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Internal Medicine Quiz – Case 23

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In February 2022, an 80-year-old man presented general malaise and moderate pharyngeal pain successfully treated by azithromycin and analgesics. Physical exam showed axillary temperature: 36.2 °C, blood pressure: 130/80 mm Hg, pulse rate: 72/min, and respiratory rate: 16/min. Laboratory revealed white blood cells (WBC): 11,760/μL, Hb: 14.7 g/dL, hematocrit: 42.9%, MCV: 89.6, platelets: 167,000/μL, serum protein: 7.0 g/dL (albumin: 4.4 g/dL), glucose: 81 mg/dL, total cholesterol: 180 mg/dL, urea: 43 mg/dL, creatinine: 1.3 mg/dL, uric acid: 0.75 mg/dL, sodium: 143 mEq/L, potassium: 4.1 mEq/L, calcium: 8 mg/dL, AST: 23 IU/L, ALT: 32 IU/L, free T4: 1.21 ng/dL, TSH: 1.38 mcIU/mL, ACTH: 8.9 pg/mL, erythrocyte sedimentation rate: 13 mm/hour, and CRP: 0.75 mg/L. Besides, the specific molecular test for an infectious disorder was performed. Three months after, following asymptomatic and without local trauma, he noticed some progressive nail changes which affected the right-hand thumb and left-hand ring finger. The nail abnormalities included leukonychia, splinter hemorrhages, Beau's line, and distal onychomadesis that spontaneously evolved to cure in five months, as shown in figure 1.

Comment

The diagnostic hypothesis was raised with base on the literature, and later confirmed by the positive specific RNA molecular test for SARS-CoV-2 in nasopharyngeal swab.[1–10] The patient had underwent two doses of the Astra Zeneca vaccine against SARS-CoV-2 in February 26th and May 20th 2021, respectively; and the control determination for the level of specific neutralizing antibodies revealed 94% of positivity on August of 2021. However, in spite of all routine precautions against COVID-19 infection, he developed pharyngitis and the nasal swab resulted positive for SARS-CoV-2 on June 24th of 2022. Thence, a causal relation of the COVID-19 infection with the development of nail changes could not be ruled out. Besides, the abnormal nail characteristics are in accordance with diverse published case reports and reviews dealing with nail disorders associated with SARS-CoV-2 pandemic.[1–10]

Figure 1. Evolutive aspects of the nail changes limited to two of the hand fingers.

Nail changes in COVID-19 have included transverse grooves (Beau's lines),[1–10] half and half nails (Lindsay's nails), leukonychia (Mees lines),[2,3,5–10] onycholysis, and onychomadesis,[2,4,5,7–10] splinter hemorrhages, and the distal discoloration (Terry's nails).[4–8] Four of these abnormalities were observed in two fingers of the patient herein described. According to literature, the mechanisms of nail changes include transient matrix vascular injury, immunoglobulins and C3 deposits on the vessels, besides local microthrombi, microvascular injury or a procoagulant state due to inflammatory immune response.[2–5,8] Capillaroscopy studies of nail-folds have shown pericapillary edema, dilatation, folding and density decrease of local capillaries, telangiectasias, as well as megacapillaries,[3–5] and the histopathology evaluations have revealed thrombi, lymphocytic vasculitis and endotheliitis.[3]

Beau's lines may take 6 to 12 months to resolve totally, and are usually related to local trauma, febrile illnesses, severe malnutrition, pemphigus, Raynaud and Kawasaki diseases, and chemotherapy adverse effect.[1,4–7] Terry's nails are described during normal ageing, in addition to cirrhosis, chronic kidney failure and congestive heart failure.[3,6] Half and half (Lindsay's nails) have been more often associated with chronic renal failure.[3,4,6] Leukonychia (Muehrcke's bands) is more frequently reported in patients with nephrotic syndrome, liver cirrhosis, hypoalbuminemia of malnutrition, and anticancer therapy.[4] Lindsay's nails are due to uremic stimuli to melanin formation by matrix melanocytes, and is described in association with the yellow nails syndrome, Crohn's disease, Kawasaki's disease, Behçet's disease, cirrhosis, hyperthyroidism, zinc deficiency, citrullinemia, pellagra, and HIV infections.[2] Transverse leukonychia, Beau's lines, besides splinter hemorrhages can also occur shortly after each dose of the Pfizer-BioNTech COVID-19 messenger RNA vaccination;[7] however,

this hypothesis was ruled out in the present case study due to the too large lag time.

Lam et al reported a female who first noticed whitening of the nails three weeks after the first dose of the COVID-19 vaccine, and five days after the second dose, and exhibited transverse leukonychia in most of the fingernails during two months. Besides, six weeks after the second dose of vaccination, she presented with Beau's lines on two of the right fingernails.[7] The patient also had erythema at the proximal nail folds, mild onychorrhexis, mottled red-brown nail discoloration, splinter hemorrhages, and melanonychia in some fingernails. Worthy of note was the negativity of the polymerase chain reaction (PCR) test for SARS-CoV-2.[7] The pathogenetic mechanisms of nail changes related to COVID-19 vaccine remains unclear.

The authors aim to emphasize the continued reports of the easily observed nail changes associated with COVID-19 infection or the preventive vaccination, because they can be useful diagnostic clues that would contribute to better clear the pathophysiologic events.

References

1. ALOBAIDA S, LAM JM. Beau lines associated with COVID-19. *CMAJ* 2020, 192:E1040
2. DEMIR B, YUKSEL EI, CICEK D, TURKOGLU S. Heterogeneous red-white discoloration of the nail bed and distal onycholysis in a patient with COVID-19. *J Eur Acad Dermatol Venereol* 2021, 35:e551–e553
3. GALVÁN-MARÍN ÁR. Beau lines associated with COVID-19. *Acta Medica Colomb* 2021, 46:61
4. GROVER C, SAHA S, PANDHI D. Nail changes in COVID-19: A cross-sectional study from India. *Indian Dermatol Online J* 2022, 13:326–333
5. HADELER E, MORRISON BW, TOSTI A. A review of nail findings associated with COVID-19 infection. *J Eur Acad Dermatol Venereol* 2021, 35:e699–e709
6. IDE S, MORIOKA S, INADA M, OHMAGARI N. Beau's lines and leukonychia in a COVID-19 patient. *Intern Med* 2020, 59:3259
7. LAM K, YIM E. Transverse leukonychia and Beau lines following COVID-19 vaccination. *Cutis* 2022, 110:E28–E31
8. OCAMPO-GARZA SS, OCAMPO-CANDIANI J, CAMELA E, VASTARELLA M, FABBROCINI G, SCALVENZI M ET AL. Nail changes as manifestation of systemic disease in COVID-19 infection. *J Eur Acad Dermatol Venereol* 2021, 35:e474–e475
9. TAMMARO A, ADEBANJO GAR, PARISELLA FR, LUZI F, SCARABELLO A. Hair and nail manifestations of COVID-19. *J Cosmet Dermatol* 2022, 21:1339–1346
10. WOLLINA U, KANITAKIS J, BARAN R. Nails and COVID-19 – A comprehensive review of clinical findings and treatment. *Dermatol Ther* 2021, 34:e15100

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