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Extensive Thromboembolism in a Young Male with Asymptomatic COVID-19 Infection and Heterozygous Factor V Leiden Mutation

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Abstract

In this case report we present a previously healthy 21-year-old male with extensive thromboembolism in the setting of asymptomatic COVID-19 infection and heterozygous factor V Leiden mutation with no additional thrombophilic risk factors.

Keywords

- asymptomatic COVID-19
- factor V Leiden
- thromboembolism

Case Description

A previously healthy 21-year-old male presented with dull pain and swelling of the left lower limb. Apart from slightly elevated heart rate, clinical features of pulmonary embolism were absent. Thrombophilic risk factors were negated. Ultrasonography confirmed extensive deep vein thrombosis (DVT) of the lower left extremity extending into the inferior caval vein. Laboratory results showed elevated D-dimers (15.1 mg/L [0–0.5 mg/L]), C-reactive protein (17 mg/dL [0–0.6 mg/dL]), procalcitonin (0.39 ng/mL [<0.1 ng/mL]), LDH (310 U/L [135–250 U/L]), and leukocytosis (11.4 G/L [3.9–10.9 G/L]). Troponin-I, NT-pro-BNP, prothrombin time, partial thromboplastin time, and platelet count were within standard range. Oxygen saturation on room air was 95% or above. Electrocardiography exhibited no distinctive abnormalities. Echocardiography showed no signs of right ventricular impairment. Thrombophilia screening revealed heterozygous factor V Leiden (FVL) mutation. Computed tomography angiography (CTA) was performed revealing bilateral central pulmonary embolism (►Fig. 1) and wall-adherent thrombus in the inferior caval vein (►Fig. 2). While showing no signs of COVID-19 infection other than thromboembolism, our patient was tested positive for SARS-CoV-2 via RT-PCR. CT scan excluded ground-glass opacities. Therapy was started on intravenous heparin combined with ultrasound-accelerated catheter-directed thrombolysis using alteplase administered to the left common iliac vein. CTA after 48 hours showed adequately regressive thrombotic mass in the pulmonary arteries (►Fig. 3) while no significant therapeutic response could be obtained concerning the venous obstruction (►Fig. 4). Consequently, the patient underwent interventional rheolytic thrombectomy and conventional balloon angioplasty. Duplex ultrasound verified restored perfusion of the left iliac and femoral veins. Ultimately, the therapy was switched to oral direct factor-Xa inhibitor.

Discussion

The aggressive approach in treating the DVT was justified by significant symptoms, massive thrombotic burden, and counteracting foreseeable postthrombotic syndrome.[1]

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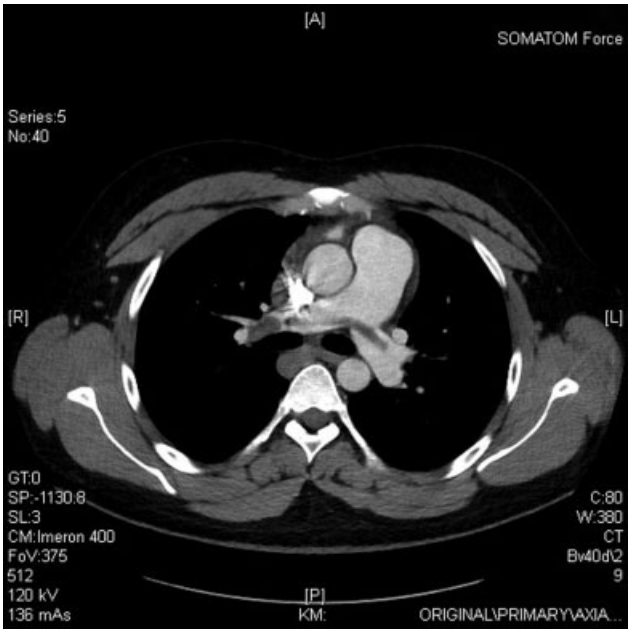

Fig. 1 Computed tomography angiography of the chest: central and bilateral pulmonary emboli before heparin/alteplase therapy.

