

AORTIC THROMBOSIS AND ACUTE MESENTERIC ISCHEMIA IN A PATIENT WITH COVID-19 DIAGNOSIS

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ABSTRACT

INTRODUCTION: COVID-19, a rapidly spreading infectious disease caused by the Sars-CoV-2 virus, represents a continuous global threat. Among the extrapulmonary disorders associated with COVID-19, arterial and venous thromboembolism has been gaining prominence as one of the most serious consequences and with a very poor prognosis. The thromboembolic events of the arterial macrovasculature described in the literature in association with COVID-19 include thrombosis of the thoracic aorta, infrarenal abdominal aorta, aortoiliac segments and upper mesenteric artery. **CASE REPORT:** Patient LRCJ, 41 years old, male, with non-insulin-dependent diabetes mellitus and systemic arterial hypertension, he presented positive laboratory tests for the detection of Sars-CoV-2 by the viral PCR method. He reported severe abdominal pain for 1 day, associated with a stop of the elimination of flatus and feces in the same period. Abdominal tomography showed a hypodense thrombus in the distal thoracic aorta and in the superior mesenteric artery. He underwent an exploratory laparotomy with resection of 130 cm of ischemic small intestine. In the postoperative period he evolved with hemodynamic instability, significant clinical deterioration, Acute Renal Insufficiency. He presented with a Cardiorespiratory Arrest on the 16th day of hospitalization, progressing to death. **DISCUSSION:** Although there is still a need for a more detailed investigation, a possible association between COVID-19 and thrombotic events seems to be increasingly evident, which makes us more aware of its repercussions in diagnosed patients. Therefore, under COVID-19, assessments of abdominal pain should be thoroughly investigated, and ischemic events should be considered.

KEYWORDS: AORTIC THROMBOSIS; ACUTE MESENTERIC ISCHEMIA; COVID-19

INTRODUCTION

COVID-19, an infectious disease caused by the Sars-CoV-2 virus which was discovered in late 2019 in the city of Wuhan, China and quickly spread around the world, becoming a pandemic in the first few months of 2020.⁷ This rapidly spreading disease represents a continuing global threat.⁴ It is still growing in several countries, having been lethal to thousands of people around the world, with a mortality rate ranging from 0.8% to 12% depending on the country affected.⁷

In moderate and severe forms, the predominant manifestation is that of the respiratory system, which can range from mild pneumonia to acute respiratory distress syndrome.⁷ Among the extrapulmonary affections associated with COVID-19, arterial and venous thromboembolism has gained prominence as one of the most serious consequences and with a very poor prognosis.^{1,11}

Such events associated with COVID-19 may be related to an exacerbated inflammatory response that would lead to a cytokine storm, complement activation and

endothelial damage. A possible direct role of the virus in inducing the coagulation cascade has also been suggested. These observations are causing the use of anti-coagulants, in therapeutic and prophylactic doses, to be considered by many health institutions in their disease treatment protocols.¹

Compared to venous thrombosis, arterial thrombosis seems to have a lower incidence, which is still a significant concern.¹ The thromboembolic events of the arterial macrovasculature described in the literature in association with COVID-19 include thrombosis of the thoracic aorta, infrarenal abdominal aorta, aortoiliac segments and superior mesenteric artery.^{3,4,11}

CASE REPORT

Patient LRCJ, 41 years old, male, with non-insulin-dependent Diabetes Mellitus and Systemic Arterial Hypertension, admitted to the Emergency Hospital of Aparecida de Goiânia (HUAPA) in early July 2020, complaining of severe dyspnea, cough dryness, asthenia, fever and

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pain in the body for 11 days, with intense worsening of the condition for 2 days, when he started to present concomitant complaints of severe diffuse abdominal pain. He also presented a positive laboratory test for detection of Sars-CoV-2 by the viral PCR method performed 8 days before.

At the time, he was admitted to an isolation bed for clinical treatment of COVID-19. He evolved with improvement in respiratory complaints, with a report of partial improvement in abdominal pain after analgesia and dietary measures, being discharged on the 4th day of the first hospitalization, after 15 days of the onset of symptoms.

Two days after hospital discharge, the patient returned to HUAPA, when an assessment by the General Surgery team was requested, with a report of progressive worsening of the abdominal pain, which started to be characterized again as severe for 1 day, associated with a condition of stoppage of the elimination of flatus and feces in the same period. In the anamnesis, the patient denied having any personal or family hematological diseases, as well as previous thromboembolic events, cardiac arrhythmias, or other comorbidities in addition to those reported. On physical examination, the patient was conscious, Glasgow 15, with heart rate of 112 bpm, blood pressure of 142 x 82 mmHg, SatO₂ in 95% room air, pain face, intense painful sensitivity to abdominal palpation, abdominal stiffness, defense, reduction of abdominal hydro-aerial noises. Laboratory tests indicated Hemoglobin 16.6mg/dl, Leukocytes 18 000 /mm³ (with 10% Lymphocytes), Platelets of 198 000 mm³, INR of 1.18, APTT of 29 sec, Creatinine 1.2, PCR of 13.6mg/L. Patient underwent abdominal contrast tomography with identification of absence of enhancement of multiple segments of the small intestine, presence of intestinal pneumatosis in the small segment; presence of a hypodense thrombus determining partial filling failure at the distal end of the Thoracic Aorta, measuring 1.7 x 1.3 x 3.8 cm and the presence of a hypodense thrombus determining occlusion of the distal third of the superior mesenteric artery.

