

## Symptomatic Aortic Mural Thrombus in a Patient With COVID-19

*Trombo Mural Aórtico Sintomático em Paciente com Covid-19*

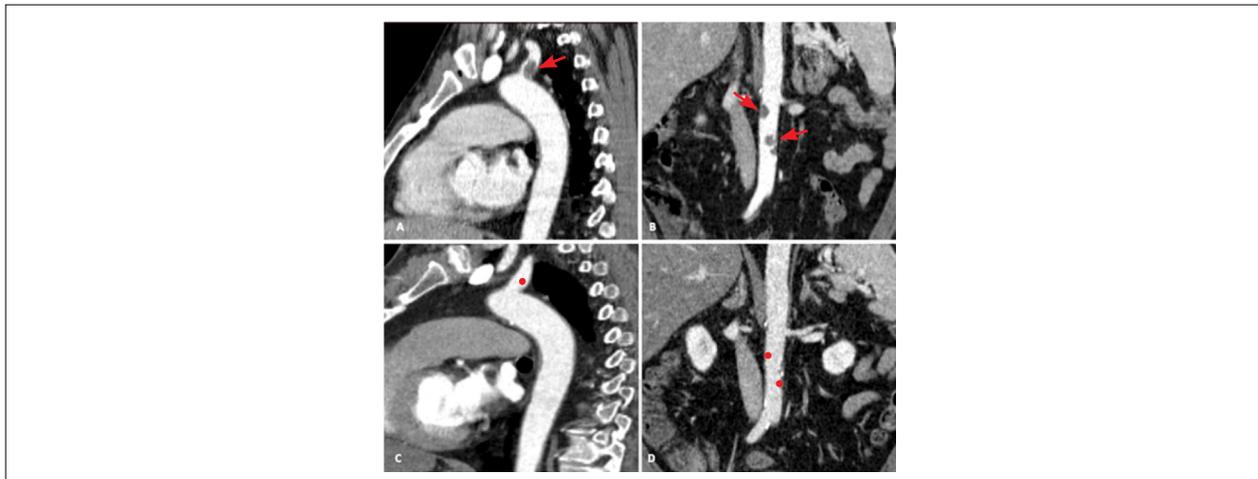
Milton Sérgio Bohatch Júnior<sup>1</sup> , Amanda Fernandes Vidal da Silva<sup>2</sup> , Marcelo Bellini Dálio<sup>1</sup> ,  
Maurício Serra Ribeiro<sup>1</sup> , Edwaldo Edner Joviliano<sup>1</sup> 

<sup>1</sup>Hospital das Clínicas of Ribeirão Preto, University of São Paulo, São Paulo, Brazil; <sup>2</sup>Hospital Base of São José do Rio Preto, São Paulo, Brazil.

A 56-year-old male former smoker with a history of diabetes mellitus developed flu-like symptoms (cough, fever, and myalgia) that worsened after nine days (dyspnea and asthenia) sought medical attention in an emergency care unit. He was hospitalized with novel coronavirus (sudden acute respiratory syndrome coronavirus 2) infection confirmed by polymerase chain reaction testing. His condition progressed with sudden pain in the left lower limb, toe coldness and paresthesia without motor changes, and pain in the third finger of the left hand associated with non-fixed cyanosis. The patient was referred to the emergency room of Hospital das Clínicas of Ribeirão Preto with acute arterial occlusion. On evaluation, he presented non-fixed cyanosis in the distal phalanx of the third finger of the left hand with no pulse or neurological changes throughout the limb. The left lower limb presented no pulse of or arterial flow in the anterior and posterior tibial arteries. He underwent urgent thrombectomy

(Rutherford class 2A) with thrombus removal, and limb perfusion was restored with pulsatile tibial artery flow. The patient remained on anticoagulant therapy with unfractionated heparin. Computed tomography angioplasty used to analyze the embolism demonstrated mural thrombi at the origin of the left subclavian artery and in the infrarenal aorta (Figures 1A, 1B). The patient progressed with good arterial condition (resolution of left upper limb non-fixed cyanosis and presence of pulse in the left leg), stayed in the intensive care unit for three days, and was discharged after two days of anticoagulant treatment (rivaroxaban [Xarelto®]). In outpatient follow-up, he remained asymptomatic and presented no new embolic events, and the mural thrombi resolved completely after one year of anticoagulant therapy (Figures 1C, 1D).

