Correspondence

Erythema gyratum repens following COVID-19 infection

Dear Editor,

Erythema gyratum repens (EGR) is a rare figurate erythema, which presents as annular, erythematous concentric bands resembling wood grain. The diagnosis of EGR is based on clinical findings, supported by histologic findings.[1]

Though EGR has been originally reported as a paraneoplastic syndrome,[2] in up to 20–30% of cases, it is associated with nonneoplastic causes, of which 1% are related to infection.[3]

We report on a 71-year-old previously healthy (non-smoking) male with the sudden onset of inferior limb pain and paresthesia followed by progressive itchy, erythematous, annular, concentric, slightly scaly patches on the thighs, lower abdomen, and buttocks (Figs. 1 and 2), which started 30 days after a moderately severe COVID-19 infection.

Histopathology revealed perivascular lymphocytic infiltrate on the superficial and intermediate dermis, with slight erythrocyte extravasation and eosinophils (Fig. 3).

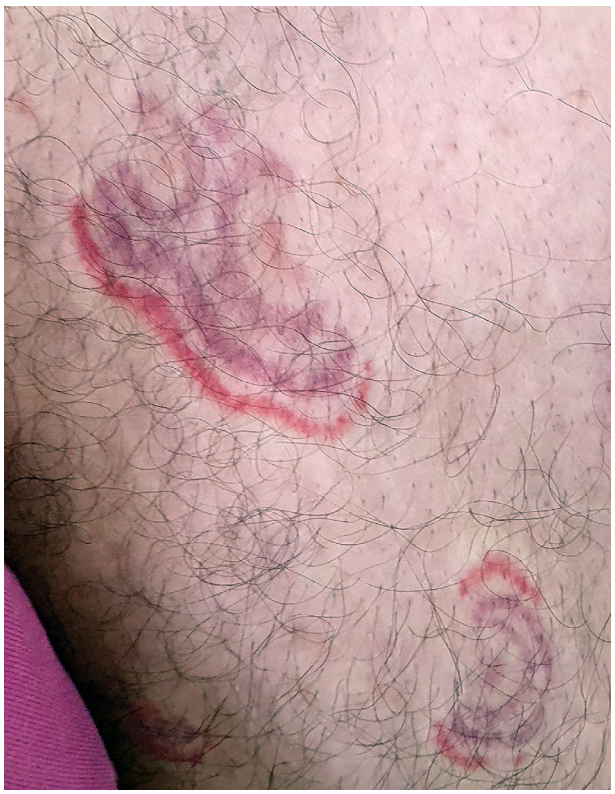

Figure 1 Erythema gyratum repens. Initial concentric erythematous purpuric linear ring patches on the thighs

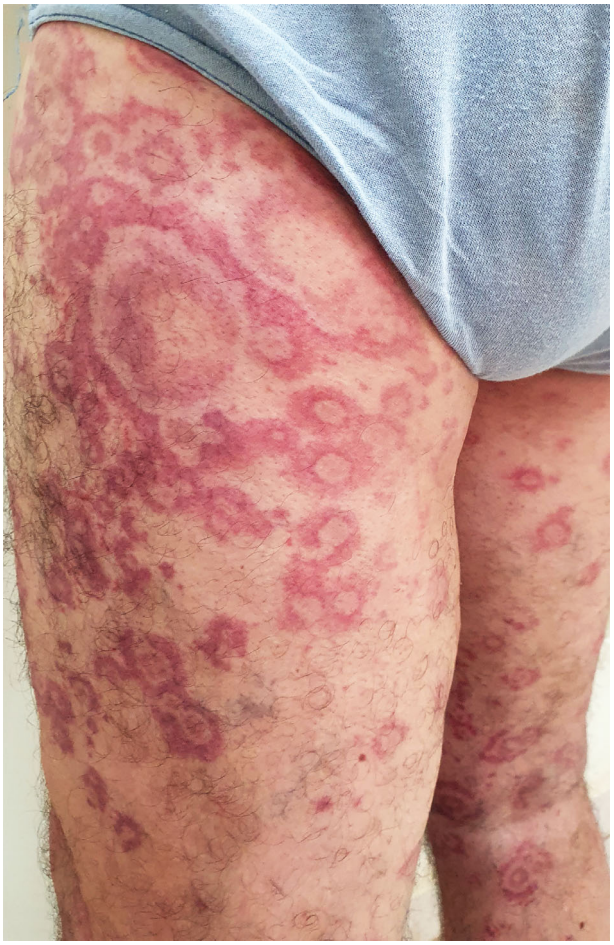

Figure 2 Erythema gyratum repens. Progression of the lesions on a "wood grain-like" pattern on the thighs, lower abdomen, and buttocks

Electroneuromyography was performed, and it revealed a diffuse sensorimotor neuropathic process, with mainly axonal compromise. The involvement was severe in the inferior limbs (secondary myelin degeneration) and moderate in the upper limbs.

