

NOTES & COMMENTS

Unilateral livedo reticularis in a COVID-19 patient: Case with fatal outcome

To the Editor: Recently, Strom et al¹ described a patient whose initial sign of COVID-19 infection was a reticular skin eruption. Other reports have also indicated that livedoid eruptions in COVID-19 patients are associated with more severe disease and that these skin findings may be a clinical clue to an underlying thrombotic state.² In contrast, Manalo et al³ described transient unilateral livedo reticularis (LR) in 2 patients with mild-to-moderate disease and a favorable outcome. The authors speculated that such manifestations might be associated with low-grade disseminated intravascular coagulation as a possible cause. However, the small number of reported cases and lack of coagulation studies make it difficult to draw definitive conclusions at this time.

We report a case of unilateral LR in a patient, with a fatal outcome, presenting their initial and follow-up clinical and laboratory findings.

A previously healthy 59-year-old woman presented with an 8-day history of dry cough, mild dyspnea, and low-grade fever. Physical examination revealed a body temperature of 37.6°C, blood pressure of 110/70 mmHg, pulse rate of 75 beats/min, and an oxygen saturation of 70% on room air. A chest radiograph demonstrated patchy bilateral lung opacities. COVID-19 was confirmed by polymerase chain reaction.

Her skin examination revealed nonblanching, nontender, and red-to-purple reticular discoloration over the lower portion of her right limb, which persisted for 8 hours (Fig 1). The patient denied sun or heat exposure before the onset of the cutaneous lesions. Within 24 hours after admission, her skin lesions gradually faded.

On the second day after admission, the oxygen saturation decreased, and the patient was transferred to the intensive care unit for full ventilatory and inotropic support. Despite intensive treatment, the patient died 12 days after admission. The clinical and laboratory parameters are summarized in the Table I.



Fig 1. Unilateral LR in a PCR-confirmed COVID-19 patient. LR, Livedo reticularis; PCR, polymerase chain reaction.

A variety of cutaneous manifestations in COVID-19 patients have been described. At present, the potential association between morphological subtypes with different COVID-19-associated syndromes and/or outcomes remains unclear. A reticulated vascular pattern indicates partial or intermittent cutaneous blood flow disturbance. LR is characterized by nonfixed, dusky patches forming complete rings, while livedo racemosa, which is representative of a more significant reduction in blood flow, presents with broken rings, which are persistent but rarely necrotic or ulcerative.⁴

Coagulation disorders in COVID-19-infected patients range from thrombocytopenia, elevated D-dimers, and prolonged prothrombin time to episodes of macro- and microvascular thrombosis. Several mechanisms have been proposed to explain these observations, including (i) disseminated intravascular coagulation, (ii) properties of the virus itself, (iii) antiphospholipid syndrome, (iv) activation of complement cascade, (v) endothelial dysfunction, and (vi) drug interactions.⁵

Similarly to that in the case described by Strom et al,¹ the only parameters that were evident in our patient when LR persisted were the low oxygen

Table I. Laboratory results of the patient on different days of hospitalization

| Variable | HD1* | HD2* | HD3 | Extreme values HD4 to HD12 | Reference range |
|--------------------------------|--|---|---|---|-----------------|
| WBC 10 ⁹ /L | 14.0 | 15.8 | 16.3 | 15.7 | 3.5-10 |
| RBC 10 ¹² /L | 5.06 | 4.42 | 4.52 | 2.75 | 3.50-5.50 |
| Platelet (×10 ⁹ /L) | 210 | 248 | 318 | 51 | 150-400 |
| D-dimer (ng/mL) | 0.95 | 4.05 | 2.65 | 6.57 | <0.55 |
| PT (seconds) | 12.8 | 12.5 | 12.2 | 14.9 | 10.3-13.0 |
| LDH (U/L) | 464 | 499 | 538 | 750 | 81-234 |
| Ferritin (μg/L) | 438 | / | / | / | 20-290 |
| CRP (mg/dL) | >201 | 162 | 155 | 280 | 0-10 |
| SpO ₂ (%) | 70 | 97 | 92 | 88 | 92-100 |
| pH | / | 7.34 | 7.39 | 7.52 | 7.35-7.45 |
| pO ₂ (mmHg) | / | 34 | 62 | 41 | 90-100 |
| Lactates (mmol/L) | / | 2.9 | 1.3 | 1.6 | 0.5-2.2 |
| Treatment | AZM 500 mg CFX 2 g MPS 120 mg Fraxiparin 0.6 mL × 2 | AZM 500 mg CFX 2 g MPS 120 mg Fraxiparin 0.6 mL × 2 NA Lopinavir 200 mg Ritonavir 50 mg CPAP | AZM 500 mg CFX 2 g MPS 120 mg Fraxiparin 0.6 mL × 2 NA CPAP | Meropenem 1500 mg CFX 2 g MPS 120 mg Fraxiparin 0.6 mL × 2 NA IMV (IPPV) | |

AZM, Azythromycin; CFX, ceftriaxone; CRP, C-reactive protein; CPAP, continuous positive airway pressure therapy; IMV, invasive mechanical ventilation; IPPV, intermittent positive-pressure ventilation; LDH, lactate dehydrogenase; MPS, methylprednisolone; HD hospital day; NA, noradrenaline; PT, prothrombin time; RBC, red blood cells; SpO₂, oxygen saturation; WBC, white blood cells.

*Bold formatting indicates results when livedo reticularis persisted.

saturation and increased lactate levels, and coagulopathy occurred a few days later (Table I).

Therefore, close monitoring is required in patients with COVID-19 and LR to ensure the early detection of disease progression, even in initially asymptomatic or mild-to-moderate cases.

Ivana Tusheva, MD,^a Katerina Damevska, PhD,^b Irena Dimitrovska, MD,^a Zorica Markovska, MD,^c and Liljana Malinowska-Nikolovska, PhD^c

From the Department of Dermatology, 8th September General City Hospital^a; University Clinic of Dermatology, Ss Cyril and Methodius University^b; and Department of Anesthesiology, 8th September General City Hospital, Skopje, Macedonia.^c

Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Approved by 8th September General City Hospital, Skopje, Macedonia.

Correspondence to: Ivana Tusheva, MD, St. Manush Turnovski No. 6, 2400 Strumica, Republic of Macedonia

E-mail: tusevaivana@yahoo.com

REFERENCES

1. Strom MA, Trager MH, Geskin LJ. Reticular skin eruption as the initial sign of coronavirus disease 2019 infection. *JAAD Case Rep.* 2020;6(8):790-792.
2. Droesch C, Hoang M, DeSancho M, Lee E, Magro C, Harp J. Livedoid and purpuric skin eruptions associated with coagulopathy in severe COVID-19. *JAMA Dermatol.* 2020;156(9):1-3.
3. Manalo IF, Smith MK, Cheeley J, Jacobs R. A dermatologic manifestation of COVID-19: transient livedo reticularis. *J Am Acad Dermatol.* 2020;83(2):700.
4. Georgesen C, Fox LP, Harp J. Retiform purpura: a diagnostic approach. *J Am Acad Dermatol.* 2020;82(4):783-796.
5. Rico-Mesa JS, Rosas D, Ahmadian-Tehrani A, White A, Anderson AS, Chilton R. The role of anticoagulation in COVID-19-induced hypercoagulability. *Curr Cardiol Rep.* 2020;22(7):53.

<https://doi.org/10.1016/j.jdc.2020.10.033>