An atypical cause of dyspnea in times of COVID-19 pandemic: a case report

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Abstract

COVID-19 is a disease that has changed the scenario in emergency departments worldwide. Cardiac involvement should be considered in certain cases making ultrasound a mandatory tool to aid in diagnosis, follow-up, and treatment.

An atypical cause of dyspnea in times of COVID-19 pandemic: a case report

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Key Clinical Message

COVID-19 is a disease that has changed the scenario in emergency departments worldwide. Cardiac involvement should be considered in certain cases making ultrasound a mandatory tool to aid in diagnosis, follow-up, and treatment.

Introduction

Coronavirus disease 2019 (COVID-19) is an emerging disease that has shown a wide range of clinical presentations. Cardiac involvement is one of these. However, the interest in follow-up in this type of patient and the usefulness of imaging tests in these cases has not barely been described.

Case presentation

We present the case of an 84-year-old woman complaining of dyspnea for 3 weeks. She had a recent history of bilateral severe acute respiratory syndrome 2 (SARS-CoV-2) pneumonia. After an initial evaluation in the emergency department, the patient was admitted with a diagnosis of heart failure. In the internal medicine department, a re-evaluation was performed together with point-of-care ultrasound (POCUS) confirmed

with transthoracic echocardiography (TTE). Bilateral pleural and pericardial effusion was noted. The patient was treated with ibuprofen for a few days; however, the patient's condition worsened. After reevaluation with

TTE and verifying the involvement of the right chambers, pericardiocentesis was performed. The patient's vitals improved and a diagnosis of exclusion of pericardial tamponade was made after secondary to COVID-19.

Conclusions

COVID-19 is a disease that has changed the scenario in emergency departments worldwide. Cardiac involvement should be considered in certain cases making ultrasound a mandatory tool to aid in diagnosis, follow-up, and treatment.

Keywords: COVID-19, pericardial tamponade, echocardiography

Introduction

Since the first case detected in the city of Wuhan, Coronavirus disease 2019 (COVID-19) cases have been increasing exponentially and declared as a global pandemic (1,2). This virus causes the infection known as severe acute respiratory syndrome 2 (SARS-CoV-2) and produces in most cases respiratory symptoms progressing from pneumoniae to acute respiratory distress syndrome. However, it is well known that the virus can be expressed as extrapulmonary manifestations (3). Some prospective observational studies have already described cardiac involvement such as arrhythmias, acute myocardial injury, and Heart failure (HF) (4). Specifically, some cases of pericarditis, cardiac effusion and pericardial tamponade have been described (5,6). Highlighting the importance to consider this pathology on a patient with COVID-19 who persists with dyspnea prior to discharge. We present a case of COVID-19 readmission due to severe pericardial effusion that progressed to cardiac tamponade. This case wants to show the importance of considering cardiac manifestations as a cause of dyspnea in patients with COVID-19.

Case presentation

A 84 year old female patients with a medical history of hypertension, atrial fibrillation, asthma, hyperlipidemia, left breast cancer in remission for 2 years after lumpectomy and chemotherapy and a recent history of SARS-CoV-2 bilateral pneumoniae discharged with supplementary oxygen two weeks previously, presented to the emergency room with worsening dyspnea since discharged and lower extremity edemas. Her presenting blood pressure (BP) was 125/85 mmHg, heart rate (HR) was 147 beats/minute, respiratory rate (RR) was 20 breaths/minute, temperature was 96.2 ºF and she was saturating 83% on room air rising with nasal cannulas at 2 liters to 97%. Physical exam showed a pathological pulmonary auscultation with bilateral crackles and confirmed edemas in legs, and absence of jugular engorgement. An electrocardiogram at presentation showed atrial fibrillation with diffusely decreased voltages (Figure 1). The patient's chest x-ray at presentation showed bilateral pleural effusion predominantly at the left side and a cardiomegaly not described in previous images (Figure 2). Blood test at presentation showed and hemogram with leukocytosis and neutrophilia, blood chemistry showed a normal renal function and increased inflammatory markers, cardiac enzymes showed negative troponins with minimal elevated brain natriuretic peptide and arterial blood gas confirmed a partial respiratory insufficiency. With a first diagnostic approach of heart failure the patient was admitted, and diuretics were started.

On day 2 of hospitalization, point-of-care ultrasound (POCUS) was performed, confirmed with a transthoracic echocardiography (TTE), showing a severe circumferential pericardial effusion. Partial collapse of right atrium, respirophasic variation of tricuspid flow $< 50\%$ and dilatation of inferior vena cava with inspiratory collapse (Figure 3).