Despite an elevated erythrocyte sedimentation rate (48 mm), the biochemical workup (including blood count and lactate dehydrogenase) was normal. Syphilis, hepatitis B and C, and HIV serologies were negative. Serum electrophoresis, CPR, CA 19-9, CA15.3, ANA, C3, C4, anti-Ro, and anti-La were also unremarkable.

The patient refused computed tomography of the chest, abdomen, and pelvis. A colonoscopy only resulted in histopathologically proven benign polyps.

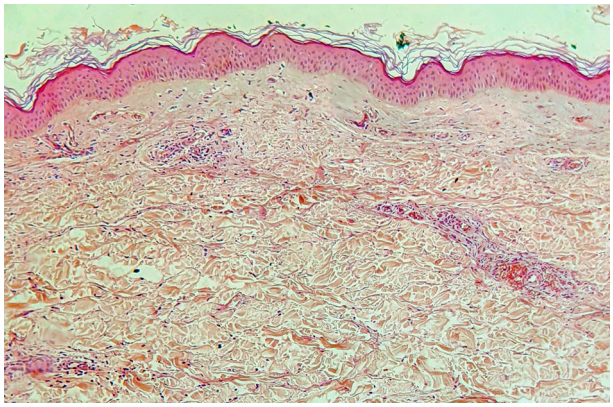

Figure 3 Erythema gyratum repens. Perivascular lymphocytic infiltrate on superficial and intermediate dermis, with erythrocyte extravasation and occasional eosinophils (H&E; ×40)

Two months later, all the cutaneous lesions disappeared without specific treatment beyond moisturizers and oral antihistamines. Neurologic symptoms persisted for one additional month, with progressive improvement until complete resolution. At the 8-month follow-up, the patient remained completely asymptomatic.

The COVID-19 pandemic is challenging for all medical specialties since new affections present alone or with other findings due to SARS-CoV-2 infection. In dermatology, nonspecific lesions are found in up to 30% of all patients; they are described in 17% of patients as initial manifestations and in 21% as the only manifestation.[4–6]

The systemic inflammatory response induced by SARS-CoV-2 virus infection starts as an innate immune response and evolves into a cellular response, involving NK- and Th-cell activation. The virus demonstrates tropism toward endothelial cells, inducing the secretion of proinflammatory cytokines (IL-6, IFN, and TNF-α). The damaged endothelial cells produce nitric oxide and reactive oxygen species, which evoke a cascade of coagulation. Moreover, the circulating antigen–antibody complexes can further aggravate the cytokine storm (TNF-α, interferon γ, IL-2, IL-6, IL-8, IL-10, and IL-17) and increase the products of inflammation (CRP, D-dimer, ferritin, fibrin degradation products, and higher erythrocyte sedimentation rates).[7]

Cutaneous manifestations related to COVID-19 result from nonspecific systemic inflammation and a procoagulant status, leading to multiple dermatologic symptoms. Nevertheless, up to 20% of moderate and severe COVID-19 infections present symptom worsening or the onset of new symptoms beyond 4 weeks of the disease onset. Dyspnea, fatigue, kidney disease, arthralgia, peripheral neuropathy, chest pain, depression, cognitive impairment, and thromboembolic events characterize a so-called post-COVID-19 syndrome, the pathophysiology of which is not well understood but is likely resultant of a persistent immune dysregulation induced by the viral infection.[8] The exact pathogenesis of paraneoplastic EGR is still controversial. There is a rationale on the immune responses triggered by the malignancy, such as (I) cross-reactivity of tumor antigens, (II) transformation of normal skin proteins into antigenic, and (III) deposition of immune complexes at the basement membrane.[9] The pathophysiology of COVID-19, summarized above, resembles the potential EGR mechanisms I and III.

In this case, the complete spontaneous resolution of EGR and the polyneuropathy suggest it is related to a late inflammatory COVID-19 manifestation of a post-acute COVID-19 syndrome.[8,10]

Acknowledgment

The patient provided consent for publication.

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