TURKISH JOURNAL OF INTERNAL MEDICINE
ISSN:2687-4245
Case Report

Pulmonary Embolism Developing Despite the Use of Anticoagulants in COVID-19 Pneumonia: A Case Report

Iffet Beril GOKMEN[1], Sidelya Ecem YIGIT[1], Yıldız OKUTURLAR[1], Gul DABAK[2], Iftihar KOKSAL[3]

[1]Acıbadem Mehmet Ali Aydınlar University Faculty of Medicine, Department of Internal Medicine, Division of General Internal Medicine, Istanbul, Turkey
[2]Acıbadem Mehmet Ali Aydınlar University Faculty of Medicine, Department of Chest and Lung Diseases, Istanbul, Turkey
[3]Acıbadem Mehmet Ali Aydınlar University Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Istanbul, Turkey

ABSTRACT

COVID-19 pneumonia is one of the diseases that can cause hypercoagulability. It is not uncommon to encounter arterial or venous thromboembolic events during COVID-19 infection. In this case, we wanted to discuss a case of a pulmonary embolism due to COVID-19 infection, which developed despite the usage of therapeutic dosage of anticoagulants. A 41-year-old male patient with a known diabetes mellitus was admitted to our clinic with complaints of cough and headache. The patient was found to be COVID-19 positive. Along with steroid treatment, 2x6,000 IU enoxaparin treatment was initiated for the patient. He developed sudden respiratory distress and showed an increase in oxygen demand. D-dimer value increased abruptly to 35.2 mg/L. Pulmonary CT angiography showed multiple bilateral subsegmental pulmonary embolisms. Since COVID-19 infection can cause arterial and venous thromboembolic events in patients following up with COVID-19 pneumonia, prophylactic anticoagulation should be initiated in hospitalized patients. Attention should be paid to signs of bleeding, and dose adjustment should be made by monitoring coagulation parameters.

Turk J Int Med 2022;4(Supplement 1):S160-S163
DOI: 10.46310/tjim.1073686

Keywords: *COVID-19, pneumonia, hypercoagulability, thromboembolic events, pulmonary embolism.*

Introduction

COVID-19 pneumonia is one of the diseases that can cause hypercoagulability. It is not uncommon to encounter arterial or venous thromboembolic events during COVID-19 infection. Many changes in circulating prothrombotic factors have been reported or proposed in patients with severe COVID-19, such as elevated levels of factor VIII, fibrinogen, circulating prothrombotic microparticles, neutrophil extracellular traps (NETs) and hyperviscosity.[1,2] Venous thromboembolism (VTE), including extensive deep vein thrombosis (DVT) and pulmonary embolism (PE), was very common in acutely ill patients with COVID-19 during the early

Received: February 15, 2021; Accepted: March 09, 2021; Published Online: March 14, 2022

Address for Correspondence:
Iffet Beril Gokmen, MD
Acibadem Mehmet Ali Aydınlar University Faculty of Medicine, Department of Internal Medicine, Division of General Internal Medicine, Istanbul, Turkey
E-mail: berilgk@gmail.com

stages of the pandemic. Even when prophylactic anticoagulation was used, it is seen in up to one-third of patients in the intensive care unit (ICU).[3,4] Therefore, the importance of the usage of anticoagulant therapy and the follow-up of coagulation parameters, especially in inpatients, is obvious. In this case, we wanted to discuss an issue of a pulmonary embolism due to COVID-19 infection, which developed despite the usage of therapeutic dosage of anticoagulants.

