



Henoch-Schoenlein Purpura Following Severe Acute Respiratory Syndrome Coronavirus-2 Infection: A Case Report

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Abstract

Introduction: As the novel coronavirus pandemic continues to affect people worldwide, immune-mediated inflammatory syndromes related to this virus have been reported. SARS Coronavirus-2 infection disease (COVID-19) may accompany various cutaneous symptoms, such as viral exanthems or wheels. These symptoms may occur at the early course of the disease or after that. Cutaneous symptoms of COVID-19 usually have a favorable outcome.

Case Presentation: We presented a rare case of inpatient COVID-19 pneumonia, who developed a purpuric rash, abdominal pain, and hematuria. His dermal histopathological study revealed small-vessel vasculitis. We diagnosed Henoch-Schoenlein purpura based on clinical and histopathological findings and treated him with intravenous dexamethasone followed by oral prednisolone. The purpuric rashes disappeared in two weeks.

Conclusions: Cutaneous manifestation of COVID-19 is usually diffuse maculopapular rashes. Other presentations include vesicular rashes and acral cyanosis. Dermal histopathological study in most patients with COVID-19 who developed cutaneous symptoms revealed perivascular inflammation and microthrombus in some cases. Thus, COVID-19 should be considered in any patient with a new onset of cutaneous symptoms.

Keywords: Henoch-Schoenlein Purpura, COVID-19, SARS Coronavirus-2

1. Introduction

By the end of 2020, more than 83 million confirmed cases of Coronavirus infection (COVID-19) and 1.8 million deaths occurred worldwide (1). Several studies reported the correlation between COVID-19 and inflammatory syndromes, such as Guillain-Barre, myocarditis, and encephalitis (2-4). Indeed, a significant proportion of mortalities and morbidities in COVID-19 is due to non-pulmonary immune-mediated complications. These syndromes may affect any organ and play an essential role in tissue damage and death (5). The cutaneous symptom is a relatively common presentation in COVID-19. It may occur at the onset of this disease or a few days later and usually have a favorable outcome. We reported a rare case of

COVID-19 pneumonia who developed Henoch-Schoenlein purpura (HSP) on admission.

2. Case Presentation

The patient was a 21-old-year male referred to the emergency department with three days of fever, myalgia, shortness of breath, and dry cough, five days after close contact with a patient with COVID-19. He also complained of abdominal pain and hematuria for two days. Physical examination revealed a blood pressure of 92/55 mmHg, a pulse rate of 128 beats per minute, a respiratory rate of 28 per minute, an oral temperature of 38.6°C, and O₂ saturation of 88%. He also had crackle in both lungs and a mild diffuse

abdominal tenderness. The pulmonary computed tomography scan showed diffusely scattered ground-glass opacities. The lab tests showed a white cell count of 5300 per cubic millimeter (consisting of 83% of polymorphonuclears, 13% lymphocytes, and 4% monocytes), a hemoglobin level of 11.4 mg/dL, a platelet count of 314,000 per cubic millimeter, and a creatinine level of 1.1 mg/dL. The first-hour erythrocyte sedimentation rate level was 89, and the C-reactive protein level was 68 mg per liter. Urine analysis showed mild proteinuria and 20-25 red blood cells in a 40x magnification field with 30% dysmorphic. The nasopharyngeal swab for the SARS Coronavirus-2 polymerase chain reaction (PCR) was positive.

