in 1925 by Darier[2] as a variant of melanoma but subsequently reclassified as a variant of blue nevus, which typically follows a benign course.[3,4] Blue nevi are thought to result from the ectopic deposition of melanocytes within the dermis. Normally in development, melanocytes migrate from the neural crest to the epidermis. However, with blue nevi there appears to be a premature arrest of migration resulting in the aberrant location of melanocytes. These dermal melanocytes absorb high-wavelength light and reflect low-wavelength blue light, a phenomenon known as the Tyndall effect.[5] Blue nevi derive their name from the characteristic blue hue produced by this effect.

Blue nevi can be divided into 3 groups: common blue nevi, cellular blue nevi, and combined blue nevus–nevomelanocytic nevi. Occasionally, a rare malignant variant of the cellular blue nevus has been described and is termed *malignant blue nevus*.[6] Some pathologists prefer the more accurate designation *malignant blue melanoma* because, by definition, a nevus is a benign growth. Cellular blue nevi typically are larger than common blue nevi, measuring 1 to 3 cm, while common blue nevi typically measure less than 1 cm. Cellular blue nevi are more likely to be elevated, have a smoother surface, and may be more aggressive in their capacity for malignant transformation.[1,6,7] Cellular and common blue nevi also may be differentiated by their location. Common blue nevi frequently occur on the dorsum of

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Figure 1. Dome-shaped, nonfluctuant, nontender, firm mobile nodule on right dorsal foot.

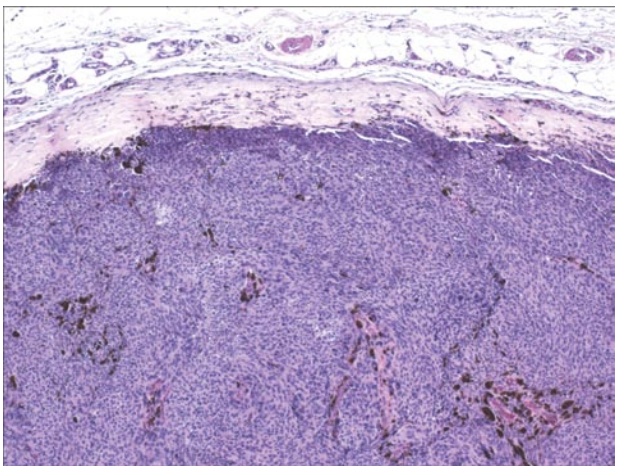

Figure 2. A highly cellular tumor filling the entire dermis with a pushing border at the base (H&E, original magnification ×40).

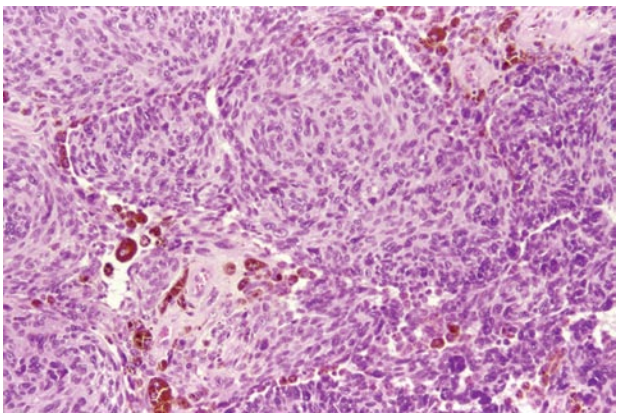

Figure 3. Nodular aggregates of rounded to spindle-shaped cells with significant pigment production (H&E, original magnification ×200).

the hands and feet,[1,8] while cellular blue nevi most commonly occur on the buttocks or sacrococcygeal region but also can be seen on the scalp, face, and feet.[1,6,8] Combined blue nevus–nevomelanocytic nevus share features of blue nevi and melanocytic nevi. They may have any of the features of a blue nevus, but they also will have histologic evidence of a melanocytic nevus at the epidermal-dermal junction or in the dermis.[6]

While the 3 clinically described variants of blue nevi may be distinguished histologically, other pathologic distinctions have been made among these categories of blue nevi. Common blue nevi are composed of pigmented dendritic melanocytes and melanophages in the reticular dermis, positioned with their long axis parallel to the epidermis.[6,9] These lesions have an intact epidermis and epidermal-dermal junction. Cellular blue nevi, however, consist of foci of oval, spindled, fusiform, or epithelioid melanocytes that occupy the deep dermis and extend along adnexal structures and neurovascular bundles into the subcutaneous tissue. The cells contain abundant pale cytoplasm containing little or no melanin. While mitoses may be present in blue nevi, they tend to occur in limited numbers.[5,10]

Epithelioid blue nevi have been described in association with the Carney complex, which includes endocrine abnormalities, myxomas, spotty skin pigmentation, and schwannomas.[11,12] Epithelioid blue nevi are composed of 2 cell populations: (1) large, globular, heavily pigmented cells with small nucleoli; and (2) large epithelioid cells with faint to no pigmentation and large vesiculated nuclei. Epithelioid blue nevi described with the Carney complex were more likely to be present with multiple nevi, have a familial occurrence, and appear without fibrosis. More recently, these nevi have been described arising outside the Carney complex.[12]

The sclerosing blue nevus is another unique histologic variant of blue nevus.[13,14] These lesions appear histologically with a scarlike reaction, revealing a discrete nodule composed of dendritic/spindled melanocytes in the dermis with associated fibrosis and lack of an intraepidermal component as well as an orderly involvement of nerves and a stromal reaction. Care must be taken to differentiate this lesion from desmoplastic malignant melanoma.[13,14]

Melanomas can rarely arise in the background of cellular blue nevi. These malignant blue nevi typically raise clinical concerns because of their increasing size. Histologic evidence of malignant transformation is demonstrated by a sheetlike growth pattern, necrosis, nuclear hyperchromasia, nuclear pleomorphism, prominent nucleoli, excessive and atypical mitotic activity, and infiltrative borders.[1] Malignant blue nevi follow an aggressive course and studies have documented mortality rates as high as 73% due to metastases.[1,9,15] As a result, clinical guidelines recommend prompt excision of blue nevi

to evaluate for malignant change in cases of rapid growth, size greater than 2 cm, or atypical clinical morphology (ie, multinodularity).[1,9]

In our patient, the nodule was completely excised and no histologic evidence of malignant transformation was found. The patient is doing well 2 years after the primary excision.

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