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**Letter to the Editor**

# A Fatal Recurrent Artery Occlusion During SARS-CoV-2 Infection Requires a Thorough Investigation of the Underlying Cause

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**Abstract**
The article by Afaq *et al*. about a 53-year-old man with severe SARS-CoV-2 infection (SC2I) who, despite therapeutic anticoagulation and multiple surgical interventions such as thrombectomy, angioplasty, and stent implantation, developed recurrent acute thrombosis of the aorta, external iliac arteries, and arteries of the left lower extremities [1]. His clinical course was further complicated by pneumothorax and hemothorax, which ultimately led to cardiopulmonary arrest and death is noteworthy, but some points should be discussed. Overall, fatal recurrent arterial thrombosis during SC2I requires a thorough investigation of the underlying cause, which can only be attributed to SC2I after various differential diagnoses have been thoroughly ruled out.

**Keywords:** Artery Occlusion, SARS-CoV-2, COVID-19, Anticoagulation, Fatal Outcome

**Letter to the Editor**
We read with interest the article by Afaq *et al*. about a 53-year-old man with severe SARS-CoV-2 infection (SC2I) who, despite therapeutic anticoagulation and multiple surgical interventions such as thrombectomy, angioplasty, and stent implantation, developed recurrent acute thrombosis of the aorta, external iliac arteries, and arteries of the left lower extremities [1]. His clinical course was further complicated by pneumothorax and hemothorax, which ultimately led to cardiopulmonary arrest and death [1]. The study is noteworthy, but some points should be discussed.
The first point is that it was not reported whether the recurrent arterial thrombosis of the aorta, external iliac arteries, and arteries of the lower extremities was atherogenic, embolic, due to a coagulation disorder, vasculitis, decreased rheology, exsiccosis, or hypovolemia, or a combination thereof [1]. Knowledge of the underlying pathophysiology is crucial in order to apply the most effective treatment and reduce the risk of recurrence. Therefore, we should know whether the patient suffered from atherosclerosis and whether there were other risk factors for atherosclerosis in addition to arterial hypertension, in particular diabetes, hyperlipidemia, and whether or not the patient was a smoker. To determine whether the arterial thrombosis was due to a cardiac or arterial-arterial embolism, it would have been essential to perform transthoracic or transesophageal echocardiography or cardiac MRI with contrast medium to rule out myocarditis, endocarditis, valvular stenosis, intracardiac thrombus formation, left ventricular hypertrabeculation, systolic dysfunction, or takotsubo syndrome. SC2I has been described as a complication of myocarditis, endocarditis, or even pericarditis [2]. It would also have been essential to subject the patient to long-term ECG recording to determine whether there was atrial fibrillation, atrial flutter, or other supraventricular or ventricular arrhythmias or conduction disturbances prone to thrombus formation. There is also no mention of whether there was a family history of hereditary or acquired coagulopathy such as hyperfibrinogenemia, vitamin K deficiency, disseminated intravascular coagulation (DIC), thrombin mutations, protein S or protein C deficiency, hemophilia, von Willebrand disease, or APC resistance (factor V Leiden mutation).
The second point is that there was no report or discussion of whether the recurrent arterial occlusion was due to a side effect of the current medication he received during his hospital stay. The patient received remdesivir, azithromycin, ceftriaxone, and steroids. Steroids are known to have a thrombogenic effect and can cause blood clots.
The third point is that the patient did not undergo an autopsy to determine whether causes other than SC2I could have been responsible [1]. It would be of particular interest to know whether endocarditis, myocarditis, liver disease, vasculitis, or intracardiac thrombus formation was present. Vasculitis has been repeatedly reported as a vascular complication of SC2I [4].

The fourth point is that no explanation was given as to why the patient required cardiopulmonary resuscitation [1]. Was this due to cardiac arrest caused by myocardial infarction, malignant arrhythmias, drug overdose, or asphyxia, or was it due to respiratory arrest?

In summary, fatal recurrent arterial thrombosis during SC2I requires a thorough investigation of the underlying cause, which can only be attributed to SC2I after various differential diagnoses have been ruled out.

**Declarations**

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**Consent to Participation:** Not applicable.

**Consent for Publication:** Not applicable.

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**Author Contribution:** JF was responsible for the design and conception, discussed available data with coauthors, wrote the first draft, and gave final approval. SZ: contributed to literature search, discussion, correction, and final approval.

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