Dermoscopic Patterns of Acral Melanocytic Lesions in Skin of Color

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PRACTICE **POINTS**

- Dermatologists should be familiar with common dermoscopic patterns seen at acral sites in patients with skin of color as well as the most up-to-date diagnostic algorithms.
- Acral lentiginous melanoma should be strongly suspected if dermoscopy reveals a parallel ridge pattern or if dermoscopy of volar skin reveals a lack of typical dermoscopic patterns in lesions with a diameter greater than 7 mm.

Acral lentiginous melanoma (ALM) is a rare but aggressive subtype of melanoma often associated with poor prognosis. Although overall incidence is rare, ALM accounts for a larger proportion of melanomas among black, Asian, and Hispanic individuals than among white individuals. Similarly, the proportion of acral melanocytic nevi tends to be greater in ethnic skin despite a lower overall nevi count. Dermoscopy can help differentiate between benign and malignant acral melanocytic lesions. Herein, we discuss the population trends of acral melanocytic lesions in patients with skin of color. We also examine the diagnostic challenges of acral lesions and review the dermoscopic patterns unique to acral volar skin.

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Acral lentiginous melanoma (ALM) is a rare subtype of melanoma that occurs on the palms, soles, and nail apparatus. Unlike more common types of melanoma, ALM occurs on sun-protected areas of the skin and has distinct clinical, histologic, and genetic features. Acral lentiginous melanoma accounts for a larger proportion of melanomas in individuals with skin of color and has a worse prognosis and recurrence rate than other forms of melanoma.

Population Trends in Skin of Color

Much of the literature on malignant melanoma historically has involved non-Hispanic white patients, but the incidence in lighter-skinned populations has been increasing steadily over the last few decades.[1] Although ALM can occur in any race, it disproportionately affects skin of color populations; ALM accounts for only 0.8% to 1% of all melanomas in white populations, but it constitutes 4% to 58% of melanomas in ethnic populations and is the most common melanoma subtype among black Americans.[2-5] Acral lentiginous melanoma also is associated with a worse prognosis compared to other subtypes, which may indicate a more aggressive biological nature[6] but also may point toward socioeconomic and cultural barriers (eg, low income or education levels, lack of insurance, lower health literacy), leading to disparities in access to care and diagnosis at advanced stages.[5]

Similarly, the distribution of acral melanocytic nevi appears to demonstrate an association with ethnicity and skin pigmentation. Although skin of color patients have fewer nevi than non-Hispanic whites, the proportion of acral melanocytic nevi tends to be greater.[6,7] Given its grim prognosis, accurately differentiating ALM from acral nevi is of utmost importance.

Diagnostic Challenges of Acral Lesions

Due to the unique nature of the surfaces of acral sites, melanocytic lesions on the palms, soles, and nail apparatus present many diagnostic challenges. It can be difficult to distinguish acral melanoma from benign lesions using the naked eye alone. Volar surfaces are characterized by the presence of dermatoglyphics, and pigment deposition along ridges and furrows create particular dermoscopic patterns exclusive to these sites.[8] Thus, dermoscopy can be useful on acral surfaces, but the dermoscopic features are different from those on the rest of the body and must be learned separately.

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In addition, nearly half of patients are unaware of their acral lesions.[6] Acral surfaces may not always be examined by clinicians during total-body skin examinations, leading to further possibility of overlooking a lesion. Obtaining biopsies on glabrous skin or nails also is challenging because they can be more painful and hemostasis can be more difficult, especially in the nail. Acral melanomas also may be amelanotic, including those at subungual sites. Although the overall incidence of amelanotic ALM is low, approximately 20% to 28% of amelanotic melanomas in Asian patients are located on acral sites.[9] Due to these challenges, acral lesions may be overlooked or misdiagnosed as warts,[10] tinea pedis,[11] or traumatic ulcers.[12]

Dermoscopic Patterns of Acral Volar Skin

Dermoscopy is a useful noninvasive tool for distinguishing between benign and malignant acral melanocytic lesions, and its efficacy in improving diagnostic accuracy and decreasing unnecessary biopsies is well-established in the literature.[13,14] Acral dermoscopy allows for visualization of pigment along the dermatoglyphics that constitute the characteristic dermoscopic patterns.

