



Myocarditis Secondary to COVID 19 Infection: A Case-Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Coronavirus disease 2019 (COVID 19) is an emerging viral infection caused by the strain of coronavirus SARS-CoV-2, primarily affecting the respiratory system. However, it can be responsible for heart damage.

The aim of this work was to report a case of symptomatic myocarditis in a 53-year-old patient.

Patient and Observation: We report the case of a 53-year-old patient with no particular history or cardiovascular risk factor found who had consulted in June 2020 in a hospital for dyspnea, dizziness and palpitations in whom the electrocardiogram had demonstrated ventricular tachycardia. The echocardiography was normal and coronary artery disease was ruled out on coronary angiography and antiarrhythmic treatment allowed it to regress. Two months later, after a break in therapy, this tachycardia recurred despite several electrical and chemical cardioversions. Subsequently, myocarditis was suspected. This motivated the realization of a cardiac magnetic resonance imaging

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(MRI) which came back in favor of myocarditis. As part of the etiological research, RT-PCR and COVID 19 serology were requested and the serology returned positive for IgG.

Conclusion: COVID 19 disease is known for its respiratory manifestations. However, several cases of cardiac involvement, in particular myocardial damage, have been described and among these, a considerable proportion of arrhythmias. They can be multifactorial in origin, due to the virus itself, or the prolongation of the QT interval from various drug therapies. These arrhythmias are the source of sudden death, hence the interest of RT-PCR and COVID 19 serology, but also the need for early and appropriate management, as well as long-term monitoring of patients. cured patients.

Keywords: myocarditis; COVID 19; ventricular tachycardia.

1. INTRODUCTION

Coronavirus disease 2019 (COVID 19) is an emerging viral infectious disease caused by the strain of coronavirus SARS-CoV-2 primarily affecting the respiratory system. However, it can be responsible for cardiac damage, namely myocarditis.

The aim of this work was to report a case of symptomatic myocarditis in a 53-year-old patient.

2. CASE PRESENTATION

A 53-year-old patient with no history who had consulted in June 2020 in a hospital for exertional dyspnea, dizziness, and palpitations. Hemodynamic constants were stable apart from regular tachycardia at 180 beats/minute (bpm) and physical examination was normal. The emergency electrocardiogram (ECG) showed monomorphic ventricular tachycardia (VT) (Fig. 1a).

The patient had undergone electrical cardioversion allowing resinsualisation with negative and hollow T waves in the lower territory.

The transthoracic echocardiography (TTE) was normal, however the ultrasensitive troponinemia was positive, suggesting an ischemic etiology related to this tachycardia.

As part of the etiological assessment, a diagnostic coronary angiography performed revealed discreetly atheromatous coronaries without significant stenosis.

Discharge treatment was low dose beta blocker and amiodarone.

Two months later, after a break in therapy, the patient again felt the same symptoms, prompting his consultation in our department.

The examination noted regular tachycardia at 190 bpm, tachypnea and arterial hypotension at 90/60 mmHg.

The ECG at entry again recorded this ventricular tachycardia with a rate of 180 cpm and was subsequently hospitalized.

The biology found a non-specific inflammatory syndrome with a leukocytosis predominantly neutrophilic (13,920 / mm³) and a high C-Reactive Protein (131.4 mg / l).

The Transthoracic Echocardiogram (TTE) this time noted an undilated cardiomyopathy with a mean alteration of the LVEF to 42% and disturbances of the segmental kinetics.

The evolution during hospitalization was marked by several recurrences of this ventricular tachycardia despite several electrical and chemical cardioversions, sometimes with cardiovascular collapsing episodes, as well as a persistence of the inflammatory syndrome. Faced with this picture of recurrent ventricular tachycardia and the elimination of an ischemic etiology, myocarditis was suspected.

Cardiac Magnetic resonance imaging (MRI) was requested and was compatible with myocarditis with severe left ventricular dysfunction with early and late enhancement of the lateral and lower basal and mid-ventricular segments (Figs. 2a and 2b).

Faced with this picture of myocarditis complicated by recurrent ventricular tachycardia, the HIV, hepatitis B and C serologies were negative. RT-PCR and COVID 19 serology were performed and PCR was negative, however serology was positive for IgG.

A regression of the tachycardia was noted at the 3rd week of hospitalization after optimization of the doses of B-blockers.



