

Mesenteric Infarction With Cerebral Thrombotic Relapses and Pulmonary Embolism Two and Four Months After COVID-19

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Abstract

The aim of the present study was to report different sites of thrombotic events during and after coronavirus disease 2019 (COVID-19) in a 49-year-old patient who had acute mesenteric infarction in acute phase, stroke 2 months after and pulmonary thromboembolism 4 months after infection by COVID-19. The obese, previously healthy patient experienced myalgia and headache with subfebrile peaks and was tested positive for COVID-19 with a fast polymerase chain reaction (PCR) assay. Ten days after the onset of symptoms, the patient was submitted to exploratory laparotomy, which revealed 20 cm of small intestine loop with signs of suffering and thickening of the wall approximately 120 cm from the ileocecal valve. Two months after the event, angiotomography was performed, revealing effacement of the sulci in the right parietal region and hypersignal of the right middle cerebral artery with stop in M1. Two months later (4 months after the mesenteric infarction), chest angiotomography revealed signs of acute pulmonary thromboembolism, with no typical image of pulmonary infarction. Despite all these complications in the postoperative period, the patient survived.

Keywords: Mesenteric infarction; Cerebral; Thrombotic; Pulmonary embolism; COVID-19; Treatment

Introduction

The coronavirus disease 2019 (COVID-19) predisposes infected individuals to thrombosis, the underlying mechanisms of which are not fully understood. The balance between pro-coagulant factors and natural coagulation inhibitors in critically ill patients with COVID-19 is fundamental to the prevention and treatment of complications [1, 2]. In a study evaluating 40 patients hospitalized with COVID-19 who developed acute abdominal pain, computed tomography angiographic and venographic imaging studies detected hemorrhagic complications in 47.5% of cases and thrombotic events in 20%. In the latter group, 25% of the thrombotic events were arterial, 25% were venous, 12.5% were cases of splenic infarction, 12.5% were cases of intestinal ischemia and 25% of cases had multiple sites of thromboembolism [3].

Among the few cases of splenic infarction associated with COVID-19, half were found accidentally during autopsy. This may be due to a clinically silent presentation or symptoms mistakenly attributed to pain caused by the effects of COVID-19 [4].

Acute ischemic stroke and the occlusion of large blood vessels can be concomitant to infection by COVID-19. A study evaluating cases of mechanical thrombectomy in these patients detected a 29% mortality rate in 30 days and early neurological improvement in 19.5% of patients [5]. In another study, patients with COVID-19 who received endovascular therapy had less successful reperfusion rates in comparison to patients without COVID-19 and greater in-hospital mortality [6].

A multicenter study found that the weighted mean incidence of pulmonary thromboembolism was 11.1% and remained high even after prophylactic anticoagulation therapy [7]. Tachypnea (> 22 bpm), the absence of findings suggestive of infection by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the chest radiography and D-dimer levels > 3,000 ng/mL have been identified as predictive factors of pulmonary thromboembolism in patients with COVID-19 [8].

The aim of the present study was to report different sites of thrombotic events during and after COVID-19 in a 49-year-old patient who had acute mesenteric infarction in the acute phase, stroke 2 months after and pulmonary thromboembolism 4 months after infection by COVID-19.

Manuscript submitted March 31, 2023, accepted May 28, 2023
Published online June 11, 2023

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doi: <https://doi.org/10.14740/gr1525>

Case Report

Investigations

A 49-year-old male patient, obese, previously healthy, experienced myalgia and headache with subfebrile peaks and was tested for COVID-19 with a fast polymerase chain reaction (PCR) assay. Ten days after the onset of symptoms, the patient experienced sudden diffuse abdominal pain refractory to simple analgesia as well as vomiting and anorexia and a sign of peritoneal irritation on palpation.

Diagnosis

The patient was sent to our service, where the chest tomography revealed bilateral lung impairment with a “ground-glass” appearance affecting approximately 25% of the lungs.

