

[PICTURES IN CLINICAL MEDICINE]

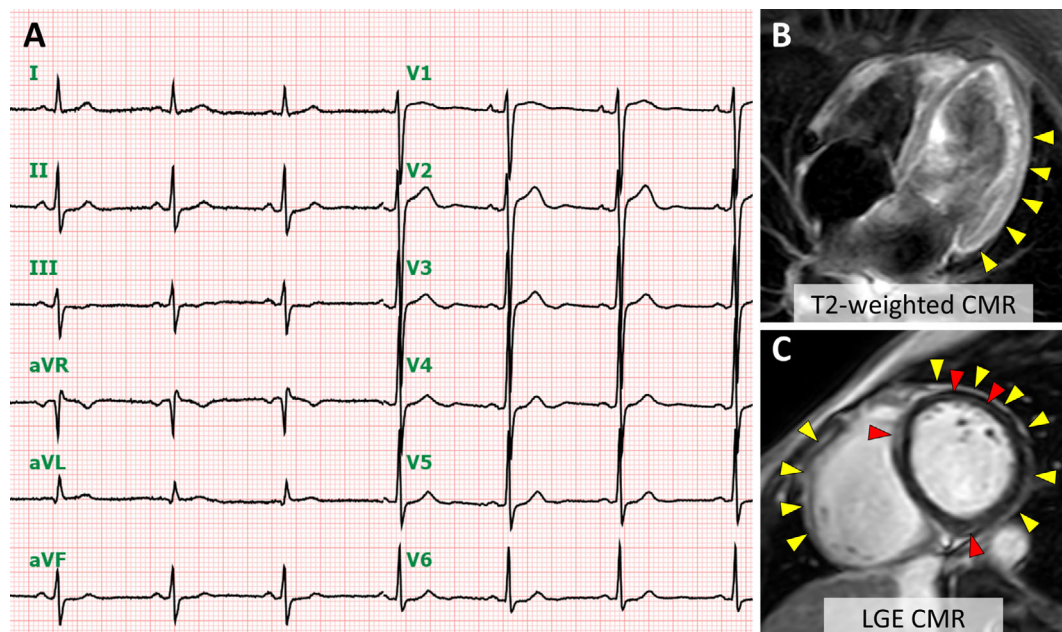
Vasospastic Angina: A Cause of Post-acute COVID-19 Syndrome

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Key words: vasospastic angina, coronavirus disease 2019 (COVID-19), post-COVID-19 syndrome, post-acute sequelae of COVID-19, long COVID

(Intern Med 61: 2693-2695, 2022)

(DOI: 10.2169/internalmedicine.0137-22)



Picture 1.

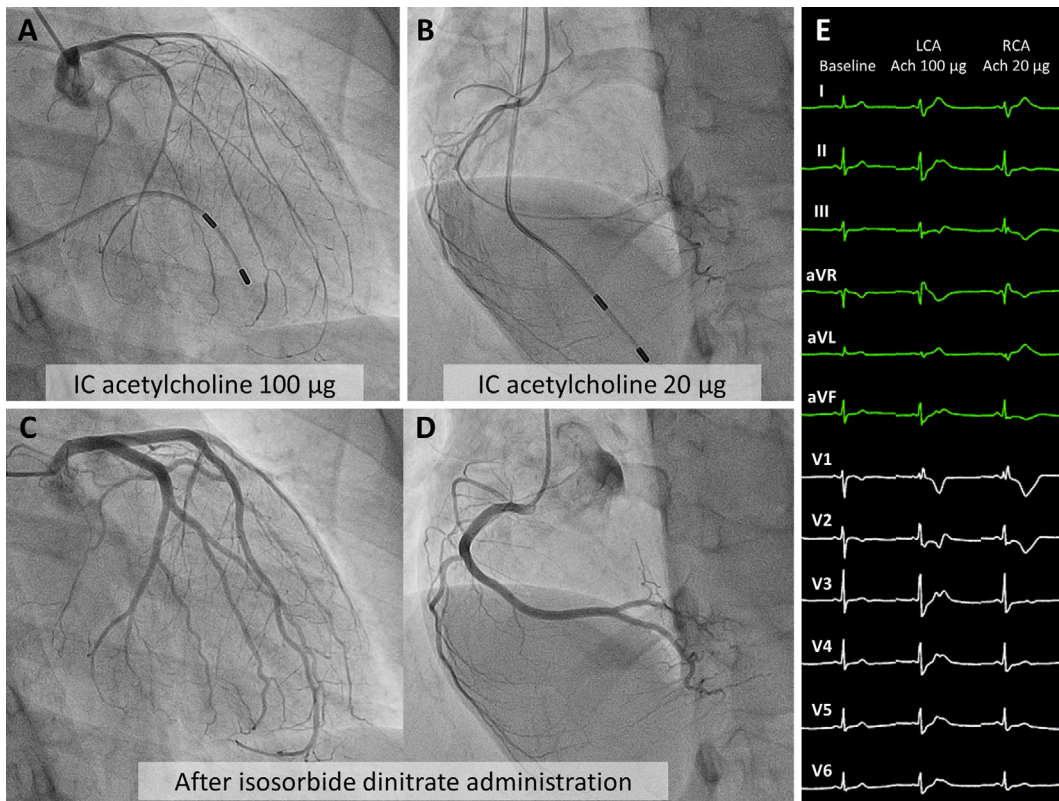
A 37-year-old woman presented with intermittent chest pain and dyspnea 1 month after recovering from non-severe COVID-19 pneumonia. She had never experienced chest pain before the infection. Electrocardiography showed slight ST-segment depression (Picture 1A). Cardiovascular magnetic resonance imaging (MRI) demonstrated T2-weighted hyperintensity and delayed-enhancement of the pericardium (Picture 1B, C, *yellow arrowheads*) and myocardium (Picture 1C, *red arrowheads*), indicating COVID-19-related myopericarditis. Although three-month treatment with aspirin and colchicine was partially effective, she still complained of rest angina occurring at night and in the morning.