Since this time, the patient was hemodynamically stable with BP pressure of 126/82 mmHg and a HR of 96 beats/minute. In the management of severe pericardial effusion in a stable patient, it is decided to initiate medical treatment and continue with the diagnostic approach. Diuretics were withdrawn, non-steroidal anti-inflammatories (NSAIDs) were started with ibuprofen on a dose of 600 mg every 8 hours. With the history of recent breast cancer, a thoracentesis, a body scan, and tumor markers were requested. The thoracocentesis showed a transudative fluid (Table 1) and the body scan was negative for malignancy.

The patient continued with NSAIDS till day 5 of hospitalization when the dyspnea increased accompanied by a BP of 100/60 mmHg, a HR of 105 beats/min and on blood exams an acute kidney injury AKIN I was detected. In consequence of this finding, a new TTE was repeated showing a collapse of the right atrium and ventricle with non-inspiratory collapse of the inferior vena cava. The patient was immediately transferred to the intensive cardiology unit for pericardiocentesis. After extraction of 1 liter of pericardial fluid with serous appearance (Table 1), the patient presented an improvement of her dyspnea, blood pressure, heart rate stabilized and normalized kidney function (figure 4). Pericardial fluid was analyzed showing an exudative fluid with negative bacterial, mycobacterial, and fungal cultures. PCR for COVID-19 in pericardial fluid is not available in our center but since the past infection the pericardial effusion was attributed to a past pericarditis secondary to COVID-19.

Discussion

Most admitted patients of COVID-19 are more than 70 years old and have cardiovascular comorbidities. The patients most vulnerable to the disease are those with chronic diseases, including cardiovascular disease [HF, ischemic heart disease, hypertension, diabetes mellitus (DM)] (7,8). As cases of cardiac manifestation are increasing, it is important to consider other causes than pulmonary for dyspnea in such patients. It is important to consider follow up in discharged patients with x-ray controls and possibly echocardiograms if dyspnea does not resolve totally to their previous baseline. Pericarditis and pericardial effusion are rare complications of COVID-19 and the approach of management have not been totally described (5,6).

The management of pericarditis starts with a TTE to rule out pericardial effusion or tamponade. If there is no hemodynamic compromise a pharmacological approach can be considered. High dose aspirin and NSAIDs are described as the first line management in such cases. Colchicine can be added as an additional treatment. However, if the effusion progresses or there is hemodynamic compromise a pericardiocentesis must be attempted (9).

As COVID-19 cases become increasingly common and of daily management in hospitals, it is important to be aware of their possible complications. With this case we want to highlight the importance of follow-up at discharge of patients with COVID-19 and the value of clinical ultrasound in patients presenting with dyspnea in the emergency room.

List of abbreviations

COVID-19 (Coronavirus disease 2019)

SARS-CoV-2 (Severe acute respiratory syndrome 2)

BP (Blood pressure)

HR (Heart rate)

RR (Respiratory rate)

Transthoracic echocardiogram (TTE)

Non-steroidal anti-inflammatories (NSAIDs)

Heart Failure (HF)

Diabetes mellitus (DM)

Declarations

Ethics approval and consent to participate

Written informed consent was given to the patient for inclusion of images and chemistry data.

Consent for publication

Informed consent was given for publication of data related to the patient.

Availability of data and material

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

LAV and PL designed and created the manuscript. LM review and contributed to the final manuscript. All authors approved the submitted version and agree to be personally accountable for their own contributions and warrant that questions concerning the accuracy or completeness of any part of the work, even those in which the authors were not personally involved, were adequately investigated, and resolved, and the resolution is documented in the bibliography.

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Figure and Table legends.

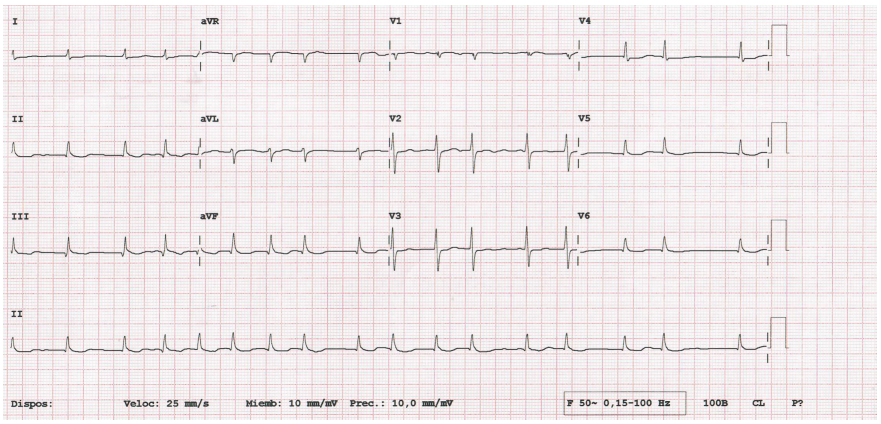
Figure 1 . Electrocardiogram of the patient at presentation on emergency room.

