HISTORY

A 57-year-old woman presented with a progressively enlarging irregular black patch of 1-year duration on the left fourth toenail (Fig 1). The patient denied new medications, history of trauma, or previous nail dyspigmentation. Proximal and lateral nail folds were not involved and pigmentation of the hyponychium was not evident. The patch could not be removed with scratching of the nail plate. Dermoscopy revealed nonlongitudinal, black to brown, reticular pigmentation with overlying white scale and distal onycholysis (Fig 2).

Question 1: What is the most likely diagnosis?
A. Nevus of the nail matrix
B. Fungal melanonychia
C. Subungual melanoma
D. Trauma-related nail plate hemorrhage
E. Exogenous pigment

Answers:
A. Nevus of the nail matrix—Incorrect. Nevi of the nail matrix are a common cause of longitudinal melanonychia in children and are characterized by uniform nests of cytologically banal melanocytes. Nevil tend to present with homogenous brown to black longitudinal bands. On dermoscopy, small dark granules less than 0.1 mm in diameter may be visualized and represent intracellular melanin inclusions.
B. Fungal melanonychia—Correct. Fungal melanonychia is a rare nail infection caused by fungal organisms that produce melanin pigment, most commonly Trichophyton rubrum and Scytalidium dimidiatum.1,2 The dystrophic nail changes, onycholysis, subungual hyperkeratosis, and yellowish discoloration of the involved nail (and nearby nails) point to the clinical possibility of fungal infection.
Additionally, the lack of trauma and the nonlongitudinal clinical appearance further support this diagnosis.

C. Subungual melanoma—Incorrect. Subungual melanoma is an important cause of melanonychia, with concerning features that include presentation in the fifth to seventh decade of life, sudden onset or widening of irregular brown-black longitudinal bands, and pigment extension to the lateral or proximal nail fold (Hutchinson sign).1,3

D. Trauma-related nail plate hemorrhage—Incorrect. Nail plate hemorrhage is a common finding and often presents with red to maroon discoloration. Patients often report a history of trauma, anticoagulant use, or both. The diagnosis can be confirmed with nail plate clipping.1,4

E. Exogenous pigment—Incorrect. Exogenous pigment includes that from tobacco, dirt, potassium permanganate, tar, iodine, and silver nitrate. These substances may cause a brown to black pigmentation of the nails and can often be easily scratched off. These features are lacking in the presented case.1

Question 2: What are key dermoscopic features of the correct diagnosis?

A. Longitudinal brown to black lines with irregular color, spacing, and thickness, with pigment extension onto the hyponychium, revealing a parallel ridge pattern

B. Gray homogenous band consisting of multiple thin homogeneous gray lines

C. Red-black globules along proximal and lateral margins of homogenous pigment that lacks melanin granules—Incorrect. Homogenous red-maroon pigmentation with round globules at the periphery likely represents subungual hematoma. However, red-maroon pigmentation that does not resolve with nail growth may require additional histopathologic examination because of the concern for subungual melanoma.4

D. Light- to dark-brown parallel striae that extend beneath a translucent eponychium—Incorrect. This feature is known as pseudo-Hutchinson sign and is a common feature of nail matrix nevi, often observed in younger adults and children.3 Other features of a nevus include the presence of melanin inclusion granules, regular nail band pattern, parallel lines, and uniform band thickness and spacing.4

E. White or yellow streaks, nonlongitudinal homogenous pattern, and reverse triangular pattern—Correct. These features, along with subungual hyperkeratosis, yellow or multicolor pigmentation, and white scale, are more significantly associated with fungal melanonychia than sources of melanocyte activation or melanocyte hyperplasia.5 The presence of irregular reticular pigmentation has not previously been described, but may represent another dermoscopic feature of fungal melanonychia. Additional studies are needed to confirm the diagnostic accuracy of this feature.

Question 3: What is the best next step in confirming the diagnosis?

A. Dermoscopic short-term monitoring alone

B. Gray homogenous band consisting of multiple thin homogeneous gray lines—Incorrect. This dermoscopic feature is a sign of benign melanocytic activation and may be observed in several diagnoses, such as drug-induced pigmentation or ethnic-type melanonychia.1,4

C. Red-black globules along proximal and lateral margins of homogenous pigment that lacks melanin granules—Incorrect. Homogenous red-maroon pigmentation with round globules at the periphery likely represents subungual hematoma. However, red-maroon pigmentation that does not resolve with nail growth may require additional histopathologic examination because of the concern for subungual melanoma.4

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Answers:

A. Dermoscopic short-term monitoring alone

B. Gray homogenous band consisting of multiple thin homogeneous gray lines—Incorrect. Although monitoring for pigment clearance is important, short-term monitoring with dermoscopy does not confirm the diagnosis of
fungal melanonychia. Pigmented onychomycosis requires antifungal treatment to assist with infection clearance, allowing pigment to clear as the nail grows out.²

B. Nail matrix biopsy—Incorrect. If clinical or dermoscopic features were concerning for subungual melanoma, a nail matrix biopsy would be recommended as the best next step. Given the lack of melanoma-specific clinical or dermoscopic features, alternative diagnostic evaluation should be performed first. However, a nail matrix biopsy may be considered for cases refractory to antifungal treatment to rule out subungual melanoma.²

C. Nail clipping—Correct. Nail clipping is the best next step to confirm onychomycosis. Nail clipping in this patient case demonstrated a dystrophic nail plate with subungual parakeratosis and neutrophil collections. Fontana-Masson stain and periodic acid–Schiff stain with diastase revealed numerous fungal organisms that contained melanin, preferentially located on the nail plate surface. However, pigment associated with fungus is often best observed on hematoxylin-eosin staining of a nail clipping.

D. Reassurance—Incorrect. Reassurance alone without follow-up or treatment would not be appropriate for this patient. Additionally, surveillance for pigment clearance is important to ensure that the nail pigmentation is not associated with an underlying malignancy.

E. Amputation—Incorrect. Amputation of the involved digit may be considered for the treatment of locally advanced melanoma. Amputation is not recommended for onychomycosis, the diagnosis presented in this patient case.⁴

REFERENCES
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4. Braun RP, Baran R, Le Gal FA, et al. Diagnosis and management of nail pigmentation. J Am Acad Dermatol. 2007;56(5):835-847.
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