

Pulmonary thromboembolism in a patient with scant symptomatology due to COVID-19, treated at the Cuban hospital in Qatar

Tromboembolismo pulmonar en paciente con escasa sintomatología por COVID19, atendido en el hospital cubano en Catar

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SUMMARY

Coronavirus disease (COVID-19) is caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). For the follow-up of the disease, chest radiography, and chest computed tomography are useful and sensitive, showing the lesions of the lung parenchyma. The risk of pulmonary thromboembolism is increased in this disease, which can be diagnosed by chest CT angiography, looking for the presence or absence of a thrombus in the pulmonary arteries. This study presents the case of a 36-year-old male patient, from India, without comorbidity, who was admitted in the Cuban Hospital in Qatar with the diagnosis of COVID-19. During the progress of the disease, he was clinically stable, with only a slight increase in respiratory rate, scant symptomatology, and chest right side pain. Laboratory tests, including D-dimers, were altered, arousing the suspicion of pulmonary thromboembolism. Chest CT angiography was performed, which confirmed the diagnosis. Anticoagulant treatment was prescribed, which improved the progress of the patient until his medical discharge.

Keywords: CORONAVIRUS; COVID-19; PNEUMONIA; THROMBOEMBOLISM.

Descriptors: CORONAVIRUS; COVID-19; PNEUMONIA; THROMBOEMBOLISM.

RESUMEN

La enfermedad por coronavirus, COVID-19, es causada por el nuevo síndrome respiratorio agudo severo por coronavirus 2 (SARS-CoV-2). Para el seguimiento de la enfermedad son útiles y sensibles la radiografía y la tomografía de tórax, evidenciando las lesiones del parénquima pulmonar. El riesgo de tromboembolismo pulmonar se incrementa en esta enfermedad, pudiendo ser diagnosticadas por AngioTAC de tórax, en busca de la presencia o no de trombo en arterias pulmonares. Se presenta el caso de un paciente masculino de 36 años, procedente de India, con antecedentes de salud, sin comorbilidad, ingresado en el hospital cubano en Catar con el diagnóstico de COVID-19, que durante la evolución de su enfermedad se mantuvo clínicamente bastante estable, solo con discreto incremento de la frecuencia respiratoria, escasa sintomatología, y dolor en punta de costado. Los exámenes de laboratorio, incluyendo los Dímeros-D, estaban alterados, dando sospechas de un tromboembolismo pulmonar. Se realizó AngioTAC de tórax, corroborándose el diagnóstico. Se prescribió tratamiento anticoagulante, mejorando la evolución del paciente hasta su alta médica.

Palabras clave: CORONAVIRUS; COVID-19; NEUMONÍA; TROMBOEMBOLISMO.

Descriptores: CORONAVIRUS; COVID-19; NEUMONÍA; TROMBOEMBOLIA.

INTRODUCTION

Coronavirus disease (COVID-19), caused by the new severe acute respiratory syndrome by coronavirus 2 (SARS-CoV-2), emerged in Wuhan, China, in December 2019. ⁽¹⁾ Until July 13, 2020, the disease was considered a pandemic global, with a total of confirmed cases in Qatar of 103 thousand 598 and 147 deaths. ⁽²⁾

For the diagnosis of the same, it is used the reverse-transcription-polymerase-chain-reaction (RT-PCR), that is performed on the sample taken from the nose, oropharynx, or bronchial lavage. The primary and preferred method for the diagnosis of COVID-19 is the collection of the upper airway sample from the nasopharynx and oropharynx with a swab. ⁽³⁾



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For the follow-up of the disease, it is useful and have high sensibility the chest tomography. Typical Findings in individuals with COVID-19 are, ground glass opacities, particularly in the periphery and inferior lobes, and multiple subsegmental and lobular areas of condensation, especially in patients admitted to care units intensive (ICU). Non-typical findings include pleural effusion, masses, cavitation, and lymphadenopathy, which, therefore, should suggest alternative diagnoses. ⁽⁴⁾

