

Transient Third-degree Heart Block Secondary to Asymptomatic COVID-19 Infection

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Abstract COVID-19 predominantly affects the lungs manifesting as respiratory illnesses including pneumonia and acute respiratory distress syndrome. Cardiac manifestations are also being increasingly reported such as pericardial disease, myocardial injury and dysfunction, arrhythmias and conduction abnormalities. A 70-year-old male with asymptomatic COVID-19 infection developed a transient episode of complete heart block just prior to his planned discharge from hospital. There are only few case reports purporting the development of a transient complete heart block in patients with moderate to severe COVID-19 infection. However, to date, this is the first report of incidentally detected, asymptomatic COVID-19 infection manifesting as third degree heart block.

Keywords: Coronavirus, complete heart block, arrhythmia, COVID-19 myocardial injury

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1. Introduction

Novel Coronavirus was declared a pandemic by World Health Organization in March 2020. COVID-19 infection typically affects the lungs, manifesting with respiratory diseases ranging from atypical pneumonia to severe respiratory distress syndrome. There are emerging reports of COVID-19 affecting the heart and presenting with pericardial disease, myocardial injury and dysfunction, arrhythmias and conduction abnormalities. This case adds to the growing literature of the cardiac effects of COVID-19 infection and presents an interesting perspective of an asymptomatic COVID-19 infection manifesting as a third-degree AV Block.

2. Case Report

A 70-year-old male with no prior comorbidities was hospitalized for treatment of *Streptococcus pyogenes* bacteremia from intravenous drug use. He had initially presented with fevers for 2 days and apart from positive blood cultures, the infectious workup including chest radiography was unremarkable. On admission, a COVID-19 molecular test was negative. ECG revealed sinus rhythm without evidence of conduction disease and transthoracic echocardiography was unremarkable for pericardial, myocardial or valvular pathology, including the absence of vegetations. The patient was successfully treated with Ceftriaxone therapy with ensuing sterility of blood cultures and significant clinical improvement within

48 hours. His subsequent 14-day hospital course, although protracted in anticipation of a socially safe discharge disposition, had been grossly uneventful until the night prior to his planned discharge date.

The patient experienced sudden facial flushing followed by a transient loss of consciousness while watching television. He denied chest pain or palpitations and clinically there were no focal neurologic deficits. Telemetry revealed a 5 second complete heart block at the time of his symptoms, followed by a spontaneous return to normal sinus rhythm which was confirmed on subsequent ECG (Figure 1). Cardiac biomarkers were negative along with serum electrolyte panels and thyroid function tests within normal limits. The patient was transferred to the coronary care unit and underwent emergent transvenous pacing.

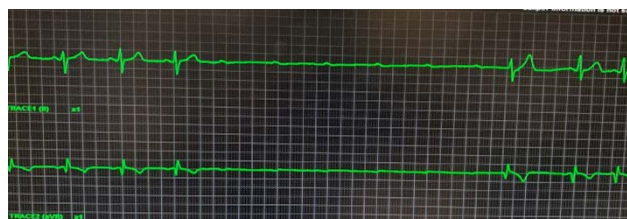


Figure 1. Telemetry with five second pause with spontaneous return to normal sinus rhythm

Prior to permanent pacemaker implantation, screening COVID-19 RT-PCR returned positive. He had remained asymptomatic, without elevation of inflammatory markers, hypoxia or abnormal chest radiography. In lieu of the absence of other causes of heart block, SARS-CoV-2 infection was deemed the inciting etiology of his acute onset third degree AV Block.

3. Discussion

With the WHO's declaration of COVID-19 a global pandemic, there has been an emergence of case reports/series discussing the potential cardiovascular disease manifestations of COVID-19 infection.

Cardiovascular implications of COVID-19 include asymptomatic myocardial injury to acute coronary syndrome, mild to fulminant myocarditis, stress cardiomyopathy and cardiogenic shock [1]. Notably inflammatory cells and COVID-19 virus have been detected in the myocardium in autopsy studies, suggesting direct invasion of the heart [2]. COVID-19 viral RNA was detected in the hearts of 35% of patients with COVID-19 infection [3]. Wang et al reported that 7.2% of 138 patients hospitalized with COVID-19 infection had myocardial injury and 16.7% of the patients developed arrhythmias, although unspecified [4]. Deng et al noted 12.5% of patients with COVID-19 had evidence of myocardial injury with abnormalities suggestive of myocarditis [5].

COVID-19 related heart block is reported in only a few case studies thus far, although typically in patients with hypoxia or moderate to severe disease [6,7,8]. This phenomenon has been also reported in a patient without overt myocarditis [9], but this is the first reported case noted in asymptomatic COVID-19 infection devoid of hypoxia at rest. The mechanism of AV nodal involvement is yet uncertain, whether through direct viral invasion, viral inflammatory response, autoimmune sequelae or microthrombotic insults to the AV node from the hypercoagulable milieu of COVID-19 [6]. As a result, the prognosis is unpredictable and elucidation would unfortunately require the coveted long term prospective data. Until such a time, it may be safer to consider permanent pacemaker implantation, especially in patients with mild or asymptomatic COVID-19 infection such as in our case.

4. Conclusion

The cardiovascular implications of COVID-19 are incessantly being recognized as a myriad of events continue to occur. While the exact mechanism remains to be determined, the inflammatory and prothrombotic nature of the COVID-19 infection seems to contribute significantly. Even asymptomatic patients may be at risk for such cardiac manifestations, which can even initially go unnoticed. Thus, until there are high quality data on the risk and prognostic stratification of COVID-19 related cardiovascular complications such as complete heart block, even asymptomatic patients may warrant continuous telemetry monitoring and subsequent aggressive management strategies.

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