Treatment

The patient was submitted to exploratory laparotomy, which revealed 20 cm of small intestine loop with signs of suffering and thickening of the wall approximately 120 cm from the ileocecal valve. Enterectomy was performed and the patient was discharged after surgical recovery (Fig. 1). Histological examination showed ischemic necrosis of the mucosal layer and acute perivisceral inflammation of the resected intestinal portion with ischemic necrosis from recent thrombosis of the mesenteric vessel and inflammatory infiltration of the endothelium.

Two months after the event, the patient had a grand mal seizure with no postictal period lasting approximately 5 min, followed by confusion. The hypothesis of ischemic stroke was raised. Angiotomography was performed, revealing effacement of the sulci in the right parietal region and hypersignal of the right middle cerebral artery with stop in M1. The patient was submitted to thrombolysis, presenting a period of greater drowsiness 3 h after the onset of thrombolysis. RT-PA (Actilyse) was administered, 0.9 mg/kg, intravenous 10% bolus over 2 min, the remaining infusion pump over 60 min. The microsurgery team indicated and performed mechanical thrombectomy. The patient remained hospitalized for 12 days, experiencing gradual motor recovery with deficit, receiving discharge with a prescription for acetylsalicylic acid and anti-hypertensive agents.

Follow-up and outcomes

Two months later (4 months after the mesenteric infarction), the patient presented with sudden dyspnea and sought care in his hometown. Electrocardiography was performed, which revealed a S1Q3T3 pattern and the chest radiography revealed perihilar infiltrate. Hydrocortisone and non-fractionated heparin were initiated and the patient was sent to our service. Chest



Figure 1. Portion of the resected intestinal loop.

angiogram revealed signs of acute pulmonary thromboembolism, with no typical image of pulmonary infarction. The treatment option was anticoagulation therapy and clinical support.

Discussion

The present study reports the relapse of thrombotic events that occurred during the acute phase of COVID-19 and months later at different vascular sites in a 49-year-old patient. Mesenteric infarction was the first thrombotic episode, which was diagnosed and treated in a timely manner. Two months later, the patient had a stroke, which was first treated clinically, followed by mechanical thrombectomy, but with only partial improvement. Four months after the initial thrombotic event, the patient suffered a pulmonary embolic event, which was treated clinically. This is the first report in the literature on a case of late rethrombosis involving the cerebral and pulmonary circulation. However, there are several case reports and series involving these thrombotic sites separately.

Mesenteric infarction is rare, with only four confirmed cases among the approximately 6,000 patients with COVID-19 in the wards and intensive care units at our institute. One of these patients died and multiple sites of microthrombosis and macrothrombosis were detected, with ischemia and several perforations detected during the pathological evaluation. However, this prevalence is underestimated, as intubated,

sedated patients are often unable to report symptoms and end up dying. One of the studies reports that nearly half of cases of mesenteric infarction were diagnosed during autopsy [3].

Early diagnosis and treatment are fundamental in such cases to avoid perforations and fecal peritonitis and reduce the mortality rate. The conduct is the same as that for non-COVID-related mesenteric infarction. One study identified that 47% of patients with abdominal pain had bleeding and thrombosis in other abdominal sites, as revealed by computed tomography, suggesting the need for imaging exams in symptomatic patients.

All patients hospitalized with COVID-19 have received antithrombotic prophylaxis with Clexane, conventional heparin or rivaroxaban in most cases. We have detected approximately 300 patients with deep vein thrombosis, which is likely underestimated, and the number of such cases tripled with the predominance of the SARS-CoV-2 P.1 variant at our service, along with an increase in the mortality rate. Prophylaxis for thrombosis is fundamental to avoiding one of the most serious complications of COVID-19 - thrombotic events.