Coagulopathy associated with coronavirus infection has been described in a globally increased number of cases of



**Figure 1** – (A e B) Computed tomography angiography images showing mural thrombi at the origin of the left subclavian artery and in the infrarenal aorta. (C e D) Complete resolution of mural thrombi after one year of anticoagulant therapy.

### Keywords

SARS-CoV-2, Thrombosis, Aorta.

**Mailing Address: Milton Sérgio Bohatch Júnior** •  
Hospital das Clínicas, Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Rua Tenente Catão Roxo, 3.900 – Monte Alegre.  
CEP: 14015-010 – Ribeirão Preto, SP, Brazil.  
E-mail: milton.jr87@hotmail.com

Manuscript received 11/9/2021; revised 3/2/2022; accepted 7/1/2022

DOI: 10.47593/2675-312X/20223503eabc270



venous thromboembolism and arterial thrombosis, mainly acute myocardial infarction, stroke, and limb ischemia.<sup>1</sup> Multifactorial mechanisms involve endothelial dysfunction interacting with an intense inflammatory condition caused by cytokine storm and complement activation combined with immobilization and a hypercoagulability state.<sup>2-4</sup> The virus itself may directly activate the clotting cascade.<sup>2</sup>

Aortic mural thrombus without occlusive atherosclerotic or aneurysmal disease is an uncommon entity with potentially poor outcomes due to multiple or massive embolizations.<sup>5</sup> Incidental aortic thrombus has an incidence of 0.75% among infected patients with moderate to severe conditions, representing approximately 6.6% of arterial thrombosis cases. This finding highlights critical forms of the disease that are partly mediated by a hypercoagulability

state characterized by macro- and microvascular thrombotic angiopathy.<sup>6,7</sup>

### Authors' contributions

Research concept and design: Bohatch Júnior MS; data collection: Bohatch Júnior MS, Silva AFV; data analysis and interpretation: Bohatch Júnior MS, Dálio MB; manuscript writing: Bohatch Júnior MS, Silva AFV, Dálio MB, Joviliano EE; intellectual content review: Bohatch Júnior MS, Silva AFV, Dálio MB, Ribeiro MS, Joviliano EE.

### Conflict of interest

The authors have declared that they have no conflict of interest.

### Referências

1. Fan BE, Chia YW, Sum CL, Kuperan P, Chan SS, Ling LM, et al. Global haemostatic tests in rapid diagnosis and management of COVID-19 associated coagulopathy in acute limb ischaemia. *J Thromb Thrombolysis*. 2020 [cited 2022 Jul 6];50(2):292-7. Available from: <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-1017011>
2. Abou-Ismaïl MY, Diamond A, Kapoor S, Arafah Y, Nayak L. The hypercoagulable state in COVID-19: Incidence, pathophysiology, and management. *Thromb Res*. 2020;194:101-15. doi: <https://doi.org/10.1016/j.thromres.2020.06.029>
3. Woehl B, Lawson B, Jambert L, Tusch J, Ghassani A, Hamade A. 4 cases of aortic thrombosis in patients with COVID-19. *JACC Case Rep*. 2020;15;2(9):1397-401. doi: <https://doi.org/10.1016/j.jaccas.2020.06.003>
4. Ramacciotti E, Macedo AS, Biagioni RB, Caffaro RA, Lopes RD, Guerra JC, et al. Evidence-based practical guidance for the antithrombotic management in patients with coronavirus disease (COVID-19) in 2020. *Clin Appl Thromb Hemost*. 2020 [cited 2022 Jul 6];26:1076029620936350. Available from: <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-639157>
5. Karaolani G, Moris D, Bakoyiannis C, Tsilimigras DI, Palla VV, Spartalis E, et al. A critical reappraisal of the treatment modalities of normal appearing thoracic aorta mural thrombi. *Ann Transl Med*. 2017;5(15):306. doi: <https://doi.org/10.21037/atm.2017.05.15>
6. Cheruiyot I, Kipkorir V, Ngure B, Misiani M, Munguti J, Ogeng'o J. Arterial thrombosis in coronavirus disease 2019 patients: a rapid systematic review. *Ann Vasc Surg*. 2021;70:273-81. doi: <https://doi.org/10.1016/j.avsg.2020.08.087>
7. de Carranza M, Salazar DE, Troya J, Alcázar R, Peña C, Aragón E, et al. Aortic thrombus in patients with severe COVID-19: review of three cases. *J Thromb Thrombolysis*. 2021;51(1):237-42. doi: <https://doi.org/10.1007/s11239-020-02219-z>