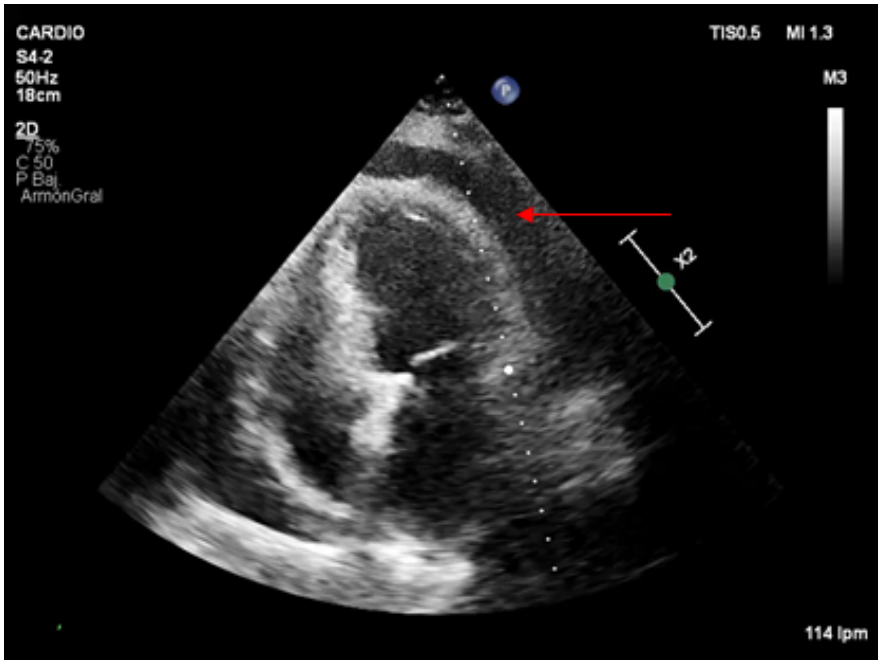
Figure 2 . Anterior-Posterior X-Ray of the patient at presentation.

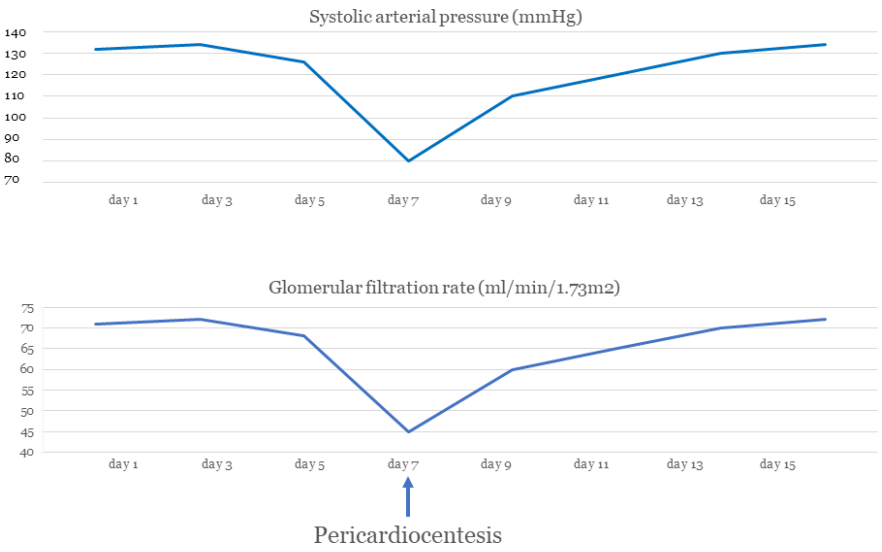
Figure 3 . Apical 4 chambers echocardiography. Arrow pointing pericardial fluid.

Figure 4. Evolution of systolic arterial pressure and renal function. Arrow pointing the day where pericardiocentesis was done.

Table 1. Pleural and pericardial fluid analysis.







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