Incidental finding of mild COVID-19 pneumonia with multiple thromboembolic disease: A case report

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Abstract
Corona virus disease is thought to be of zoonotic origin which has been named SARS-CoV-2 (COVID-19) and was first introduced in Wuhan, China, in December 2019. Although the corona virus-associated inflammatory state can additionally lead to significant thromboembolic complications despite prophylaxis, previous studies have reported the clinical manifestations of SARS-CoV-2 are varied, ranging from asymptomatic to severe. Here, we reported a 69-year-old female infected with COVID-19 pneumonia, presenting with shortness of breath, chest pain, and left leg swelling for 1 week. Although the patient has history of chronic disease, she was diagnosed with pulmonary thromboembolism and deep vein thrombosis (DVT) from mild case of COVID-19 pneumonia.

Keywords
SARS-CoV-2, pulmonary thromboembolism, deep vein thrombosis

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Introduction
COVID-19 pneumonia is a highly communicable disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) and appears to be associated with increased thrombotic events including arterial thrombosis, pulmonary embolism (PE), and deep vein thrombosis (DVT). Myocardial damage can also occur throughout several mechanisms in COVID-19 infected patients, particularly in those with pre-existing cardiovascular disease.

The clinical manifestations of SARS-CoV-2 are varied, ranging from asymptomatic to severe, including acute respiratory distress syndrome, thromboembolic events, and multi-organ failure. Patients with COVID-19 and coagulopathy were described by increased D-dimer levels, a modest reduction in platelet count, and a prolongation of the prothrombin time, some of which are conclusively associated with disease severity and an increased risk of death. Here, we report a patient with mild COVID-19 pneumonia who abruptly developed pulmonary embolism and complete femoro-popliteal venous thrombosis.

Case report
A 67-year-old female with no known history of chronic disease came to the emergency department with shortness of breath, chest pain, and left leg swelling for 1 week. Also patient has history of fever and non-productive cough before 2 weeks. The patient denied any chronic diseases like diabetes, hypertension, and heart disease. Also the patient had no risk factors and no familial history of venous thromboembolism (VTE). On emergency department admission, she was a febrile, with blood pressure of 106/67 mm Hg, pulse rate of 90 bpm, respiratory rate of 24, and SpO2 of 95% on room air. On her physical examination revealed with decreased air entry on both lungs. Her laboratory findings demonstrated D-dimer (quantitative) >10 mg/L, and C-reactive protein (CRP) was 69 mg/dL, while other blood results were normal range (Table 1).

Electrocardiography (EKG) revealed normal sinus rhythm with right ventricular hypertrophy (Figure 1). Chest computerized tomography angiography (CTA) was obtained and revealed a filling defect in the main pulmonary arteries.

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Table 1. Summarizing of Laboratory results on Admission.

| Blood investigations | Results     | Normal range |
|----------------------|-------------|--------------|
| WBC                  | 8.49 X1000/m|              |
| HGB                  | 10.4        | 12–16 mg/dL  |
| PLT                  | 257         | X1000/m      |
| Urea                 | 21          | 10–45 mg/dL  |
| Creatinine           | 0.69        | 0.5–1.35 mg/dL|
| AST                  | 19          | 0–31 U/L     |
| ALT                  | 16          | 0–45 U/L     |
| Sodium               | 137         | 135–150 mEq/L|
| Potassium            | 4.33        | 3.5–5.5 mEq/L|
| Albumin              | 2.8         | 3.5–5.5 g/dL |
| Glucose              | 157         | 60–110 mg/dL |
| D-dimer              | 0.0        | >10          |
| LDH                  | 369         | 0–247 mg/dL  |
| Ferritin             | 715.9       | 12–135 μg/L  |
| Troponin             | 0.001       | 0.02–0.06 ng/mL|
| Fibrinogen           | 3.84        | 2–4 g/L      |
| INR                  | 1.1         | 0.8–1.2      |
| APTT                 | 28.6        | 23.2–35.2 s  |

WBC: white blood cell; HGB: hemoglobin; PLT: platelet; AST: aspartate aminotransferase; ALT: alanine transaminase; LDH: lactic acid dehydrogenase; INR: international normalized ratio; APTT: activated partial thromboplastin time.

