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Myocarditis caused by long COVID, “Dermatomyositis-like changes” in our Case

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Description

Myocarditis is often reported as a complication of COVID-19 infection or post-vaccination, but there are few reports of "myocarditis for Post-acute COVID-19 syndrome" (Long COVID-19 related myocarditis), and many unknowns still remain. Apart from that, an association between COVID-19 infection and dermatomyositis has also been reported.

Kinoshita, et al. recently reported that myocarditis for Post-acute COVID-19 syndrome may be Dermatomyositis-like myocarditis [1]. In our case, a 49-year-old man was diagnosed with COVID-19 infection based on a PCR test approximately one month prior and had recovered with home treatment. However, he developed a fever 32 days after the initial diagnosis (PCR CT value: 40.8) with myalgias and experienced a sudden worsening of his general condition.

In ECG, there was AV block, inversion of the T wave in II III aVf and ST elevation and QS pattern waveforms in V1–V3, thus raising concern about myocardial ischemia. Transthoracic echocardiography revealed diffuse hypokinesis wall motion of the left ventricle with a left ventricular, although the posterior inferior wall region showed significant wall motion abnormalities. Since bradycardia due to complete A-V block continued, the patient was taken to the catheter lab, and a temporary pacemaker was inserted from the right internal jugular vein. An IABP was inserted through the right femoral artery, and subsequent coronary angiography revealed normal coronary artery disease. His hemodynamics were stable during catheter examination, so he was admitted to the ICU after myocardial biopsy. Immediately after admission to the ICU, sudden VT and Vf were observed, so CPR, endotracheal intubation, and V-A ECMO were started. We diagnosed fulminant myocarditis caused by long COVID.

Notably, the myocardial biopsy revealed significant perifascicular staining patterns of human Myxovirus Resistance Protein 1 (MxA). There has been a case report in which a patient diagnosed with COVID-19 myositis was positive for an anti-SAE antibody, one of the dermatomyositis-specific antibodies [2], and that there is a close relationship between patients with COVID-19 infection and dermatomyositis autoantibodies such as anti-MDA5 antibody [3].

It is generally uncommon for dermatomyositis to directly cause myocarditis [4] and relatively rare to clinically manifest as cardiac involvement in polymyositis and dermatomyositis [5]. However, the incidence of myocarditis is known to be elevated in the presence of autoimmune diseases and immune system overactivity [6]. In our case, we speculate that the overactive immune response associated with a COVID-19 infection may have triggered a cytokine storm, which in turn, could have contributed to “Dermatomyositis-like changes” in the myocardium.

With the COVID-19 pandemic, among patients suspected of ACS, it is expected that there will be patients with a history of COVID-19 who present with Dermatomyositis-like myocarditis, such as in our case, and whose condition may become severe. Careful follow-up and preparation of circulation maintenance devices (IABP, VA-ECMO, Impella CP, etc.) were considered necessary.

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