Case Report

A 41-year-old male patient with no comorbidities other than a diagnosis of diabetes mellitus was admitted to our clinic with complaints of cough and headache lasting for seven days. The patient's saturation was 95% at room air. Heart rate was 95 beats/min, arterial blood pressure was 155/87 mmHg, and respiratory rate was 19 per minute. There were widespread bilateral crackles in all zones on auscultation of the lungs. The abdomen was not defensive to palpation, and there was no rebound tenderness. There were bilateral ground-glass consolidations on obtained thorax computed tomography (CT). The patient was not vaccinated against COVID-19. The patient was found to have a positive COVID-19 PCR test with a nasal and throat swab was admitted to our clinic for treatment and supportive care. In the laboratory tests performed on the first day of his hospitalization, D-dimer was found to be 1.03 mg/L. CRP was determined as 10.87 mg/dL, INR 0.9, and fibrinogen as 731 mg/dL. Along with steroid treatment, inhaler interferon and supportive treatment, 2x6,000 IU enoxaparin treatment was initiated to the patient who weighed 78 kilograms.

Since the patient developed hemoptysis on the 3rd day of follow-up, enoxaparin was started to be administered as a single dose of 6,000 IU and was used as a single dose for two days. On the 5th day of follow-up, the patient, who was supported with 4 L/min nasal oxygen support, developed sudden respiratory distress and increased oxygen demand. The patient was then supported with an 8 L/min reservoir oxygen mask. The patient's D-dimer value increased abruptly to 35.2 mg/L (*Figure 1*). With the current clinical and laboratory findings and a preliminary diagnosis of pulmonary embolism, the dose of enoxaparin was increased to 2x8,000 IU and pulmonary CT angiography was performed. Pulmonary CT angiography

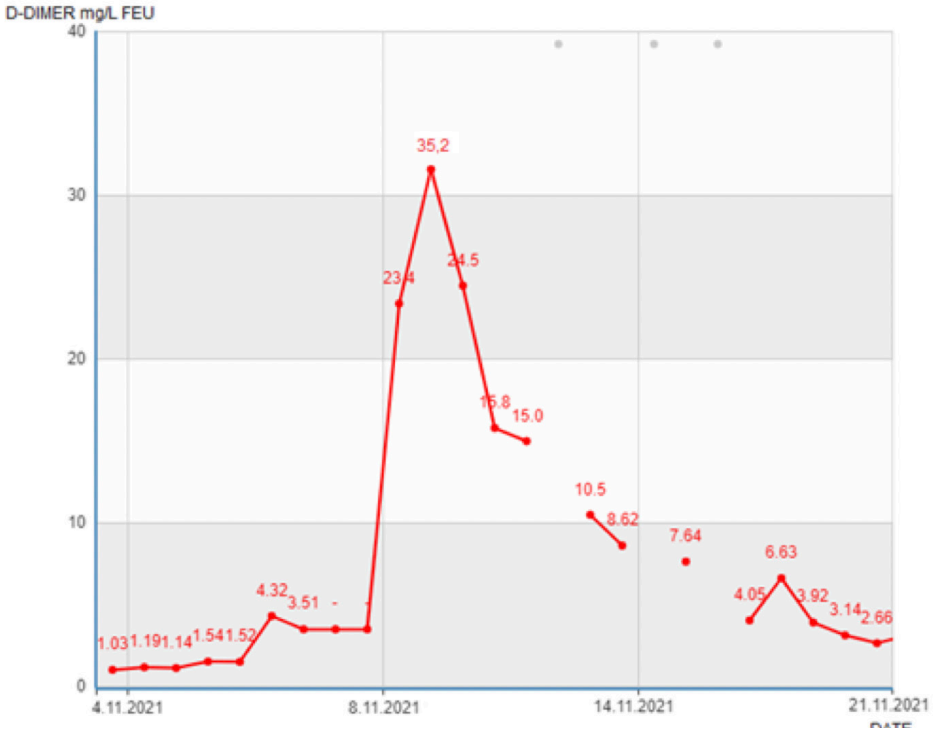

Figure 1. Daily D-dimer values.