One of the complications described in COVID-19 is pulmonary thromboembolism (PTE). The coronavirus increases the risk of suffering this disease, which can be diagnosed by AngioTac of the thorax, where it can be demonstrated or not the presence of thrombus in one or more of the pulmonary arteries. Sometimes PTE is seen in patients who rapidly worsen their respiratory condition and fall into the acute respiratory syndrome, raising the risk of death. On the other hand, several authors demonstrate the direct relationship between risk of PTE and D-dimers values, thrombocytopenia, activity of plasma factor VIII, Von antigen Willebrand. ⁽⁵⁻⁷⁾

The morbidity and mortality of PTE are high, despite advances in diagnosis and cardiovascular treatment. The annual report of the incidence of venous TE is between 23 and 69 per 10000 inhabitants, with approximately a third of patients with pulmonary thromboembolism and two thirds with deep vein thrombosis (DVT). It has been estimated that 10% of patients with PTE die during the first 1-8 months, 1% of patients admitted to hospitals die of PTE and 10% of all in-hospital deaths have a relationship with this disease. ⁽⁸⁻⁹⁾

Based on current knowledge, gravity of this disease, its high mortality, morbidity and lethality, and in the context of the pandemic by COVID-19, it is made this case presentation, with the objective of reviewing the clinical diagnosis, radiological and laboratory and contribute to the update it. Hope that it will be used as a gateway to future research.

CASE REPORT

He is a 36-year-old male patient, from India, with a health history, without comorbidity, admitted to "The Cuban Hospital" from Qatar with the diagnosis of COVID-19; he came from a quarantine institution after contact with an infected patient of COVID-19, and demonstrated test positive for RT-PCR. In the clinical evolution, from the first day to the tenth day, he complained of cough, chest right side pain, discreet shortness of breath; on the physical exam there was only respiratory rate (RR) 16 'min, which kept oscillating until 20' min. Based on the X-ray and laboratory findings, pneumonia was diagnosed and antibiotics were administered. From the eleventh day to the thirteenth day: The most important finding was increased D-dimer, for this reason, it was decided to incorporate enoxaparin into treatment and was performed CT scan of the chest due to the suspicion of pulmonary thromboembolism, the patient kept complaining in the interrogatory of cough and chest right side pain, respiratory rate 19 'min. From the fourteenth to the twenty-six day of the discharged: the patient reports feeling much better, the pain on his side disappeared and a sporadic dry cough persists. He progressed positively until discharged with a prescription of rehabilitation therapy in the primary health area.

TABLE 1. Evolutionary results of laboratory tests by days

Parámetros	1 st day	4 th day	8 th day	13 th day	14 th day	15 th day	16 th day	17 th day
WBC	17,87	10,94		10,78	10,86			
Platelets	491	399		373	367			334
Neutrophils	14,6	9,3		7,3	7,4			
D-dimers	4,35	2,2	4,4	3,2	3,63	4,2	2,6	
Alkaline phosphatase	101	155	164		103			
ALT	54	332	272		69			
AST	28	176	96		27			
LDH	321	363	353					
CRP	294		74		45			
Ferritin	1240	2083	1747	705	603			

Legend: WBC - white blood cells; ALT - alanine aminotransferase; AST - aspartate aminotransferase; LDH -lactate dehydrogenase.

It was described as a patient who was becoming clinically complicated, although he remained stable; only was described a slight increase in respiratory

rate and few symptoms, such as chest right side pain, which disappeared on day 14 after medical treatment prescribed for suspected

thromboembolism. It was evolving satisfactorily so far of discharge, being his hospital stay of 26 days in total, he is currently under rehabilitative therapy.

The evolution of laboratory tests is shown in table 1, where it can be seen that from admission the patient had altered biomarkers, which are usually used to predict poor response in COVID19 disease: ⁽³⁾ number of white blood cells in the blood (WBC) with a baseline value of 17.87 mmol / L, neutrophils

14.6%, altered liver enzymes, LDH, and C-reactive protein both increased. In particular, the augmented WBC corroborated the clinical suspicion of sepsis, for which it was added antibiotic to treatment, with a good response: decrease in WBC to 10.94 mmol / L, 10.78 mmol / L, and 0.86 mmol / L on days 4, 13 and 14, respectively. Platelets were observed altered only at the beginning of the table, it should be noted that this result associated with D-dimer, ferritin, time prothrombin, and C-reactive protein should have to make suspect from the beginning the probability of

