Erythema on the Hands of a Patient Undergoing Chemotherapy

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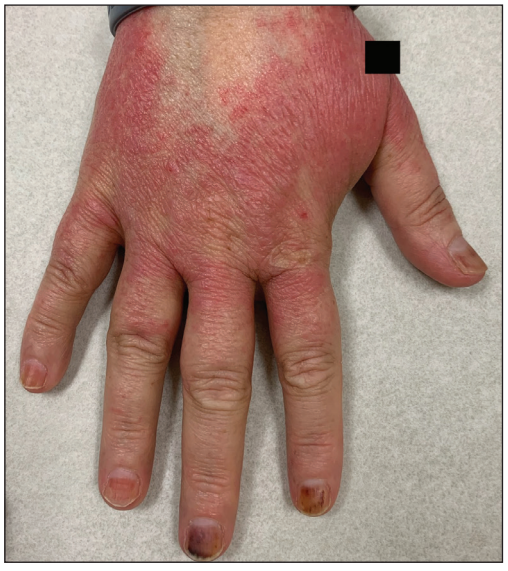

A 47-year-old woman with stage IB invasive ductal carcinoma currently being treated with paclitaxel and trastuzumab chemotherapy presented to the dermatology clinic with worsening nail changes and lesions on the dorsal surfaces of the hands of 4 weeks' duration. The patient first noticed a pruritic eruption at the thenar eminence on both hands following her third cycle of chemotherapy, which worsened over the next several weeks as she continued chemotherapy. Treatment with over-the-counter hydrocortisone cream 1% and oral diphenhydramine did not relieve the eruption. Physical examination revealed thin, bright-pink, erythematous plaques on the thenar eminences and dorsal metacarpophalangeal joints on both hands. Onycholysis and yellow discoloration of the fingernails were noted along with thin papules and plaques on the mid dorsal arms.

WHAT'S YOUR **DIAGNOSIS?**

a. acrodermatitis enteropathica
b. erythromelalgia
c. hand-foot skin reaction
d. papular purpuric gloves and socks syndrome
e. periarticular thenar erythema and onycholysis syndrome

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THE **DIAGNOSIS:** Periarticular Thenar Erythema and Onycholysis Syndrome

Given the history of taxane-based chemotherapy and the characteristic clinical appearance, a diagnosis of periarticular thenar erythema and onycholysis (PATEO) syndrome was made. Although the exact mechanism is unknown, PATEO syndrome is considered a rare variant of toxic erythema of chemotherapy that may manifest in patients receiving taxane-based chemotherapy.[1] It was defined first by Childress and Lockich[2] as a unique hand-foot syndrome (HFS) specific to patients treated with paclitaxel and docetaxel, manifesting with violaceous coloration of the dorsum of the hands over the thenar and hypothenar eminences and Achilles tendon area as well as nail changes that can progress to onycholysis. Early diagnosis and management of PATEO syndrome are key to allowing patients to continue their chemotherapy, though diagnosis may be difficult at a time when patients are receiving multiple treatments. This may lead to misdiagnosis as hand-foot skin reaction (HFSR), acrodermatitis enteropathica, erythromelalgia, or papular purpuric gloves and socks syndrome.

Similar to PATEO syndrome, HFSR manifests on the palmar and plantar surfaces in patients receiving chemotherapy; however, the reaction targets pressure points and may have "skip areas" with no rash present at sites of less friction, and it will frequently appear on the feet before the palms. Additionally, HFSR is associated with newer targeted multikinase inhibitors such as sorafenib rather than taxane-based chemotherapies.[3] Although HFSR and HFS (including PATEO syndrome) both are associated with chemotherapy, the two have distinct histologic features. It is thought that the blockade of multikinase pathways in HFSR could alter microvascular structure or repair mechanisms and thus damage the vessels at pressure points or other high-friction areas.[4] Hand-foot skin reaction is not a toxic erythema of chemotherapy, whereas PATEO syndrome is a specific HFS, also known as palmar-plantar erythrodysesthesia, under the umbrella of toxic erythema of chemotherapy.

Acrodermatitis enteropathica may manifest with erythematous scaly eruptions over the acral extremities and periorificial areas and may mimic PATEO syndrome in a patient with cancer undergoing chemotherapy who is chronically not receiving adequate nutritional intake.[5] Another similarity shared with PATEO syndrome is the involvement of the nails; however, patients with zinc deficiency typically present with a triad that also includes alopecia and diarrhea, which usually are not present in PATEO syndrome.

Erythromelalgia is thought to be a vascular disorder that manifests with intermittent pain and erythema at the extremities. In contrast to PATEO syndrome, pain often is the most prominent feature. Most patients find relief by cold-water immersion commonly enough that it is almost pathognomonic of erythromelalgia.[6]

In papular pruritic gloves and socks syndrome, onset is rapid with painful and pruritic edema and erythema of the palms and soles. The exanthem is self-limited and typically resolves after 1 to 2 weeks. Papular pruritic gloves and socks syndrome also can be followed by onychomadesis, a nail change in addition to the acral erythema that can create a picture similar to that of PATEO syndrome; however, affected individuals usually are younger, previously healthy patients as opposed to patients with PATEO syndrome. Etiology often is related to a viral infection, most commonly parvovirus B19 but also other viral infections such as Epstein-Barr virus.[7]

In our patient, the diagnosis of PATEO syndrome was made based on the characteristic clinical presentation and history of concomitant taxane-based chemotherapy. Treatment is largely based on therapies used for toxic erythema of chemotherapy, including potent topical corticosteroids. Our patient was started on a short course of clobetasol ointment 0.05% twice daily as well as oral vitamin D 100,000 IU per week for 2 doses. After 2 weeks, the erythema was improved, and some postinflammatory hyperpigmentation remained at the follow-up visit. The nail findings were improved, but resolution often is delayed for months after completion of chemotherapy.

This patient with PATEO syndrome was treated not only with a topical corticosteroid but also oral vitamin D based on prior evidence demonstrating that a single dose of oral vitamin D 200,000 IU exerts anti-inflammatory effects in the skin. Increased skin expression of the anti-inflammatory mediator arginase-1 is the proposed mechanism by which vitamin D supports skin barrier repair.[8] Although further study is required to support the use of oral vitamin D specifically in the management of toxic erythema of chemotherapy, it is overall a safe and well-tolerated supplement. The improvement in erythema observed in our patient with PATEO syndrome following treatment with a topical corticosteroid and oral vitamin D may help guide dermatologists in the management of toxic erythema of chemotherapy.

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