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Polymyositis and raised troponin after mRNA COVID-19 vaccination

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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/imj.15882

Case Report

A previously well 36 year old male presented to hospital six days after receiving his first Pfizer-BioNTech BNT162b2 COVID-19 vaccine (COMIRNATY) into the left deltoid. He presented with a three-day history of subjective fevers and bilateral thigh and calf pain. Physical examination demonstrated normal lower limb neurology. He had no other extra muscular manifestations of inflammatory myositis. Laboratory investigations notably included raised D-dimer 1.09 mg/L, creatinine kinase 6044 unit/L, lactate dehydrogenase 393 unit/L, C-reactive protein 29 mg/L, alanine aminotransferase 782 unit/L and aspartate aminotransferase 480 unit/L. Screening was negative for antinuclear antibodies, extractable nuclear antigens and myositis specific antibodies. Lower limb venous dopplers and CT pulmonary angiogram were negative for thromboses. MRI of bilateral thighs demonstrated extensive myoedema (Figure 1A-B). A right thigh biopsy confirmed the diagnosis of immune mediated polymyositis (Figure 1C-H).

A troponin I test was sent at the time of presentation due to the raised D-dimer, although notably there were no symptoms of chest pain nor shortness of breath. The troponin I was elevated at 296 ng/L and normalised to 12 ng/L after polyethylene glycol (PEG) extraction. The troponin I was also discrepant from the troponin T, which was minimally elevated at 25 ng/L. Transthoracic echocardiogram and cardiac MRI were not supportive of myocarditis, and this diagnosis was deemed unlikely. Together, this suggested the presence of interfering antibodies causing elevation of the troponin I assay result rather than true myocardial damage.

A diagnosis of myositis likely secondary to Pfizer COVID-19 mRNA vaccine was made based on the clinical presentation, temporal association and confirmatory imaging and biopsy findings. A short tapering oral corticosteroid course was commenced, with subsequent clinical and biochemical improvement and reversal of MRI findings.

This is the first case to report concurrent polymyositis and likely spuriously elevated troponin following mRNA COVID-19 vaccination. While the overall benefits of vaccination certainly outweigh the risk of adverse events, it is important for clinicians to be aware of potential immune-mediated vaccine complications. Several immune-related adverse effects of SARS-CoV-2 vaccination have previously been reported, including myositis after mRNA vaccination[1-3]. Reports have also described inflammatory myositis after ChAdOx1 nCoV-19[4]. However no reports thus far have described the phenomenon of raised troponin I secondary to interfering antibodies following mRNA COVID-19 vaccination. This should therefore be a consideration for clinicians faced with a raised troponin in the absence of clinical or radiological evidence supporting myocardial damage, particularly given the current concerns of myocarditis following mRNA vaccination. Indeed previous reports from the general hospital population have described patients with elevated troponin I that improves with PEG extraction, suggesting the presence of interfering antibodies[5]. Furthermore it is noteworthy that troponin I is not typically elevated with inflammatory myopathies, whereas troponin T elevation is common[6]. Overall this case presents two rare post-vaccination clinical phenomena, but should more generally encourage clinicians to consider a broad differential that includes immune-related adverse events for patients presenting after mRNA COVID-19 vaccination.

Figure Legend

Figure 1. A. Axial and **B.** Coronal MRI of thighs with spectral attenuated inversion recovery sequence demonstrates extensive multifocal tricompartmental muscle signal abnormality and mild swelling. **C.** H&E (x 200) demonstrates endomysial lymphocytic infiltrate (black arrow heads). **D.** H&E (x 200) demonstrates necrotic muscle fibres (blue arrows). **E.** Demonstrates CD8 positive T lymphocytes infiltrating intact myofiber (x 400). **F.** Demonstrates MHC-1 positive sarcolemmel staining. **G.** Transmission electron microscopy (TEM) image (x 1700) shows a low power micrograph of a cluster of necrotic fibres infiltrated with histiocytes (H) and lymphocytes (L). **H.** TEM image (x 16500) high power micrograph of a healthy myofibre containing a cluster of small autophagic membrane whorls (black arrows), lysosomal material and glycogen (G).