Fig. 1a. Percritical ECG showing ventricular tachycardia

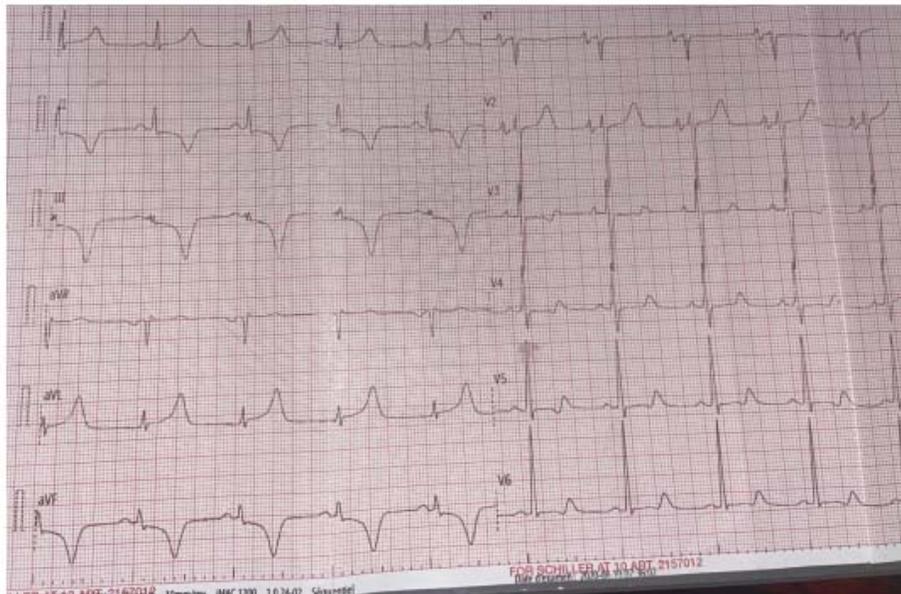


Fig. 1b. ECG after electrical cardioversion with sinus rhythm

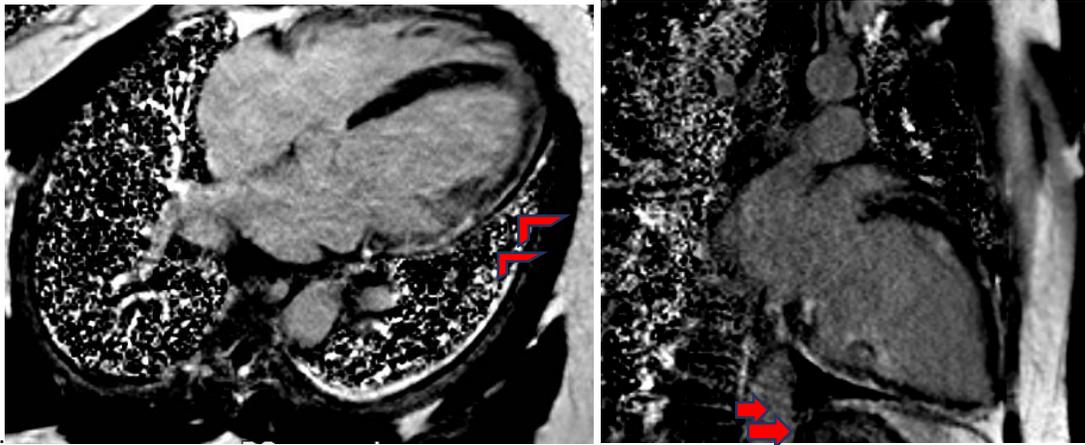
3. DISCUSSION

COVID 19 presents a broad spectrum of cardiovascular complications, including acute heart failure, arrhythmias, myocarditis [1].

A retrospective analysis of the causes of death in Chinese patients infected with COVID-19 found that 40% of patients died at least in part from myocardial injury and circulatory collapse.

Due to the relative novelty of COVID 19, data surrounding the association between COVID-19 and myocarditis is still being released.

However, we know that the ACE-2 receptor, the cellular gateway for SARS-CoV-2, which is very present in the upper airways and the lungs, is also in the heart. We can therefore think that the coronavirus infects cardiomyocytes by binding to the ACE2 receptor, which induces cell necrosis



Figs. 2a et 2b. Cardiac MRI after gadolinium injection showing subepicardial hypersignal in T1

The exact pathophysiology of COVID-19 disease is still elusive. However, a consistent observation is the presence of a pro-inflammatory surge, the so-called “cytokine storm”.

ECGs are usually abnormal in patients with myocarditis, often showing arrhythmias. Nonetheless, dynamic changes could herald clinical deterioration and should be documented in all hospitalized patients with COVID-19 [2].

Transthoracic echocardiography (TTE) for most reported cases of myocarditis in patients with COVID-19 has revealed altered LVEF [3,2].

Cardiac MRI is one of the first line diagnostic tools in the analysis of myocarditis associated with COVID-19 [4,5]. This is documented because several authors have used cardiac MRI to meet the criteria of Lake Louise to diagnose patients with myocarditis associated with COVID-19 [6,7,8].

There are some data from randomized trials which conclude that the routine use of corticosteroids and other immunosuppressive strategies in patients with myocarditis is not recommended [9,10].

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4. CONCLUSION

Coronavirus disease 19 is a multi-faceted disease of which several cases of cardiac attack including myocardial described and among these, a considerable proportion of arrhythmias which can be of multifactorial origin either due to the virus itself, or the prolongation of the QT interval of various pharmacotherapies. Through this clinical case, we wanted to highlight the capital place occupied by additional investigations, in particular cardiac Magnetic Resonance Imaging, RT-PCR but also COVID 19 serology for the diagnosis which can be retrospective.

Myocarditis requires an adequate therapeutic attitude because it can lead to serious complications such as arrhythmias which can be life-threatening through sudden death, but also long-term monitoring of cured patients.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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