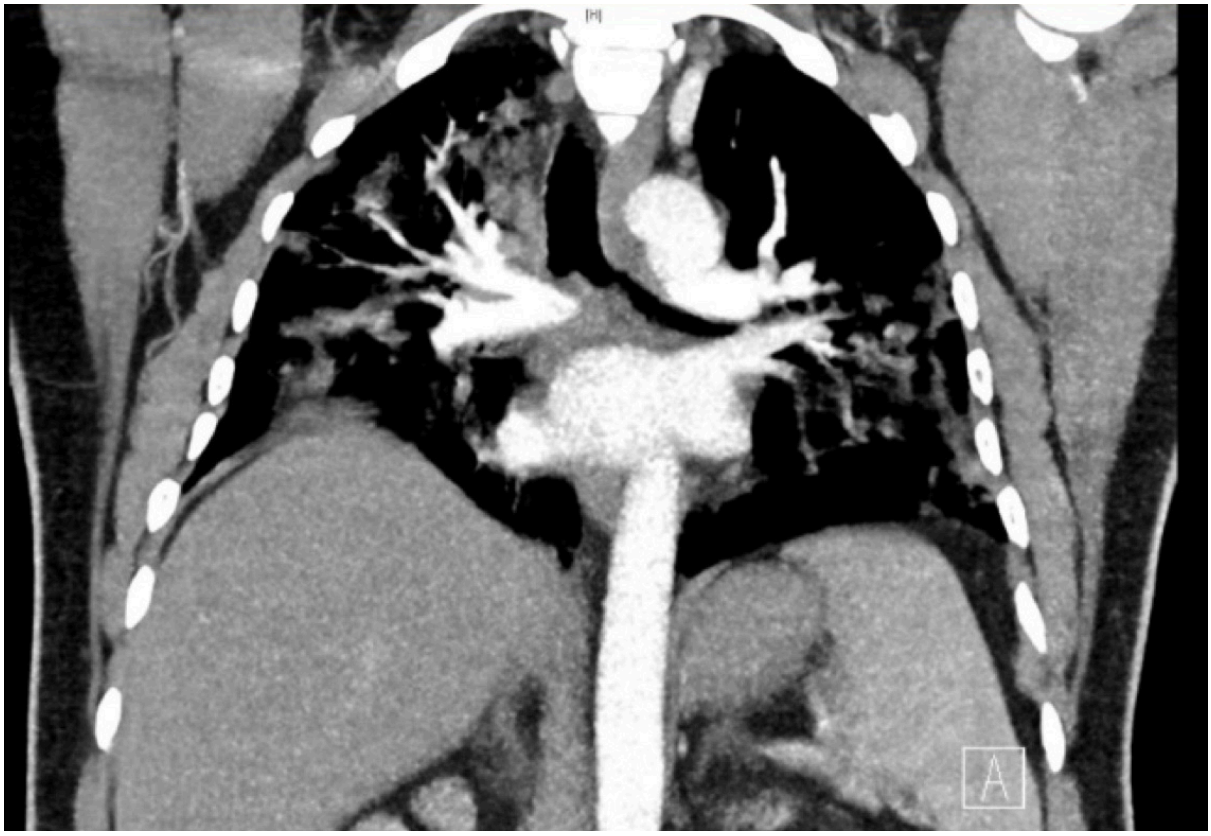

Image 1. Bilateral partial filling defects in subsegmental pulmonary arteries consistent with pulmonary embolism.

showed multiple bilateral partial filling defects in subsegmental pulmonary arteries, mainly in the posteroinferior segment of the left lung compatible with pulmonary embolism (*Image 1*). The patient showed no signs of discolouration, temperature increase, tenderness, swelling or pain in his lower extremities. There was no finding of deep vein thrombosis in the lower extremity venous doppler ultrasonography. The patient continued to use 2x8,000 IU enoxaparin, and the D-dimer value gradually decreased to 4.05 mg/L in the follow-ups. The treatment of the patient who did not have deep vein thrombosis and had pulmonary embolism foci in the subsegmental areas were arranged in consultation with the department of cardiovascular surgery and chest diseases. The patient was discharged after his clinical condition improved. There was no desaturation at room air on the 14th day with supportive, steroid and anticoagulant treatment, and he continued his prescribed medicine to be later seen at office visits.

