Cutaneous Lupus Erythematosus–like Isotopic Response to Herpes Zoster Infection

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PRACTICE **POINTS**

- Wolf isotopic response describes the occurrence of a new skin condition at the site of a previously healed and unrelated skin disorder; a granulomatous reaction is a commonly reported isotopic response.
- Treatment with topical or intralesional corticosteroids usually suffices for inflammatory-based isotopic responses.

To the Editor:

Wolf isotopic response describes the development of a skin disorder at the site of another healed and unrelated skin disease. Skin disorders presenting as isotopic responses have included inflammatory, malignant, granulomatous, and infectious processes. Discoid lupus erythematosus (DLE) is a rare isotopic response. We report a cutaneous lupus erythematosus–like isotopic response that presented at the site of a recent herpes zoster infection in a liver transplant recipient.

A 74-year-old immunocompromised woman was referred to the dermatology clinic for evaluation of a rash on the right leg. She was being treated with maintenance valganciclovir due to cytomegalovirus viremia, as well as tacrolimus, azathioprine, and prednisone following liver transplantation due to autoimmune hepatitis for 8 months prior to presentation. Eighteen days prior to the current presentation, she was clinically diagnosed with herpes zoster. As the grouped vesicles from the herpes zoster resolved, she developed pink scaly papules in the same distribution as the original vesicular eruption.

Physical examination revealed numerous erythematous, 2- to 3-mm, scaly papules that coalesced into small plaques with serous crusts; they originated above the supragluteal cleft and extended rightward in the L3 and L4 dermatomes to the right knee (Figure 1). A 3-mm punch biopsy specimen was obtained from the right anterior thigh. Histologic analysis revealed interface lymphocytic inflammation with squamatization of basal keratinocytes, basement membrane thickening, and follicular plugging by keratin (Figure 2). There was a moderately intense perivascular and periadnexal inflammatory infiltrate of mature lymphocytes with rare eosinophils within the papillary and superficial reticular dermis. There was no evidence of a viral cytopathic effect, and an immunohistochemical stain for varicella-zoster virus protein was negative. The histologic findings were suggestive of cutaneous involvement by DLE. A diagnosis of a cutaneous lupus erythematosus–like Wolf isotopic response was made, and the patient's rash

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The authors report no conflict of interest.

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doi:10.12788/cutis.0529

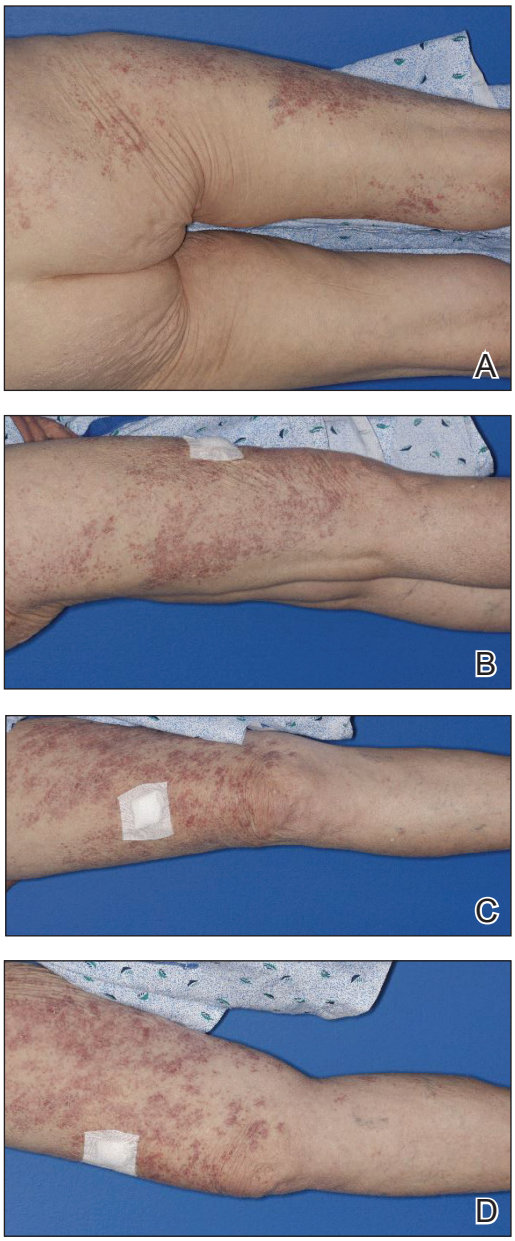

FIGURE 1. A–D, Dermatomal distribution of grouped erythematous papules (2 to 3 mm in size) at the site of a recent herpes zoster infection on the right leg.

