

Coronavirus 19 presenting with atypical Sweet's syndrome

Dear Editor,

On 11 March 2020, the first case of the novel coronavirus 2019 disease (COVID-19) was officially confirmed in Turkey. The disease continues to spread, and the number of patients has risen to 120 000 by the end of April. In this observation, we report an atypical presentation of COVID-19 in a patient with indurated painful nodules.

A 61-year-old woman with a 1-week history of fever (axillary 38°C) and nodules on the cheek was admitted to the hospital with fatigue, arthralgia and myalgia. There were numerous erythematous nodules on the scalp, extremities and the trunk (Fig. 1). Minor aphthous ulcers were observed on the hard palate and buccal mucosa. The patient's history was unremarkable, and she was not using any medication. She did not have any respiratory symptoms.

In laboratory work-up, leucocytosis was detected 13.75 (4.1–11.1 K/UL). Neutrophils constituted 83% of the white blood cells 11.4 (0.0–0.5 K/UL). Lymphocyte count was 1.2 (1.2–5.8 K/UL). Eosinopenia was not detected. Acute-phase reactants were significantly elevated [erythrocyte sedimentation rate: 101 (0–25 mm/h), C-reactive protein level: 78.2 (<5.0 mg/L) and fibrinogen: 7.74 (1.8–3.6 g/L)]. The D-dimer level was 1230 (<650 µg/L). The first SARS-CoV-2 RT-PCR test from nasopharyngeal swab on admission was negative. Thorax computed tomography (CT) showed paramediastinal, peribronchoalveolar multifocal ground-glass opacities in <30% of lung parenchyma. The patient was treated empirically with hydroxychloroquine, azithromycin and oseltamivir.

To rule out other causes of fever, the patient underwent an abdominal CT. Abdominal CT did not reveal a mass lesion or a causative location for the fever. Skin biopsy from the right elbow revealed diffuse neutrophilic infiltration in the upper dermis and vascular proliferation with swollen endothelial cells and extravasated erythrocytes (Fig. 2a,b). In the lower dermis and at the periphery of the lobules of subcutaneous fat tissue, there were small granulomas, composed of epithelioid histiocytes and multinuclear giant cells, together

with mild infiltration of histiocytes, lymphocytes and sparse neutrophils (Fig. 2c,d). The periodic acid–Schiff stain was negative. In the light of both clinical and histopathological features, the findings were interpreted as erythema nodosum-like Sweet's syndrome (SS).

The repeated SARS-CoV-2 RT-PCR was positive. Due to prolonged fever despite the empirical treatment, a positron emission tomography scan was performed. It showed diffuse, bilateral parenchymal lung infiltration > 30%. Tocilizumab 400 mg intravenous infusion was given once, and favipiravir was started for five days. Fever subsided in 24 h. The skin lesions regressed with treatment.

Acute febrile neutrophilic dermatosis (SS) is a rare reactive dermatosis associated with malignancies, inflammatory bowel disease, autoimmune disorders, drugs and infections.^{1,2} Fever, myalgia, arthralgia and leucocytosis are the typical findings of SS. Oral mucosa involvement is an uncommon finding in Sweet's syndrome (2–12%).^{3,4} Oral ulcers are the most frequent mucosa involvement as in our patient. An immune reaction against the drugs, tumours or microbiological agents may start a cytokine cascade resulting in the onset of SS.⁵ In our case, no other cause except SARS-CoV-2 could be identified. The overlapping symptoms of SS with COVID-19 complicated the diagnosis in this case. Recently, pseudo-chilblain, atypical vesicular eruptions, urticarial lesions, maculopapular eruptions, and livedo or necrosis were reported as dermatological findings of COVID-19.⁶ To our knowledge, this is the first reported case of SS associated with COVID-19.

The aberrant host response in COVID-19 infection was proposed to be centred around neutrophils, and neutrophil extracellular traps were shown in the lung.⁷ In autopsy specimens, neutrophil infiltration in pulmonary capillaries, extravasation of neutrophils to alveolar space and capillaritis with fibrin deposition were shown.^{7,8} The exaggerated neutrophilic response caused by the COVID-19 in our patient may have triggered SS in the skin. Predominant cells in the inflammatory infiltration of oral aphthous ulcers are the neutrophils, compatible with the inflammation in SS.⁹

We want to draw attention to the overlapping symptoms of reactive neutrophilic dermatosis with COVID-19 and the possibility of concurrent onset.



Figure 1 (a) Multiple erythematous nodules on the face and (b) an infiltrated erythematous nodule on the knee.

