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Pulmonary Embolism, the Only Demonstration of Covid-19 in a 53-year-old Patient

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On March 30, 2021, a 53-year-old man was hospitalized, complaining of breath shortness, chest pain, and pain in his right leg from 2 weeks ago when he went mountain climbing. His symptoms did not improve, and his shortness of breath worsened. Therefore, he went to a hospital and was hospitalized to investigate the possibility of Deep Vein Thrombosis (DVT) and Pulmonary Thromboembolism (PTE) further. At admission, O2 sat was 91, followed by Respiratory Rate (RR) of 18 and White Blood Cell (WBC) of 9.6. The patient was admitted to Coronary Care Unite (CCU), and color Doppler sonography, echocardiography, and pulmonary angiography were conducted.

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admission, O2 sat was 91%, followed by RR of 18 and WBC of 9.6 × 10^3 /µL. The patient was admitted to CCU, and color Doppler sonography, echocardiography, and pulmonary angiography were conducted:

- Angiography
- PTE diagnosis
- Echocardiography
- Normal (Nl) Left Ventricle (LV) size and systolic function
- Ejection Fraction (EF) =50%
- Mild to moderate PVC(Premature Ventricular Contractions) (36 min)
- Moderate Tricuspid regurgitation (TR)
- Systolic Pulmonary Artery Pressure (SPAP)= 40
- Color Doppler sonography

Thrombosed Echo in Right Superficial Femoral Vein (R-SFV)and Right Popliteal vein (R-POP) , no normal arterial flow was observed and reported non-compressible in the analysis. Therefore, a sub-massive PTE was proposed for the patient, but he left the hospital with personal consent and received a prescription of 15 mg rivaroxaban twice a day.

In the examination, his right leg was swollen and had a size increase compared to lower extremities. It was firm and tender when touched. Therefore, microangiopathy was evident in the lower right extremities. The patient's abdomen was distended, and a surgical scar was visible. Vital signs were recorded:

- O2 saturation : 94% (without O2)
- Blood pressure (BP): 122/87 mmHg
- Pulse Rate (PR): 83/min
- RR: 21/min
- Temperature (T): 37.2

The patient was admitted to Baghiatallah Hospital on March 30, 2021. He received 8000 units of heparin stat. The first day of hospitalization tests were as follows: WBC 6.7 poly 57 lymph 31

- Hemoglobin(HB): 17.1 g/ dL
- Aspartate aminotransferase(AST) : 23 U/L
- Alanine aminotransferase (ALT) :42 U/L
- Alkaline phosphatase(ALP) : 255 U/L
- Troponin I : 0.002 ng/ml
- Erythrocyte Sedimentation Rate (ESR) 1hr : 26 mm/hour
- C-reactive protein (CRP) : 43.3 mg/l
- Prothrombine Time (PT): 21.5 Sec
- Partial Thromboplastin Time (PTT) : 33 Sec
- International Normalized Ratio (INR): 1.7 Sec

On the first day of hospitalization on March 30, a color Doppler sonography of arteries and vein was done at the right lower extremities of the patient. The results were reported as the following:

The pop vein demonstrated that the proximal SFV vein was dilated, presenting a non-compressible venous, and contains echogenic material (venus thrombosis). Moreover, the small saphenous vein from Saphenopopliteal Junction (SPJ) to the distal vein was dilated, non-

compressible, and contained echogenic material in favor of thrombophlebitis (Figure 1). The right external iliac was found to be normal. The right lower extremities were also normal. On the advice of an internal physician, heparin was prescribed to the patient. The patient received a dose of rivaroxaban. Then Transthoracic echocardiography (TTE) was performed.

- LVEF :50%
- PAP: 35 mmHg
- Trivial Mitral Rigurgitation (MR)
- Mild TR
- Normal LV size with mild systolic dysfunction
- Hypokinesis (HK) of septum diastolic dysfunction
- Moderate RV enlargement with mild systolic dysfunction

