



Case Report

Myocardial infarction complicated by cardiac arrest revealing SARS-COV-2 infection: Case report

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ABSTRACT

Introduction: COVID19 infection is most often revealed by pulmonary symptoms, however cardiovascular manifestations has been observed revealing this infection with absence of respiratory symptoms.

Clinical case: A 62 year old female patient, with no medical history, admitted to the emergency room for epigastric pain, with no respiratory signs, the exploration revealed myocardial infarction with COVID 19 infection.

Conclusion: COVID19 infection manifest mainly with respiratory symptoms but it can also be revealed by cardiac manifestations with absence of respiratory symptoms.

Physicians must be aware of these atypical manifestations and act accordingly to isolate patients to limit the spread of this disease.

1. Introduction

Pulmonary signs are the most revealing of COVID 19 infection. However, cardiovascular symptoms are observed and might reveal COVID-19 infection [1].

In this paper, we will represent a case of a 62 year old female patient, with no medical history, admitted to the emergency room for epigastric pain, the exploration revealed myocardial infarction with SARS COV 2 infection in the absence of respiratory symptoms.

The importance of the case: SARS COV 2 infection can be revealed by cardiac manifestations, in the absence of respiratory symptoms. Physicians must be aware of these atypical manifestations and act accordingly to isolate patients to limit the spread of this disease.

2. Case report

A 62-year-old female patient, with no medical history, was admitted to the emergency department for epigastric pain with no sign of respiratory symptoms.

The clinical examination was as follow: conscious patient with Glasgow score 15/15, blood pressure at 145/86 mmHg, a heart rate of 90 bpm, a respiratory rate of 19 breath/m, with a pulsed O2 saturation of 90% on ambient air, a temperature of 37.3 °C, the rest of the examination was normal.

Electrocardiogram (ECG) performed found regular sinus rhythm, left ventricular hypertrophy, negative T wave in DIII derivation, R wave abrasion in the anterior territory (Fig. 1).

Biological assessment showed white blood cells at 11750/μl (normal between 4000-10.000/μl), C-reactive protein at 88 mg/l (normal between 0.00 and 5.00 mg/l), ferritin at 204 μg/l (normal for adults

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20–200µg/l), TROPONIN us at 4522 ng/l first hour then 11519 ng/l after 6 hours, the rest without any particularity.

Chest X-ray performed found a cardiomegaly and diffuse bilateral alveolar-interstitial syndrome.

Transthoracic echocardiography (TTE) found non-dilated, slightly enlarged left ventricle (LV), with hypokinesia of the inferolateral wall, the apex, and of the apical segments of the other walls, with moderate LV dysfunction (left ventricular ejection fraction at 45%), the rest of the TTE was normal.

The patient was put on aspirin, Clopidogrel, simvastatin, Enoxaparin, proton pump inhibitor (PPI), and then she was admitted to the coronarography room.

The patient presented during her coronarography a cardiac arrest resuscitated successfully after 2 minutes of external cardiac massage and injection of 1mg of adrenaline, without intubation.

The coronarography found several anomalies mainly a stenosis of the left coronary artery and the anterior interventricular artery treated with angioplasty (Figs. 2 and 3), then the patient was admitted to the intensive care unit.

On admission to the intensive care unit, the patient was unconscious with a Glasgow score 11/15, heart rate of 121 b/m, blood pressure 85/60 mmHg, respiratory rate of 21 breath/m with a pulsed O2 saturation of 94% on oxygen goggles 4 l/min.

The patient was put on noradrenaline 2 mg/hour and dobutamine 10 µg/Kg/min.

A chest CT scan was performed, showing an appearance compatible with SARS-Cov-2 pneumonia with lung damage of 30% (Fig. 5).

2.1. PCR test for SARS-Cov-2 came back positive

The patient was put on azithromycin, methylprednisolone, Vitamin C, Zinc, proton pump inhibitor, Enoxaparin, Clopidogrel and statin.