Discussion

This systematic review of the evidence suggests that hospitalized patients with COVID-19, screened or assessed for VTE, present a pooled prevalence of DVT and PE at about 30% each, despite thromboprophylaxis in most cases. The VTE risk appears to be considerably higher than in patients without COVID-19 admitted in the same ICU's.[4] A meta-analysis of a total of 91 studies reporting on 35,017 patients with COVID-19 showed the overall frequency of VTE in all patients, ICU and non-ICU, was 12.8%, 24.1%, and 7.7%, respectively.[5]

Cytokine storm induced by the COVID-19 profoundly activates the coagulation cascade causing venous thromboembolism.[5] The risk of developing venous thromboembolism continues even if prophylactic anticoagulants are used in COVID-19 cases who are hospitalized and followed up especially in the ICU.

Keeping in mind that COVID-19 infection can cause arterial and venous thromboembolic events in patients followed up with COVID-19 pneumonia, increase in oxygen demand, sudden dyspnea, deterioration in general condition or in patients with a significant increase in serial D-dimer follow-ups as in our case, diagnoses such as pulmonary embolism, obstructive cerebral disease and myocardial infarction should also be considered in differential diagnosis. Therefore, prophylactic anticoagulation should be initiated in hospitalized patients, attention should be paid to signs of bleeding, and dose adjustment should be made by monitorization of coagulation parameters.

Acknowledgment

This study has been presented in 18th Uludag Internal Medicine National Winter Congress, 7th Bursa Family Medicine Association National Congress, 12th Uludag Internal Medicine Nursing Congress, 3-6 March 2022, Bursa, Turkey.

Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Authors' Contribution

Study Conception: IBG, SEY, YO; Study Design: YO, SEY, IK; Supervision: YO, IK, SEY; Materials: IBG, SEY; Data Collection and/or Processing: IBG, SEY; Statistical Analysis and/or Data Interpretation: IBG, SEY; Literature Review: IBG, SEY, YO; Manuscript Preparation: IBG, SEY, YO, IK; Critical Review: YO, IK, SEY, IBG.

References

1. Panigada M, Bottino N, Tagliabue P, Grasselli G, Novembrino C, Chantarangkul V, Pesenti A, Peyvandi F, Tripodi A. Hypercoagulability of COVID-19 patients in intensive care unit: A report of thromboelastography findings and other parameters of hemostasis. J Thromb Haemost. 2020 Jul;18(7):1738-42. doi: 10.1111/jth.14850.
2. Maier CL, Truong AD, Auld SC, Polly DM, Tanksley CL, Duncan A. COVID-19-associated hyperviscosity: a link between inflammation and thrombophilia? Lancet. 2020 Jun 6;395(10239):1758-9. doi: 10.1016/S0140-6736(20)31209-5.
3. Mansory EM, Srigunapalan S, Lazo-Langner A. Venous thromboembolism in hospitalized critical and noncritical COVID-19 patients: A systematic review and meta-analysis. TH Open. 2021 Jul 6;5(3):e286-e294. doi: 10.1055/s-0041-1730967.
4. Kollias A, Kyriakoulis KG, Lagou S, Kontopantelis E, Stergiou GS, Syrigos K. Venous thromboembolism in COVID-19: A systematic review and meta-analysis. Vasc Med. 2021 Aug;26(4):415-25. doi: 10.1177/1358863X21995566.
5. Dolhnikoff M, Duarte-Neto AN, de Almeida Monteiro RA, da Silva LFF, de Oliveira EP, Saldiva PHN, Mauad T, Negri EM. Pathological evidence of pulmonary thrombotic phenomena in severe COVID-19. J Thromb Haemost. 2020 Jun;18(6):1517-9. doi: 10.1111/jth.14844.