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### Myopericarditis in a Patient with Recent Covid-19 mRNA Vaccine

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# Myopericarditis in a patient with recent Covid-19 mRNA vaccine

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## Abstract:

Myopericarditis after covid-19 mRNA vaccination is not well described. However, there have been several cases described throughout the pandemic suggesting some correlation between covid-19 vaccination and myopericarditis. We described such a case where a patient developed myopericarditis after receiving Johnson & Johnson vaccine.

## Introduction:

Myopericarditis is a relatively rare condition and even more rare when it's secondary to a Covid—19 vaccine. In this case, we describe a patient with a presumed diagnosis of myopericarditis shortly after receiving the covid-19 vaccine. She had two Emergency Department visits, and on the second visit was admitted and worked up by cardiology after having elevated troponin levels. Patient subsequently fully recovered with no known morbidity.

## Case Presentation:

Patient is a 38 year old female with history of diabetes and asthma who presented to the ED on 4/24/2021 with fever, chills, diffuse myalgias, headache, and sore throat. Patient had been seen at an urgent care earlier in the week and had a negative Covid test and viral bio fire. Patient reported getting the Johnson & Johnson on 4/7 and her symptoms started on 4/16. The patient was febrile to 102.9 in the ED. She was also tachycardic in the 120s and described the chest pain as positional and pleuritic. EKG was without ischemic changes with elevated troponin. Patient's initial troponin were 2,014, 3,415, and peaked at 3,438. Patient was diagnosed with myocarditis. She was septic on admission and started on IV antibiotics which were later discontinued. During this visit her Strep, Flu, HIV, and EBV were negative. CMV was positive for IgG but no IgM. Parvovirus was pending. Patient was evaluated by Cardiology and had a negative echocardiogram. Patient's pain improved with colchicine, NSAIDs, and Tramadol. Patient was deemed stable and discharged on 4/28/2021.

Patient returned to the ED on April 29<sup>th</sup> with continued chest pain. Her troponins continued to trend down with initial one being 93, 61, and 47. CTA PE study was negative for pulmonary embolism. Patient was again evaluated by Cardiology. Further investigation proved that patient started to have symptoms 24 hours after receiving the Johnson & Johnson vaccine and has had it for over a month despite using NSAIDs. Patient also had positive titers for Coxsackie virus. However, cardiology believed patient's symptoms combined with lab findings suggest the diagnosis of myopericarditis. They believed the etiology is more involved than viral myocarditis. They believe the vaccine, most likely, played a role in the development of the myopericarditis given the proximity of the symptom development to the vaccine. Outpatient cardiac MRI was recommended. Patient's troponins and symptoms continued to improve and she was discharged in a stable condition.



Figure 1

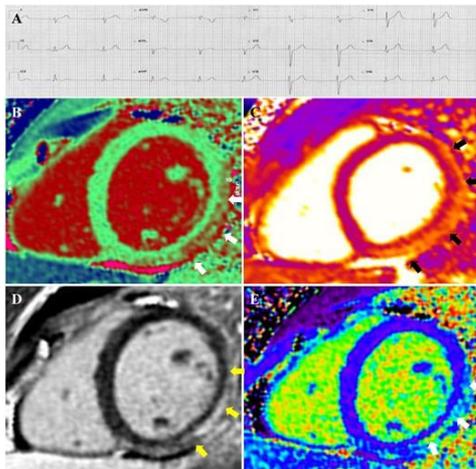


Figure 2

## Discussion:

Myopericarditis remains a rare side effect of Covid vaccination and number of cases reflect that. A single center case series described eight cases of myopericarditis where 18,671 patients ages 16 to 25 received two doses of the Pfizer-BioNTech BNT162b2 (Pfizer) vaccine, 5,999 received two doses of the Moderna mRNA-1273 vaccine, and three received a combination of the two. All eight patients that developed myopericarditis were males and all received two doses of the Pfizer vaccine. All of the patients presented with chest pain as the chief complaint which occurred within 3 days after the second dose. All patients had elevated troponin levels and ST elevations on EKG (Figure 1). All of the patients reported resolution of their symptoms and were discharged after a short hospitalization. It is reassuring the fact that these eight cases comprise 0.03% of the 24,673 individuals who received two doses of a COVID-19 mRNA vaccine in the hospital system where the study was conducted. Although our patient did not get any confirmatory imaging, there are certain findings on cardiovascular magnetic resonance (CMR) imaging that can make a definitive diagnosis of myopericarditis. In one such case of a teenager that developed myopericarditis after the first dose of the Covid mRNA vaccine, CMR was used to make the diagnosis. The CMR showed mild left ventricular systolic dysfunction, with elevated myocardial T1 in the basal to mid-inferior and lateral segments, consistent with myocardial fibrosis and edema, with corresponding sub-epicardial late gadolinium enhancement and increased extracellular volume (Figure 2). As more and more young people are getting vaccinated it is important to consider the small number of cases of myopericarditis that appears to affect patients in the age range of 16 to 25. Fortunately, the symptoms described appear to be mild and patients recover fully with great prognosis (Fleming-Nouri A et al).

One possible proposed mechanism of vaccine induced myopericarditis is the exaggerated levels of antibodies that mRNA vaccines can generate in young adults and mRNA being a natural activator of the innate immune system and results in an immune overreaction that can affect multiple organs, such as the heart (Michele Golino et al).

## Conclusions:

We described a case of myopericarditis resulting presumably from a recent Covid-19 mRNA vaccine. Patient presented with chest pain, myalgias, and malaise. On labs patient had markedly elevated troponin levels with no EKG changes. Patient recovered fully with anti-inflammatory medications. Although, no CMR was done in our patient, the findings of sub-epicardial late gadolinium enhancement point to a diagnosis of myopericarditis (Daniel H Chen et al). Although there are several such reported cases, vaccine induced myopericarditis still remains a rare diagnosis and benefits of protection through vaccines far outweighs the small risk of myopericarditis.

## References:

Fleming-Nouri A, Haimovich AD, Yang D, Schulz WL, Coppi A, Taylor RA. Myopericarditis in young adults presenting to the emergency department after receiving a second COVID-19 mRNA vaccine. *Academic emergency medicine*. 2021;28(7):802-805. doi:10.1111/aeem.14307

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