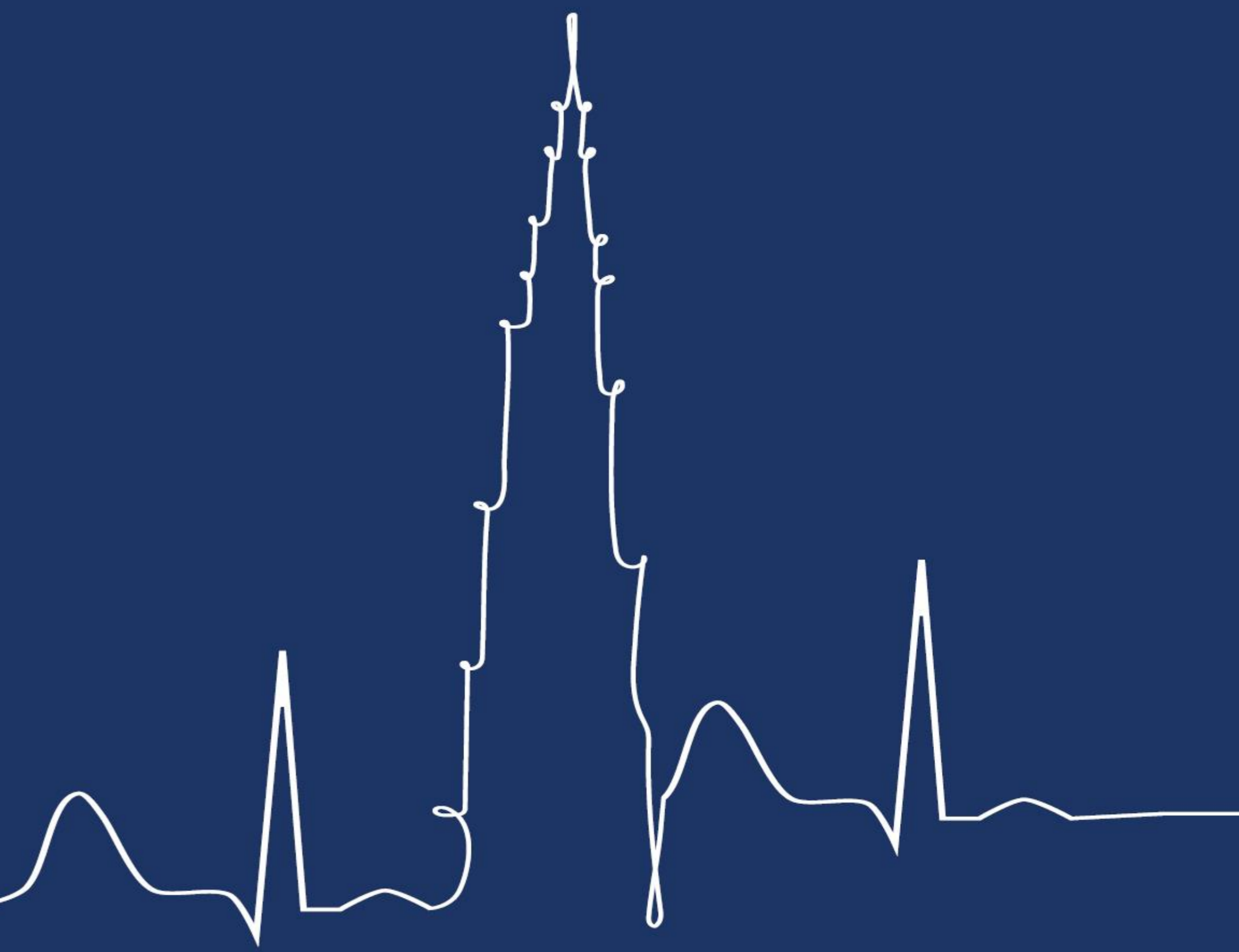




GAC 2025 GULF ARRHYTHMIA CONGRESS

ePOSTER



Complete Heart Block Post mRNA Vaccine, Association or Coincidence, Case Report and Review of Literature

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INTRODUCTION

Vaccines have been an integral part of fighting against the ongoing COVID pandemic. However, as with any other therapy, side effects exist. Cardiovascular complications including myocarditis, pericarditis, arrhythmias, and atrioventricular conduction problems have been documented with the COVID infection. [1,2] The association between myocarditis and the vaccination has been well established and reported to occur more frequently in younger patients especially after the second dose. [3,5] Yet, when it comes to conduction abnormalities, there have been only a few documented cases. [4] Here, we present a case of complete heart block occurring twice suspected after receiving COVID vaccination.

AIM

The purpose of this study is to raise additional awareness of such complications. It is crucial that these cardiac complications secondary to COVID vaccination are studied further including the pathophysiology behind such circumstances to be able to determine the best treatment method.

METHODS

This paper is a case report and literature review pertaining to the case that was chosen.