Learning points

The early treatment of mesenteric infarction in patients with COVID-19 can avoid complications such as fecal peritonitis and reduce the mortality rate. However, other thrombotic sites, such as the brain and lung, may occur and should be treated as early as possible.

Acknowledgments

None to declare.

Financial Disclosure

The authors declared no financial support.

Conflict of Interest

The authors declared no conflict of interest.

Informed Consent

This study was approved by Ethical Committee and Research in Medicine School of Sao Jose do Rio Preto-FAMERP#4.987.408. The patient signed informed consent.

Author Contributions

Design and conduct of the study: Godoy HJP, Marum G, Godoy JMP, Espada PC. Collection of data: Godoy HJP, Marum

G, Godoy JMP, Espada PC. Management: Godoy HJP, Marum G, Godoy JMP, Espada PC. Analysis and interpretation of the data: Godoy HJP, Marum G, Godoy JMP, Espada PC. Preparation: Godoy HJP, Marum G, Godoy JMP, Espada PC. Review: Godoy HJP, Marum G, Godoy JMP, Espada PC. Approval of the manuscript: Godoy HJP, Marum G, Godoy JMP, Espada PC. Decision to submit the manuscript for publication: Godoy HJP, Marum G, Godoy JMP, Espada PC. All authors agree the manuscript.

Data Availability

The authors declare that data supporting the findings of this study are available within the article.

References

1. Pereira de Godoy JM, Russeff G, Cunha CH, Sato DY, Silva D, Godoy HJP, Silva M, et al. Increased prevalence of deep vein thrombosis and mortality in patients with COVID-19 at a referral center in Brazil. *Phlebology*. 2022;37(1):21-25. [doi pubmed pmc](#)
2. Pereira de Godoy JM, Russeff G, Costa CH, Sato DY, Silva D, Guerreiro Godoy MF, Pereira de Godoy HJ, et al. Mortality of patients infected by COVID-19 with and without deep-vein thrombosis. *Medicines (Basel)*. 2021;8(12):75. [doi pubmed pmc](#)
3. Abdelmohsen MA, Alkandari BM, Abdel Razek AAK, Tobar AM, Gupta VK, Elsebaie N. Abdominal computed tomography angiography and venography in evaluation of hemorrhagic and thrombotic lesions in hospitalized COVID-19 patients. *Clin Imaging*. 2021;79:12-19. [doi pubmed pmc](#)
4. Dennison JJ, Carlson S, Faehling S, Phelan H, Tariq M, Mubarak A. Splenic infarction and spontaneous rectus sheath hematomas in COVID-19 patient. *Radiol Case Rep*. 2021;16(5):999-1004. [doi pubmed pmc](#)
5. Cagnazzo F, Piotin M, Escalard S, Maier B, Ribo M, Requena M, Pop R, et al. European multicenter study of ET-COVID-19. *Stroke*. 2021;52(1):31-39. [doi pubmed](#)
6. Tejada Meza H, Lambea Gil A, Sancho Saldana A, Martinez-Zabaleta M, Garmendia Lopetegui E, Lopez-Cancio Martinez E, Castanon Apilanez M, et al. Impact of COVID-19 outbreak in reperfusion therapies of acute ischaemic stroke in northwest Spain. *Eur J Neurol*. 2020;27(12):2491-2498. [doi pubmed pmc](#)
7. Ng JJ, Liang ZC, Choong A. The incidence of pulmonary thromboembolism in COVID-19 patients admitted to the intensive care unit: a meta-analysis and meta-regression of observational studies. *J Intensive Care*. 2021;9(1):20. [doi pubmed pmc](#)
8. Gil Mosquera M, Fernandez-Ruiz M, Sanz Rodriguez E, Mata Martinez A, Ibanez Sanz L, Munoz Martin D, Bisbal Pardo O, et al. Prediction of pulmonary embolism in patients with SARS-CoV-2 infection. *Med Clin (Barc)*. 2022;158(5):206-210. [doi pubmed pmc](#)