

Blue Lesions in Dermoscopy: A Practical Guide to Risk Stratification and Management

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Blue Lesions are Concerning by Definition

In dermoscopy, the color blue often evokes a sense of alarm, not simply because of its rarity, but because of its depth. Blue pigmentation typically indicates the presence of melanin in the deeper dermis[1], which automatically introduces differential diagnoses that include potentially aggressive malignancies. Yet not all blue lesions are created equal, and more importantly, not all require excision. The goal of this editorial is to provide a clinically useful framework for assessing bluish lesions in daily practice.

Color as a Diagnostic Clue

The dermoscopic color spectrum corresponds to the histologic depth of pigmentation. Black correlates with superficial pigment (stratum corneum) [2], brown with melanin in the epidermis, gray with pigment in the papillary dermis, and blue with deep dermal pigmentation. Red, often seen in vascular lesions, also originates from dermal structures.

While these correlations are well known, the diagnostic value of the blue color itself is limited. In fact, the only lesion reliably diagnosable by its blue color alone is the blue nevus. [3] In all other cases, the presence of blue must be contextualized with surrounding features.

The Diagnostic Challenge of Blue Lesions

Blue is a nonspecific color. Many lesions, both melanocytic and non-melanocytic, can appear bluish. Among melanocytic lesions, the differential includes:

- Blue nevus (Figure 1)
- Spitz nevus (pigmented variant) (Figure 2)
- Melanoma (especially nodular subtype) (Figure 3)

Among non-melanocytic lesions, the spectrum is broader:

- Angiokeratoma (Figure 4)
- Basal cell carcinoma (pigmented) (Figure 5)
- Seborrheic keratosis (Figure 6)

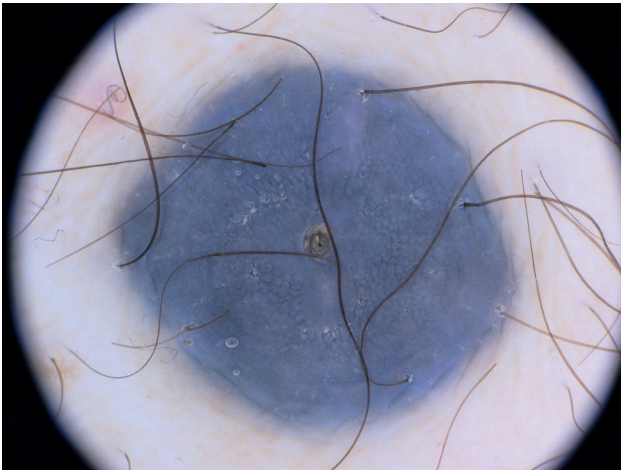


Figure 1. Dermoscopy of a blue nevus showing homogeneous, structureless blue pigmentation.

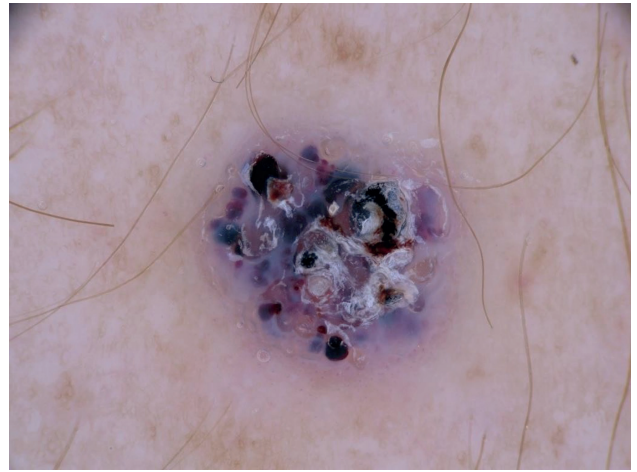


Figure 4. Angiokeratoma with blue areas and sharply demarcated purple-to-black lacunae.



Figure 2. Pigmented Spitz nevus displaying streaks at the periphery and central bluish pigmentation.

