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Retiform purpura as a dermatological sign of coronavirus disease 2019 (COVID-19) coagulopathy

Dear editor,

Since December 2019, coronavirus disease 2019 (COVID-19) has spread worldwide to become a pandemic. Multiple skin manifestations related to the infection have been described progressively. Recalcati[1] asserted that 20.4% of infected patients developed cutaneous manifestations, and Galván-Casas *et al.*[2] have recently proposed five clinical patterns (pseudo-chilblain, vesicular, urticarial, maculopapular and livedo/necrosis). We report a case of COVID-19 with retiform purpura and its histopathological correlation.

A 79-year-old woman presented to the Emergency Department with a 7-day history of high temperature (up to 39°C), asthenia, cough, shortness of breath and livedoid skin lesions on her legs. Physical examination showed painful retiform purpuric-violaceous patches of 15 cm with some haemorrhagic blisters and crusts on both legs (Fig. 1) suggestive of retiform purpura. Two punch biopsies were performed. Conventional histology showed multiple thrombi occluding most small-sized vessels of the superficial and mid-dermis (Fig. 2a). Direct immunofluorescence showed the deposition of IgM, C3 and fibrinogen within superficial-to-deep dermal blood vessel walls (Fig. 2b). In addition, C9 deposition was also revealed on the vessel walls by immunohistochemistry (Fig. 2c). Blood tests showed elevation of acute phase reactants, leukopenia and D-Dimer of >10 000 ng/mL (reference value, <500). RT-PCR from a nasopharyngeal swab specimen confirmed a SARS-CoV-2 infection. The patient was hospitalized and treated with hydroxychloroquine (200 mg bid), azithromycin (250 mg/day), lopinavir-ritonavir (200 mg/50 mg bid) and low-molecular-weight heparin. After some days, given the lack of clinical improvement and the need for oxygen therapy a chest CT was performed, showing a segmental pulmonary thromboembolism in the right lower lobe. Anticoagulation was changed to fondaparinux due to progressive thrombocytopenia. Anti-platelet factor IV, antiphospholipid antibodies, lupus anticoagulant, crioglobulinemia and serum and urine immunofixation were all negative. Three weeks after hospital discharge, the patient continues with anticoagulation treatment and her cutaneous lesions are slowly recovering.

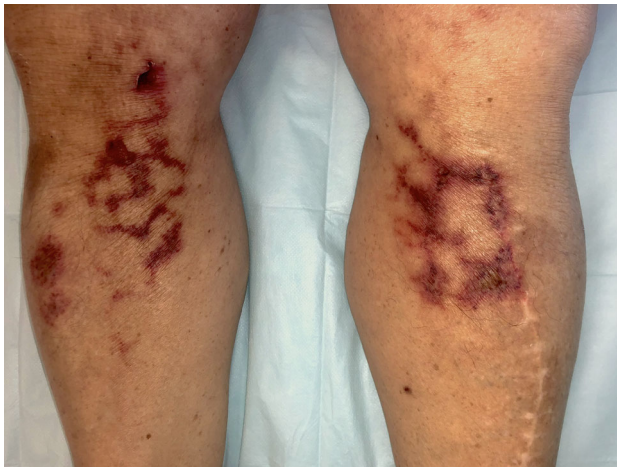

Figure 1 Bilateral retiform purpura in both legs.

COVID-19 can be associated with coagulopathy which indicates a worse prognosis.[3] The activation of both alternative and lectin-based complement pathways plays a key role in this procoagulant state and microvascular injury,[4] but the exact pathophysiology is still unclear. Skin manifestations of COVID-19 coagulopathy can vary from transient unilateral livedo reticularis in mild cases[5] to disseminated intravascular coagulation with true-ischemic lesions in critically ill patients.[6] Purpura, Raynaud's phenomenon, chilblain-like and erythema multiforme-like lesions in young asymptomatic patients have also been observed with this infection, although the connection with coagulopathy is unknown.[7,8] Our patient presented with retiform purpura as a cutaneous manifestation of COVID-19 coagulopathy. Galván-Casas *et al.*[2] linked the livedoid/necrotic lesions to older patients and severe disease (10% mortality) but no biopsies were performed. In the present case, histology showed thrombi in small cutaneous vessels, with complement pathway activation as demonstrated by C3 and C9 deposition. Heparin was changed to fondaparinux after suspecting heparin-induced thrombocytopenia, but Fan *et al.*[9] described mild thrombocytopenia (100–150 $\times$ 10^9/L) in 20% of COVID-19 patients.

Our case highlights the concomitant presentation of cutaneous microthrombi presenting as retiform purpura and macrothrombi presenting as pulmonary thromboembolism in the setting of COVID-19 coagulopathy. To our knowledge, there have been no histologically proven cases describing this phenomenon. We hope that in the coming months, pathophysiology of skin manifestations secondary to coagulation alterations will be better understood. From now on, we will have to include

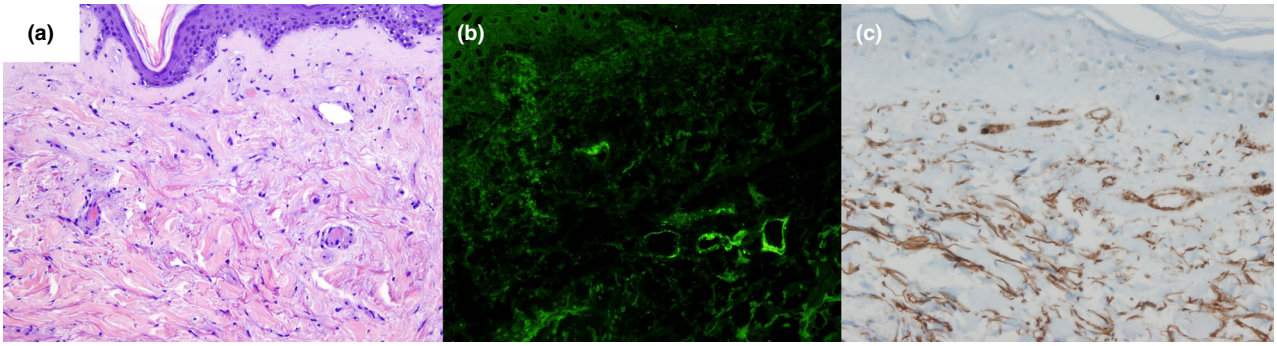

Figure 2 (a) Microthrombi occluding almost all small vessels in the superficial and mid dermis (Haematoxylin–eosin stain, ×100). (b) C3 deposits on small dermal vessels walls (Direct immunofluorescence, ×200). (c) C9 deposits on small dermal vessels walls. There is a background staining of elastic fibres (Immunohistochemistry, ×200).

COVID-19 infection in the differential diagnosis of retiform purpura.[10]

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The patient in this manuscript has given written informed consent to publication of their case details.

Conflict of interest

The authors declare that they have no conflict of interest.

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Retroauricular dermatitis with vehement use of ear loop face masks during COVID-19 pandemic

To the Editor

The coronavirus disease 2019 (COVID-19) pandemic forged the exponential use of masks of various kinds, not just by health workers but also by general population as a personal protective equipment (PPE). Although contact dermatitis due to PPE is well reported, mask induced dermatitis is a relatively unexplored phenomenon. In this article, we report a preliminary data of patients experiencing retroauricular dermatitis due to ear loop face masks.

From 1st April to 30th April, we came across 14 patients including both healthcare workers and general population who