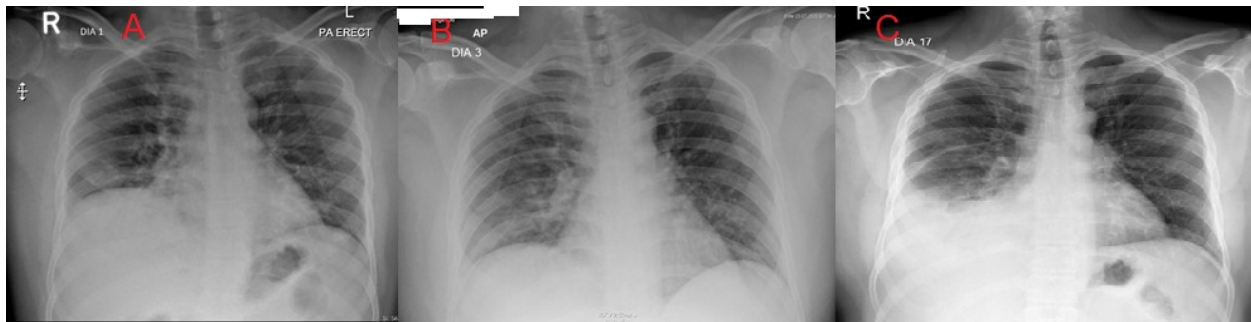
pulmonary thromboembolism since these values have been described as predictors of this complication and PTE. ⁽⁵⁻⁷⁾

Laboratory tests played an important role in the description of the patient's evolution; they were modifying while the treatment of associated conditions have been adjusting; the laboratory tests are useful in patients like this, with only a few symptoms of its complications.

Radiological evolution

On the day of admission, an alveolar reticulum pattern was evidenced in both pulmonary fields predominantly at bases, with no evidence of condensation of the lung parenchyma at that time, as observed in the admission radiograph (**Image 1A**). Two days later an evolutionary study was carried out, where a reticular-alveolar shading was observed on both lung bases, compatible with pneumonia by COVID-19; the representation of the description is shown in **image 1 B**.

IMAGE 1. The three AP chest radiographs corresponding to days 1 (A), 3 (B) and 17 (C) are shown, note the progressive worsening



On day 14 of admission, CT angiography of lung was performed, due to the clinical suspicion of PTE; a thrombus was demonstrated in the right lower basal pulmonary artery, right pleural effusion, and partial

condensation of the posterior and lateral segment of the right lower lobe (**image 2 A and B, image 3 A and B**).

IMAGE 2. A, 5 mm coronal reconstruction of the simple study, the right lower lobar artery is indicated, note the thickening of the minor fissure. Artery phase B image showing the thrombus in the lower lobar branch of the right pulmonary artery

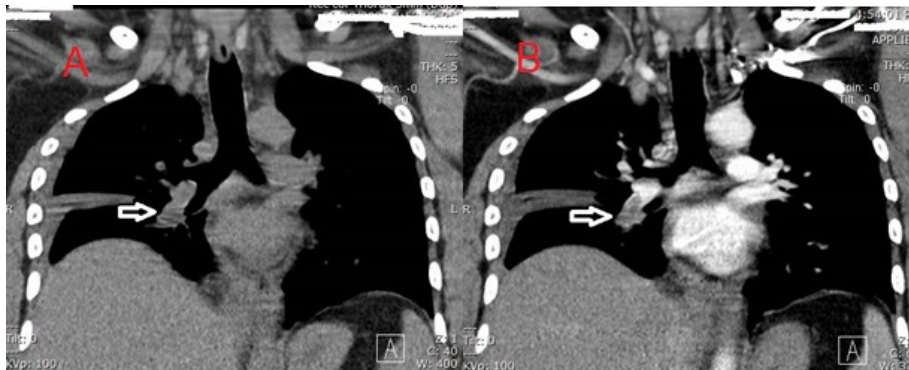
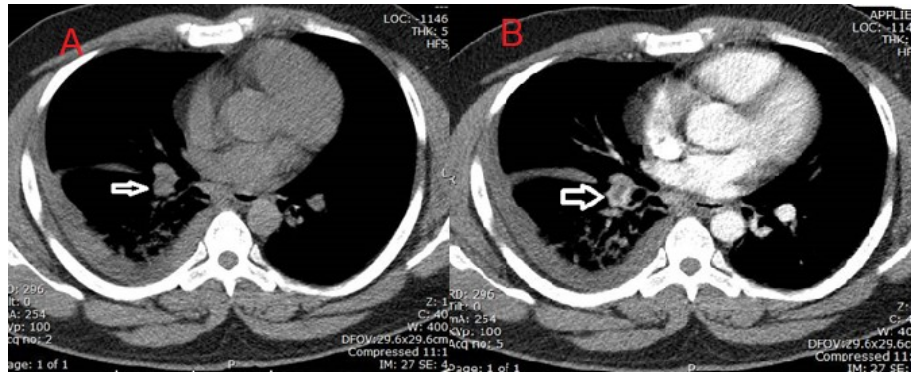


