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RESEARCH ARTICLE

ST-ELEVATION MYOCARDIALINFARCTION INPATIENTS WITH COVID-19(ABOUT A CASE REPORT AND REVIEW OF THE LITTERATURE)

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Abstract

The World Health Organization declared the SARS-CoV-2 infection causing severe acute respiratory distress a global pandemic in March 2020. While respiratory features are commonly at the forefront of the disease, cardiovascular complications have been observed and associated with a poorer prognosis [1]The mechanism is multifactorial, associating endothelial damage, anabnormality of hemostasis, and immunothrobosis [2].We report the case of a 37-year-old female patient who had a myocardial infarction related to a thrombus located in the left coronary artery,who's his covid 19 disease was subsequently diagnosed, andwhose evolution was favorable.The interest of this case report is to show the need to acquire the reflexto think about a covid 19 disease in case of acute coronary syndrome (especially for theyoung) even in the absence of other obvious respiratory signs, as well asto shed light on the mechanism and the particularity of diagnostic andtherapeutic management of this kind of complications.

Introduction:-

The SARS-CoV-2 infection known as COVID-19 started in December 2019 in the Wuhan region of China. It is the cause of life-threatening pneumonia and has spread globally to the point of becoming a pandemic. Its clinical presentation can range from an asymptomatic profile to a severe clinical form including acute respiratorydistress syndrome, or death. In addition to these fairly frequentcomplications,a wide range of cardiovascular manifestations have and have been identified in patients with COVID19, usually associated with a poor prognosis, these manifestations include: thromboembolic events, acute coronary syndrome, heart failure and cardiogenic shock.

Case Report:-

This is a 37-year-old patient with no medical history or cardiovascular riskfactors, who presented to the emergency room for acute constrictive chestpain, radiating to the left upper limb.On clinical examination, we note a normal blood pressure with normal cardiopulmonary auscultation.

Theelectrocardiogram (H3) shows a regular sinus rhythm, ST segment elevation of 2 mm on anteroseptoapical (Figure 1)

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Coronary angiography done at H4, demonstrated an acute thrombotic occlusion of the distal part of the proximal anterior interventricularartery, including the origin of the first diagonal, revascularized by angioplasty with thrombectomy and placement of an active stent with success(Figure 2)

Biological tests shows high level of troponine T at 1326 ng/L (Normal value < 14 ng/L) and NTproBNPat 5166 pg/Ml(Normal value < 125 pg/mL);

A transthoracic echocardiogram (TTE) showing normalsized heart chambers, hypokinésia of the apex and adjacent segments with a normal ejection fraction.

Subsequently, at day 3 of admission fever and dyspnea was installed, so a PCR of SARS-COV-2 was done, coming back positive, and a thoracic CT objectifyng an aspect in favor of a Covid 19 disease, classified corads 5 (Figure 3)

The patient was put on conventional treatment for Covid 19 disease, with curative HBPM-based anticoagulation and double anti-plateletaggregation and statin.

The evolution was favorable,the symptoms gradually resolved over a 2 week period, and the troponin T level decreased after a few days. Control PCR carried out on day 15 came back negative.

Discussion:-

Despite the respiratory tropism covid 19 disease, the rate of cardiovascular involvement, and thromboembolic events remains non-negligible. It is difficult to highlight the precise mechanisms of acute myocardial damage because of its possible multiple implications, The ACE2 enzyme intrinsically involved in the physiology of cardiac function and in the development of hypertension and diabetes has been identified as a functional receptor for SARS-CoV-2.

Severalmechanisms can be at the origin of myocardial damage of coronary origin: by type 1 myocardial infarction (rupture of plaque favored by infection as is the case with influenza. Thus, the proposed mechanisms include the release of pro-inflammatory cytokines, resulting in inflammation of the myocardium, instability of the atherosclerotic plaque, and a hypercoagulable state) or type 2 myocardial infarction (mismatch between oxygen demand and supply due to respiratory failure and hypoxemia).Coronary spasm, microembols linked to the prothrombotic reaction or direct endothelial damage is also possible [3]

Sometimes, SCA ST + is the first manifestation of COVID-19 infection. Its clinical presentation is then very variable and often unusual. In fact, chest pain is not always present, ranging from 33% of cases in an American series to 78.6% of cases in an Italian series [4].