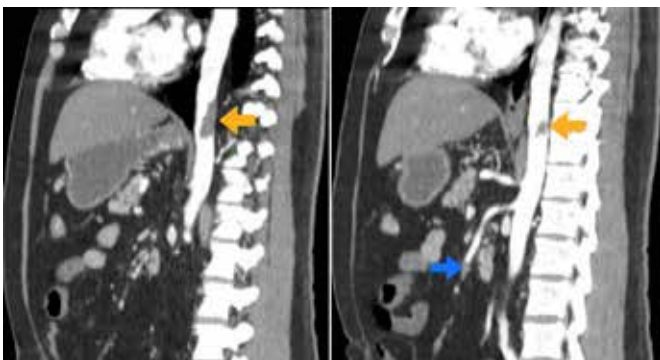


Figure 1: Contrast-enhanced Computed Tomography of the abdomen in the arterial phase - Yellow arrows indicating thrombus located in the distal portion of the thoracic aorta and blue arrow, occlusion point of the superior mesenteric artery.

Exploratory laparotomy was indicated, with intraoperative finding of an ischemic lesion of a 120 cm segment of small bowel located 70 cm from the Treitz angle and 180 cm from the ileocecal valve. 130 cm small bowel enterectomy with manual primary anastomosis was performed.



Figure 2: A) Intraoperative finding of small bowel ischemia. B) Resected segment of ischemic small intestine.

Postoperatively, early anticoagulation was instituted. The resumption of intestinal transit 72 hours after surgery was observed, with the presence of air-fluid noises and elimination of flatus, when an oral diet was started. On the 5th postoperative day, he presented diffuse abdominal distension, and deterioration of the clinical condition, with decreased level of consciousness, tachycardia, hypotension and worsening of leukocytosis with a left shift, and a new laparotomy was indicated. Enteric content in the abdominal cavity and anastomotic dehiscence were identified. It was decided to wash the cavity and make a double ileostomy. Postoperative management took place in the intensive care unit, with the use of vasoactive drugs for hemodynamic stabilization, maintenance of maximum anticoagulation dose, antibiotic therapy and mechanical ventilation. The patient evolved with Acute Renal Failure and presented cardiopulmonary arrest on the 16th day of hospitalization, with no success in resuscitation measures.

DISCUSSION

The identification of aortic thrombus without association with aneurysm and atherosclerosis is a rare presentation. In this situation, it is usually accompanied by a state of hypercoagulability, trauma, malignant neoplasms, previous surgeries and turbulent blood flow. Clinically, it can manifest asymptotically or with symptoms that are related to embolization. Thus, the diagnosis is based on findings in routine exams or after cerebral, peripheral

or visceral embolic events.^{2,9}

Acute mesenteric ischemia is defined as sudden intestinal hypoperfusion. They are triggered by occlusive events such as embolisms or plaque thrombosis or by non-occlusive events such as situations of low output and vasoconstriction. Impaired blood flow mainly by the superior mesenteric artery.⁵ In addition, mesenteric venous thrombosis presents as a rare entity, manifesting in about 10 to 15% of intestinal ischemia, mainly caused by coagulopathies, inflammatory processes and neoplasms.⁸

In the case presented here, contrast-enhanced tomography shows the presence of thrombosis of the thoracic aorta and superior mesenteric artery, with a thrombus with an aspect suggestive of acute formation. The images do not identify other vascular changes that might suggest aneurysmal or atherosclerotic lesions. There are not enough parameters to conclude whether mesenteric thrombosis manifests itself synchronously with aortic thrombosis, or whether it is of emboligenic origin.

The Dutch study by Klok et al. brought an epidemiological analysis of the incidence of thrombotic complications in patients admitted to Intensive Care Units of three hospitals in the Netherlands.⁶ The study evaluated 184 patients diagnosed with COVID-19, of which 49% had some thrombotic event. Pulmonary thromboembolism was the most prevalent event, manifesting 87% of the time. Other thrombotic events identified were Stroke (6.6%), Deep Vein Thrombosis (4%) and Arterial Thrombosis (2.6%).^{6,10}

As for the pathophysiology of the thrombotic action triggered by the presence of SARS-Cov-2, it is postulated that it is initiated by a severe proinflammatory action of alveolar origin with the release of inflammatory cytokines that lead to the activation of epithelial cells, monocytes and macrophages. In addition, a direct action of endothelial cell infection through the Angiotensin-converting Enzyme² (ACE2) receptor also leads to endothelial activation and dysfunction, tissue factor expression, platelet activation, increased levels of von Willebrand factor (VWF) and factor VIII (FVIII), in such a way that they promote the formation of fibrin clots.¹

Although more detailed investigation is still needed, a possible association between COVID-19 and thrombotic events seems to be increasingly evident, which makes us more aware of its repercussions on diagnosed patients. In the case presented here, the absence of a history of vascular lesions, coagulopathies and other prothrombotic events reinforces the possibility of viral action in the genesis of the diagnosed thrombi. Intestinal ischemia is a potentially fatal condition, which must be diagnosed early so that treatment can be instituted soon to provide greater chances of survival for the patient. Therefore, under COVID-19, evaluations of abdominal pain conditions should be thoroughly investigated, and ischemic events should be considered.¹²

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