

Multiple arterial thrombosis in a patient with COVID-19

Luís Monteiro Dias ^{1,2}, José Martins,³ Rui Castro,³ Anabela Mesquita³

¹Department of Internal Medicine, Hospital de Braga, Braga, Portugal

²School of Medicine, University of Minho, Braga, Portugal

³Intensive Care Unit, Hospital de Braga, Braga, Portugal

Correspondence to
Dr Luís Monteiro Dias;
Lfmsd13@gmail.com

Accepted 1 June 2021

DESCRIPTION

A 61-year-old man presented to the emergency department with complaints of asthenia, dyspnoea and dry cough for the past 4 days. He had a medical history of type 2 diabetes and dyslipidaemia. On chest CT, an extensive bilateral SARS-CoV-2 pneumonia was diagnosed, and pulmonary embolism was ruled out. Dexamethasone (6 mg once daily) as well as enoxaparin (1 mg/kg per day) were initiated.

Five days later, due to severe respiratory failure, the patient was admitted to the Intensive Care Unit. At the time, there was no clinical or analytical evidence of coinfection.

Twenty-four hours after admission, he complained of intense pain on the lower limbs. On physical examination, both femoral pulses were palpable, but there was pulselessness, pallor and poikilothermia of the distal extremities, suggestive of arterial ischaemia ([figure 1](#)). Due to worsening of the respiratory failure, the patient was intubated.

Blood tests showed new onset hyperlactataemia (4.87 mmol/L), coagulopathy (elevated INR- 1.32, aPTT- 49 seconds, d-dimer and fibrinogen), leucocytosis ($14.8 \times 10^9/L$) and elevated inflammatory markers (C reactive protein: 162.4 mg/dL; procalcitonin: 2.41 mg/dL; ferritin: 5961 $\mu\text{g/L}$; lactate dehydrogenase 817 mmol/L).

A CT angiography was performed ([video 1](#)) and revealed an intramural aortic thrombosis with more than 50% stenosis of the descending thoracic aorta, as well as a complete occlusion of the lower



Video 1 In this video, a CT angiography is displayed, showing multiple arterial thrombus in both thoracic and abdominal aorta, as well as in both common iliac arteries and femoral arteries. A left renal infarction as well as a pulmonary right lower lobe consolidation suggestive of coinfection are shown.

abdominal aorta with extension to both common iliac arteries. A left renal infarction was also present as well as a pulmonary consolidation suggestive of coinfection. There was no evidence of pulmonary thromboembolism or aortic dissection.

A total of 100 mg of alteplase were infused over 2 hours. Blood cultures and tracheal aspirate were obtained, and intravenous antibiotics were started.

In spite of these therapeutic measures, the patient was refractory to all supportive care and ended up dying.

A complete blood panel was available a few days later and showed no signs suggestive of an acquired or congenital thrombophilia.

This case report intends to reinforce the difficulty to manage multiple arterial thrombotic events in a patient with COVID-19, despite prophylactic therapy with enoxaparin.¹ In fact, arterial thrombotic events can occur in up to 4% of critical patients with COVID-19, sometimes affecting multiple territories.² Several authors report that this occurs due to endothelitis as well as to a hypercoagulable



Figure 1 Lower limbs showing marked signs of ischaemia.

 Check for updates

© BMJ Publishing Group Limited 2021. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Monteiro Dias L, Martins J, Castro R, et al. *BMJ Case Rep* 2021;**14**:e244024. doi:10.1136/bcr-2021-244024

Learning points

- ▶ SARS-CoV-2 infection can associate with multiple arterial thrombotic events, despite prophylactic measures.
- ▶ Critical patients with COVID-19 have a higher risk to develop thromboembolic events.
- ▶ Prophylaxis as well as a prompt diagnosis and initiation of directed therapy are the mainstay to manage these patients.

status with elevation of fibrinogen and d-dimer.³⁻⁵ These factors, alongside prolonged immobilisation in a critical patient, promote thrombotic events, even in the absence of previous history of atherosclerosis.⁶

Distinct from other viral infections, SARS-CoV-2 infection promotes arterial thrombotic events. Prophylaxis as well as a prompt diagnosis and initiation of directed therapy are the mainstay to manage these patients.

Contributors LMD: acquisition of data, clinical data review, literature review and final manuscript writing. RC and JM: clinical data review, acquisition of data and literature review. AM: clinical data review, literature review and final manuscript review.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise

determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

ORCID iD

Luis Monteiro Dias <http://orcid.org/0000-0002-3159-8629>

REFERENCES

- Lodigiani C, Iapichino G, Carenzo L, *et al*. Venous and arterial thromboembolic complications in COVID-19 patients admitted to an academic hospital in Milan, Italy. *Thromb Res* 2020;191:9–14.
- Cheruiyot I, Kipkorir V, Ngure B, *et al*. Arterial thrombosis in coronavirus disease 2019 patients: a rapid systematic review. *Ann Vasc Surg* 2021;70:273–81.
- Varga Z, Flammer AJ, Steiger P, *et al*. Endothelial cell infection and endotheliitis in COVID-19. *Lancet* 2020;395:1417–8.
- Lippi G, Favalaro EJ. D-Dimer is associated with severity of coronavirus disease 2019: a pooled analysis. *Thromb Haemost* 2020;120:876–8.
- Henry BM, de Oliveira MHS, Benoit S, *et al*. Hematologic, biochemical and immune biomarker abnormalities associated with severe illness and mortality in coronavirus disease 2019 (COVID-19): a meta-analysis. *Clin Chem Lab Med* 2020;58:1021–8.
- Perini P, Nabulsi B, Massoni CB, *et al*. Acute limb ischaemia in two young, non-atherosclerotic patients with COVID-19. *Lancet* 2020;395:1546.

Copyright 2021 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/>
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

Customer Service

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at support@bmj.com.

Visit casereports.bmj.com for more articles like this and to become a Fellow