Acral Lentiginous Melanoma—The hallmark dermoscopic pattern and most important finding of ALM is the parallel ridge pattern, characterized by parallel linear pigmentation along the ridges of dermatoglyphics. In the early phases of malignancy, the pattern appears light brown and involves most of the lesion; as the tumor develops, increasing melanin production results in focal areas of the parallel ridge pattern with darker bands.[15,16] The sensitivity and specificity of a parallel ridge pattern for diagnosing early ALM has been shown to be 86% and 99%, respectively.[15,16]

A pattern of irregular diffuse pigmentation also can be observed in more advanced ALM. Dermoscopy may reveal a structureless pattern (ie, lack of identifiable structures or patterns) in a background of tan-black coloration due to more exuberant melanocyte proliferation along the epidermis.[15] Sensitivity and specificity of this dermoscopic finding for invasive lesions is high at 94% and 97%, respectively.[16,17] Interestingly, once ALM lesions have advanced even further, conventional melanoma-associated structures (ie, blue-white veil, polymorphous blood vessels, ulceration, irregular dots/globules or streaks) or atypical forms of typically benign acral dermoscopic patterns may be observed.[15]

Per a 3-step diagnostic algorithm created by Koga and Saida,[18] a suspected acral lesion should first be evaluated for a parallel ridge pattern to determine the need for biopsy, as it is seen in approximately two-thirds of ALMs.[19] If no parallel ridge pattern is observed, the lesion should then be checked for any of the typical dermoscopic patterns seen in benign acral nevi (eg, parallel furrow, latticelike, or fibrillar patterns).[18] The maximum diameter should be measured only if the lesion does not exhibit any of the typical dermoscopic patterns. If the lesion's diameter is greater than 7 mm in diameter, it should be biopsied; if the diameter is less than 7 mm, it should have regular clinical and dermoscopic follow-up.[18]

In 2015, Lallas et al[20] developed the BRAAFF checklist, a scoring system of 6 variables: blotches, ridge pattern, asymmetry of structures, asymmetry of colors, parallel furrow pattern, and fibrillar pattern. The checklist also was shown to substantially improve diagnostic accuracy of dermoscopy for ALM, with sensitivity and specificity at 93.1% and 86.7%, respectively.[20]

Acquired Acral Nevi—Three classic dermoscopic patterns are associated with acquired acral nevi: parallel furrow pattern, latticelike pattern, and fibrillar pattern.[15,21] Approximately three-quarters of all acquired acral nevi exhibit one of these patterns, roughly half exhibiting parallel furrow with tan-brown bandlike pigmentation along dermatoglyphic grooves.[16,17]

Latticelike patterns also are characterized by brown parallel lines along the sulci of dermatoglyphics but additionally have multiple intersecting lines. Thus, this pattern can be considered a variant of the parallel furrow pattern.[15] The crisscross markings can be predominantly found in the plantar arch.[22] This dermoscopic pattern comprises 15% to 25% of all acral nevi.[21]

Fibrillar pattern accounts for 10% to 20% of all acral melanocytic nevi.[21] Dermoscopically, these lesions demonstrate parallel filamentous streaks that cross dermatoglyphics obliquely. The fibrillar pattern is predominantly found on weight-bearing areas of the sole,[22] which likely is explained by pressure causing slanting of melanin columns in the horny layer.[23] The fibrillar pattern has been shown to be the benign acral dermoscopic pattern that is most commonly misdiagnosed, with higher reported rates of biopsy.[24]

Acral Congenital Melanocytic Nevi—Congenital melanocytic nevi (CMN) present at birth or appear during the first few weeks of life. Congenital melanocytic nevi can vary widely in size, shape, and color, and they are occasionally biopsied in cases of larger diameter or dermoscopic atypia to differentiate from melanoma.[25] Congenital melanocytic nevi also can occur on acral volar surfaces. Possible dermoscopic patterns include parallel furrow or fibrillar patterns as well as a crista dotted pattern, defined as evenly spaced dots/globules on the ridges near the openings of eccrine ducts.[26] A more commonly observed dermoscopic pattern in acral CMN is a combination of the crista dotted and parallel furrow patterns, known as the peas-in-a-pod pattern. Changes in the clinical appearance and dermoscopic features of an acral CMN are possible over time; some lesions also may fade with age.[26]

Final Thoughts

Acral lentiginous melanoma is a rare but potentially aggressive melanoma subtype that accounts for a larger proportion of melanomas in patients with skin of color than in white patients. Dermoscopy of acral volar skin provides invaluable diagnostic information and allows

for better management of acral melanocytic lesions. Dermoscopic patterns such as the parallel ridge, parallel furrow, latticelike, fibrillar, and peas-in-a-pod patterns are unique to acral sites and can be used to differentiate between ALMs, acquired nevi, or CMNs.

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