

SHORT REPORT

Leukocytoclastic vasculitis after COVID-19 vaccination

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Abstract

Leukocytoclastic vasculitis (LCV) is the vasculitis of small vessels. In this report, we describe a 38-year-old male patient who presented to our outpatient clinic with a 1-week history of rash on his lower extremities that had started 4 days after receiving the Pfizer-BioNTech SARS-CoV-2 vaccine. A diagnosis of LCV was made based on clinical and histopathological findings. The patient was treated with antihistamines and prednisolone, after which improvement was observed in the lesions. With this paper, we aim to raise awareness concerning the possibility of LCV development after COVID-19 vaccination.

KEYWORDS

COVID-19, COVID-19 vaccination, leukocytoclastic vasculitis

1 | INTRODUCTION

SARS-CoV-2 is a single-stranded RNA virus responsible for COVID-19.¹ The disease usually targets the respiratory system and presents in different forms ranging from the mild disease with common cold-like symptoms to serious and fatal conditions related to pneumonia, including acute respiratory distress syndrome and septic shock.¹ Vaccines reduce the severity of the disease. However, as more people are vaccinated, various adverse events have been reported, including cutaneous adverse events. Large clinical trials have shown that vaccines are safe and effective. Common side effects include mild to moderate tenderness at the injection site, fever, fatigue, body ache, and headache.² Leukocytoclastic vasculitis (LCV), also known as hypersensitivity vasculitis, is the vasculitis of small vessels, which causes vascular damage and extravasation of erythrocytes with the accumulation of immune complexes and the subsequent activation of the complement system.³

In this paper, we present a case of LCV that developed after COVID-19 vaccination.

2 | CASE REPORT

A 38-year-old male patient presented to our outpatient clinic with the complaints of rash, mild pain, swelling, and arthralgia on both legs lasting for 1 week. There was no nausea, vomiting, or diarrhea. No

concomitant disease, systemic problems, or previous medications were reported. The patient had received the first dose of the Pfizer-BioNTech COVID-19 vaccine 4 days before the rash appeared. The biochemical and hematological parameters were normal except for C-reactive protein (12.20 mg/L) and sedimentation (31 mm/h). He was negative for anti-nuclear antibody, complement C3, complement C4, anti-double stranded DNA, anti-neutrophil cytoplasmic antibody, and the extractable nuclear antigen antibodies panel. His dermatological examination revealed purpuric-erythematous macules, papules, and plaques on both lower extremities, more prominent on the left (Figure 1A,B). In the histological analysis, vascular proliferation in the dermis, swollen appearance in the endothelium, accumulation of fibrinoid material in some vessel walls, perivascular lymphocyte and eosinophil infiltration, interstitial eosinophils, leukocytoclasia, neutrophils penetrating the vessel walls in places, extravasated erythrocytes, and edema were observed (Figure 2A,B). The patient's financial constraints precluded direct immunofluorescence.

The patient was recommended rest and leg raises, and prescribed antihistamines and prednisolone therapy. Following treatment, there was improvement in the lesions.

3 | DISCUSSION

Vaccines reduce the risk of many life-threatening diseases by increasing natural immune responses. Globally, millions of people are being

