Bilateral sole hyperkeratosis and nonhealing foot mass

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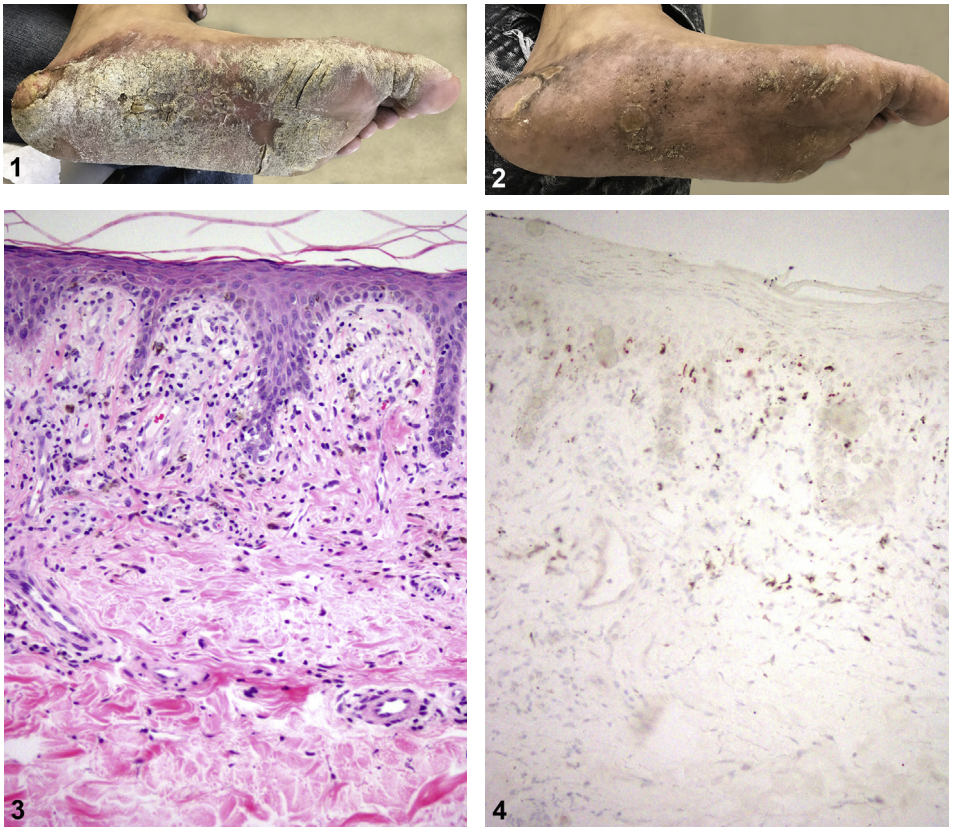

A 30-year-old man presented with 3 months of sudden-onset and progressive worsening of hyperkeratotic lesions on his bilateral plantar feet and a painful exophytic mass on his left medial heel that hindered his ability to walk (Fig 1). The patient did not have any known medical comorbidities or recent sexual contacts. On physical examination, he had malodorous, thick yellow hyperkeratotic plaques on his bilateral soles with a large exophytic mass on the left medial heel and hyperpigmented annular lesions with scaling on his right palm and right medial lower leg. At his initial presentation, laboratory studies, a wound culture, and a biopsy were performed. He also received empiric treatment with doxycycline based on the wound culture before further workup with laboratory testing or histology resulted (Fig 2). His biopsy was processed for hematoxylin-eosin stain and additional immunohistochemical stains (Figs 3 and 4).

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Question 1: What is the diagnosis?

A. Tinea pedis

B. HIV

C. Psoriasis

D. Syphilis

E. Mal de meleda

Answers:

A. Tinea pedis — Incorrect. Tinea pedis with *Trichophyton rubrum* can present with involvement on the bilateral soles in a moccasin distribution with fine scale and can have palmar involvement—so-called "two foot one hand."[1]

B. HIV — Incorrect. HIV can cause varied cutaneous eruptions with many associated infections and malignancies but on its own does not typically present with palmoplantar keratoderma.

C. Psoriasis — Incorrect. Psoriasis can present with confluent erythematous scaly plaques on the palms and soles. It is helpful to examine the remainder of the skin for any psoriasiform plaques in a characteristic distribution and the nails for any changes concerning for psoriasis. This patient had one lesion on his ankle but otherwise his skin was clear, and he did not have nail findings. Skin biopsy is helpful in excluding this diagnosis.

