Acute coronary artery occlusion masquerading as vaccine-induced myocarditis

Short Title:
ACS mimicking COVID vaccine myocarditis

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Conflict of interest: No conflicts of interest or financial disclosures declared by any of the authors.

Consent: Informed consent for publication has been obtained from the individual being reported on, in line with the COPE best practice guidelines.

Author contributions
MYK conceptualised the idea and provided supervision. NA and SA wrote the manuscript draft. MYK and RAA revised the manuscript and provided critical input during the writing and management of the patient. MYK provided the imaging expertise.

Word count: 292
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A 39-year-old south Asian male presented following three episodes of central chest pain which radiated down his right arm. The pain was provoked by diminishing levels of activity, pleuritic, and eased by sitting forward. He had no medical history and he had never smoked or used recreational drugs. He had received his second COVID-19 vaccine dose (Pfizer-BioNTech BNT162b2) eight days earlier.

On examination, he was hypertensive (198/121 mmHg). Electrocardiograms showed global saddle-shaped ST-elevation and PR-segment depression suggestive of pericarditis (Panel A). Plasma concentrations of high sensitivity troponin T (316 ng/L, normal <14 ng/L), total cholesterol (5.7 mmol/L), triglycerides, and HbA1c (43 mmol/mol, normal 20-41 mmol/mol) were elevated. Transthoracic echocardiography showed normal left ventricular systolic function and no regional wall motion abnormalities or pericardial effusion.

Differential diagnoses of an acute coronary syndrome (ACS) or post vaccine myopericarditis were considered. Cardiovascular magnetic resonance (CMR) imaging, apart from showing mild left ventricular hypertrophy, did not show any evidence of either myocardial infarction or myocarditis (Panel B & C, supplementary video 1). Subsequent coronary angiography revealed a proximally occluded left anterior descending artery (LAD) (Panel D) with collaterals from the right coronary artery (Panel E, supplementary video 2). The LAD was opened successfully by percutaneous coronary intervention which involved the deployment of one stent (Panel F, supplementary video 3). The diagnosis was felt to be an acute coronary obstruction, from underlying coronary artery disease, with associated post infarct pericarditis. The presence of mature collateral circulation suggested significant underlying chronic atherosclerosis and explained the absence of infarction seen on CMR.
Although myopericarditis has been reported as a rare complication following mRNA SARS-CoV-2 vaccination, detailed history-taking (suggesting a mixture of ischaemic and pericardial pain) and multimodality imaging led to the correct diagnosis of an ACS thus avoiding unrealised opportunities for revascularisation and secondary prevention.

**Conflict of interest:** none.

**Funding:** The authors report no specific funding related to this article.

**Consent:** The patient has given consent for the use of his medical data and images.

**Figure legend**

**Figure 1.** *Panel A:* 12-lead electrocardiogram showing saddle-shaped ST-elevation and PR-segment depression suggestive of pericarditis. *Panel B:* CMR short-axis slice with no evidence of late gadolinium enhancement. *Panel C:* CMR short-axis T2 myocardial map with no focal oedema. *Panel D:* Coronary angiogram of the left coronary circulation showing proximal LAD occlusion (yellow arrow). *Panel E:* Coronary angiogram of the right coronary circulation providing collateral (red arrows) vessels to the occluded LAD. *Panel F:* Coronary angiogram of the left coronary circulation showing restored LAD flow following stent deployment (yellow arrow indicating previous site of occlusion).

**Supplementary online material**

Video S1. CMR short-axis steady state free precession cine stack showing good left ventricular function with no regional wall motion abnormalities or pericardial effusion.
Video S2. Coronary angiogram of the right coronary circulation providing collateral vessels to the occluded LAD.

Video S3. Coronary angiogram of the left coronary circulation showing restored LAD flow following stent deployment.

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14. Figure

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