In a study that included 28 patients with COVID-19 (mean age 68 ± 11 years, high blood pressure 71.4%, diabetes 32.1%), admitted with ST-segment elevation myocardial infarction (STEMI) in Lombardy, coronary angiography found a guilty lesion to be revascularized in 60.7% of patients [5]

The various studies carried out [6], show us that with or without associated myocardial damage, abnormal elevations of myocardial damage markers (CK-MB, LDH, NT-pro-BNP and hs-cTnI) are widely present in patients diagnosed with COVID-19.

In a series of 341 patients, the elevation of troponin was greater in severe forms of COVID-19 and was associated with a poor prognosis [7]

The level of myocardial markers is affected by many factors such as sepsis, hypoxia and kidney function, and there may be false positives [8]. Therefore, an elevation of troponin alone does not constitute by itself evidence of myocardial infarction in the absence of a suggestive clinical background or supporting results of additional tests (ECG and echocardiography).

Echocardiography can find wall motion abnormalities or diffuse hypokinesiaornormal.

A left ventriculography can avoid performing an ultrasound, except in case of appearance of hemodynamic instability.

The absence of coronary obstruction on coronary angiography is frequent. These "pseudo-infarcts" may be related to the cytokine storm ofinfection, hypoxia of respiratory distress, coronary spasm, microembols linked to the prothrombotic reaction described in patients with COVID-19 or direct damage of the endothelium.

Many scientific societies have published guidance for acute coronary syndrome management for STEMI patients during the COVID-19 pandemic [9]. The Society for Cardiac Angiography and Interventions (SCAI) and American College of Cardiology continue to recommend primary percutaneous angioplasty the standard treatment of STEMI patients during the current pandemic and to carry out a complete revascularization if necessary, to avoid a new hospitalization in this context. [10, 11]

In France, where primary angioplasty is by far, the most widely used mode of revascularization in infarction, the epidemic has not modified this strategy with a rate of use of thrombolysis which has remained exceptional (2 %). This has not been the case in others countries such as China where thrombolysis has been much more used due to a share of very long transfer times and the dissemination, from the beginning of the epidemic, of a national protocol promoting this mode of revascularization in the acute phase of infarction [12]several studies report a decrease in the frequency of hospitalizations for myocardial infarction during the lockdown. This decrease seems to be mainly linked to a less frequent use of emergency services by patients, responsible for longer treatment times and therefore a poor prognosis.

Conclusion:-

Cardiovascular complications, including necrosis severe myocardial disease, can occur after asymptomatic or mild infection with coronavirus.

We aim through our case report to shed light on this complication, which can inaugurate symptomatology and therefore mask its initial etiology being the COVID19 disease.

ST-segment elevation myocardial infarction (STEMI) is a fatal cardiovascular emergency requiring rapid reperfusion treatment. During the coronavirus disease-2019 (COVID-19) pandemic, medical professionals need to strike a balance between providing timely treatment for STEMI patients and implementing infection control procedures to prevent nosocomial spread of COVID-19 among health care workers and other vulnerable cardiovascular patients.

Conflict Of Interest

The authors declare no competing interest.

Figure Legends:

Figure 1:- EKG showing ST segment elevation of 2 mm on anteroseptoapical.