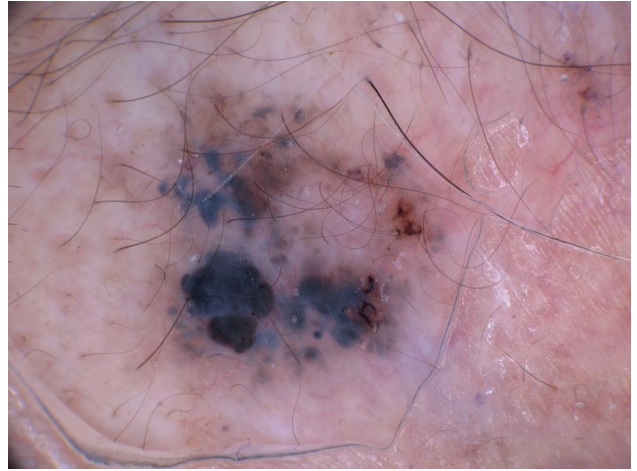


Figure 5. Pigmented basal cell carcinoma showing blue-gray ovoid nests and globules.

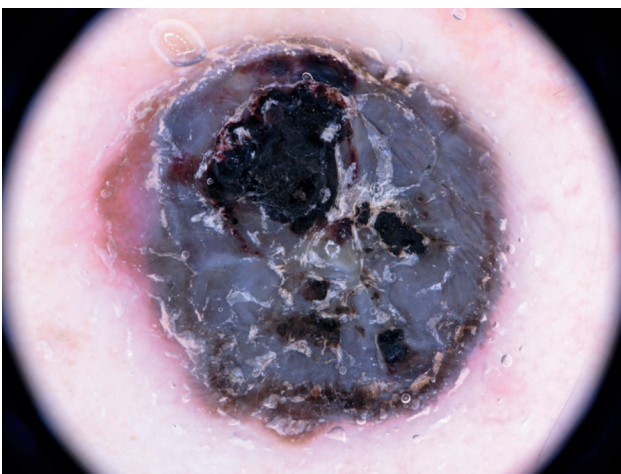


Figure 3. Nodular melanoma with irregular blue-black pigmentation.

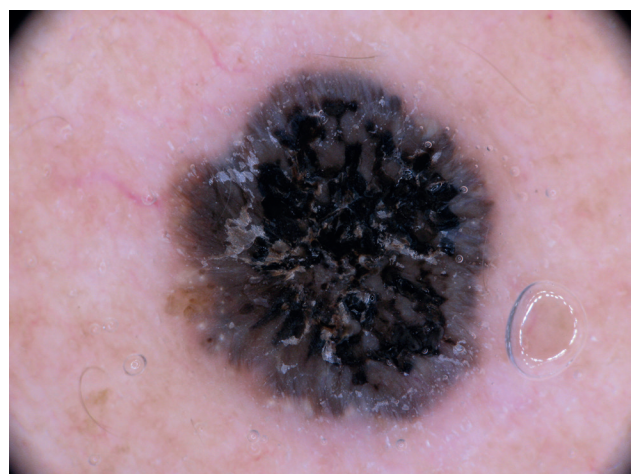


Figure 6. Seborrheic keratosis with structureless blue-gray-to-black areas mimicking melanocytic pigmentation. The diagnosis is facilitated by the visualization of multiple milia-like cysts at the periphery.

- Hemosiderotic dermatofibroma (Figure 7)
- Adnexal tumors (Figure 8)

Given this wide range, blue alone is rarely sufficient to guide clinical decisions. Instead, the key lies in what surrounds the blue.

Context Is Everything: Structures Around the Blue

For example, a lesion with a central blue area surrounded by milia-like cysts and comedo-like openings is likely a seborrheic keratosis. In another case, blue areas combined with sharply in-focus vessels suggest a pigmented basal cell carcinoma. Recognizing these additional clues is essential.

