

## Myositis ossificans following COVID-19 vaccination

**Manuscript type:** Case Report

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### **Learning Point for Clinicians:**

Vaccination injection site adverse reactions are common and usually are represented by transitory pain and edema. We present a case of an intramuscular inflammatory nodule related to myositis ossificans following COVID-19 vaccination, and focus on the imaging findings to differentiate with other diagnosis such as muscle edema, abscess and tumors.

### **Manuscript**

A 51-year-old healthy man with no prior SARS-CoV-2 infection presented with profound right upper arm pain, soreness and palpable mass. The patient reported no unusual movement, trauma or vigorous exercise prior to the onset of symptoms. Pain had developed 3 months after the second dose of COVID-19 vaccine. The first attempt of the vaccine application was at the deltoid muscle, but was unsuccessful. The health care worker responsible for the application made a second attempt and applied the immunizing distally from the first attempt. The patient had no systemic symptoms as malaise and fever. During physical examination, there were no signs of skin erythema or swelling. There was tenderness and a palpable mass at the level of the middle third of the arm. A Magnetic Resonance (MR) was performed to evaluate arm pain and the palpable mass, demonstrating an intramuscular nodule in the proximal fibers of the brachii muscle of the arm, close to the inferior fibers of the deltoid muscle, with perilesional muscle edema, with no muscle tear or abscess (Figure 1a). One week later a Computed Tomography (CT) of the arm was performed showing a hypoattenuating intramuscular nodule with internal calcifications (Figure 1b). Management consisted of rest, cryotherapy, compression and NSAIDs to decrease subjective pain. Symptoms resolved over the course of 2 weeks with no arm or shoulder loss of function.

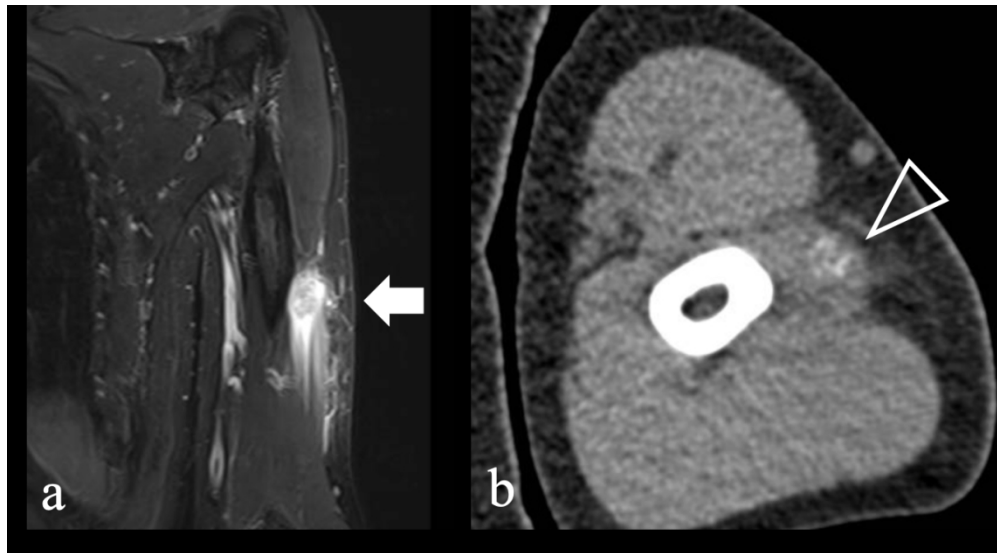
Vaccination injection site adverse reactions are common and usually represented by transient pain, edema and redness at the site of the injection<sup>1</sup>. Recent reports identified deltoid myositis<sup>2</sup> and subacromial-subdeltoid bursitis after COVID-19 vaccination<sup>3</sup>, representing immune response elicited by the intramuscular injected antigen. The muscular inflammatory response may be related to the patient's immune response to the vaccine components<sup>4,5</sup>. In this report we did not performed a muscle biopsy and the temporal link between symptoms and vaccination procedure suggests diagnosis of COVID-19 vaccine-related myositis ossificans as the cause of symptoms. We considered that in addition to minor muscle injury at the site of injection, toxic myopathy may also

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3 be a cause for reported pain at the vaccination site. Although neuromuscular presentations  
4 of COVID-19 infection have been reported<sup>6</sup>, muscular injury at the injection site is not  
5 known, the report of this case of myositis ossificans is valuable.  
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12 Conflict of interest: None declared.  
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Intramuscular nodule in the proximal fibers of the brachii muscle of the arm, with perilesional muscle edema (Figure 1a). Computed Tomography (CT) of the arm showing a hypoattenuating intramuscular nodule with internal calcifications (Figure 1b).

230x127mm (150 x 150 DPI)