

Short Report

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A case of constrictive pericarditis after COVID-19 vaccine**Federico Cacciapuoti¹; Paolo Tirelli²; Carlo Liguori²; Fulvio Cacciapuoti³**¹Department of Internal Medicine "L. Vanvitelli" University – Naples, Italy.²Department of Internal Medicine and Radiology Unit "Ospedale del Mare"-Naples, Italy.³Department of Cardiology-ICU "V. Monaldi" Hospital – Naples, Italy.***Corresponding Author: Federico Cacciapuoti**

Department of Internal Medicine, "L. Vanvitelli"

University of Campania, Italy.

Email: fulvio.cacciapuoti@gmail.com

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Abstract

It is known that mRNA vaccines against COVID-19 infection are effective in reducing symptoms, mortality and hospitalization of the patients suffering from COVID-19. In fact, these can cause some complications, as fever, headache, dizziness and, rarely, can induce some cardiac involvement, such as the inflammatory reaction of myocardium and/or pericardium. We describe a case of young healthy male-subject who received a second dose of Spikevax vaccine. Two days from the vaccine inoculation, he developed an acute inflammation of the pericardial leaflets, responsible for constrictive pericarditis. The clinical suspect was confirmed by instrumental and laboratory data. But, after the anti-inflammatory drugs administration, he completely recovered.

Learning objective: This case report describes the occurrence of constrictive pericarditis following the vaccination against COVID-19. The most common instrumental and laboratory texts, useful for the diagnosis, are illustrate. The therapeutic treatment are reported. The pathogenetic mechanisms are hypothesized.

Keywords: Vaccine; COVID-19; Constrictive pericarditis.

Introduction

The m-RNA vaccines (Cominarty and Spikevax) against Corona Virus Disease-19 (COVID-19) infection seems to be effective in reducing the symptoms related to the infection. But, the vaccines can frequently induce some adverse reactions, such as pain in the site of inoculation, headache, myalgia and, rarely, fever and/or Bell's paralysis [1]. Acute myocarditis/pericarditis can also happen [2,3]. In particular, an increase in pericarditis rate was reported in young adults after the second dose of COVID-19 mRNA vaccines [4,5]. These inflammatory reactions are unchanged too, but could be referred to the immunopathological mechanisms due to the spike-protein involved in the COVID-19 infection [6]. That causes an imbalance of the Renin-Angiotensin-Aldosterone System (RAAS).

Case report

A 32-year old man was admitted to the Emergency Room because of progressively worsening chest pain and dyspnea on effort started two days after the inoculation of the second dose of Spikevax vaccine against COVID-19.

On physical examination, the jugular venous pressure was paradoxically increased on inspiration (Kussmaul's sign). The peripheral blood pressure resulted of 130/90 mmHg, the heart rate was 91 bpm and the oxygen saturation of 98%. In addition, the body temperature was normal (36.5°C), while white blood test count increased (10.325/mm³) with 162.2% of neutrophils and 39.8% of lymphocytes. The inflammatory parameters and cardiac markers were both raised (HS-troponin=8 ng/L, fibrinogen=758 mg/dL). The first and second sound were present at

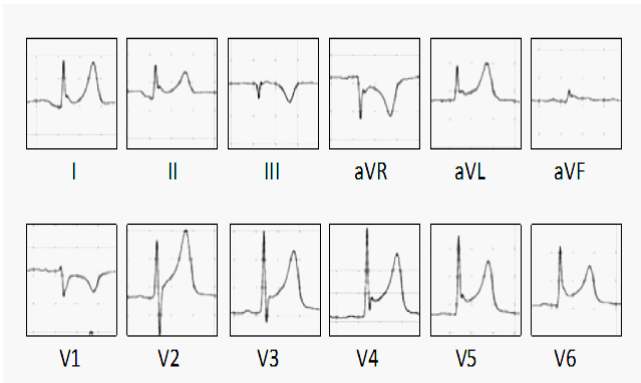


Figure 1: Leads ECG performed during the early phase of constrictive pericarditis. PR and ST tracts depression, most evident in aVR, with increased T wave in the left derivations (D1-aVL and V2, V3, V4-V5).