Even histopathology can struggle in some cases. In regressive lesions with melanophages but no evident architecture,

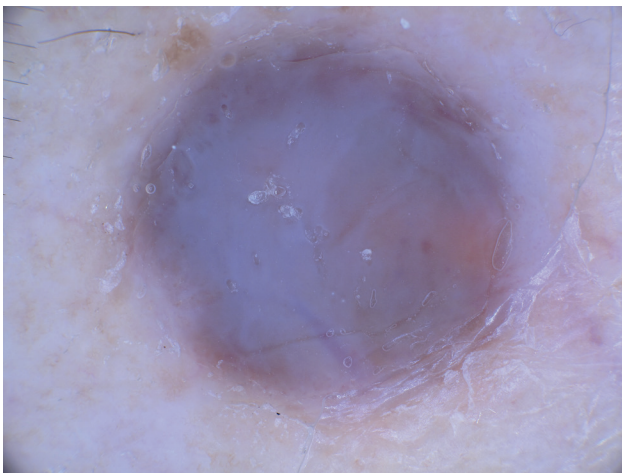


Figure 7. Hemosiderotic dermatofibroma characterized by irregular blue pigmentation. Of note, no black color is observed, making the diagnosis of nodular melanoma less probable.

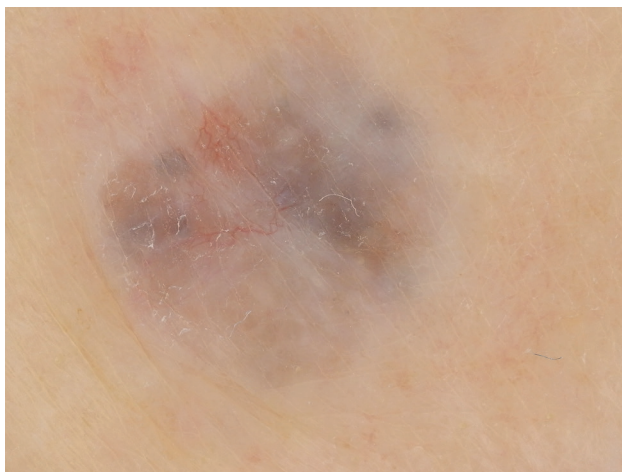


Figure 8. Trichoepithelioma presenting with structureless bluish areas and arborizing vessels mimicking basal cell carcinoma.

pathologists may find it difficult to determine the nature of the original lesion. This further highlights the value of morphological clues in dermoscopy.

The Blue-Black Rule: A Practical Tool

One of the most useful insights in recent years is the blue-black rule, a concept supported by published data [4]. In nodular melanoma, a subtype often lacking classic melanoma-specific criteria, color may be the only clue. While blue coloration reflects depth, the simultaneous presence of black (suggesting more superficial pigment) appears to be highly specific for melanoma.

In our previous study, we found that only 7% of blue-black negative lesions were melanomas, and, conversely, that only 9% of blue-black positive lesions were benign.

Thus, the blue-black combination is both sensitive and specific, and should raise suspicion, especially in nodular or symmetrical lesions without clear benign features.

However, care must be taken to exclude other causes of black coloration, such as comedo-like openings in seborrheic keratosis and lacunae in vascular lesions like angiokeratoma or hemangioma.

Additional Diagnostic Criteria

A recent study by Lallas et al.[5] introduced further dermoscopic predictors in predominantly blue lesions:

Predictors of benignity

1. Blue color covering >75% of the lesion
2. Homogeneous and diffuse blue distribution
3. Absence of vessels

Predictors of malignancy

1. Asymmetric blue color distribution
2. Presence of blue clods
3. Coexistence of gray color and linear vessels

These criteria can help clinicians refine the risk assessment of equivocal lesions, especially when histological confirmation is not immediately available.

Management Strategy: Excision or Leave it Alone

Given the ambiguity of blue lesions, management must err on the side of caution. As a general rule, any bluish lesion that cannot be clearly diagnosed as blue nevus, hemangioma,

or seborrheic keratosis should be excised. Follow-up is discouraged. The risk of misclassifying a melanoma, especially nodular or regressed forms, outweighs the benefits of observational strategies. If doubt remains after dermoscopic assessment, excision is the safest path.

Conclusion

Blue lesions are a common source of diagnostic uncertainty in dermoscopy. Yet by combining basic color understanding with well-defined dermoscopic criteria and pattern recognition, we can stratify risk with greater confidence.

- The blue-black rule remains a valuable clinical tool.
- The presence or absence of vessels, symmetry, and associated structures improves specificity.
- Most importantly, if doubt persists, excision is mandatory.

In dermoscopy, color guides the eye, but structure confirms the diagnosis.

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