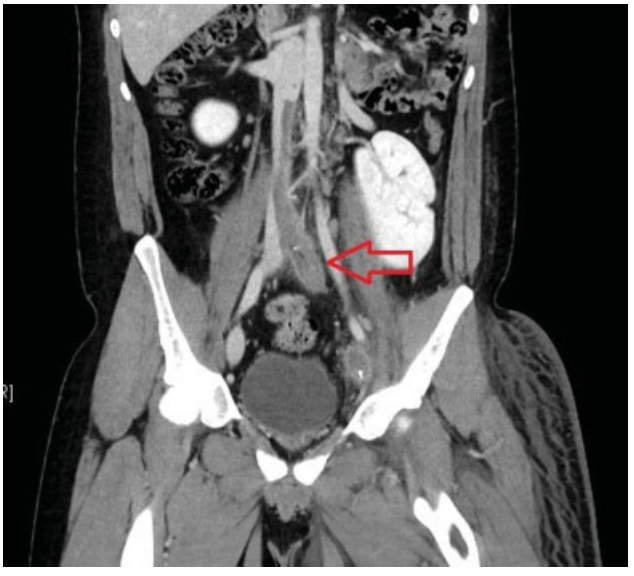

Fig. 2 Computed tomography angiography of the abdomen and lower extremity: occlusive venous thrombosis of the left common femoral and iliac veins extending to the lower caval vein.

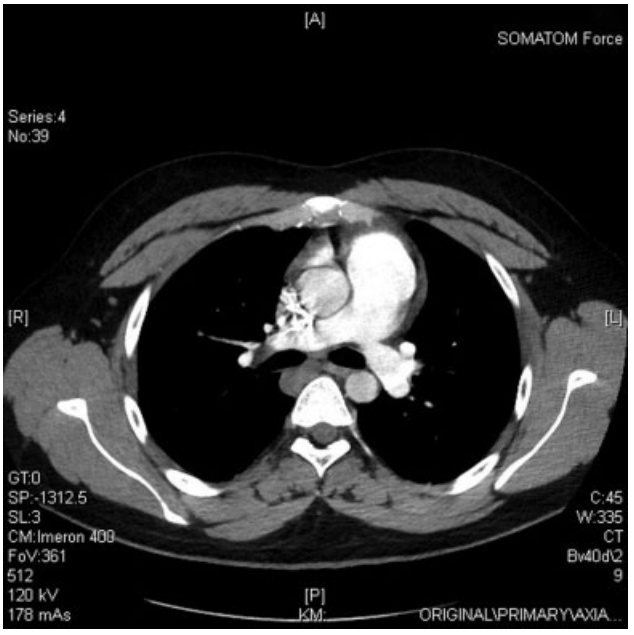

Fig. 3 Computed tomography angiography of the chest: regressive thrombotic mass after 48 hours of heparin/alteplase.

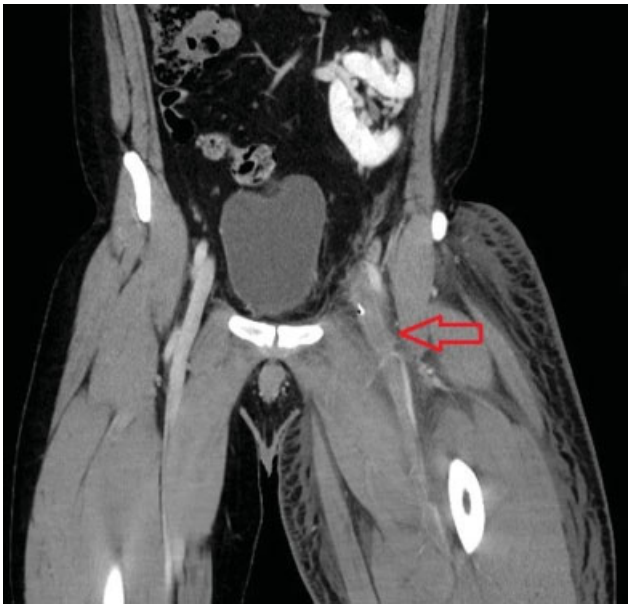

Fig. 4 Computed tomography angiography of the abdomen and lower extremity: no significant change in thrombotic mass after 48 hours of heparin/alteplase. In situ lysis catheter is partially truncated.

Whether the thromboembolic event in our patient was primarily owed to FVL or if the asymptomatic COVID-19 infection had a contributing effect remains uncertain. FVL is a hereditary thrombophilic diathesis caused by a point mutation in the gene coding for coagulation factor V rendering the protein partially resistant to degradation by activated protein C. In severe COVID-19 infection, factor V activity was found to be significantly elevated and associated with venous thromboembolic complications.[2] Therefore, a potentiating effect in combination with impaired factor V degradation in FVL is a novel aspect of interest. A similar association has been proposed with FVL and sepsis-induced hypercoagulability. Results have been inconsistent and a meta-analysis from 2015 found no association between FVL and sepsis mortality.[3]

No data are available on altered coagulation parameters in asymptomatic COVID-19 cases and further research is needed to evaluate benefits from prophylactic anticoagulation in patients with FVL and asymptomatic COVID-19 infection.

Conflict of Interest

The authors declare that they have no conflict of interest.

Acknowledgments
None.

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