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Definite Acute Myocarditis After Coronavirus Disease 2019 mRNA Vaccination

Manabu Maeda, MD; Tsuyoshi Isawa, MD; Norio Tada, MD

A 29-year-old man with no medical history or coronavirus disease 2019 (COVID-19) infection developed chest pain 4 days after his first dose of the Moderna mRNA COVID-19 vaccine (Moderna, MA, USA). On presentation to the emergency department, reverse transcription–polymerase chain reaction test for COVID-19 was negative, but creatine kinase (686 U/L; reference, 40–220), creatine kinase MB isoenzyme (47 U/L; reference, 0–24), and troponin I (18.4ng/mL; reference, <0.026) were elevated. Electrocardiogram was normal except for ST-T changes in leads III, V1, and aVL (**Figure A**); echocardiogram and coronary angiogram were unremarkable (**Figure B**, **Supplementary Movie**); serology tests for cardiotropic viruses were negative. Cardiac magnetic resonance (CMR) imaging 6 days after initial symptoms (**Figure C**,**D**) indicated acute myocarditis. Spontaneous recovery occurred within 1 week without any specific treatment. CMR 3 weeks after initial symptoms revealed reduced signal changes in the anterior and lateral walls (**Figure E**,**F**). This is one of the first reports of definite acute myocarditis after COVID-19 vaccination in Japan. Although attention has been paid to the development of myocarditis after COVID-19 vaccination,[1] the causality between the vaccine and myocarditis remains unclarified.

Disclosures

None.

IRB Information

The study was approved by the Institutional Review Board of Sendai Kousei Hospital on August 27, 2021 (Approval no. 3-47).

Reference

1. Witberg G, Barda N, Hoss S, Richter I, Wiessman M, Aviv Y, et al. Myocarditis after Covid-19 vaccination in a large health care organization. *N Engl J Med*, doi:10.1056/NEJMoa2110737.

Supplementary Files

Supplementary Movie. Echocardiogram.

Please find supplementary file(s);
http://dx.doi.org/10.1253/circj.CJ-21-0840

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Department of Cardiology, Sendai Kousei Hospital, Sendai, Japan
Mailing address: Tsuyoshi Isawa, MD, Department of Cardiology, Sendai Kousei Hospital, 4-15 Hirose-machi, Sendai 980-0873, Japan. E-mail: isa.tsuyo@gmail.com

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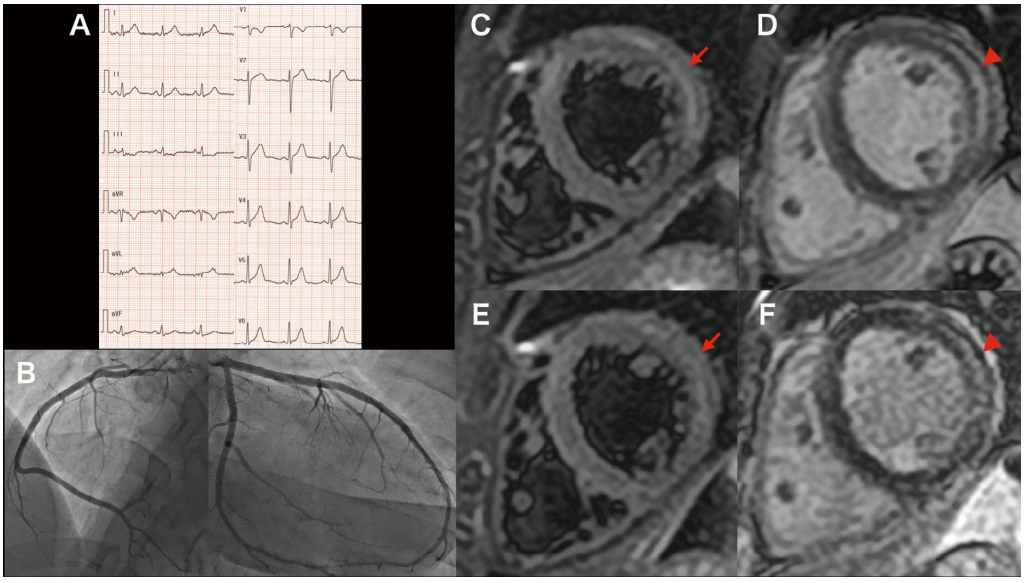

Figure. (**A**) Normal ECG except for ST-T changes in leads III, V1, and aVL. (**B**) No significant coronary artery stenosis. (**C**) Fat-saturation T2-weighted images display focal myocardial edema involving the anterior and lateral walls (arrow), especially in the basal lateral segment. (**D**) Areas in (**C**) corresponded with inflammatory necrosis observed on late gadolinium enhancement imaging (arrowhead). (**E**, arrow) Reduced signal changes in the anterior and lateral walls on fat-saturation T2-weighted and (**F**, arrowhead) late gadolinium enhancement images acquired 3 weeks after initial symptoms.