We started treatment with parenteral ceftriaxone and pantoprazole, oral azithromycin and lopinavir/ritonavir, and oxygen supplement. The pulmonary symptoms recovered gradually during the following days, but abdominal pain and malaise continued. We also asked for a nephrology consultation and complete abdominopelvic ultrasound for evaluating hematuria. The ultrasound study was unremarkable. Other laboratory tests showed a urine protein level of 565 mg in a day, negative results for the urine culture, anti-nuclear antibody, anti-double-stranded DNA, antineutrophil cytoplasmic antibodies, HBs antigen, HCV antibody, and HIV antibody. Also, D-Dimer, prothrombin and partial thromboplastin times, peripheral blood smear, and the serum complements were normal. In the second week of admission, a palpable purpuric rash appeared on his back and lower extremities and extended in two days ([Figure 1](#)). Upon consultation with a dermatologist and rheumatologist, we performed a skin punch biopsy and started intravenous dexamethasone 4 mg three times a day, which improved his condition in the following days. The histopathology study revealed superficial lymphocytic infiltrate and small-vessel vasculitis in the dermis ([Figure 2](#)). We diagnosed HSP based on clinical presentations and histopathological findings. Finally, we discharged him on day 18 of admission without any vital organs damage with oral prednisolone and ferrous sulfate supplement. The purpuric rashes disappeared after two weeks.

3. Discussion

Henoch-Schoenlein purpura is a small-vessel vasculitis, which mainly affects the skin and mucous membranes. It may develop after upper respiratory tract infections such

as Streptococci, Adenoviruses, and coxsackievirus (6). In our case, HSP occurred after SARS Coronavirus-2 infection, which is a new manifestation of COVID-19. The cutaneous presentation of COVID-19 is often like the other viral exanthemas, such as maculopapular rash. [Table 1](#) lists the different types of dermal histopathology in COVID-19. As we showed in the table, the most common cutaneous manifestations of COVID-19 are widespread maculopapular rashes, papulovesicular rashes, and acral cyanosis. Skin symptoms in COVID-19 are usually self-limited and leave with a favorable outcome, but severe dermal involvement such as vasculitis needs a systemic treatment. Physicians should consider COVID-19 in the differential diagnosis of a new-onset cutaneous symptom, even a rare dermal presentation such as vasculitis.

Footnotes

Authors' Contribution: Saeed Soleiman-Meigooni as the main physician, wrote the primary and final draft. Ramin Yaghmaee as the pathologist, diagnosed vasculitis and reviewed the literature. Ramin Hamidi-Farahani reviewed the literature and contributed to the treatment. Ali Asgari reviewed the literature and contributed to the treatment. Moosa Ahmadi reviewed the literature and contributed to the treatment. Allahyar Taheri as the dermatologist, contributed to diagnosis and literature review. Azam Soleimani, as the nephrologist, contributed to diagnosis and literature review.

Conflict of Interests: The authors declare that they do not have any conflicts of interest.

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Informed Consent: We obtained informed consent from the patient for the publication of his illness course.



Figure 1. The palpable purpuric rash appeared on the back and lower extremities on the second week of admission