D. Syphilis — Correct. Syphilis is the correct diagnosis for this patient with rapidly progressive painful, hyperkeratotic plaques on the soles with erythematous thin scaly plaque on the hand. Syphilis is a chronic bacterial infection with *Treponema pallidum* sub. *pallidum*, a slow-growing spirochete. *Primary syphilis* refers to the initial lesion that occurs at the site of inoculation, commonly a painless chancre, that lasts for 3 to 6 weeks. Secondary syphilis is the longest stage and cutaneous manifestations range widely. After resolution of the cutaneous manifestations of secondary syphilis, patients enter latent-stage syphilis. Patients may get additional cutaneous manifestations while in this stage, which can make them contagious. Complications of latent syphilis include neurosyphilis, cardiovascular syphilis, or gummatous syphilis.[2] On histology, patients may show slender rete ridges with plasma cell inflammation (Fig 3) and actual spirochetes with a treponemal immunohistochemical stain (Fig 4). In this case, the patient presented with skin findings and a rapid plasma reagin (RPR) concerning for secondary syphilis.

E. Mal de meleda — Incorrect. Mal de meleda is an autosomal recessive form of painful palmoplantar keratoderma caused by mutation in Ly-6/uPar—related protein. It is most commonly seen in patients from the island of Meleda. Patients can present with hyperhidrosis, malodor, and perioral erythema.[3]

Question 2: What would be the first step in your workup of this patient?

A. Wound culture

B. RPR

C. Venereal disease research laboratory (VDRL)

D. HIV antibodies

E. Potassium hydroxide preparation

Answers:

A. Wound culture — Incorrect. Spirochetes are not identified on wound culture.

B. RPR — Correct. RPR is considered a nontreponemal test and is used as a screening test for syphilis, which is the correct answer. If the result is positive, it requires secondary testing to confirm the diagnosis. VDRL is another nontreponemal test. These tests result as antibody titers with a positive result being greater than 1:32. Titers can be followed after therapy to identify response to treatment.[4]

C. VDRL — Incorrect. Fluorescent treponemal antibody absorption (FTA-ABS) is a treponemal test and is generally reserved as a confirmatory test after a patient has had a positive screening nontreponemal test result. Some laboratories have a cost-effective and efficient test allowing it to be first line. Examples of treponemal tests include FTA-ABS, microhemagglutination test for antibodies to *T pallidum*, and *T pallidum* particle agglutination assay.[4]

D. HIV antibodies — Incorrect. There is a growing cohort of patients who are presenting with co-infection of HIV and syphilis making HIV an important adjuvant test, but it would not lead to the primary diagnosis in this case.[2,5]

E. Potassium hydroxide preparation — Incorrect. The patient does not have tinea pedis, and, as such, a potassium hydroxide preparation will not lead you to the diagnosis.

Question 3: What would your first-line treatment be?

A. Penicillin G, 2.4 million units intramuscularly (IM) once

B. Penicillin G, 2.4 million units IM every week for 3 weeks

C. Doxycycline, 100 mg twice daily for 14 days

D. Antiretroviral therapy

E. Topical steroids

Answers:

A. Penicillin G, 2.4 million units IM once — Correct. Penicillin G, 2.4 million units IM once, is the correct answer as this patient has secondary syphilis. Primary syphilis, secondary syphilis, and early latent disease are treated with this regimen.[2] After receiving a 10-day course of doxycycline, the patient was additionally treated with 2.4 million units of penicillin G IM. The lesions on his palm resolved and the ones on the soles greatly improved (Fig 2). Unfortunately, he was lost to follow-up to monitor for complete resolution; however, complete resolution of his cutaneous findings would be expected following treatment of secondary syphilis.

B. Penicillin G, 2.4 million units IM every week for 3 weeks — Incorrect. Penicillin G, 2.4 million units IM weekly for 3 weeks is the treatment of choice for patients who have late or unknown duration latent syphilis.[2]

C. Doxycycline, 100 mg twice daily for 14 days — Incorrect. Doxycycline, 100 mg twice daily for 14 days,[2] is an alternative therapy for syphilis for penicillin-allergic patients; however, it is not first-line therapy. Interestingly, in this case, the patient had a wound culture performed that showed methicillin-resistant *Staphylococcus aureus* prompting the initiation of doxycycline. With 10 days of treatment, the patient had almost complete resolution of his cutaneous manifestations (Fig 2).

D. Antiretroviral therapy — Incorrect. All patients who are co-infected with HIV and syphilis should be referred to the infectious disease department for evaluation of their HIV and initiation of antiretroviral therapy; however, this therapy will not treat his syphilis.

E. Topical steroids — Incorrect. Topical steroids are not appropriate in this patient.

Abbreviations used:

FTA-ABS: fluorescent treponemal antibody absorption
RPR: rapid plasma reagin
VDRL: venereal disease research laboratory

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