The evolution was marked by the clinical and biological improvement of the patient by improvement of consciousness, progressive weaning of noradrenaline and dobutamine until a blood pressure of 135/81 mmHg without vasoactive drugs with a heart rate of 90 bpm. On the respiratory side, the patient became eupneic with a pulsed O2 saturation of 94% on ambient air.

Patient was transferred to the cardiology department after 24 hours of hospitalization in the intensive care unit, then discharged to her home after 48 hours of hospitalization in cardiology.

This case report followed care guidelines [1].



Fig. 2. Coronary image showing stenosis of the left coronary artery and the anterior interventricular artery before angioplasty.



Fig. 3. Coronary image showing the same anomalies before angioplasty.

3. Discussion

Pulmonary signs are the most revealing of COVID 19 infection. However, cardiovascular symptoms has been observed and might reveal it [2].

Cardiovascular manifestations reported in COVID-19 infection include: myocarditis, acute coronary syndromes, rhythm disorders,

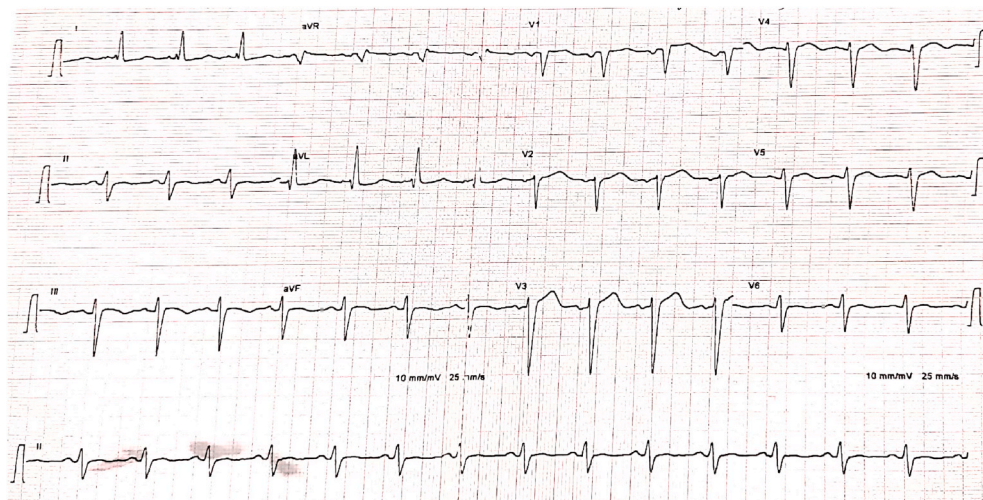


Fig. 1. ECG showing regular sinus rhythm, left ventricular hypertrophy, negative T wave in DIII derivation, R wave abrasion in the anterior territory.



Fig. 4. Coronary image after angioplasty.

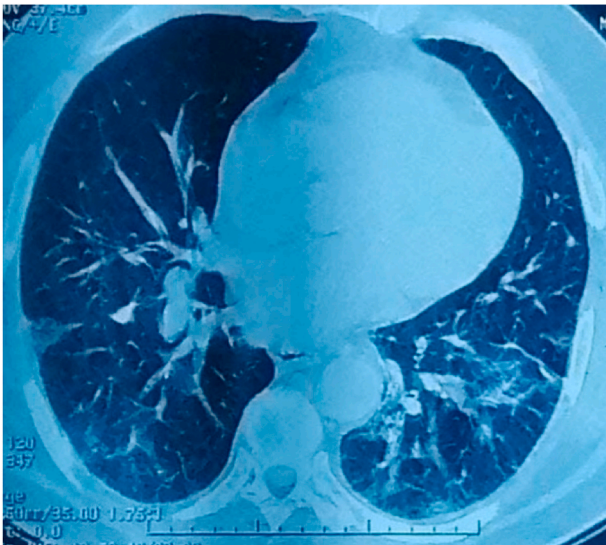


Fig. 5. A chest CT scan was performed, showing an appearance compatible with SARS-Cov-2 Pneumonia with lung damage of 30%.

thromboembolic complications and heart failure [3].

