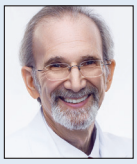

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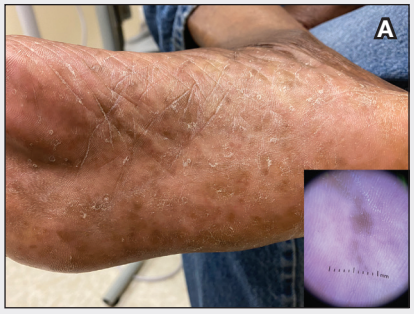
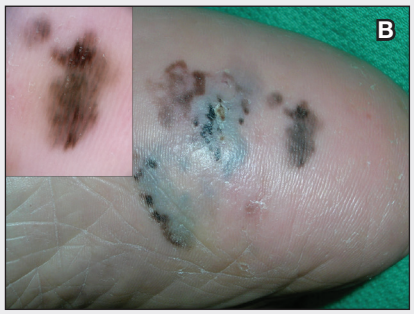
Plantar Hyperpigmentation





Photographs courtesy of Richard P. Usatine, MD.

THE COMPARISON

A Plantar hyperpigmentation (benign ethnic melanosis) on the sole of the foot in a 62-year-old man of African descent with deeply pigmented skin. Dermoscopy showed a parallel ridge pattern even though the hyperpigmentation was benign (inset).

B Melanoma in situ with multicomponent hyperpigmentation on the sole of the foot in a 65-year-old Hispanic woman. Dermoscopy revealed a parallel ridge pattern (inset).

Plantar hyperpigmentation (also known as plantar melanosis [increased melanin], volar pigmented macules, benign racial melanosis, acral pigmentation, acral ethnic melanosis, or mottled hyperpigmentation of the plantar surface) is a benign finding in many individuals and is especially prevalent in those with darker skin tones. Acral refers to manifestation on the hands and feet, volar on the palms and soles, and plantar on the soles only. Here, we focus on plantar hyperpigmentation. We use the terms *ethnic* and *racial* interchangeably.

It is critically important to differentiate benign hyperpigmentation, which is common in patients with skin of color, from melanoma. Although rare, Black patients in the United States experience high morbidity and mortality from acral melanoma, which often is diagnosed late in the disease course.[1]

There are many causes of hyperpigmentation on the plantar surfaces, including benign ethnic melanosis, nevi, melanoma, infections such as syphilis and tinea nigra, conditions such as Peutz-Jeghers syndrome and Laugier-Hunziker syndrome, and postinflammatory hyperpigmentation secondary to atopic dermatitis and psoriasis. We focus on the most common causes, ethnic melanosis and nevi, as well as melanoma, which is the deadliest cause.

Epidemiology

In a 1980 study (N=251), Black Americans had a high incidence of plantar hyperpigmentation, with 52% of affected patients having dark brown skin and 31% having light brown skin.[2]

The epidemiology of melanoma varies by race/ethnicity. Melanoma in Black individuals is relatively rare, with an annual incidence of approximately 1 in 100,000 individuals.[3] However, when individuals with skin of color develop melanoma, they are more likely than their White counterparts to have acral melanoma (acral lentiginous melanoma), one of the deadliest types.[1] In a case series of Black patients with melanoma (N=48) from 2 tertiary care centers in Texas, 30 of 40 primary cutaneous melanomas (75%) were located on acral skin.[4] Overall, 13 patients developed stage IV disease and 12 died due to disease progression. All patients who developed distant metastases or died of melanoma had acral melanoma.[4] Individuals of Asian descent also have a high incidence of acral melanoma, as shown in research from Japan.[5-9]

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Key clinical features in individuals with darker skin tones

Dermoscopy is an evidence-based clinical examination method for earlier diagnosis of cutaneous melanoma, including on acral skin.[10,11] Benign nevi on the volar skin as well as the palms and soles tend to have one of these 3 dermoscopic patterns: parallel furrow, lattice, or irregular fibrillar. The pattern that is most predictive of volar melanoma is the parallel ridge pattern (PRP) (Figures A and B [insets]), which showed a high specificity (99.0%) and very high negative predictive value (97.7%) for malignant melanoma in a Japanese population.[7] The PRP data from this study cannot be applied reliably to Black individuals, especially because benign ethnic melanosis and other benign conditions can demonstrate PRP.[12] Reliance on the PRP as a diagnostic clue could result in unneccessary biopsies in as many as 50% of Black patients with benign plantar hyperpigmentation.[2] Furthermore, biopsies of the plantar surface can be painful and cause pain while walking.

It has been suggested that PRP seen on dermoscopy in benign hyperpigmentation such as ethnic melanosis and nevi may preserve the acrosyringia (eccrine gland openings on the ridge), whereas PRP in melanoma may obliterate the acrosyringia.[13] This observation is based on case reports only and needs further study. However, if validated, it could be a useful diagnostic clue.

Worth noting

In a retrospective cohort study of skin cancer in Black individuals (n=165) at a NewYork City–based cancer center from 2000 to 2020, 68% of patients were diagnosed with melanomas—80% were the acral subtype and 75% displayed a PRP. However, the surrounding uninvolved background skin, which was visible in most cases, also demonstrated a PRP.[14] Because of the high morbidity and mortality rates of acral melanoma, clinicians should biopsy or immediately refer patients with concerning plantar hyperpigmentation to a dermatologist.

Health disparity highlight

The mortality rate for acral melanoma in Black patients is disproportionately high for the following reasons[15,16]:

- Patients and health care providers do not expect to see melanoma in Black patients (it truly is rare!), so screening and education on sun protection are limited.
- Benign ethnic melanosis makes it more difficult to distinguish between early acral melanoma and benign skin changes.
- Black patients and other US patient populations with skin of color may be less likely to have health insurance, which contributes to inequities in access to health care. As of 2022, the uninsured rates for nonelderly American Indian and Alaska Native, Hispanic, Native Hawaiian and Other Pacific Islander, Black, and White individuals were 19.1%, 18.0%, 12.7%, 10.0%, and 6.6%, respectively.[17]

Multi-institutional registries could improve understanding of acral melanoma in Black patients.[4] More studies are needed to help differentiate between the dermoscopic finding of PRP in benign ethnic melanosis vs malignant melanoma.

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