Concurrent Beau Lines, Onychomadesis, and Retronychia Following Scurvy

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PRACTICE POINTS
- Beau lines, onychomadesis, and retronychia are nail conditions with distinct clinical findings.
- Beau lines and onychomadesis may be seen concurrently following trauma, inflammatory diseases, systemic illnesses, hereditary conditions, and infections.
- Retronychia shares a common pathophysiology with Beau lines and onychomadesis, and all reflect slowing or cessation of nail plate production.

Beau lines, onychomadesis, and retronychia are nail conditions with their own characteristic clinical findings. It has been hypothesized that these 3 disorders may share a common pathophysiologic mechanism of slowing and/or halting nail plate production at the nail matrix. We report the case of a 41-year-old woman who presented with concurrent Beau lines, onychomadesis, and retronychia 6 months following a diagnosis of scurvy. Simultaneous presentation of these 3 nail conditions is not commonly reported, and our case supports a shared pathophysiologic basis.

Beau lines are palpable transverse depressions on the dorsal aspect of the nail plate that result from a temporary slowing of nail plate production by the proximal nail matrix. Onychomadesis is a separation of the proximal nail plate from the distal nail plate leading to shedding of the nail. It occurs due to a complete growth arrest in the nail matrix and is thought to be on a continuum with Beau lines. The etiologies of these 2 conditions overlap and include trauma, inflammatory diseases, systemic illnesses, hereditary conditions, and infections.1-5 In almost all cases of both conditions, normal nail plate production ensues upon identification and removal of the inciting agent or recuperation from the causal illness.3,4,6 Beau lines will move distally as the nail grows out and can be clipped. In onychomadesis, the affected nails will be shed with time. Resolution of these nail defects can be estimated from average nail growth rates (1 mm/mo for fingernails and 2–3 mm/mo for toenails).7

Retronychia is defined as a proximal ingrowing of the nail plate into the ventral surface of the proximal nail fold.4,6 It is thought to occur via vertical progression of the nail plate into the proximal nail fold, repetitive nail matrix trauma, or shearing forces, resulting in inflammation that leads to nail plate stacking.8,9 Although conservative treatment using topical corticosteroids may be attempted, proximal nail plate avulsion typically is required for treatment.10

Braswell et al1 suggested a unifying hypothesis for a common pathophysiologic basis for these 3 conditions; that is, nail matrix injury results in slowing and/or cessation of nail plate production, followed by recommencement of nail plate production by the nail matrix after removal of the insult. We report a case of a patient presenting with concurrent Beau lines, onychomadesis, and...

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retronychia following scurvy, thus supporting the hypothesis that these 3 nail conditions lie on a continuum.

Case Report
A 41-year-old woman with a history of thyroiditis, gastroesophageal reflux disease, endometriosis, osteoarthritis, gastric ulcer, pancreatitis, fatty liver, and polycystic ovarian syndrome presented with lines on the toenails and no growth of the right second toenail of several months’ duration. She denied any pain or prior trauma to the nails, participation in sports activities, or wearing tight or high-heeled shoes. She had presented 6 months prior for evaluation of perifollicular erythema on the posterior thighs, legs, and abdomen, as well as gingival bleeding. At that time, one of the authors (S.R.L.) found that she was vitamin C deficient, and a diagnosis of scurvy was made. The rash and gingival bleeding resolved with vitamin C supplementation.

At the current presentation, physical examination revealed transverse grooves involving several fingernails but most evident on the left thumbnail (Figure, A). The grooves did not span the entire breadth of the nail, which was consistent with Beau lines. Several toenails had parallel transverse grooves spanning the entire width of the nail plate such that the proximal nail plate was discontinuous with the distal nail plate, which was consistent with onychomadesis (Figure, B). The right second toenail was yellow and thickened with layered nail plates, indicative of retronychia (Figure, B). Histopathology of a nail plate clipping from the right second toenail was negative for fungal hyphae, and a radiograph was negative for bony changes or exostosis.

Comment
The nail matrix is responsible for nail plate production, and the newly formed nail plate then moves outward over the nail bed. It is hypothesized that the pathophysiologic basis for Beau lines, onychomadesis, and retronychia lies on a continuum such that all 3 conditions are caused by an insult to the nail matrix that results in slowing and/or halting of nail plate growth. Beau lines result from slowing or disruption in cell growth from the nail matrix, whereas onychomadesis is associated with a complete halt in nail plate production. In retronychia, the new nail growing from the matrix pushes the old one upward, interrupting the longitudinal growth of the nail and leading to nail plate stacking.

Our patient presented with concurrent Beau lines, onychomadesis, and retronychia. Although Beau lines and onychomadesis have been reported together in some instances, retronychia is not commonly reported with either of these conditions. The exact incidence of each condition has not been studied, but Beau lines are relatively common, onychomadesis is less common, and retronychia is seen infrequently; therefore, the concurrent presentation of these 3 conditions in the same patient is exceedingly rare. Thus, it was most likely that one etiology accounted for all 3 nail findings.

Because the patient had been diagnosed with scurvy 6 months prior to presentation, we hypothesized that the associated vitamin C deficiency caused a systemic insult to the nail matrix, which resulted in cessation of nail growth. The mechanism of nail matrix arrest in the setting of systemic disease is thought to be due to inhibition of cellular proliferation or a change in the quality of the newly manufactured nail plate, which becomes thinner and more dystrophic. Vitamin C (ascorbic acid) deficiency causes scurvy, which is characterized by cutaneous signs such as perifollicular hemorrhage and purpura, corkscREW hairs, bruising, gingivitis, arthralgia, and impaired wound healing. These clinical manifestations are due to impaired collagen synthesis and disordered connective tissue. Ascorbic acid also is involved in fatty acid transport, neurotransmitter synthesis, prostaglandin metabolism, and nitric oxide synthesis. Ascorbic acid has not been studied for its role in nail plate synthesis; however, given the role that ascorbic acid plays in a myriad of biologic processes, the deficiency associated

CONTINUED ON PAGE 149
with scurvy likely had a considerable systemic effect in our patient that halted nail plate synthesis and resulted in the concurrent presentation of Beau lines, onychomadesis, and retronychia.

REFERENCES