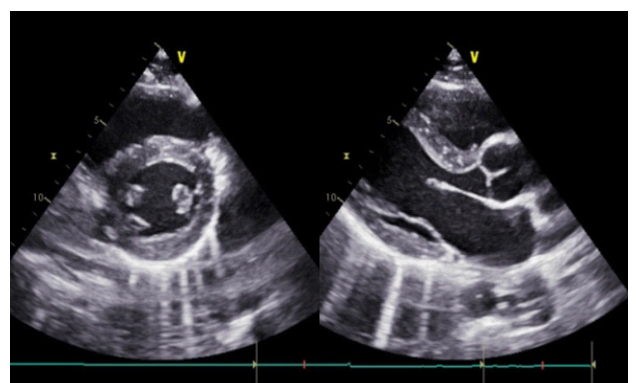


Figure 2: 2-TTE. Left ventricle recorded in short- and long-axis pointed out the pericardial thickening and brightness. Multiple comets originating from the pericardium are also seen.

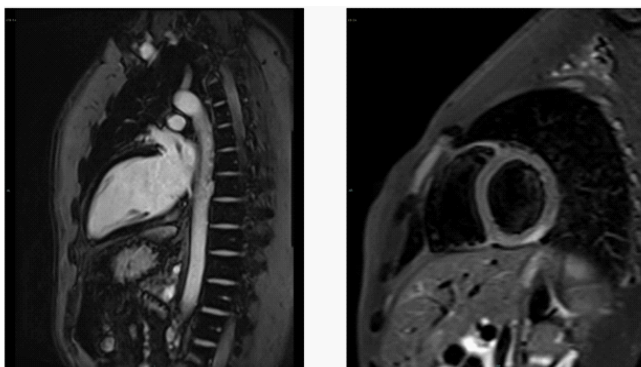


Figure 3: CMR T1 weighted fast spin-echo of left ventricle seen in long- and short-axis. Pericardial thickening of latero-basal wall (red arrow) in a case of constrictive pericarditis.

cardiac auscultation, in absence of any systolic and/or diastolic murmurs. 12 leads-electrocardiography showed left axis deviation, and ST and PR depression, with normal T wave amplitude (Figure 1).

At chest radiogram no evident pleural effusion was reported, while the cardiac silhouette was in to the normal limits. Trans thoracic echocardiography (TTE) shown normal left ventricular diameters with normal systolic function and a moderate mitral regurgitation. A thickening of pericardial layers and numerous

comets starting from thickened pericardium were seen [7] (Figure 2). The increased pericardial thickening, due to the inflammation of pericardial leaflets, is typical of constrictive pericarditis and is evident at cardiac resonance imaging (CMR) (Figure 3). The patient was treated with ibuprofen and colchicine [8] and completely recovered after 17 days, exhibiting a favorable clinical course, with cessation of all clinical symptoms and resolution of the other signs (ECG, TTE, CMR and laboratory texts).

Conclusion

The incidence of acute pericarditis related to COVID-19 vaccine inoculation is rather rare [9]. This post-vaccine complication is more frequent among adolescents of both sexes. Until now, no specific examination is available for its prediction. The diagnosis of constrictive pericarditis was performed for chest pain, cardiac palpitations, and dyspnea present at physical evaluation. It was confirmed by the characteristic findings at 12-leads electrocardiography found during the early phase of pericarditis. Usually, ECG changes of pericarditis evolve through four stages. At stage 1, ST tract and PR tract depression, with reciprocal changes are present (first week). T wave flattening is evident in the stage 2 (third week). The T flattening or its normalization continues in the stage 3 (after third week). In the final phase (stage 4) ECG returns to normal aspect [10]. Trans-thoracic echocardiography (TTE), with thickened pericardium and the characteristic comets, further documented the constrictive pericarditis. Finally, CMR definitely confirmed the diagnosis [11]. The immunologic reactivity to the vaccine's content was hypothesized as a mechanism able to induce inflammatory reaction of pericardium to vaccine [12]. Really, various potential mechanisms were proposed, such as the hypersensitivity to vaccine, inflammatory reaction, excessive activation of immune system [13]. But, at moment, no specific mechanism was verified.

Conflict of interests: The Authors declare that there is no conflict of interest

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