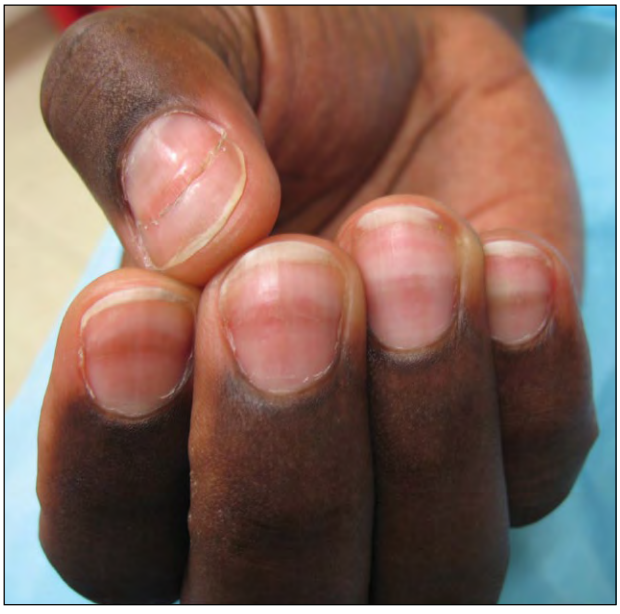
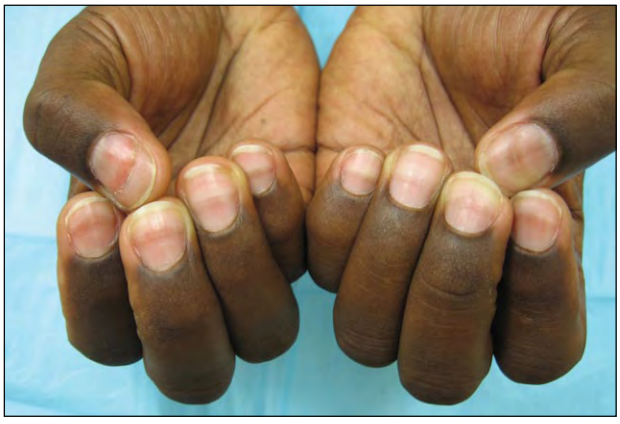
What Is Your Diagnosis?





A 38-year-old man presented to the dermatology clinic with multiple parallel transverse white bands and several painless transverse depressions involving all 10 fingernails. The banding did not dissipate with pressure and the pressure did not elicit pain or tenderness. The patient denied any associated symptoms and reported no history of nail trauma. At the time of presentation, the patient was undergoing a remission-induction regimen for acute promyelocytic leukemia that included all-*trans*-retinoic acid in conjunction with arsenic trioxide.

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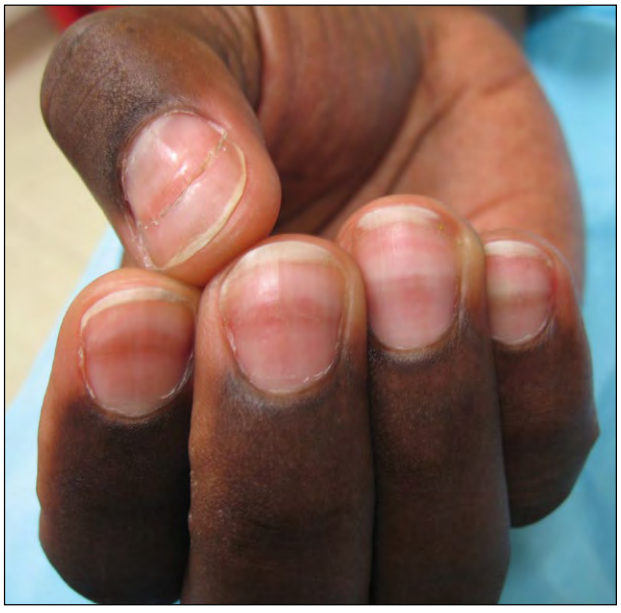
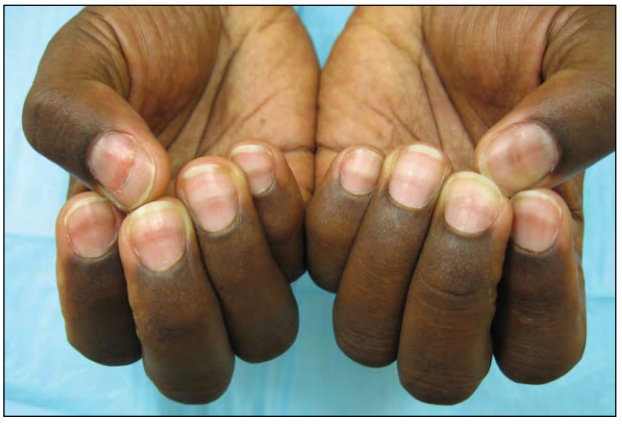
The Diagnosis: Mees Lines and Beau Lines