(right and left) and sub-segmental pulmonary arteries on both sides consistent with pulmonary embolism (Figure 2(a) and (b)). Additional multifocal, bilateral, and peripheral patchy ground-glass opacities predominantly in basal segments (COVID-19 pneumonia) (Figure 2(c) and (d)). There was mild sign of coronavirus 2019 disease (COVID-19) pneumonia, but no evidence of solid or hematologic malignancy. Doppler vascular sonography of bilateral lower extremities found complete occlusive intravenous thrombosis of femoropopliteal veins (Figure 3). While echocardiography showed mild left ventricular hypertrophy, left ventricular diastolic dysfunction grade 1, mild tricuspid regurgitation, and ejection fraction was 61%. The patient was promptly tested for COVID-19 with a nasopharyngeal swab, which was positive and she was admitted.

The patient was supplied immediately with persistent low flow oxygen therapy, low molecular weight heparin (6000 IU two times daily, p.o.), and moxifloxacin (400 mg once daily, i.v.) as antibacterial therapy and while bronchodilators were given as symptomatic and supportive treatment. On day 4 of hospitalization, the patient’s clinical condition improved with normal clinical parameters and no new COVID-19-related symptoms, and eventually discharged home on a new oral anticoagulant.

Figure 1. Electrocardiography (EKG) revealed normal sinus rhythm with right ventricular hypertrophy.
Discussion

SARS-CoV-2-infected patients are at increased risk of thrombosis due to many reasons, including inflammation, immobility, and other factors that contribute to a hypercoagulable state and many studies have shown the increased risk of mortality associated with VTE.\textsuperscript{4}

The overreach in clinical manifestations between SARS-CoV-2 pneumonia and thromboembolism presents a challenge for clinical diagnosis, especially for those patients without any high-risk factors. In the present case, we described a patient with low-risk factors of VTE according to the Padua prediction scale and no familial history of VTE.

Figure 2. Chest computerized tomography angiography (CTA) was obtained and revealed a filling defect in the (a) main pulmonary arteries (right and left) and (b) right and left sub-segmental pulmonary arteries (pulmonary embolism). Additional multifocal, bilateral, and peripheral patchy ground-glass opacities predominantly in basal segments (COVID-19 pneumonia) on the axial (c) and coronal views (d).

Figure 3. Doppler vascular sonography of bilateral lower extremities found complete occlusive intravenous thrombosis of femoropopliteal veins.
VTE including pulmonary embolism is the most common thrombotic presentation of COVID-19 pneumonia. Alonso-Fernández et al.\textsuperscript{5} mentioned in their single-center prospective cohort study that 50% of the COVID-19 patients were positive for pulmonary embolism confirmed by the computed tomography pulmonary angiography (CTPA). Mestre-Gómez et al.\textsuperscript{6} in a meta-analysis has published an incidence of 31.9% hospitalized patients with COVID-19 who developed pulmonary embolism.

Biologically, various studies have shown that COVID-19 patients tend to have higher D-dimer, fibrinogen, and fibrin degradation product levels and were associated with fatal outcome.\textsuperscript{7,8} In this study, although the patient has completely recovered, D-dimer was >10 mg/L.

In a single cohort of 75 hospitalized patients in the Netherlands, the dimension of patients who were diagnosed with DVT was 13%.\textsuperscript{9} In a study of 81 intensive care unit (ICU) patients in China, in which routine thromboprophylaxis was not the standard of care, 25% had VTE; a follow-up duration or cumulative incidence was not reported.\textsuperscript{10} In our case demonstrates the importance of mild COVID-19 infection can develop multiple VTE despite the patient has no risk factor of VTE. As it is uncommon to develop multiple venous thromboemboli in cases of mild COVID-19, our case is unique and we decided to emphasize such mild COVID-19 case can complicate multi-organ thromboembolism.

**Conclusion**

VTE is a common complication of SARS-CoV-2 infection. It is diagnosed by radiographic imaging with treatment that is mainly anticoagulant. Given the absence of any highly effective medical intervention currently, anticoagulation seems a reasonable option for the time being till additional investigation suggests otherwise. This case report shows that multiple VTE can occur during a mild case of COVID-19 in the absence of any risk factor.

**Declaration of conflicting interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Ethical approval**

Our institution does not require ethical approval for reporting individual cases report.

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**Informed consent**

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this case report.

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