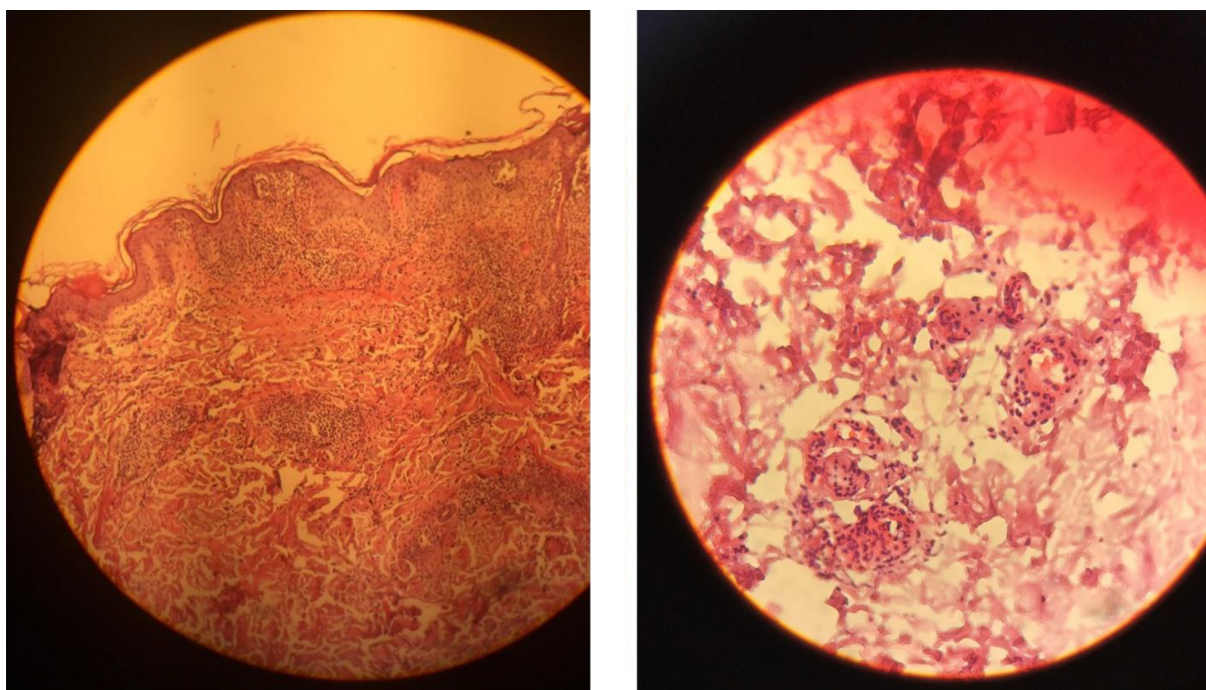


Figure 2. Superficial lymphocytic infiltrate and small-vessel vasculitis in the histopathological study of the dermis

Table 1. Histopathological Findings of Skin Lesions in Patients with COVID-19

Reference	Outcome	Histopathological Findings	Types of Skin Lesion	Age (Mean)	Female to Male	Number of Patients
(7)	Recovery	Intraepidermal vesicles with mild acantholysis and ballooned keratinocytes	Vesicular skin rash including palms and soles	40.5	15/3	24
(7)	Recovery	Intraepidermal vesicles with mild acantholysis and ballooned keratinocytes	Localized pattern (trunk)	47.5	3/3	24
(8)	Three death, twelve recovery	Hyperkeratosis, vacuolar degeneration of the basal layer with multinucleate hyperchromatic keratinocytes and dyskeratotic cells	Diffuse (73%) or scattered (27%) papulovesicular rash on trunk and limbs	56.4	16/6	22
(9)	Recovery	Spongiosis in epidermis, dilated vessels filled with neutrophils, extravasation of RBCs, lymphocytic perivascular and interstitial infiltrate	Erythema multiform-like exanthema, target lesions	66.7	F	4
(10)	Recovery	Superficial perivascular dermatitis, small thrombus, extravasated of RBCs	Widespread erythematous macules on arms, trunk, and lower limbs, exanthema on the trunk and arms	68.3	2/1	3
(11)	Recovery	Edema of the papillary dermis superficial and lymphocytic infiltrate	Chilblains or multiple asymptomatic erythematous and edematous, partially eroded, macules and plaques on dorsal aspects of the fingers	16	M	1
(9)	NA	Viral exanthema, thrombotic vasculopathy	Morbiliiform rash in trunk, acral cyanosis, ulcerated purpuric plaque	68	M	1
(12)	Recovery	Viral exanthema or urticariform dermatitis with discrete blood extravasation	Rash under breasts, back, and genital area	65	F	1
(13)	Recovery	Leukocytoclastic vasculitis affecting dermal vessels, extravasation of RBC, basal epidermal layer necrosis, dermal perivascular neutrophil infiltration, and fibrin deposition	Purple palpable papules. blisters on both her legs, feet, and toes, five days before pulmonary symptoms	83	F	1
(14)	Recovery	Perivascular mixed inflammatory infiltration of neutrophils and lymphocytes and extravasation of RBCs in upper dermis	Multiple red raised lesions symmetrically in extremities.	22	M	1
This case	Recovery	Leukocytoclastic vasculitis affecting dermal vessels	Purpuric rash on the trunk and lower extremities.	21	M	1

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