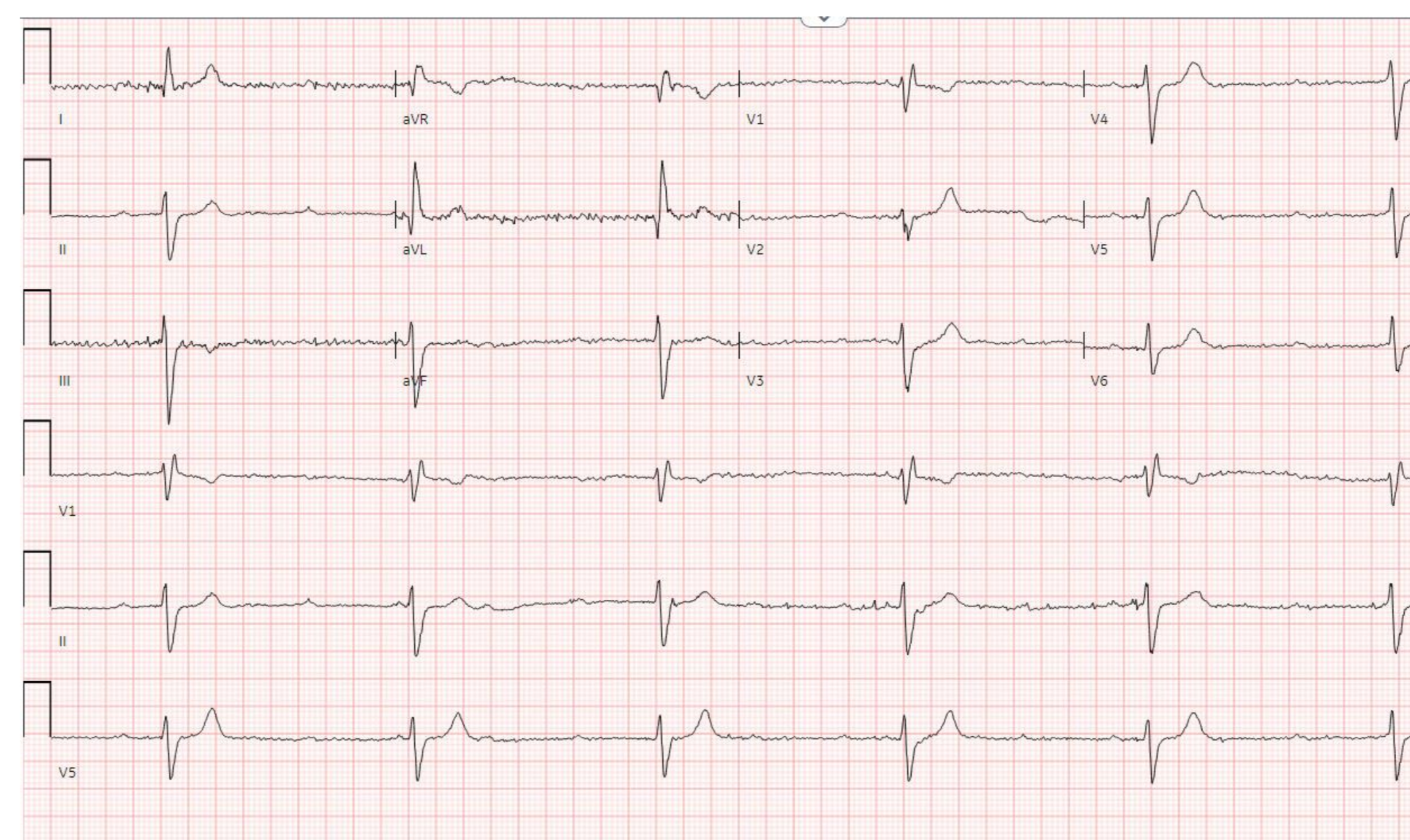
Once the appropriate case of interest was chosen, details of the patient was then collected via the hospital's electronic records. The data collected including all the information of the patient's visits to the hospital that revolved around the presentation of interest as well as all the investigations and treatment plan that the patient underwent.

Once the data was collected, literature research was then performed on the subject of the case chosen.

