



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Medical Imagery

## Aortic thrombosis in a patient with COVID-19-associated hyperinflammatory syndrome



## ARTICLE INFO

## Article history:

Received 3 January 2021

Received in revised form 24 March 2021

Accepted 26 March 2021

## Keywords:

COVID-19

Hyperinflammatory syndrome

Thromboembolic event

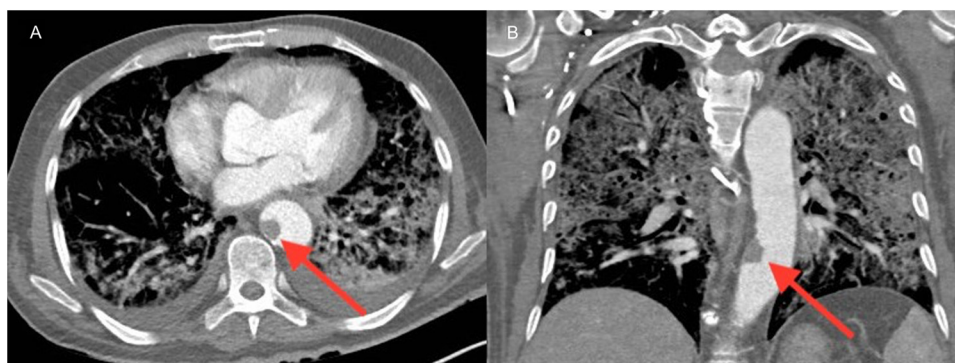
Aortic thrombosis

A 77-year-old man was admitted for severe PCR-confirmed COVID-19. The patient presented with severe hypoxemia and biological findings suggestive of a hyperinflammatory syndrome: severe lymphopenia in combination with signs of hypercytokinemia (elevated C-reactive protein), coagulopathy (elevated D-dimer levels), and hepatic injury (elevated lactate dehydrogenase) (Webb et al., 2020).

Computed tomography angiography (CTA) of the thorax showed ground glass opacities in the five lobes, but no signs of pulmonary embolism (Figure 2). The patient was treated with dexamethasone, a prophylactic dose of low molecular weight heparin (LMWH), high flow oxygen therapy, and a single infusion of tocilizumab within a clinical trial (Maes et al., 2020).

After 6 days of hospitalization, D-dimer levels had increased markedly to a level of 9210 ng/ml. CTA was repeated due to suspected pulmonary embolism. The images showed a partial thrombosis of the descending aorta (Figure 1). The patient was treated with therapeutic anticoagulation and made a full recovery.

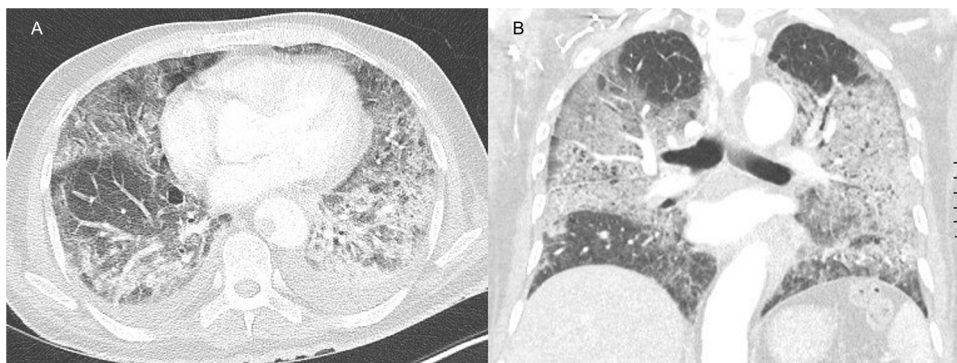
Thromboembolic events are frequently described in COVID-19 patients and are the consequence of a hyperinflammatory response and endothelial dysfunction (Gu et al., 2021). The potential role of an antiphospholipid syndrome secondary to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has been proposed (Roncati et al., 2020). An increase in D-dimer level has been shown to be associated with thromboembolic events, including arterial thrombosis.



**Figure 1.** Axial (A) and coronal (B) contrast-enhanced CT image in mediastinal window showing a thrombus in the descending thoracic aorta. The red arrow indicates the thrombus.

<https://doi.org/10.1016/j.ijid.2021.03.081>

1201-9712/© 2021 The Author(s). Published by Elsevier Ltd on behalf of International Society for Infectious Diseases. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



**Figure 2.** Axial (A) and coronal (B) contrast-enhanced CT image in pulmonary window showing extensive ground glass opacities.

An unexpected significant rise in D-dimer levels in the critically ill patient should prompt further investigation (Susen et al., 2020).

**Funding source**

None to declare.

**Ethical approval**

Patient consent was obtained.

**Conflict of interest**

The authors declare no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**References**

Gu SX, Tyagi T, Jain K, Gu VW, Lee SH, Hwa JM, et al. Thrombocytopeny and endotheliopathy: crucial contributors to COVID-19 thromboinflammation. *Nat Rev Cardiol* 2021;18(March (3)):194–209.

Maes B, Bosteels C, De Leeuw E, Declercq J, Van Damme K, Delporte A, et al. Treatment of severely ill COVID-19 patients with anti-interleukin drugs (COV-AID): a structured summary of a study protocol for a randomised controlled trial. *Trials* 2020;21(June (1)):468.

Roncati L, Manenti A, Manco G, Farinetti A, Mattioli A. The COVID-19 arterial thromboembolic complications: from inflammation to immunothrombosis

through antiphospholipid autoantibodies. *Ann Vasc Surg* 2020;(December) S0890-5096(20)31103-1.

Susen S, Tacquard CA, Godon A, Mansour A, Garrigue D, Nguyen P, et al. Prevention of thrombotic risk in hospitalized patients with COVID-19 and hemostasis monitoring. *Crit Care* 2020;24(June (1)):364.

Webb BJ, Peltan ID, Jensen P, Hoda D, Hunter B, Silver A, et al. Clinical criteria for COVID-19-associated hyperinflammatory syndrome: a cohort study. *Lancet Rheumatol* 2020;2(12):e754–63.

Naomi Michotte<sup>a,\*</sup>  
 Stéphane Alard<sup>b</sup>  
 Marie-Christine Payen<sup>c</sup>  
 Nicolas Dauby<sup>c</sup>

<sup>a</sup>Department of Internal Medicine, Centre Hospitalier Universitaire Saint-Pierre, Rue Haute 322, 1000 Brussels, Belgium

<sup>b</sup>Department of Radiology, Centre Hospitalier Universitaire Saint-Pierre, Rue Haute 322, 1000 Brussels, Belgium

<sup>c</sup>Department of Infectious Disease, Centre Hospitalier Universitaire Saint-Pierre, Rue Haute 322, 1000 Brussels, Belgium

\* Corresponding author.

E-mail address: [naomi.michotte@stpierre-bru.be](mailto:naomi.michotte@stpierre-bru.be) (N. Michotte).

Received 3 January 2021  
 Received in revised form 24 March 2021  
 Accepted 26 March 2021