Transdermal nitrates reduced angina frequency; therefore, she underwent acetylcholine provocation testing and was diagnosed with vasospastic angina (Picture 2). An endomyocardial biopsy to differentiate myocarditis from myocardial injury demonstrated mild perivascular fibrosis without inflammatory cell infiltration (Picture 3). Her symptoms disappeared after the initiation of amlodipine 5 mg/day and isosorbide mononitrate 40 mg/day. Several mechanisms underlying COVID-19-related endothelial dysfunction have been proposed, including angiotensin-converting enzyme 2 (ACE2) receptor-mediated endotheliitis and vasoconstriction and the activation of prothrombotic pathways by cytokine

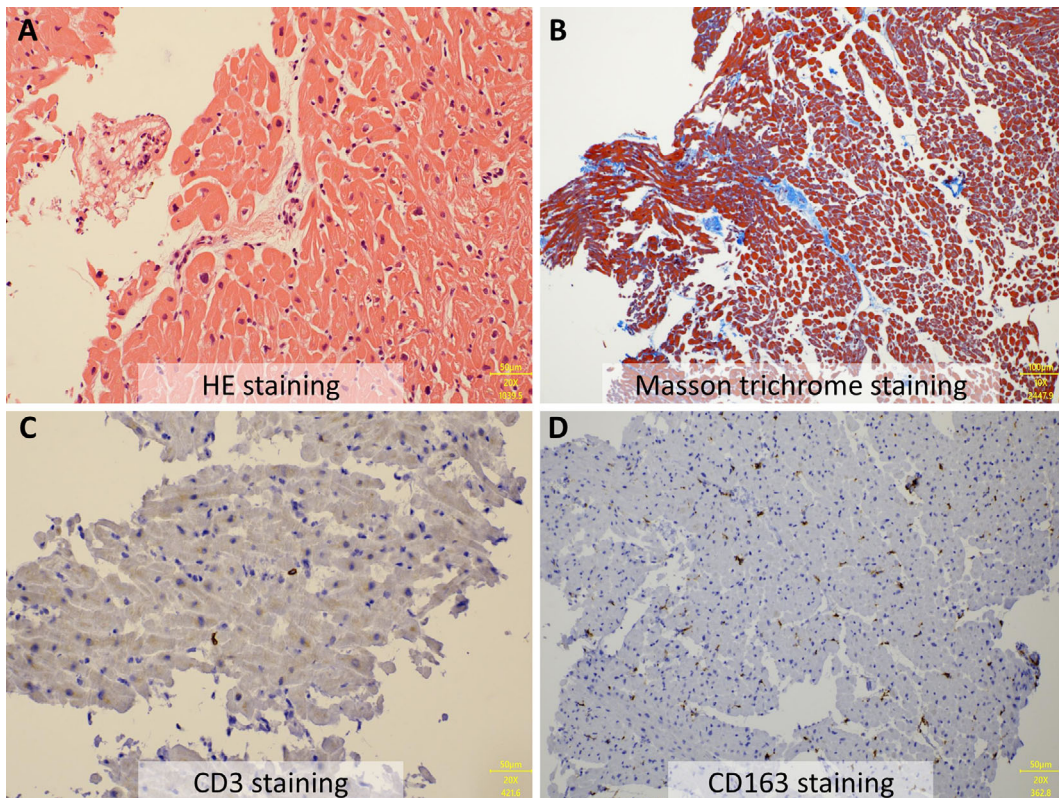
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Received: April 14, 2022; Accepted: May 19, 2022; Advance Publication by J-STAGE: June 28, 2022

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Picture 2.



Picture 3.

release (1). Additionally, vasospastic angina has been identified as a possible cause of chest pain in patients with viral myocarditis (2). Although the causal relationship between vasospastic angina and post-acute sequelae of COVID-19

(PASC) remains unclear, our case highlights the importance of taking a detailed history and multimodality imaging to identify treatable cases of PASC.

The patient provided her informed consent for the publication of this report and associated images.

Author's disclosure of potential Conflicts of Interest (COI).

Noriko Oyama-Manabe: Honoraria, Canon Medical Systems; Speaking fees, Daiichi-Sankyo, Philips Medical Systems, Eisai, Bayer Healthcare, GE Healthcare, and Canon Medical Systems.

Financial Support

This work was supported in part by JSPS KAKENHI (grant number 22K15867 to Dr. Aikawa), Fukuda Foundation for Medical Technology (to Dr. Aikawa), the Akiyama Life Science Foundation (to Dr. Aikawa), Grants-in-Aid for Regional R&D Proposal-Based Program from Northern Advancement Center for Science & Technology of Hokkaido Japan (to Dr. Aikawa), the Uehara Memorial Foundation (to Dr. Aikawa), and Grants-in-Aid of The Cardiovascular Research Fund, Tokyo, Japan (to Dr. Aikawa).

Acknowledgment

The authors thank Nozomi Aikawa MD, Atsushi Nagase RT, Yuichi Kita RT, Toru Nakamura CE, and Tamaki Kudo RT for their technical support.

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