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Spinal Cord and Small Bowel Thrombosis Associated with Post COVID-19

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Abstract

COVID-19 pneumonia had been a global pandemic with major mortality and morbidity globally. It is associated with venous thromboembolism, especially in the population that requires admission, oxygen support, or ventilator support. Arterial thrombosis remains rare complication for this disease, more-so with multi-organ arterial thrombosis. We report a case of spinal cord and small bowel infarction in a COVID-19 patient.

Keyword: COVID-19 pneumonia • Thromboembolism • Spinal cord • Infarction

Introduction

COVID-19 pneumonia has long been recognized to be associated with thrombosis especially in severe form of infection, with reported incident up to 3.1% of hospitalized patients [1]. Common thrombosis sites are at low pressure system especially at venous system, with some case reports of arterial thrombosis [2]. Spinal cord infarction is a rare disease with debilitating outcome and poor neurological recovery, while bowel thrombotic event usually lead to high mortality. Majority of the cases reported is idiopathic, with mortality rates up to 22% [3,4]. While there are reported cases of spinal cord infarct with varying degree of morbidity, it is uncommon to get both arterial infarcts in spinal cord and small bowel. We present here a case of multi-organ arterial thrombosis involving blood clotting, the spinal cord, small bowel, and pulmonary post COVID-19 infection.

Case Presentation

We present a 57 years old Malay gentleman, with underlying ischaemic heart disease, hypertension, dyslipidemia and gastritis. He was diagnosed to have COVID-19 pneumonia on the 18th August 2021, despite receiving the 2nd dose of vaccine on the 10th August. He was a category 4, requiring not more than oxygen supplementation of 3 L/min, intravenous dexamethasone 8 mg per day, subcutaneous enoxaparin 1 mg/kg/ day given throughout his stay (5 days). He responded well to treatment and was able to wean off oxygen, comfortable under room air, and discharged well. His D-dimer level was in down coming trend from 2.9 µg/mL to 1.1 µg/mL (normal value <0.5 µg/ml), ferritin 2122 µg/L and procalcitonin level of 0.24 ng/ml on August admission. He is able to ambulate independently upon discharge, hence thromboprophylaxis discontinued. CT pulmonary angiogram was unable to be done during that admission as it is at the height of the pandemic with long waiting list on the scans.

He presented to us again on 12th September 2021, complaining of epigastric pain of dull in nature, associated with on and off cramping lower abdominal pain for 2 weeks. He was treated for Non ST-Elevation Myocardial Infarction (NSTEMI) as his hs troponin I level is elevated at 6867 pg/ml, with ECG showing ST depression in V4-V6, T inversion in lead 1, aVL, and Q wave lead in 2,3, aVF. D-dimer on admission noted to be elevated at 6.8 µg/ml. subcutaneous fondaparinux 2.5 mg daily given along with aspirin and clopidogrel. An in-patient CTPA was planned on 15th September due to suspected pulmonary embolism.

On 15th September at 6 am sharp, he complained of severe lower abdominal cramping pain. Symptomatic treatment was given but no relief of pain. At 10 am, he developed acute flaccid paraplegia. Lower limbs power was zero, arreflexia, with flaccid anal tone, and equivocal plantar reflexes. Pinprick sensation was intact, proprioception impaired at right toe. Cranial nerve and upper limb examination were unremarkable.

CTPA done on same day revealed sub segmental pulmonary artery thrombosis with irregular mural thrombus noted at descending thoracic aorta (T8-T10). We proceeded with CT

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angiography of thoracic, abdominal revealed circumferential mural thrombus at bilateral proximal common carotid arteries, coeliac trunks, with luminal stenosis seen in coeliac trunk. There's also hepatomegaly with fatty liver changes, along with segment Iva, segment VI liver cyst. No suspicious bony lesions noted.

