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# Brachial Artery Thrombosis in a Patient with SARS-Cov-2 Infection: Case Report

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**Abstract** **Case Report**

COVID-19 is a viral infectious disease caused by SARS-CoV-2, it predominantly presents with respiratory symptoms, but in other cases ,its revealed by vascular presentation ,including deep venous thrombosis , pulmonary embolism, ischemic strokes, ,and arterial thrombosis .However, Limited literature is available regarding arterial thrombosis in COVID-19 disease. Here, we present a case of a 58-year old man who had COVID-19 infection with respiratory symptoms and developed upper limb ischemia. He was managed successfully by thrombolytic therapy.

**Keywords:** SARS-CoV-2, upper limb ischemia, arterial thrombosis.



## I- INTRODUCTION

Coagulopathy is one of the most prognostic factors and complications of covid-19 virus, it is associated with increased mortality, which can be suspected that a hypercoagulable state results from manipulation of circulating prothrombotic factors such as Lupus anticoagulant (LA) and fibrinogen. Endothelial injury by the virus has also been reported as a trigger for the hypercoagulable state [1]. Despite increasing cases of coagulopathy, acute limb ischemia has rarely been reported. Our patient had COVID-19 infection and developed upper limb ischemia due to clot formation in the brachial artery.

## II- CASE PRESENTATION

A 58-year-old man, presented to the emergency department (ED) with complaint of fatigue, discoloration, numbness and tingling sensation in his fingers. Physical exam, revealed signs of ischemia: pallor, coldness and slow capillary refill. Sensation and movement were intact, but no pulses palpable. He had a full set of pulses in the left upper limb. The patient was vitally stable, blood pressure was 140/90 mm Hg, regular pulse rate 96 beats/min, body temperature was 38.3°C, and his blood oxygen saturation level on breathing air was 97%. His past medical, family, and social history was unremarkable. He denied any history of prothrombotic diseases, smoking, recent surgery, malignancy, or period of prolonged immobilization.

The patient was previously treated unsuccessfully with painkiller by a general practitioner for a persistent right upper extremity pain.

In the 3 weeks prior to his admission to the ED, the patient had fever, dry cough, difficulty breathing, and myalgias, Computed tomography Scan of the Chest showed bilateral multifocal ground glass opacities with consolidation (Figure 1). Nucleic acid amplification test for SARS-CoV-2 was positive. The patient was confirmed as mild COVID-19 pneumonia and was observed in a quarantine facility. He did not receive any treatment for coronavirus infection such as hydroxychloroquine, azithromycin, vitamin C, vitamin D, based on local management guidelines.

On admission, Lab investigations: hemoglobin was 13.8 gm/dl, white blood cell count 13.85 x 103 cell/uL (9.7 % lymphocytes) and platelet count 399 x 103 cells/mm3. He had a sodium of 136 mEq/L, potassium of 4.2 mEq/L, chloride of 102 mEq/L, bicarbonate of 22 mEq/L, CRP of 78 mg/L, creatinine of 1.4mg/dL, blood urea nitrogen of 25 mg/dL, ferritin of 650 ng/mL, and D-dimer of 2,56 ng/ml, fibrinogen of 336 mg/dL. Cardiovascular risk factor screening for diabetes, dyslipidemia, and prothrombotic state (protein C, protein S, anticardiolipin antibody, and Factor V Leiden) were negative.

The Electrocardiogram and Echocardiography were normal. Chest X-ray however, revealed consolidation opacities. Doppler ultrasound confirmed fresh thrombus in the right brachial artery, and Angiography (Figure 2) showed an extensive thrombus in the brachial artery causing a 100 % stenosis.

The diagnosis was made. We treated the patient with full anticoagulation using subcutaneous low molecular weight heparin, and underwent brachial embolectomy (Figure 3).

Postoperatively the patient was stable and was discharged on the third postoperative day, Doppler ultrasound of the arteries of the right upper limb was normal. He remained on Clopidogrel 75 mg and acetyl salicylic acid tablet 100 mg once daily.

The second follow-up week, the patient was stable. He had a full set of pulses in the upper extremities.