In A paper published by BAVISHI and al, including 26 studies with 11685 patients infected with covid19, cardiac manifestations was found in 20% of cases [4].

In a population of 138 patients hospitalized at Zhongnan Hospital of Wuhan University, 26% of patients required intensive cardiac care. Of these patients 16.7% developed arrhythmias and 7.2% developed acute coronary syndrome in addition to other complications [5].

In our department, Covid-19 was revealed by different and atypical cardiac manifestations like pericarditis and myocarditis [6,7].

Physicians must be aware of these atypical manifestations and act accordingly to isolate patients to limit the spread of this disease.

Cardiovascular damage is due to different, direct and indirect, mechanisms:

1. Direct myocardial damage: via the angiotensin-converting enzyme 2 (ACE2) receptor, which is highly expressed by cardiomyocytes. This could be the cause of true myocarditis; according to Oudit's study, SARS-CoV viral RNA was detected in 35% of human hearts autopsied

during the SARS epidemic in Toronto [8]. The same authors confirmed that SARS-CoV can cause ACE2-dependent myocardial infection [9], which has been identified as a functional receptor for coronaviruses [10].

2. Indirect myocardial damage by type 1 infarction (plaque rupture favored by infection) or type 2 (secondary to inadequate myocardial oxygen demand and supply secondary to respiratory failure, cytokine storm).

Acute coronary syndrome (ACS) is an entity of several diagnoses with different management: unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI) and persistent ST-segment elevation myocardial infarction (STEMI) [11].

The clinical manifestations are variable and sometimes absent, especially in diabetic patients, in whom atypical pain or dyspnea may suggest the diagnosis [11].

ACS is an acute manifestation of a disease: atherosclerosis. The consequences of ACS imply that early invasive management should be considered, subject to the patient's age, coronary risk and risk related to comorbidities [11].

The most urgent step is to make the diagnosis of ACS, then risk stratify (mortality, cardiovascular, and hemorrhagic) based on the clinic (age, history, clinical signs), ECG, and biomarker assays (mainly troponin), and at the same time, it is crucial to rule out a secondary cause of ACS such as anemia, febrile state, dehydration, tachyarrhythmia, etc.) [11].

Regardless of the decision (invasive or medical) during the patient assessment period, immediate management of ACS is required. Emergency treatment includes oxygen, aspirin, clopidogrel, nitrates in case of angina and depending on blood pressure (BP), analgesia if painful, and anxiolysis [11].

Drug treatment, in addition to antiagregant therapy, includes [11] anticoagulant therapy (unfractionated heparin or low molecular weight heparin), beta-blockers in the absence of signs of insufficiency, treatment of heart failure if necessary, early lipid-lowering therapy in the absence of contraindications, conversion enzyme inhibitors, control of risk factors according to recommendations.

Coronarography [11]: according to the 2007 ACC/AHA and ESC guidelines, Coronarography is indicated for patients without major comorbidities, with coronary lesions accessible to angioplasty and with one of the high to very high risk criteria.

4. Conclusion

SARS COV 2 infection manifest mainly with respiratory symptoms but can also be revealed, even in the absence of respiratory symptoms, by cardiac manifestations which can be severe causing cardiac arrest.

Physicians must be aware of these atypical manifestations and act accordingly to isolate patients to limit the spread of this disease.

Ethical approval

The ethical committee approval was not required give the article type (case report). However, the written consent to publish the clinical data of the patients was given and is available to check by the handling editor if needed.

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Author statement

BOUABDALLAOUI Amine: Study concept, Data collection, Data analysis, Writing the paper.

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 Brahim Housni: Supervision and data validation.

Consent

Obtained.

Registration of research studies

This is not an original research project involving human participants in an interventional or an observational study but a case report. This registration is was not required.

Guarantor

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Declaration of competing interest

None.

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