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Uncommon Cause of Myocarditis After COVID-19 Protein Subunit Vaccine

Yi Wang, MD[1,2], and Ling Kuo, MD[1,2,3]

[1]Department of Internal Medicine, College of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan
[2]Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan
[3]Department of Biomedical Imaging and Radiological Sciences, National Yang Ming Chiao Tung University, Taipei, Taiwan

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Correspondence to
Ling Kuo, MD
School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan; Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, No. 201, Sec. 2, Shi-Pai Road, Beitou District, Taipei 112, Taiwan.
Email: ljkuo@vghtpe.gov.tw

ORCID iDs
Yi Wang
https://orcid.org/0000-0002-2147-0066
Ling Kuo
https://orcid.org/0000-0002-8604-6151

A healthy 30-year-old man was immunized with two doses of MVC-COV1901 vaccine. He suffered from chest pain and dyspnea one month after immunization. Acute coronary syndrome was impressed by abnormal ST-T change and elevated Troponin I (0.81 ng/mL). Nonetheless, coronary and left ventricular (LV) angiography demonstrated patent coronary vessels but moderate LV systolic dysfunction. Owing to profound decompensated heart failure (NT pro- BNP: 9862 pg/mL) and cardiogenic shock, mechanical ventilator, and veno-arterial extra-corporeal membrane oxygenation were applied. Cardiac magnetic resonance imaging (MRI) was performed 11 days after the onset of symptoms, which disclosed preserved LV ejection fraction (57.2%) and normal LV end-diastolic volume index (97.8 mL/m^2), thickened interventricular septum and pericardial effusions (**Figure 1A**, cine), diffusely elevated native T1 value (**Figure 1B**) as well as extracellular volume (ECV) fraction (**Figure 1C and D**). There were no increased signals on T2 mapping (T2 value: 42 ± 4 ms); in the series of delayed-contrast images, spotty late gadolinium enhancement (LGE) of LV was identified (**Figure 1E**). The myocarditis in convalescent phase was highly suggested based on Lake Louise Criteria.[1-3] The follow-up cardiac MRI was acquired 4 months later which disclosed preserved LV ejection fraction (58.6%) and normal LV end-diastolic volume index (90.2 mL/m^2), no LV hypertrophy or pericardial effusions (**Figure 1F**), considerable normalization of native T1 value (**Figure 1G**) and ECV fraction (**Figure 1H and I**), as well as the resolution of LGE (**Figure 1J**). The rare case of coronavirus disease (COVID) 2019 protein subunit vaccine-induced myocarditis in recovery was consequently diagnosed. To the best of our knowledge, this is the first case of myocarditis after protein subunit COVID vaccine injection with solid evidence demonstrated by cardiac magnetic resonance images. The similar complication was rarely identified in reported clinical trial.[4]

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Conflict of Interest

The authors have no financial conflicts of interest.

Data Sharing Statement

The data generated in this study is available from the corresponding author upon reasonable request.

Author Contributions

Writing - original draft: Wang Y; Writing - review & editing: Kuo L.

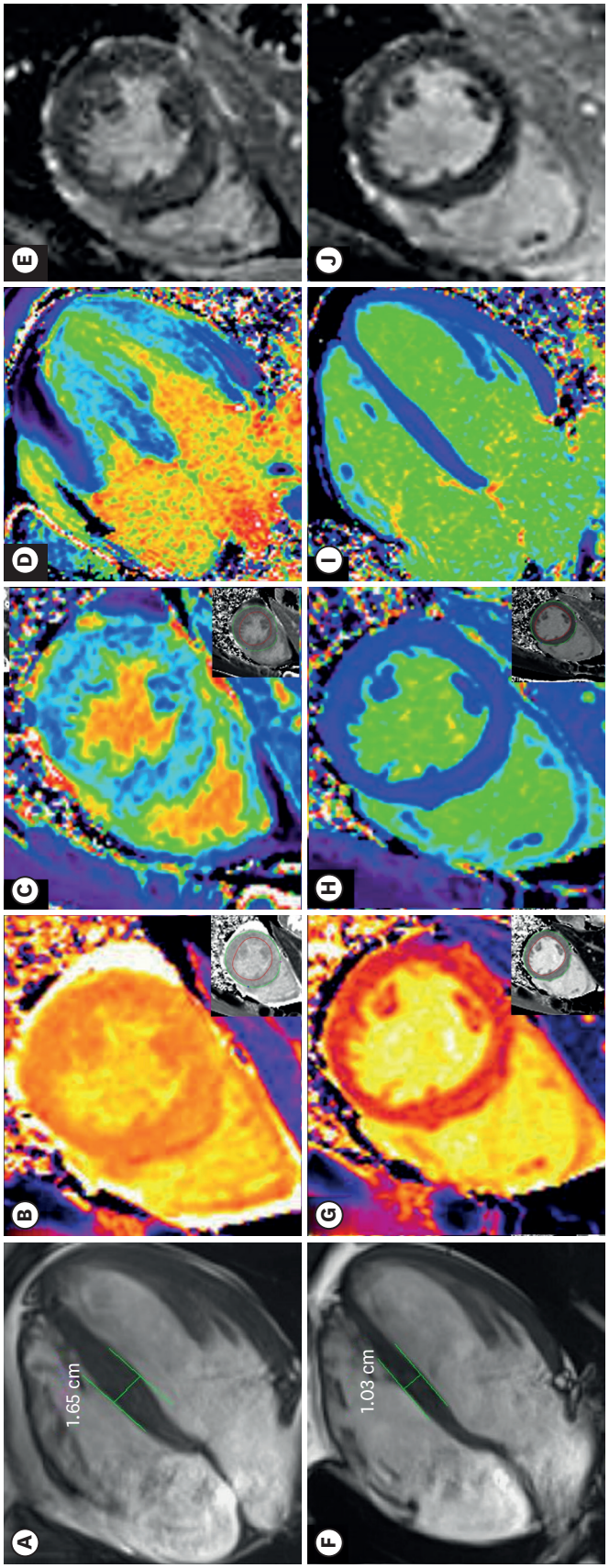

Figure 1. Cardiac MRI: (A) 4 chamber cine image, IVS thickness: 16.5 mm; (B) T1 mapping, native T1 value: 1,505±82 ms; (C) ECV mapping, SAX view, ECV fraction: 40±3%; (D) ECV mapping, 4CH view, ECV fraction: 40±4%; (E) LGE image, mid-LV: diffused spotty LGE; follow-up cardiac MRI: (F) 4 chamber cine image, IVS thickness: 10.3 mm; (G) T1 mapping, native T1 value: 1,287±81ms; (H) ECV mapping, SAX view, ECV fraction: 24±3%; (I) ECV mapping, 4CH view, ECV fraction: 25±6%; (J) LGE image, mid-LV: no LGE.
ECV = extracellular volume; IVS = interventricular septum; LGE = late gadolinium enhancement; MRI = magnetic resonance imaging.

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