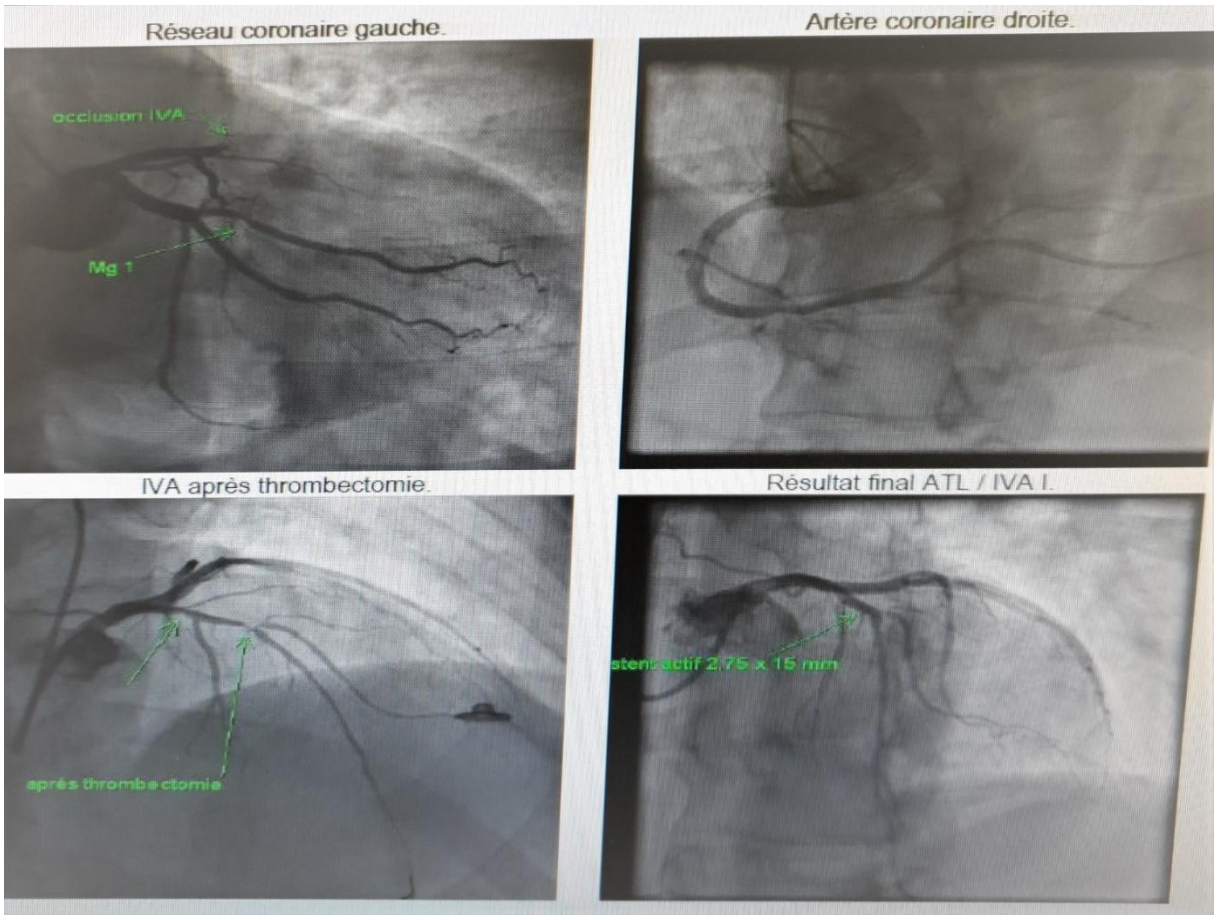

Figure 2:- Coronary angiography demonstrated an acute thrombotic occlusion of the proximal anterior interventricular artery, including the origin of the first diagonal (a) revascularized by angioplasty with thrombectomy and placement of an active stent (b)

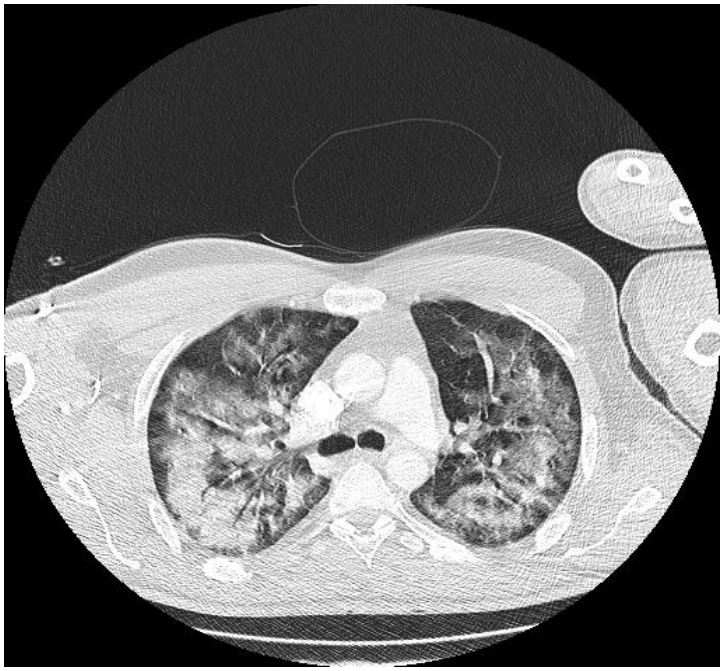

Figure 3:- Thoracic CT showing an aspect in favor of covid 19 disease (75% of the lung parenchyma).

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