Nail abnormalities have been associated with systemic disease, trauma, drugs, nutritional deficiencies, and infections. Because fingernails grow slowly (approximately 3 mm per month), pathologic nail changes often can be traced back to systemic insult or drug intake that occurred several weeks or months prior. Any trauma or medication that upsets normal onycholemmal keratinization can lead to nail growth abnormalities. The continuously dividing cells of the nail matrix are especially sensitive to chemotherapeutic agents. The presentation of simultaneous nail disorders on multiple fingernails in our patient implicates either systemic or drug-induced damage.

Mees lines, also known as Reynolds lines or Aldrich-Mees lines,[1] are true forms of leukonychia traditionally associated with arsenic intoxication. However, Mees lines also have been reported in multiple other conditions, including thallium and carbon monoxide poisoning, renal and cardiac failure, Hodgkin disease, sepsis, parasitic infection, psoriasis, and underlying malignancies.[2] Many chemotherapeutic agents and retinoids also have been associated with Mees lines. As opposed to apparent leukonychia (eg, Muehrcke lines), true leukonychia does not fade with pressure. True leukonychia indicates damage to the distal nail matrix, which results in nail plate parakeratosis that grows out with the nail. This dysfunction of the nail matrix leads to changes in light diffraction in the abnormal parakeratotic onychocytes.[3] Apparent leukonychia is due to discoloration of the nail bed and does not move distally with nail growth. Mees bands may be solitary or multiple and often are thicker than Muehrcke lines. The number of bands and the space between each band has been reported to relate to the number and duration of chemotherapeutic insults.[3]

When damage to the nail matrix becomes severe, Beau lines may appear. Beau lines are transverse depressions extending the entire breadth of the nail surface from the medial to lateral edges and represent a temporary cessation of mitotic activity in the proximal nail matrix. These depressions signal a slowing or cessation of onycholemmal keratinization. The severity of damage to the nail matrix is reflected in the depth of the depression. Similarly, the longitudinal width of the depression corresponds with the duration of the toxic or acute insult. If an insult results in cessation of nail matrix growth for 1 to 2 weeks, the lines can grow wide enough to completely divide the nail plate, resulting in onychomadesis. Single nails can be affected due to repetitive trauma, such as manicures, or other nail diseases, such as chronic paronychia; however, when multiple nails demonstrate similar abnormalities, a systemic cause (eg, hospitalization, drug therapy) is most likely. Drugs that have been reported to be associated with the development of Beau lines include azathioprine,[4] chemotherapeutic

agents, and moxilfloxacin. Exposure to high altitudes and deep-sea dives also has been associated with these clinical findings.[5] When the offending agent is discontinued, nail development recovers and the depressions grow out without pain. When associated with medications, Mees lines and Beau lines may present at any time during the course of treatment but typically appear 2 to 3 weeks following drug initiation. Both findings can be seen growing out from the proximal matrix to the hyponychium for 6 months on fingernails and 12 months on toenails after discontinuation of the offending agent.

Although Mees and Beau lines are not painful and resolve with time, these nail changes remain a concern for many patients. Because Mees and Beau lines commonly occur in relation to medical treatment of cancer, patients may mistake these changes for evidence of disease progression and experience distress. This case serves as a reminder that many chemotherapeutic agents, retinoids, and compounds containing heavy metals can cause notable changes in nail pathology. Patients can be reassured that these nail changes will cease on discontinuation of the offending agent and will completely resolve. No other treatment method has been proven to stop or reverse the development or progression of Mees lines and Beau lines once they have begun.

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