

## Case Report

# COVID-19 associated multi organ embolism and critical limb ischaemia followed by limb salvage: A case report

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### Abstract:

*First reported in Wuhan, China, SARS-COVID 19 infection is now fairly well described but understanding the disease is evolving and is associated with high incidence of fatal pneumonia. However, concomitant vascular thromboembolism is also being recognized as contributing to mortality and severe morbidity. We report limb salvage in a COVID-19 patient despite presenting late with critical limb ischaemia and radiological evidence of embolism in multiple organs.*

### Case Report

A sixty four years old, insulin dependent diabetic male patient presented with a ten day history of rest pain, discolouration and swelling of his left foot. He had been severely ill for three weeks in an ICU in another hospital with Covid positive pneumonia prior to that. He recovered well but developed left leg symptoms on the day of discharge from that hospital. His left great and second toes appeared black, the foot was oedematous, and there were no pulses in either foot. He had strong groin and popliteal pulses bilaterally.

An urgent CT angiography showed sharp cut off in crural vessels as well as profunda femoris arteries of both legs (Figure1). Abdominal component of the CT scan did not reveal any aortic thrombus but showed evidence of embolism in both kidneys and the spleen (Figures 2 and 3). An echocardiography in the other hospital was reported as normal.

Emergency left leg thrombectomy was done in all three leg vessels (Figure 4) through a medial calf incision. Good forward flow was ensured and there was good back bleed from all three calf vessels. Arteriotomy was closed with a vein patch. The asymptomatic right leg was not intervened with. He had good dorsalis paedis and posterior tibial pulses the next morning. He made an uneventful recovery in Covid unit as he was still positive and was discharged with Rivaroxaban.

The foot was improving on two weeks outpatients follow up but the great toe will eventually need amputation.

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Fig 1

(Bilateral profunda and crural vessel embolism: notice the sharp cut offs at tip of arrows)

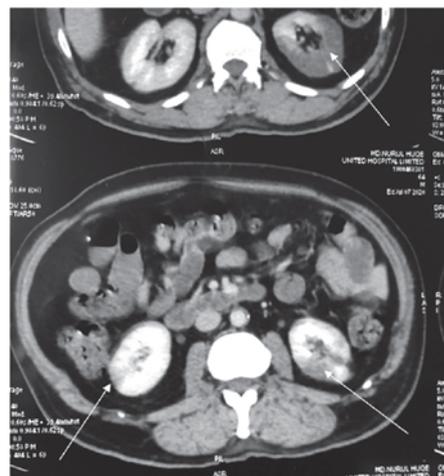


Fig 2

(Arrows point to bilateral renal emboli)

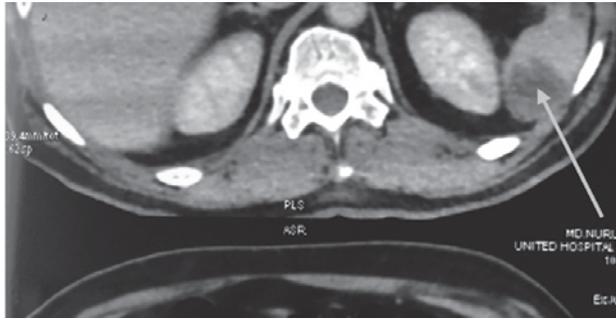


Fig 3

(Arrow points to splenic ischaemia)



Fig 4

(Embolectomy using Fogarty balloon specimen).

## DISCUSSION

As the name implies, SARS COV-2 (COVID-19) virus infection is a predominantly respiratory illness. Although case fatality rate is low, the global burden of death and disability is high given the pandemic. However the exact pathways to death is still emerging. Global numbers of deaths and case fatality rates provide only crude information<sup>1</sup>.

Although respiratory failure and shock (both cardiogenic and septic) seem to be the predominant cause of death, a lack of postmortems in these patients has denied us the opportunity to identify the exact cause of death<sup>2</sup>.

It has been shown that Covid 19 is associated with significant cardiovascular morbidity amongst which pulmonary embolism has been widely described in as much as 50% patients in ICU<sup>3</sup>.

It has been suggested that hospitalized patients with COVID-19 have significant risk of acute arterial thrombosis<sup>4</sup>. This was confirmed by Karan Garg et al and they detected an association with elevated D-dimer level<sup>5</sup>.

Study by Goldman et al demonstrated an association between COVID-19 and lower extremity arterial thrombosis with greater thrombus burden characterized by predilection for

proximal arteries<sup>6</sup>. They suggested that COVID-19 is associated with lower extremity arterial thrombosis characterized by greater clot burden and a direr prognosis.

We believe in our patient it was embolus and not thrombosis as evidenced by the appearance of the CT angiography the primary source of which could not be determined. Although a cardiac source is more likely an earlier echocardiography had been reported normal.

In the absence of any evidence of cardiac source we speculate that the thrombus formation is occurring in the setting of a hypercoagulable state and is most likely in the form of large-vessel mural thrombus formation. This is similar to what was seen by Goldman et al in the cases they described<sup>6</sup>. A paradoxical embolus (venous thrombosis with a patent foramen ovale) is another possibility. In our patient if there was an aortic mural thrombus, it was not in the abdominal component as evidenced by the CT angiography. We suspect the patient had a supracoeliac aortic thrombus given the embolism in the kidneys and the spleen.

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