

# A Rare Complication after Anti SARS CoV-2 Vaccination: Septic Arthritis of the Sternoclavicular Joint, Mediastinitis and Pulmonary Embolism

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## Abstract

**Introduction:** There is a lot of interest and spirited debate about the adverse effects of anti-SARS CoV2 vaccines in the global pandemic context of the SARS Co-V2 infection.

**Aim of the study:** the purpose of this article is to demonstrate a link between vaccine inoculation and the development of some unusual clinical symptoms.

**Methods:** We describe the case of a 21-year-old young woman who developed symptoms of fever, chest and limb discomfort in her left upper arm around 10 days after receiving her first dose of Moderna vaccine, necessitating a trip to the emergency room and hospitalization 14 days later. Septic arthritis of the left sternoclavicular joint, mediastinitis, deep vein thrombosis of the left upper limb, and pulmonary embolism were diagnosed as a result of the instrumental tests performed during the hospital stay, particularly the angio TC of the chest and left upper limb; the growth of *Staphylococcus aureus* on a blood culture. The patient receives bacterial and anticoagulant therapy and recovers clinically and radiologically, allowing him to be discharged 10 days following hospitalization.

**Results:** Given the chronological sequence, the vaccination's causative role in the formation of the clinical picture is extremely likely in this case, but with a plausible non-specific mechanism including vaccine injection at the venular or arteriolar level and adherence to asepsis.

**Conclusion:** Although cases of septic arthritis following vaccines have been reported in recent years for influenza and pneumococcal vaccines, as well as more recently for SARS CoV2 vaccines (in particular with involvement of the shoulder joint), the novelty of our finding stems from the fact that it would be the first case of septic arthritis with a sternoclavicular localization, which is unusual in and of itself.

**Keywords:** Vaccines • Side effects • SARS CoV-2 infection • Sternoclavicular joint

## Introduction

The local side effects of anti-SARS CoV-2 vaccination are common and described for all types of vaccines. The systemic side effects are also quite common, but are always mild or self-limiting. There are far fewer cases of adverse reactions that endanger the patient's life; additionally, it's nearly impossible to identify a direct causal connection between the vaccine and a systemic adverse reaction. In this report, we describe a case of a likely adverse reaction to the Spikevax (Modern) vaccine manifested by septic arthritis of the left sternoclavicular joint, mediastinitis, and pulmonary embolism.

## Case Report

21-year-old female soldier reports to the emergency room with no significant health problems and no current drug intake (estrogen-progestin is suspended about four months before). Within ten days after the first dose

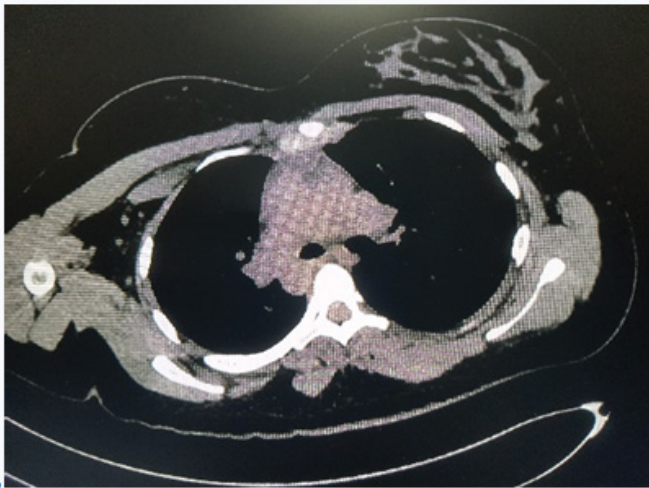
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of Spikevax Moderna vaccine, a fever, chest and left arm pain appear in the patient; This painful symptomatology, which is intensified by clinostatic position and reduced by forward trunk inclination, became more acute over the past 4 days, prompting the treating physician to send the patient to the emergency room for evaluation of pulmonary embolism. The patient is therefore hospitalized 14 days after vaccination. The patient has a tachycardia (HR 120/min); cardiorespiratory and abdominal examinations are normal; there is no bruising; she is eupneic with SpO<sub>2</sub> 98 percent in ambient air; she is afebrile with edematous and painful left arm palpation, as well as painful functional limitations of the left shoulder. The electrocardiogram is normal except for sinus tachycardia; blood gas analysis reveals only slight respiratory alkalosis (pH 7.46 with pCO<sub>2</sub> of 36 mmHg) and mild hypokalaemia (2.9 mmol/L), but pO<sub>2</sub> (96 mmHg), oximetry (99%), and lactates (0.8 mmol/L) are all within normal limits. At the time of admission, blood chemistry tests revealed a significant increase in inflammatory indices (C reactive protein 223.47 mg/L, fibrinogen 703 mg/dL), minor normochromic anemia (Hgb 11.5 g/dL), and mild thrombocytopenia (125,000/mm<sup>3</sup>), as well as mild normochromic anemia (Hgb 11.5 g/dL). There are 8110 leukocytes per mm<sup>3</sup> and 82.9 percent neutrophils. There is absolute lymphocytopenia (460 mm<sup>3</sup>). SARS CoV2 has a negative molecular buffer. She undergoes pulmonary CT angiography, which reveals many and subtle segmental and subsegmental opacification abnormalities, for which she is admitted to the hospital with the diagnosis of pulmonary embolism and treatment with anticoagulants and antibiotics. She has a repeat C.T angiography after around 36 hours, due to the intensification of local painful symptoms. This time, the neck, mediastinum, and left upper limb are enlarged (Figure 1).