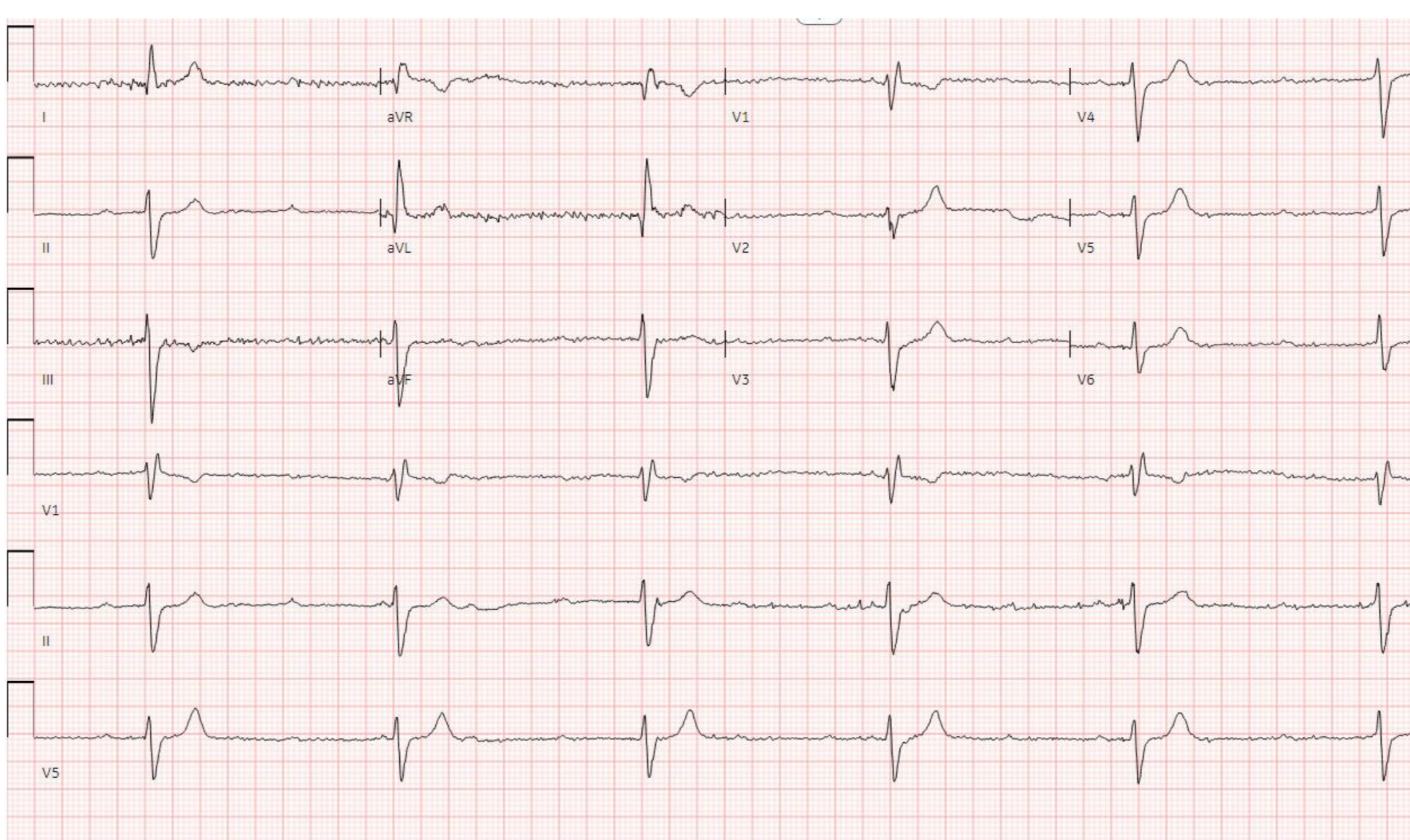
The primary search study involved using the PubMed database using the search string such as: COVID vaccination and cardiac conduction disorder, cardiac arrhythmias, and atrioventricular block) with no time limits applied. Thereafter, citation searching within the studies chosen from the primary search was then conducted.

RESULTS

A 48-year-old male with no chronic illnesses except an underlying right bundle branch block had recently received the first COVID vaccination. Thereafter, he had presented with severe dizziness and presyncope. Electrocardiograph upon presentation showed complete heart block with a heart rate of 34 beats per minute. Shortly after arrival, he had spontaneously reverted back to sinus rhythm. A coronary angiography was performed displaying normal coronaries and an echocardiography showed normal left ventricular function with no valvular diseases. Thus, no underlying etiology causing the heart block was found. He was advised to receive a permanent pacemaker implant; however, the patient had wanted to get a second opinion first. Once discharged as a case of transient complete heart block, the patient had received the second COVID vaccination, and 2 weeks later had presented again to the hospital with another dizziness spell and chest pain. He was found to have complete heart block with heart rate ranging 30-40 beats per minute. The patient had then spontaneously reverted back to normal sinus rhythm. Consequently, the patient was admitted for dual chamber pacemaker implantation.



ECG after the first vaccination



ECG after the second vaccination

CONCLUSIONS

There have been a few similar case reports noting the complication of conduction abnormalities occurring post-vaccination administration, with several of them requiring permanent pacemaker insertion eventually. [4]

There are multiple potential underlying mechanisms leading to post-vaccination conduction abnormalities. These include myocardial ischemic injury that may occur due to the high inflammatory burden and cytokine storm. Inflammation extending to the AV node may lead to heart block. With the inflammatory aspect in mind, a recently reported case has managed and recovered a patient's heart block with corticosteroid therapy. [6] Another mechanism may be secondary to the overexpression of the angiotensin-converting enzyme 2 receptor (ACE-2) as the COVID vaccine protein spikes bind to the ACE-2 receptors, leading to their imbalance and alterations and eventually abnormalities in the heart rhythm. [7]

In light of these findings, we conclude that conduction disorders post vaccination is a rare but relevant complication. The underlying mechanism is not clear, but several mechanisms have been discussed throughout the literature.

We recognize the importance of vaccinations in the pandemic. However, we believe that physicians must receive awareness of potential complications and to further promote additional research.

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