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DERMATOLOGIC THERAPY WILEY

LETTER

Vasculitis in the setting of COVID-19: From the disease to the vaccine. Report of a case of cutaneous vasculitis after immunization

Dear Editor,

The skin is often involved in primary and secondary vasculitis, and it may occur as single organ vasculitis limited to the skin. Cutaneous vasculitis may be triggered by several factors, including infections or drugs, or may be related to underlying conditions, notably connective tissue disease or malignancies. Along the COVID-19 pandemic we have identified 11 case reports about COVID-19-associated cutaneous (Table S1)[1–7]and systemic vasculitis and 29 case reports on COVID-19 vaccine-associated cutaneous and systemic vasculitis on PubMed indexed literature (Table S2).

Based on these reports, we currently know that SARS-CoV-2 can cause different types of skin lesions, with leukocytoclastic vasculitis being one of them. However, cutaneous vasculitis following COVID-19 vaccination is a relatively rare event, with only 32 cases reported in the literature up to November 1, 2021: Thirteen cases occurred after the ChAdOx1 (AstraZeneca) vaccine (40.62%), 10 of them occurred after the first dose of the BNT16B2b2 (Pfizer) vaccine (31.25%),[8,9] two cases after the Coronavac vaccine (6.25%), two cases after the COVAXIN 2 "inactivated virus" vaccine (6.25%),[10] one case after the first dose of the 1 mRNA-1273 (Moderna) vaccine[8] (3.12%), one case after the Ad26.COV2.S (Janssen) vaccine and one case after the "mRNA vaccine (nonspecified) (3.12%)." The mean interval of time of between the COVID-19 vaccine and onset of adverse reactions was 7.86 days.

We are adding a new case of cutaneous small-vessel vasculitis after COVID-19 immunization with the AstraZeneca vaccine.

A 61-year-old Caucasian woman presented with a 7-day history of intensely pruritic erythematous-purpuric macules involving the lower legs and feet that progressed within hours to involve the buttocks, axillae, and lateral aspects of the abdomen (Figure 1A,B). The cutaneous lesions were preceded by myalgia and fatigue that started about 12 h after immunization and resolved within 48 h. She had a past medical history significant for hypertension on losartan which she had been on for 2 years. She had received her first dose of the COVID-19 AZD1222 (ChAdOx1 - AstraZeneca) vaccine 5 days prior to the onset of cutaneous lesions. Patient denied any respiratory complaints or other systemic symptoms. She denied any previous infections including COVID-19 and she had never experienced adverse reactions to other vaccines, such as Influenza and Yellow Fever. When she presented to the Dermatology Department for evaluation, our clinical impression included cutaneous or systemic vasculitis and thrombocytopenic purpura. A skin biopsy from her right thigh was obtained and demonstrated leukocytoclasis, intense perivascular inflammation with neutrophils and eosinophils involving the superficial and deep dermis, as well as fibrinoid necrosis of the vessel walls (Figure 1C–E). Diagnosis of small-vessel cutaneous vasculitis was established.

Laboratory work-up was within normal limits and included nasopharyngeal RT-PCR for SARS-CoV-2, ANA, rheumatoid factor, ANCA antibodies, serologies for hepatitis B and C, HIV, cytomegalovirus, syphilis, and Epstein-Barr virus, complete blood count, aspartate aminotransferase, alanine aminotransferase, C-reactive protein, and urinalysis. Due to the extent of cutaneous lesions and intense itching, she was started on oral prednisone 20 mg/day for 2 weeks and oral antihistamine (epinastine 10 mg/day), with progressive resolution of cutaneous lesions. Per Infectious Diseases recommendations, patient did not receive her second dose of the AZD1222 vaccine.

Most cases of cutaneous vasculitis related to COVID-19 vaccination occurred with vaccines involving the messenger RNA (mRNA) mechanism,[8,9] with the exception of the COVAXIN.[10] The present patient represents a case of an immune reaction after immunization with a viral vector COVID-19 vaccine (AZD1222). Interestingly, this patient had no previous relevant medical history and negative autoimmune markers. The exact mechanism behind the development of cutaneous vasculitis after viral vector COVID-19 vaccine is still unclear. We hypothesize that immunogenicity generated by the Spike protein in the viral vector may play a role, with a similar immune mechanism to the SARS-CoV-2 infection-associated vasculitis. Further reports and studies are needed in order to better define a causal effect. Even with the possibility of severe adverse reactions after vaccine administration, we consider vaccines an essential tool to help control the current pandemic. Physicians must be aware of potential adverse reactions of COVID-19 vaccines so that they can be reported and adequately managed.