Subsequent Magnetic Resonance Imaging (MRI) of whole spine revealed long segment intramedullary lesion within thoracolumbar spinal cord associated with mild cord expansion from T5/T7 downwards. Lesions appear hyper intense on T2W and STIR, mild enhancement post Gad, restricted diffusion on DWI/ADC and abnormal signal noted at superior and inferior end plated of T9, T10 vertebrae (Figure 1).

Figure 1. The MRI supported features in favor of spinal cord and vertebra bodies' infarctions.

His in hospital stay however complicated with Klebsiella pneumoniae bacteraemia. And on 22nd September he developed abdominal distention with guarding. Abdominal X-ray showed dilated bowels, and an emergency laparotomy done. Intra-operative findings include, perforation more than 50% circumference 30 cm from duodenal junction, serosal tear over caecum, multiple microthrombotic spots seen throughout bowel. Figure 2 Peritoneal fluid grew AmpC producer Klebsiella pneumoniae; Iintravenous meropenam was initiated. His neurological deficit remained similar from presentation with lower limbs power of zero, bowel and bladder incontinence. He was transferred out of ICU and underwent rehabilitation and optimization in surgical ward. His sepsis worsened in ward and he succumbed to his illness on 12th October 2021 (Figure 2).

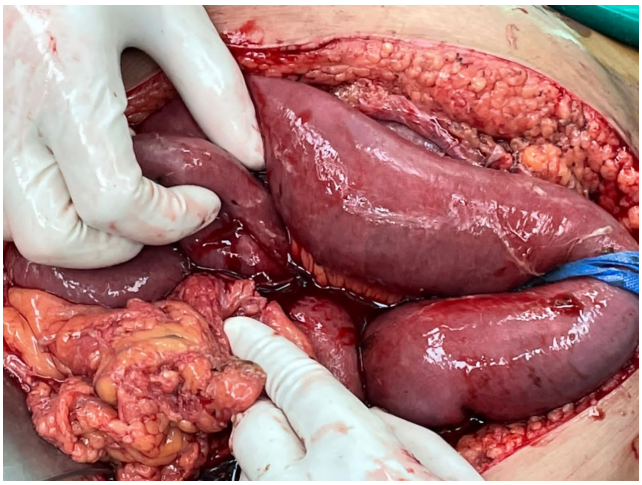

Figure 2. Peritoneal fluid grew AmpC producer klebsiella pneumoniae.

Results and Discussion

This case highlighted arterial thrombosis with multi-organ involvement in a previously vaccinated and non- critical COVID-19 pneumonia. Artery thrombosis has been reported in critically ill patients but our case showed that even previously discharged well patient could still develop thrombotic complications [5,6]. The outcome of spinal cord infraction is debilitating, as patients has permanent neurological deficit [4,5,7]. He received thromboprophylaxis during his stay for COVID-19 infection, which did not prevent him from developing thrombosis complications after discharge.

Another site of arterial thrombosis in this patient is at the bowel, which leads to perforation and ultimately leads to Klebsiella pneumoniae bacteraemia. COVID-19 related bowel ischaemia has mortality rate of 38.7%, albeit being a rare complication [8] Keshavarz, et al., also able to show that thrombotic event has been identified in half of the patients with bowel ischeamia [8]. Bowel infarct happened despite him receiving double anti platelet and anticoagulant for 10 days. This may be explained by the theory of viral-mediated endothelial inflammation, on top of hypercoagulability associated with increased concentrations of coagulation factors in a COVID patient [9]. Thromboprophylaxis may reduce thrombosis risk, it doesn't eliminate it completely, moreover there's lack of monitoring means to detect degree of endothelial damage.

Conclusion

Spinal cord infarction with proprioception impairment, bladder involvement, walking impairment has been associated with poorer prognosis in terms of neurological recovery. This is consistent with the case highlighted here. Unfortunate for him, he developed both arterial (spine, bowel) and venous (pulmonary) thrombosis. This

slowly increases his morbidity and mortality rate. From this case, we note that frequent monitoring of surrogate thrombosis marker (D-dimer) and probably role of prolonged thromboprophylaxis may be beneficial in preventing life threatening thrombosis event.

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