The examination shows erosion of the cortical lining of the sternal manubrium at the level of the left sternoclavicular joint with fluid pouring



**Figure 1.** The neck, mediastinum and left upper limb are enlarged.

into the joint capsule and an abscess fluid portion of 10 × 18 mm in the sternal insertion of the sternocleidomastoid muscle. This abscess makes its way into the anterior superior mediastinum with an additional 12 × 23 mm fluid abscess. The new CT exam also confirms the opacification defects of the segmental and sub-segmentary arterial branches of both lungs, and it also shows moderate compression of the left internal jugular vein and thrombosis of the humeral and left brachial veins, as well as small adenopathies in the left supraclavicular area. Abdominal and pelvic CT angiography is normal. The blood culture result, subsequently received, shows the development of *Staphylococcus aureus*, with an antibiogram showing good sensitivity to the main antibiotics tested. The overall picture is therefore of septic arthritis of the left sternoclavicular joint, complicated by abscess myositis of the sternal end of the sternocleidomastoid muscle, mediastinitis, deep vein thrombosis of the upper limb, and pulmonary embolism. The patient was treated with antibiotic therapy with piperacillin-tazobactam, gentamicin, and daptomycin, and with anticoagulant therapy, first with fondaparinux, and then with rivaroxaban. There was a rapid improvement in clinical conditions and normalization of laboratory tests, allowing the patient to be discharged 10 days after admission. This case was reported to the hospital's pharmacovigilance service for appropriate reporting.

## Discussion

According to the timeline of symptoms, vaccination can affect a patient's clinical syndrome. Pathogenetic mechanisms, however, in this case could be non-specific, that is, not linked to the vaccine itself, but rather to the technical act of administering the drug. There have been reports of septic arthritis after SARS CoV2 vaccination, especially in the shoulder joint [1]. Already with the influenza and pneumococcal vaccines there had been reports of septic arthritis of the shoulder joint [2,3]. Furthermore, it is known that parenteral vaccination can lead to bacterial complications, local or systemic, in the absence of routine

skin disinfection measures [4]. Compared to other major joints such as the knee, hip, and shoulder, the sternoclavicular joint has been involved in septic arthritis much less frequently, particularly in healthy subjects [5]. According to the authors, we are not aware of any known cases of this occurring following vaccination [6]; a 2004 study gathered 180 instances, with intravenous drug injection being one of the most common causes [7]. A link has also been found between sternoclavicular joint arthritis and mediastinitis [8], as in the example presented here. Anti-SARS CoV-2 vaccines are known to be administered subcutaneously, usually in the deltoid area; however, it cannot be ruled out that, despite the inoculation technique, accidental venular or arteriolar inoculation may occur, resulting in bacteremia, distant bacterial colonization, and the development of local or systemic complications.

## Conclusion

The presentation of this clinical case emphasizes the importance of maintaining a high degree of attention and caution when administering vaccines, particularly in the current worldwide setting of SARS CoV-2 infection, where vaccine use has taken on a mass scale. It's also crucial to keep a close eye on the patient in the days after the vaccine, without overlooking any local symptoms. This is especially true when, rather than regressing, the problem worsens and becomes systemic.

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