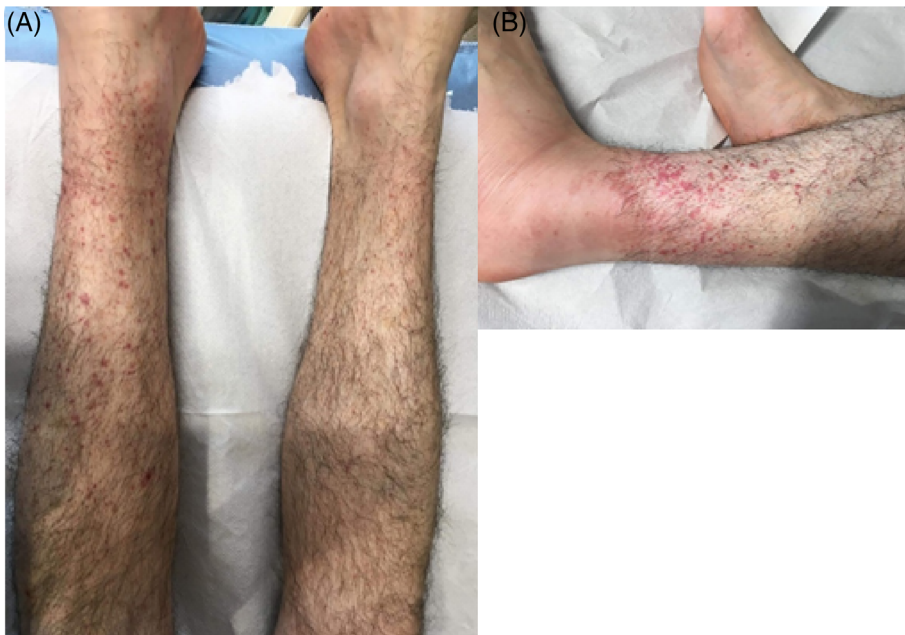


FIGURE 1 (A) Purpuric-erythematous macules and papules on both lower extremities. (B) Purpuric macules, papules and plaques on the right lower extremity

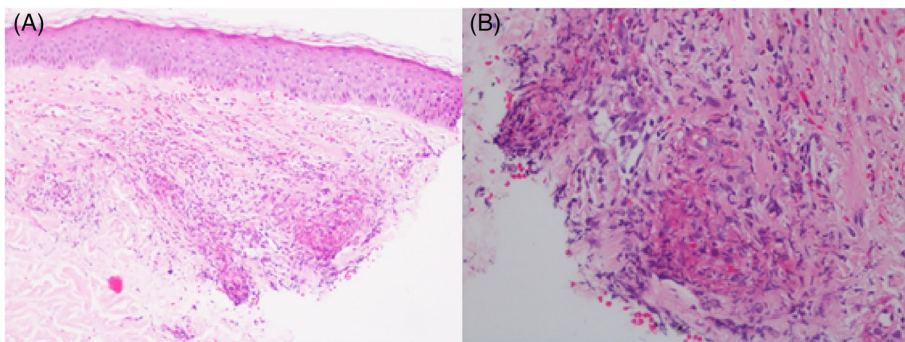


FIGURE 2 (A) Low-power view of leukocytoclastic vasculitis, superficial and mid-perivascular inflammatory pattern with a population of predominantly neutrophils in addition to marked red cell extravasation (H&E $\times 100$). (B) Neutrophilic inflammation with fibrinoid necrosis and fragmented neutrophilic nuclei (leukocytoclasia) (H&E $\times 200$)

vaccinated,⁴ and therefore it is conceivable that some people will temporarily develop vaccination-related diseases. The cutaneous patterns of symptomatic COVID-19 have been well defined, and maculopapular manifestation is one of the most common, being associated with the direct effect of the virus on the skin.⁵ In this paper, we describe a case of cutaneous LCV.

SARS-CoV-2 directly invades endothelial cells and induces a hyper-inflammatory response resulting in immune complex deposition that most likely leads to vasculitis. It can be hypothesized that the immune response to the virus/vaccination also plays a role in the development of skin rashes targeting small vessels.⁶ In the largest series of 414 patients, local reactions were identified as the most common adverse events. However, only three cases of cutaneous vasculitis have been reported following COVID-19 vaccination.⁷ In the literature, leukocytoclastic vasculitis was described in a 42-year-old female patient 4 days after the first dose of the Pfizer BioNTech COVID-19 vaccine⁸ and in a 65-year-old male patient 2 days after the third dose of the Pfizer BioNTech COVID-19 vaccine.⁹ It is important for physicians to know and report systemic and cutaneous adverse events associated with vaccines. Further studies are needed to determine the relationship between vasculitis and vaccine components.

In conclusion, with this case report, we aimed to draw attention to the possible relationship between the development of LCV and COVID-19 vaccination in order to increase awareness concerning the cutaneous side effects of the inactivated COVID-19 vaccine.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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