Cutaneous Vasculitis in a Patient With COVID-19

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We describe a 43-year-old patient with coronavirus disease 2019 who developed a bullous hemorrhagic rash that progressed to necrotic lesions. Histopathology confirmed a vasculitis of small- and medium-sized cutaneous vessels.

Keywords. COVID-19; vasculitis.

A 43-year-old patient with hypertension presented to our emergency department with suspected varicella infection. He had felt generally unwell for the past 4 weeks, starting with a sore throat but without cough or shortness of breath. Three days before presentation, he developed a vesiculous rash that started on the face and quickly progressed to involve the whole body, resembling chickenpox. On admission, he tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by polymerase chain reaction of an oropharyngeal swab.

The patient had a temperature of 38.0°C, a respiratory rate of 14 breaths per minute, and an oxygen saturation of 99% on room air. Examination of the chest was unremarkable. Laboratory tests showed leukocytosis (19.3 per nanoliter) with normal lymphocytes and an elevated C-reactive protein of 170 mg per liter. Chest computed tomography showed no abnormalities.

Within 2 days, the skin lesions first progressed to painful hemorrhagic bullae and then necrotic lesions surrounded by diffuse erythema on the trunk, arms, and legs. The nasal septum, oral mucosa, and ears were also involved (Figure 1A–C). Inflammatory markers increased markedly, with a C-reactive protein of 325.7 mg per liter and procalcitonin of 4.3 ng per milliliter. Bacterial superinfection was suspected, and the patient was started on intravenous cefazolin. Bacterial cultures of blood and skin swab remained negative. Skin lesions were negative for HSV- and VZV-DNA, and serum from the patient was negative for SARS-CoV-2 RNA.

A skin biopsy demonstrated a small- and medium-sized vessel vasculitis with neutrophils, some eosinophils, and histiocytes (Figure 1D). Small blood vessel occlusion by microthrombi, which has been described in patients with coronavirus disease 2019 (COVID-19) [1], could not be demonstrated. Direct immunofluorescence of the skin biopsies was negative, as were antineutrophil cytoplasmic autoantibodies and antiphospholipid antibodies. No symptoms or signs of systemic organ involvement were present.

Under suspicion of a SARS-CoV-2-induced cutaneous vasculitis, the patient was treated with prednisolone at 0.5 mg per kilogram. Within 3 days, the vasculitic skin manifestations and general condition improved.

Variable and heterogeneous skin manifestations in patients with COVID-19 have been described that appear before, during, and after the disease [2]. A large Chinese study of 1099 patients with SARS-CoV-2 infection only found 2 patients with...
a rash [3]. However, other groups have described skin manifestations in up to 20% of COVID patients [4, 5]. Cutaneous manifestations have been classified in inflammatory/exanthematous eruptions, for example, urticaria, erythematous/maculopapular/morbilliform rash, and papulovesicular exanthem, and in vasculopathic/vasculitic patterns including chilblain-like acral lesions, livedo reticularis–like lesions, and purpuric “vasculitic” rash [6]. Chilblain-like and livedo reticularis–like lesions have been explained by the occlusion of small blood vessels (occlusive thrombotic microvasculopathy) and an associated procoagulant state. Magro described a pauci-inflammatory thrombogenic vasculopathy with complement deposition in 3 patients with a purpuric skin rash [1]. According to Marzano, the vasculitic pattern was extremely rare.

However, our case demonstrates a small/medium-sized vessel vasculitis with involvement of mucous membranes as the cause of skin manifestations in a patient with COVID-19 that appeared late in the disease. No other explanation for the vasculitis was apparent, suggesting that it might have been caused by SARS-CoV-2. Viral infections represent a significant proportion of infection-associated cutaneous vasculitic syndromes [7]. SARS-CoV-2 could be another virus that triggers an immunologic process that leads to cutaneous vasculitis. This case underscores the need for biopsy to determine the nature of the underlying disease—here COVID-associated coagulopathy and microvasculopathy vs vasculitis. Based on the histopathologic findings, an adequate anti-inflammatory treatment with steroids was initiated.

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Patient consent. The patient’s written consent was obtained.

Study design. The design of the work conforms to standards currently applied in Germany. The authorizing body is Ärztekammer Nordrhein.

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