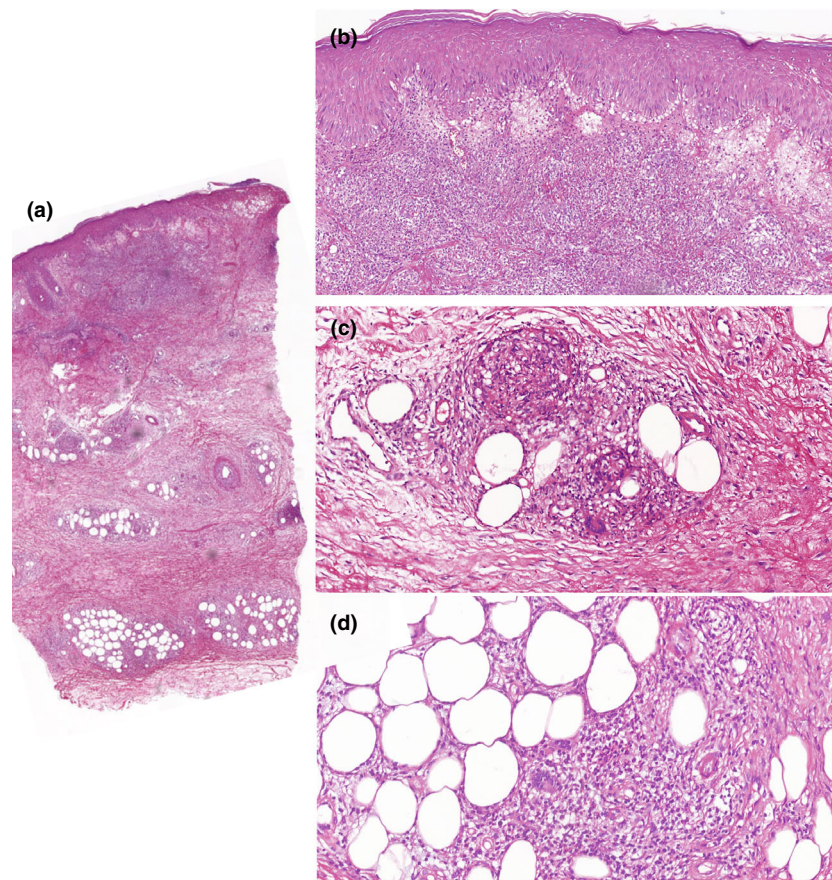



Figure 2 (a) Diffuse neutrophilic dermatitis together with panniculitis, prominent fibrinoid degeneration in the collagen fibres in the dermis and at the septum of the subcutaneous fat tissue was detected (HE $\times 4$). (b) Oedema at the papillary dermis, neutrophilic infiltration, nuclear dust and extravasated erythrocytes (HE $\times 100$). (c) In the lower dermis and at the periphery of the lobules of subcutaneous fat tissue, there were small granulomas, composed of epithelioid histiocytes and multinuclear giant cells (HE $\times 200$). (d) Lymphocytes, histiocytes, sparse neutrophils and a few multinucleated giant cells at the periphery of the lobules in the subcutaneous fat tissue (HE $\times 200$).

Acknowledgements

We would like to thank the patient for giving written informed consent to publication of the case details. We thank Dr. Levent Tabak and Dr. Siran Keske for their clinical assistance.

Conflict of interest

Dr. Taşkın, Dr. Vural, Dr. Altuğ, Dr. Demirkesen, Dr. Kocatürk, Dr. Çelebi, Dr. Ferhanoğlu and Dr. Alper have nothing to disclose.

B. Taşkın,^{1,2} S. Vural,^{1,*}  E. Altuğ,³ C. Demirkesen,⁴ E. Kocatürk,¹ İ. Çelebi,⁵ B. Ferhanoğlu,⁶ S. Alper^{1,2}

¹Department of Dermatology and Venereology, School of Medicine, Koç University, Istanbul, Turkey, ²Department of Dermatology and Venereology, VKV American Hospital, Istanbul, Turkey, ³Department of Pulmonary Medicine, VKV American Hospital, Istanbul, Turkey, ⁴Department of Pathology, School of Medicine, Acibadem Mehmet Ali Aydınlar University, Istanbul, Turkey, ⁵Department of Radiology, VKV American Hospital, Istanbul, Turkey, ⁶Department of Hematology and Oncology, VKV American Hospital, Istanbul, Turkey

*Correspondence: S. Vural. E-mail: sevural@ku.edu.tr

- 2 von den Driesch P. Sweet's syndrome (acute febrile neutrophilic dermatosis). *J Am Acad Dermatol* 1994; **31**: 535–556; quiz 557–560.
- 3 Cohen PR, Kurzrock R. Sweet's syndrome and cancer. *Clin Dermatol* 1993; **11**:149–157.
- 4 Cohen PR. Sweet's syndrome—a comprehensive review of an acute febrile neutrophilic dermatosis. *Orphanet J Rare Dis* 2007; **2**: 34.
- 5 Voelter-Mahlknecht S, Bauer J, Metzler G, Fierlbeck G, Rassner G. Bullous variant of Sweet's syndrome. *Int J Dermatol* 2005; **44**: 946–947.
- 6 Galvan Casas C, Catala A, Carretero Hernandez G *et al*. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *Br J Dermatol* 2020. [Epub-ahead of print].
- 7 Barnes BJ, Adrover JM, Baxter-Stoltzfus A *et al*. Targeting potential drivers of COVID-19: Neutrophil extracellular traps. *J Exp Med* 2020; **217**. [Epub-ahead of print].
- 8 Fox SE, Akmatbekov A, Harbert JL, Li G, Brown JQ, Vander Heide RS. Pulmonary and cardiac pathology in Covid-19: the first autopsy series from New Orleans, 2020. [Epub-ahead of print]. <https://doi.org/10.1101/2020.04.06.20050575>
- 9 Wray D, Charon J. Polymorphonuclear neutrophil function in recurrent aphthous stomatitis. *J Oral Pathol Med* 1991; **20**: 392–394.

DOI: 10.1111/jdv.16662

References

- 1 Bologna JL, Jorizzo JL, Schaffer JV, eds. *Dermatology*. Elsevier Saunders, Philadelphia, PA, 2012: 1.