Approval from institutional review board has not been obtained as this submission is a case report and not a clinical trial/study involving participants.

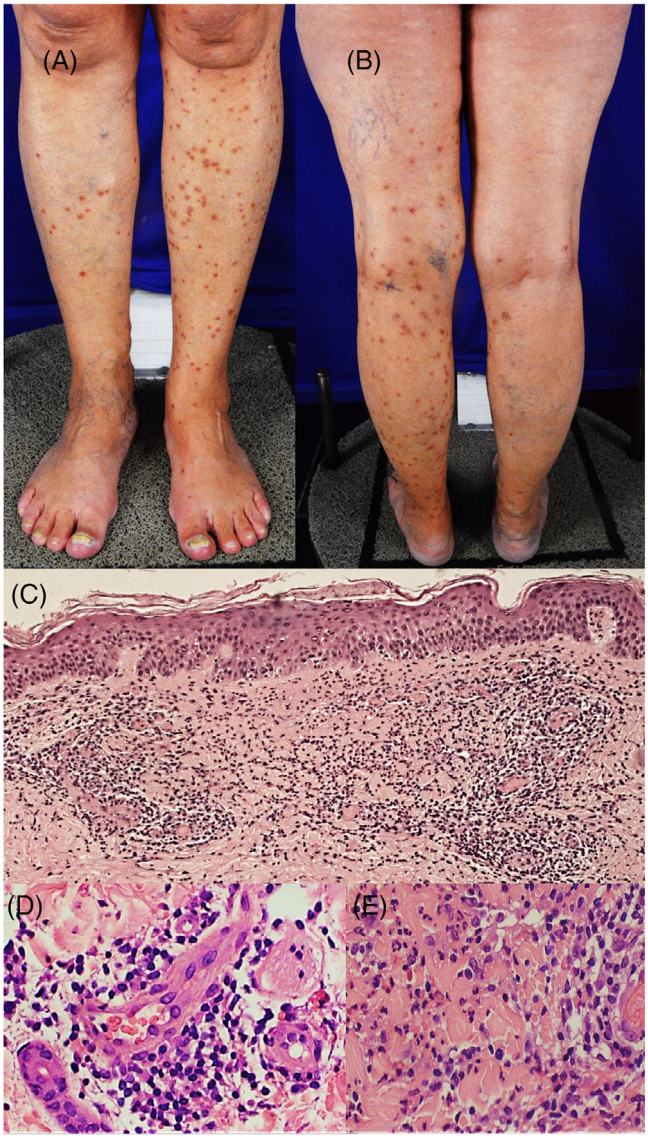

FIGURE 1 Clinical and histopathological images. **(A)** small erythematous-purpuric macules (2–5 mm in diameter) on the shins, **(B)** calves and posterior thighs, **(C)** histopathological image from cutaneous biopsy on right calf showing flattened epidermis and dense perivascular and interstitial inflammation involving the upper and mid dermis [hematoxylin–eosin stain (H.E.), OM 200×], **(D)** perivascular and transmural inflammation in dermal vessel demonstrating mild fibrinoid necrosis of vessel wall, lympho-mononuclear cells and eosinophils (H.E., OM 400x), **(E)** perivascular and interstitial inflammatory infiltrate composed by lymphocytes, monocytes, eosinophils, and leukocytoclasia (H.E., OM 400×)

CONFLICT OF INTEREST

All authors have no conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS

Data collection for manuscript preparation: Paulo Ricardo Criado, Lucas Prezotto Giordani, Thais Akemi Yoshimoto, Ingrid Campos Vieira. Analysis of data collected for manuscript preparation: Paulo Ricardo Criado, Gilles Landman, Thais Prota Pincelli. Review of literature for manuscript preparation: Paulo Ricardo Criado, Lucas Prezotto Giordani, Gilles Landman. Manuscript preparation and review: Paulo Ricardo Criado, Thais Prota Pincelli.

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DATA AVAILABILITY STATEMENT

No data generated.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.