IMAGE 3. A Simple study of 5mm thickness where the right lower lobar artery is indicated, note the thickening of the minor fissure, the pleural effusion and the partial condensation of the right basal lateral and posterior segment. Artery phase B image showing the thrombus in the lower lobar branch of the right pulmonary artery



A third X-ray was performed on the 17th day of admission, showing a clear deterioration and worsening of the radiological pattern, with evidence of right pleural effusion, thickening of the minor fissure, and peripheral pulmonary condensation in the right lung base (**image 1C**). Based on these findings the diagnosis of PTE was done, after that, treatment was prescribed, and the patient condition improve, for this reason was decided to follow the patient evolution as per clinical and laboratory result.

DISCUSSION

The patient maintained a stable clinical evolution, only reported pain in the chest right side and cough; one of the causes of this satisfactory evolution, despite the fact that he suffered a PE, is his health history and the absence of risk factors for COVID-19. However, he maintained discreet tachypnea all the time, the evolution of the laboratory tests and the radiological evolution was invaluable for the diagnosis of PTE and the follow-up. The early administration of anticoagulants favored satisfactory evolution, although with a prolonged total stay time of 26 days.

Poissy et al, 2020, ⁽⁵⁾ compared a series of 107 confirmed cases of COVID 19 admitted to the ICU, with 192 patients admitted in the same period and place, but the previous year, where an increase in the frequency of PTE was evidenced, up to 20%, compared to 7.5%. On the other hand, Bompert et al., 2020, ⁽⁶⁾ in a retrospective study of 135 patients

with a positive test for COVID 19 and pneumonia, determined: higher frequency of the male sex, obesity as a risk factor, elevated D-dimers, higher frequency of intubation and long hospital stay, with increased mortality and confirmation by CT with IV contrast, demonstrated thrombi in pulmonary arteries. Our patient evolved satisfactorily, although the laboratory and radiological examinations of the case agree with the results of the mentioned authors.

Zerbini et al, 2020, ⁽⁷⁾ Rotzinger, 2020, ⁽¹⁰⁾ Nahar et al, 2016, ⁽¹¹⁾ Wagas Ullah et al, 2020, ⁽¹²⁾ presented patients with a positive diagnosis of COVID 19 and radiological images of PET, a Clinical picture similar to that described by the other authors and increased D-dimers, showing peripheral pulmonary condensation and thrombi in the right pulmonary artery on CT scan. They conclude that before the increase in D-dimers or worsening of the clinical picture, a tomographic study should be carried out in search of PTE. ^(7,10-12) The author of this case presentation agrees with that approach.

Larger studies with larger cohorts should be done to reach conclusions that are reproducible and generalizable, but the studies suggest that COVID-19 increases the risk of PTE, thus increasing the risk of death, so an early diagnosis should be made and the administration of anticoagulants, if not contraindicated, even if the presence of thrombi is not demonstrated in the imaging study. CT angiography seems to be useful in the diagnosis of this pathology.


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Declaration of authorship

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Carried out the conception and design of the article. He participated in the analysis of the elements of the case. He drew up versions of the article.

The author declares that there are no conflicts of interest.

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