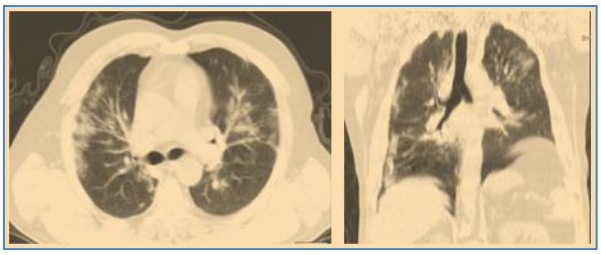

**Fig-1: Chest CT showed multiple ground-glass opacities in bilateral lungs**

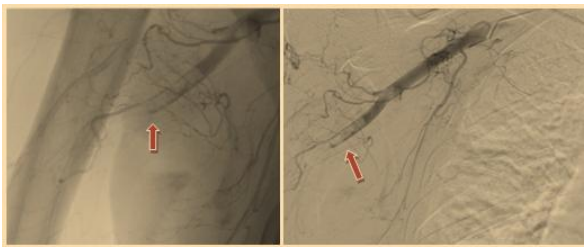

**Fig-2: Peripheral angiogram showed complete and extensive occlusion of the right brachial artery**

**Fig-3: Thrombi extracted via brachial embolectomy under general anesthesia.**

## III- DISCUSSION

COVID-19 is not only a respiratory infection, but also a vascular disease that causes clotting responses: Tang et al. reported that disseminated intravascular coagulopathy was the cause of mortality in 74% [2].

Acute limb ischemia is an extreme vascular emergency, leading to high morbidity and mortality if treatment is delayed [3]. The prevalence and incidence of thrombotic events in patients with COVID-19 is not highly studied and limited data sharing.

If literature shows that thrombosis highly occurs in severe COVID-19 patients, our patient did not have severe COVID-19.

Nikiforos Galanis et al. [4] reported a case of 80-year-old man presented with fever, dry cough and shortness of breath. His past medical history included hypertension, diabetes and dementia, but without clinical improvement, he developed acute ischemia in his right index and thumb finger. Unfortunately, the patient died 72 hour later from respiratory failure

Yuvraj S. Chowdhury et al. [5] reported a case of a 75-year-old male with a history of coronary disease, hypertension, smoking and mild dementia that presented with confusion, cough and fever. After one week, he complicated with peripheral arterial thrombosis with the high of D-dimer.

Shao et al. [6] reported a 67-year old male with no past medical history, who presented with acute upper limb ischemia before a fever and other respiratory symptoms developed with no comorbidity. The d-dimer levels were increased and the lupus anticoagulant was positive.

Muhammad Hanif et al. [7] described a case of a 75-year-old woman with no past medical history who presented with l symptoms of flu. After one week she developed an acute limb ischemia manifesting as discoloration of the left hand with numbness and pain, which was detected as intraluminal thrombosis.

Our patient had no risk factors for thrombo-embolism and a workup for thromboembolism was negative but developed an acute limb ischemia. We believe that covid-19 was the cause of thrombus in this patient.

The pathophysiology of thromboembolic complications in COVID-19 infection is not well understood. It related to dysregulation of angiotensin signaling induced by interaction of SARS-CoV-2 with ACE2, causing pro-inflammatory and prothrombotic states, which characterized by elevation of D-dimers, prothrombin, and fibrinogen, leading to activate the coagulation cascade and fibrinolysis [2].

The American Society of Hematology (ASH) have recommended that all COVID-19 patients should started a prophylactic dose of anticoagulation. [8].Similarly, a Chinese study found that anticoagulation in SARS-CoV-2 improved diagnosis and decrease mortality rate a 20% [9].

The role of anticoagulation in COVID-19 patients is becoming increasingly important to mitigate thrombotic events. The management of arterial occlusions in patients with COVID-19 is based on the same protocol before the pandemic

## IV- CONCLUSION

We report a COVID-19 patient who had no past medical history of coagulopathy, developing upper limb arterial thrombosis. Our case shows that acute upper ischemia can happen after patients have recovered from COVID-19. It reveals the role of thrombosis prophylaxis in the management of COVID-19 cases.

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