

Imaging of Myocarditis Following mRNA COVID-19 Booster Vaccination

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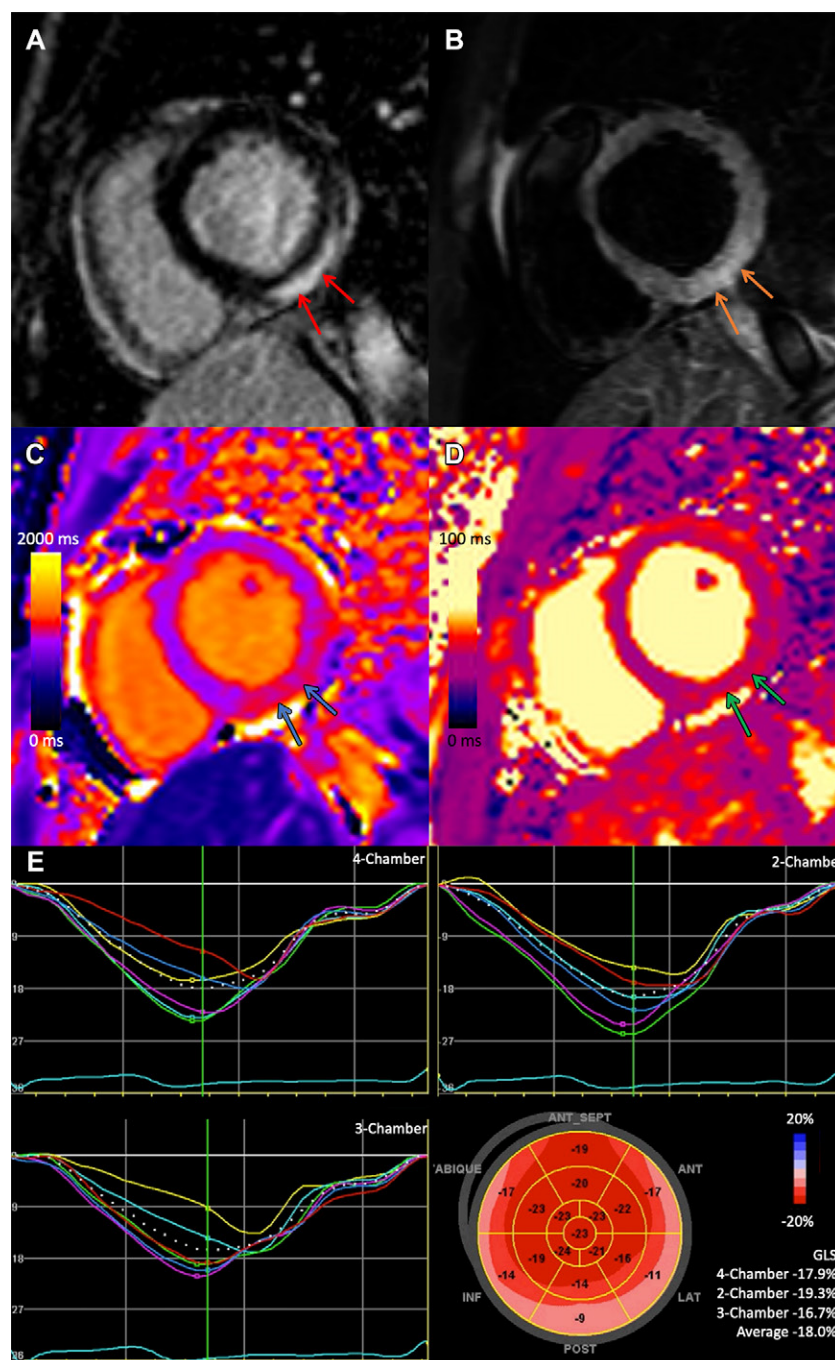
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Conflicts of interest are listed at the end of this article.

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Basal short-axis 1.5-T cardiac MR images demonstrate (A) subepicardial late gadolinium enhancement at the basal inferior and inferior lateral wall (red arrows), with corresponding (B) hyperintensity on T2-weighted image (orange arrows), (C) abnormal high regional native T1 (1123 msec, blue arrows [upper reference range, 960 msec]), and (D) abnormal high regional T2 (58 msec, green arrows [upper reference range, 51 msec]). These findings are in keeping with acute myocarditis based on the revised Lake Louise criteria. Global systolic function was impaired (left ventricular ejection fraction, 48%), with hypokinesis of the basal inferolateral wall. (E) Speckle-tracking echocardiography-based global longitudinal strain demonstrates reduced strain involving most basal segments (global longitudinal strain, -18%).

A late adolescent male patient presented with chest pain and palpitations starting 3 days after administration of the third dose of BNT162b2 mRNA COVID-19 vaccine. First and second doses of BNT162b2 mRNA had been administered 4 and 5 months prior (homologous vaccine schedule). Troponin T level was 337 ng/L at presentation and peaked at 1610 ng/L. Basal short-axis 1.5-T cardiac MR images demonstrate subepicardial late gadolinium enhancement at the basal inferior and inferior lateral wall (Fig A, red arrows), with corresponding hyperintensity on T2-weighted image (Fig B, orange arrows), abnormal high regional native T1 (Fig C; 1123 msec, blue arrows [upper reference range, 960 msec]), and abnormal high regional T2 (Fig D; 58 msec, green arrows [upper reference range, 51 msec]). These findings are in keeping with acute myocarditis based on the revised Lake Louise criteria.

Keywords

Echocardiography, MR-Functional Imaging, MRI, Cardiac

Global systolic function was impaired (left ventricular ejection fraction, 48%), with hypokinesis of the basal inferolateral wall (Movies 1, 2). Speckle-tracking echocardiography–based global longitudinal strain demonstrates reduced strain involving most basal segments (global longitudinal strain, –18%) (Fig E). The patient was treated with prednisone, bisoprolol, and colchicine, and symptoms resolved within 10 days.

Myocarditis is an infrequent adverse event following mRNA-based COVID-19 vaccination (1,2). There are limited reports of myocarditis following booster doses to date. The risk of myocarditis appears to be lower after the third dose compared with after the second dose, which could be related to a longer interdose interval (3).

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