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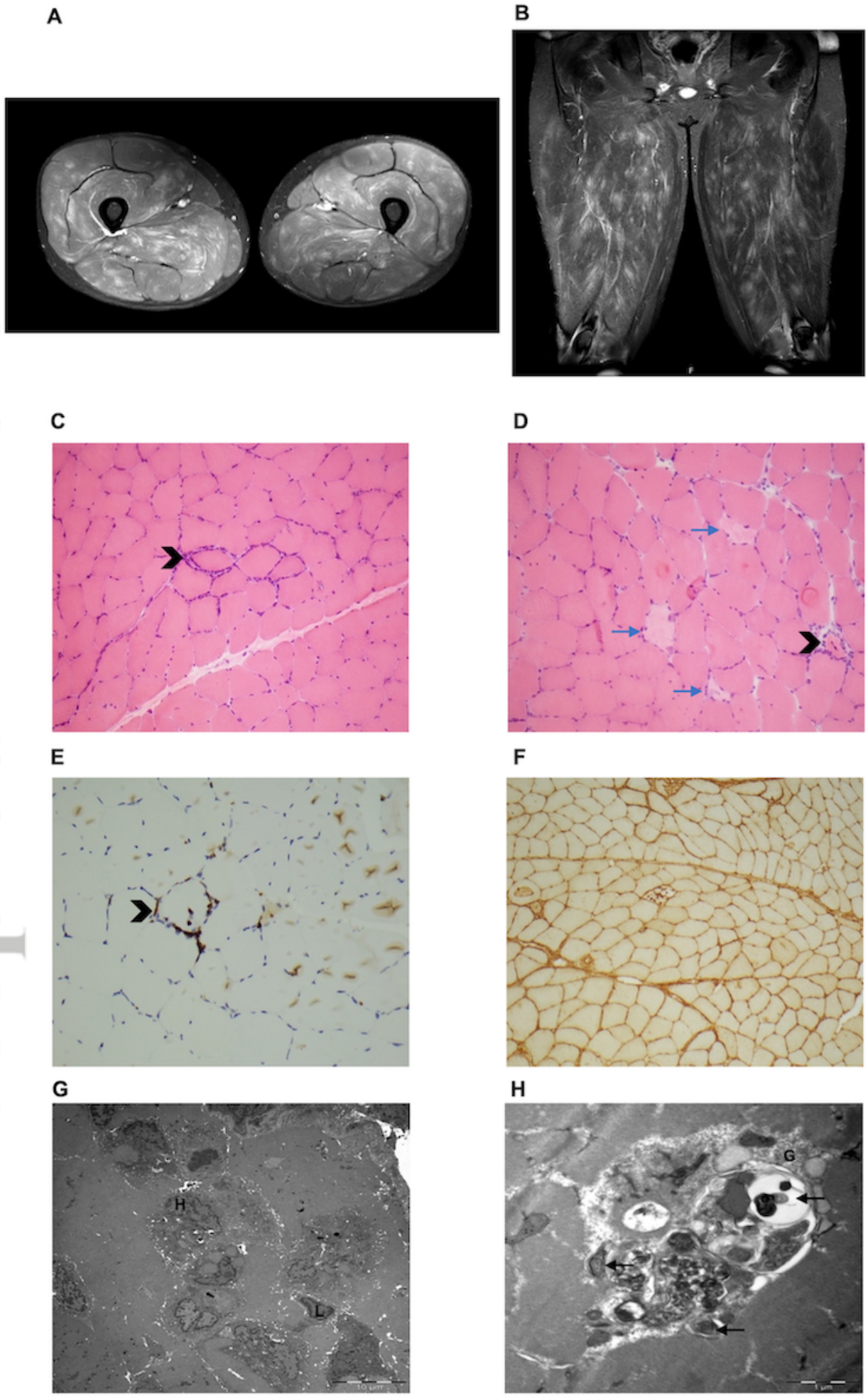

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