Cutaneous skin manifestation following messenger RNA Moderna SARS-CoV-2 vaccine with dermal hypersensitivity reaction histopathology

To the Editor: The dermal hypersensitivity reaction (DHR) is a nonspecific histologic finding seen in a variety of clinical scenarios, including bite reactions, urticarial dermatitis and vasculitis, drug eruptions, and eczematous dermatitis. DHR is described as perivascular, lymphocytic infiltrate with eosinophils involving the papillary and upper reticular dermis and sometimes minimally the epidermis. DHR has been very rarely reported in the setting of recent vaccination.[1,2] Therefore, we read with great interest the case series by Sidlow et al[3] describing a generalized urticarial and a morbilliform eruption in the setting of SARS-CoV-2 vaccination, similar to a case seen at our institution as described below.

Nine days following her first dose of the Moderna SARS-CoV-2 vaccine in her left arm, a 56-year-old female health care worker presented with an intensely pruritic rash that started on the left hand and spread to the left elbow, both hands, and both feet. Five days of prednisone taper (40 mg daily for 2 days, 20 mg daily for 2 days, and 10 mg for 1 day) from her primary care physician slightly improved the pruritus. She had a dusky violaceous papule on the small finger of her left hand; edematous, violaceous papules on the palms of the hands and dorsal feet; and urticarial lesions on the dorsal aspect of the hands, elbows, and upper portion of thighs (Fig 1, *A* and *B*). She reported occasional chills 1 day after the vaccination but denied any recent illnesses, new medications, or outdoor exposures. Our differential diagnosis included erythema multiforme, neutrophilic eccrine hidradenitis, pernio, a vasculopathic etiology, or other viral etiology. A 4-mm punch biopsy of an edematous dusky pink papule of the dorsal aspect of the right foot was performed (Fig 1, *C*). Histopathologic examination demonstrated an area of ulceration and an underlying perivascular and periadnexal mixed inflammatory infiltrate with lymphocytes and scattered eosinophils within the papillary, mid, and reticular dermis, consistent with a traumatized DHR (Fig 2). We advised her to use triamcinolone 0.1% cream twice daily and complete the prednisone taper. At her 1-month follow-up, she reported a few flareups of the pruritic rash on her hands and feet off the prednisone. Although similar to the initial presentation, the rash was controlled with the triamcinolone cream and improved overall. She was instructed to contact us for any worsening or flaring of her symptoms and has not required reevaluation as of 4 months after the visit. She declined her second vaccination dose at the time of conversation.

The pattern of DHR has been noted in the biopsies of COVID-19 infection–associated cutaneous symptoms, including perniosis-like, morbilliform and urticarial lesions.[4] Cutaneous reactions associated with the Moderna SARS-CoV-2 vaccine are varied and include injection site

Fig 1. Patient presentation of clinical findings. **A,** Dusky pink-purple papule on the left palm. **B,** Dusky purple edematous papule of the small and index fingers of the left hand and edematous pink excoriated papules on the dorsal aspect of the hands. **C,** Excoriated dusky pink-purple papules of the dorsal aspect of the feet.

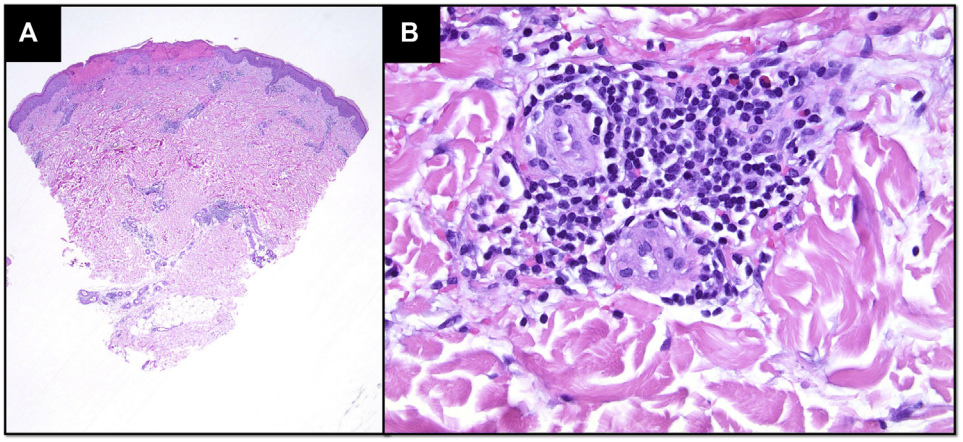

Fig 2. The dermal hypersensitivity reaction from the sampling of the dorsal aspect of the right foot shows a mixed dermal inflammation with mid- and reticular-dermal perivascular and periadnexal lymphocytic infiltration with occasional eosinophils. (**A** and **B,** Hematoxylin-eosin stain; original magnifications: **A,** ×2; **B,** ×40.)

reactions and urticaria, morbilliform rashes, and facial swelling in those with a history of dermatologic fillers.[5] Sidlow et al[3] and our report stress that the histologic findings associated with DHR can similarly be seen in the setting of both local and generalized cutaneous reactions to the SARS-CoV-2 messenger RNA vaccine, including cutaneous acral eruptions.

Awareness of these clinical and histologic findings is important for both dermatologists and dermatopathologists when counseling and evaluating patients with cutaneous concerns after vaccination.

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Conflicts of interest

None disclosed.

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