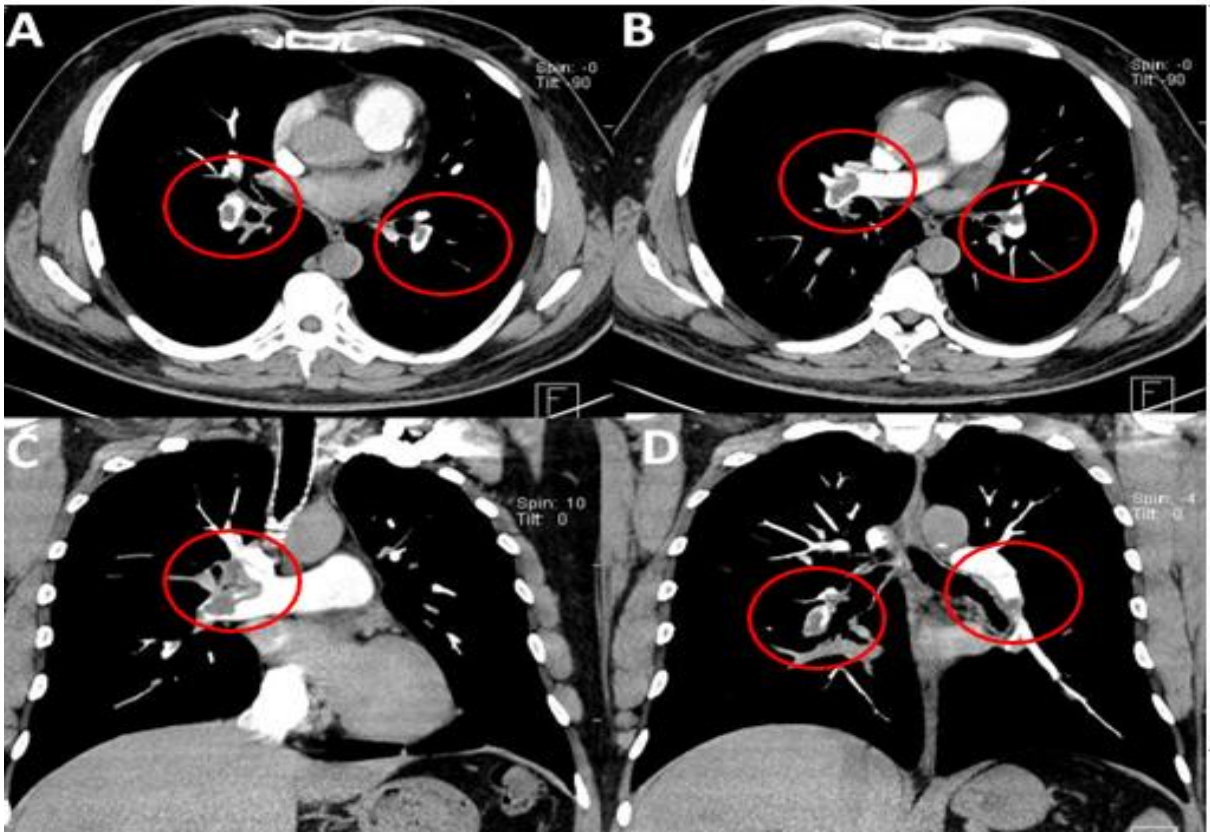

Figure 1. CT angiographicaxial (A-B) and coronal reconstruction (C-D) showed hypodense filling defect and thrombus (Red circles) in hilar branches of the right and left pulmonary arteries compatible with pulmonary thromboembolism (PTE).

On March 30, 2021, the O2 sat without oxygenation was recorded at 85. The lung consultation prescribed SQ 80 mgr. Clexane 80 mg SQ every 12 hours (31.3.2021). According to the surgical consultant, clexane was removed on the same day, 2000 per units/kg/hour. It was also recommended to keep your lower right leg up to a height of 70. Moreover, the nasal swab Polymerase Chain Reaction (PCR) test for COVID-19 was positive with N gene (CT number) :36. The patient's urine test and culture were found to be negative, and INR was also reported to be 1.2 sec.

On March 30, 2021, the pulmonary Computerized Tomography (CT) angiography was done. Here are the results: A filling defect was seen within the RT main pulmonary artery with extension to the upper, middle, and lower interlobar branches consistent with acute thromboembolism.

On April 01, 2021, the lung consultation described the chest CT as non-diagnostic and ordered a repetition of Tissue Doppler Imaging (TDI) echocardiography. The heparin intake of the patient was then stopped. The patient's O2 sat was 93%. The TTE was repeated. The results were as follows:

- Nl LV size
- Lv EF 50%
- Mildly enlarged RV reduced function
- Mild MR
- Mild TR
- Normal pap 25
- LAD 3.4
- The PCR test was again positive
  Date: 1.4.2021

  PCR: positive

  N gene (CT): 35

  RdRp gene (CT): 36

On April 02, 2021, the patient's O2 sat was 94. He got out of bed on April 03, 2021. On the advice of an internal physician, the patient started taking 10 mg of apixaban (every 12 hours) from the morning of April 03, 2021, and the enoxaparin tablet was removed. The patient was discharged from the hospital on April 03, 2021, with INR 1.7 and a good overall condition. The symptoms were healing with 15 mg axabin q12hr. The patient was also advised to do another echoangiography. Our patient was in good overall condition at his outpatient visit for echoangiography on April 13, 2021, and had no complaint. TTE + TDI was done for the patient.

- Nl LV size and LVEF 50
- Mildly enlarged RV size and Nl function
- (Reduced function in RV, which was already reported in the previous echoangiography)
- Mild TR

Due to the COVID-19 pandemic and the variety of symptoms arising from it ,for any patient with any symptom, we should consider COVID-19 as differential diagnosis. This case study shows covid-19 vaccination may be related with DVT and PTE and we need more studies to corroborate it.

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