

## LETTER TO THE EDITOR

## Urticarial vasculitis triggered by SARS-CoV-2 vaccine (mRNA vaccine)

Editor,

Multiple studies have recently reported cutaneous manifestations following SARS-CoV-2 virus infection.<sup>1</sup> Two cases of asymptomatic SARS-CoV-2 virus infection associated with urticarial vasculitis (UV) were reported and confirmed by the presence of immunolabelled nucleocapsid for SARS-CoV-2 antigens in skin biopsies.<sup>2</sup>

Cases of UV following mRNA vaccine are extremely rare. Here, we describe a case of UV following the second dose of mRNA vaccine (Pfizer-BioNTech vaccine) in a 73-year-old man with a past medical history of chronic spontaneous urticaria (CSU) evolving for 5 months before vaccination, with one episode every 2 weeks and treated with the second generation of H1-antihistamine (Cetirizine).

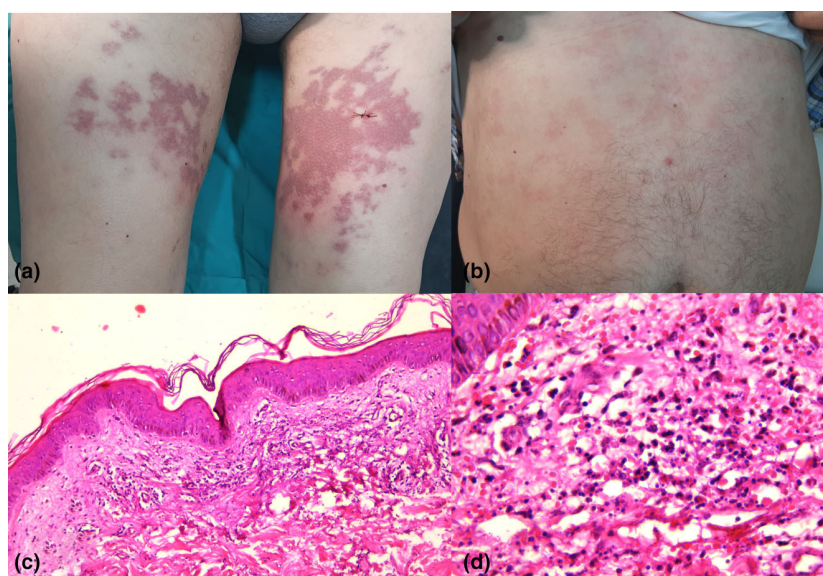
He presented with purpuric rash on both thighs, 2 days following the second injection of Pfizer-BioNTech vaccine. No history of previous SARS-CoV-2 virus infection was noticed.

Moreover, the patient denied any recent drug intake. He received the first dose of Pfizer-BioNTech vaccine on April 2021 and developed urticarial lesions within 24 h. He received the second injection of Pfizer-BioNTech vaccine, 7 months after (November 2021) due to concerns about the exacerbation of CSU. Cutaneous examination revealed two burning, purpuric oedematous and reticulated plaques with symmetric distribution located on both thighs associated with maculopapular rash on the trunk (Fig. 1a,b).

The rest of physical examination did not show any abnormalities.

Histopathological examination of skin biopsy from the purpuric plaque revealed erythrocyte extravasation, leucocytoclasia, fibrin deposits with an inflammatory infiltrate of neutrophils and lymphocytes (Fig. 1c,d). Autoimmune serology was unremarkable. Laboratory examinations were within normal levels except of inflammatory biological syndrome.

Viral analysis to exclude concomitant viral reactivations revealed chronic Epstein–Barr virus, Parvovirus B19 and Herpes Simplex virus infections. Anti-SARS-CoV-2 antibodies and RT-PCR were not performed, as clinical presumption of SARS-CoV-2 infection was not suspected.



**Figure 1** (a) Two purpuric and reticulated plaques symmetrically localized on both thighs; (b) maculopapular rash; (c) Skin biopsy of purpuric plaque showing erythrocyte extravasation, leucocytoclasia, fibrin deposits with an inflammatory infiltrate of neutrophils and lymphocytes (Haematoxylin–Eosin,  $\times 40$ ), (d) (Haematoxylin–Eosin,  $\times 100$ ).

Based on chronological, clinical and histopathological findings, the diagnosis of UV after the second dose of Pfizer-BioNTech vaccine was evoked. The lesions had healed spontaneously within 1 week with post-inflammatory hyperpigmentation. Since then, the patient continues to suffer from CSU daily with no improvement after up-dosing the second generation of H1-antihistamine.

Most of the reported cutaneous reactions after mRNA vaccines against the SARS-CoV-2 virus are immediate reactions (urticaria, morbilliform eruption, erythromelalgia, local injection site reaction and angioedema).<sup>3</sup>

Delayed large local reactions are often described with Moderna's vaccine.<sup>3,4</sup>

Recently, Larson *et al.*<sup>5</sup> have described a case of UV after the first dose of Moderna vaccine and a case of leucocytoclastic vasculitis, 1 week after the second dose of Pfizer-BioNTech vaccine.

Tihy *et al.*<sup>6</sup> reported another case of UV, 21 days following the second dose of Pfizer-BioNTech vaccine. Alden Holmes *et al.*,<sup>7</sup> described another case of UV after the second dose of Pfizer-BioNTech vaccine.

Interestingly, the first case of UV after the second dose of SARS-CoV-2 vaccine was described by Dash *et al.*,<sup>8</sup> in a young healthy man and was treated with oral indomethacin. Some authors suggest that delayed reactions to mRNA vaccines are T-cell-mediated hypersensitivity which may induce a type I interferon response, explaining the autoimmune mechanism and the activation of auto reactive antibodies with immune complex deposition and vascular inflammation.<sup>6,8</sup>

Furthermore, CSU was reported as a rare side-effect following mRNA vaccines.<sup>9</sup>

Birmingham *et al.*<sup>10</sup> discussed the exacerbation of CSU and angioedema following SARS-CoV-2 vaccination and reassured that a previous diagnosis of CSU does not increase the risk of IgE-mediated reaction to the vaccination.

Our case report seems to be the first case reporting the onset of UV in patient with CSU following SARS-CoV-2 vaccine which may be explained by auto-immune phenomenon in predisposed patient, as CSU is often associated with autoimmune dysregulation.

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The patient in this manuscript has given written informed consent to the publication to his case details.

### Conflicts of interest

None declared.

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### Data availability statement

Data sharing not applicable - no new data generated

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