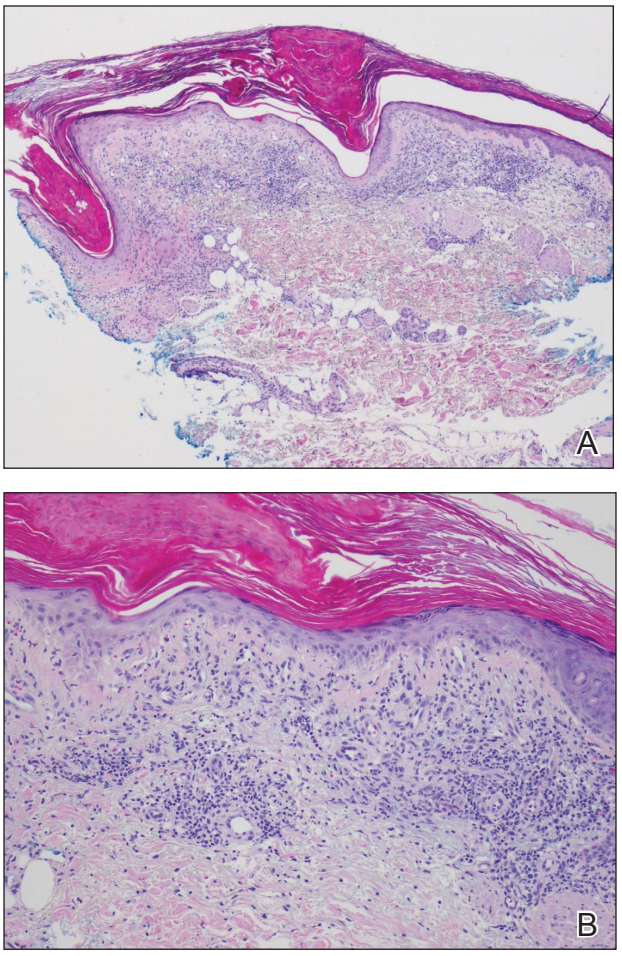

FIGURE 2. A, A punch biopsy showed interface, perivascular, and periadnexal lymphocytic inflammation and follicular plugging (H&E, original magnification ×40). B, Interface lymphocytic inflammation with squamatization of basal keratinocytes and basement membrane thickening (H&E, original magnification ×100).

resolved with the use of triamcinolone cream 0.1% applied twice daily for 2 weeks. At 6-week follow-up, there were postinflammatory pigmentation changes at the sites of the prior rash and persistent postherpetic neuralgia. Recent antinuclear antibody screening was negative, coupled with the patient's lack of systemic symptoms and quick resolution of rash, indicating that additional testing for systemic lupus was not warranted.

Wolf isotopic response describes the occurrence of a new skin disorder at the site of a previously healed and unrelated skin disorder. The second disease may appear within days to years after the primary disease subsides and is clearly differentiated from the isomorphic response of the Koebner phenomenon, which describes an established skin disorder appearing at a previously uninvolved anatomic site following trauma.[1] As in our case, the initial cutaneous eruption resulting in a subsequent Wolf isotopic response frequently is herpes zoster and less commonly is herpes simplex virus.[2] The most common reported isotopic response is a granulomatous reaction.[2] Rare reports of leukemic infiltration, lymphoma, lichen planus, morphea, reactive perforating collagenosis, psoriasis, discoid lupus, lichen simplex chronicus, contact dermatitis, xanthomatous changes, malignant tumors, cutaneous graft-vs-host disease, pityriasis rosea, erythema annulare centrifugum, and other infectious-based isotopic responses exist.[2-6]

Our patient presented with Wolf isotopic response that histologically mimicked DLE. A PubMed search of articles indexed for MEDLINE using the terms *isotopic response* and *lupus* revealed only 3 cases of cutaneous

lupus erythematosus presenting as an isotopic response in the English-language literature. One of those cases occurred in a patient with preexisting systemic lupus erythematosus, making a diagnosis of Koebner isomorphic phenomenon more appropriate than an isotopic response at the site of prior herpes zoster infection.[7] The remaining 2 cases were clinically defined DLE lesions occurring at sites of prior infection—cutaneous leishmaniasis and herpes zoster—in patients without a prior history of cutaneous or systemic lupus erythematosus.[8,9] The latter case of DLE-like isotopic response occurring after herpes zoster infection was further complicated by local injections at the zoster site for herpes-related local pain. Injection sites are reported as a distinct nidus for Wolf isotopic response.[9]

The pathogenesis of Wolf isotopic response is unclear. Possible explanations include local interactions between persistent viral particles at prior herpes infection sites, vascular injury, neural injury, and an altered immune response.[1,5,6,10] The destruction of sensory nerve fibers by herpesviruses cause the release of neuropeptides that then modulate the local immune system and angiogenic responses.[5,6] Our patient's immunocompromised state may have further propagated a local altered immune cell infiltrate at the site of the isotopic response. Despite its unclear etiology, Wolf isotopic response should be considered in the differential diagnosis for any patient who presents with a dermatomal eruption at the site of a prior cutaneous infection, particularly after infection with herpes zoster. Treatment with topical or intralesional corticosteroids usually suffices for inflammatory-based isotopic responses with an excellent prognosis.[11]

We present a case of a cutaneous lupus erythematosus–like isotopic response that occurred at the site of a recent herpes zoster eruption in an immunocompromised patient without prior history of systemic or cutaneous lupus erythematosus. Clinical recognition of Wolf isotopic response is important for accurate histopathologic diagnosis and management. Continued investigation into the underlying pathogenesis should be performed to fully understand and better treat this process.

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