



Acute Mesenteric Thrombosis in COVID-19: A Case Report

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Abstract

Coronavirus 2019 (COVID-19) is associated with a high incidence of thromboembolic events. Patients with severe form have a higher risk as well as those with embolic factors (high age, obesity, diabetes, etc.). Acute mesenteric thrombosis is among the complications to be feared during this pandemic even in patients who do not have embologenic factors. The objective of this study is to discuss and understand the mechanism of occurrence of acute mesenteric thrombosis during COVID-19 infection. The case studied is about an old woman (64 years old) with only recent history of covid-19 infection who consults for acute abdominal pain with occlusive syndrome. Thora-coabdominal CT showed superior mesenteric arterial and venous thrombosis and bilateral mid-lobe pneumonia. The patient progressed well on anticoagulant therapy. Rare cases of mesenteric ischemia secondary to vein and/or mesenteric artery thrombosis have been described during this pandemic; this requires therapeutic and preventive management of thromboembolic disease in patients to reduce mortality of this disease.

Subject Areas

Diagnostics, Gastroenterology & Hepatology, Infectious Diseases, Surgery & Surgical Specialties

Keywords

Coronavirus 2019, Acute Mesenteric Thrombosis, Case Report, Occlusive Syndrome

1. Introduction

Coagulopathy and clinical thrombotic events are commonly seen in patients with COVID-19. Dedicated observational studies have described a high incidence of thromboembolic events in COVID-19.

However, rare cases of acute mesenteric ischemia (AMI) have been reported in the absence of a thromboembolic risk factor. Apart from pulmonary embolism (PE) and deep vein thrombosis, occurs in severe cases of patients with COVID-19. AMI is a serious complication with a high risk of mortality [1] [2] [3] [4].

SARS-CoV-2 possesses the ability to penetrate inside its host cells via the interaction between its transmembrane glycoprotein, called protein S, and its functional receptor, angiotensin converting enzyme 2 (ACE2). In the respiratory tract, SARS-CoV-2 is thus able to infect epithelial cells alveolar and pulmonary endothelial cells. It results from intense local inflammation spreading to endothelial cells and causing endotheliitis, which was documented during autopsy, analyzes [5].

The objective of this article is to understand the occurrence of mesenteric thrombosis presented in the context of COVID-19 after recovery and similar studies.

2. Patient and Observation

Patient information:

A 64-year-old woman who came to our hospital had severe abdominal pain in November 2020 and occlusive syndrome. She was in the recovery phase from COVID-19 (the rapid test was positive with the presence of IgG antibodies and the PCR test confirmed the presence of the stigma of COVID-19 infection) Other than that, she had no medical or surgical history.

Clinical result:

Physical examination shows a conscious patient who is respiratory stable with a little tachycardia, her abdomen was tenderly distended and an empty rectal bulb on the digital rectal examination.

Timeline:

Patient reports occlusive syndrome 4 days ago and 20 days after recovery from COVID-19.

Diagnostic procedure:

The biologic assessment objectified a hyper leukocytosis at 17,000 a CRP at 260 mg/l.

Analysis of prothrombin time (PT) and activated partial thromboplastin time (aPTT) were normal, but D-dimer assay was greater than 480 µg/mL.

The unprepared abdomen shot showed hail-like hydroaeric levels, completed by Abdomino-pelvic CT (CTAP) which showed a dense appearance of the superior mesenteric vein and artery with no enhancement of the latter after injection of PDC in the venous phase of the PDC in the venous phase. This corresponds to

superior mesenteric venous and arterial thrombosis (**Figure 1**), thickening of the wall of the last ileal loop (**Figure 2**) without parietal pneumatosis or peritoneal effusion.

The thoracic scanner shows the sequelae of bilateral mid-lobe pneumonia.

Access to paraclinical examinations was easy since the patient was a mutualist.

We confirmed the diagnosis of acute mesenteric ischemia on thrombosis of the upper mesenteric vein and artery.

Therapeutic interventions:

We proceeded to medical treatment given the absence of signs of mesenteric ischemia.

The patient after consent was put on enoxaparin at 1 mg/kg/12h for 3 months.

Therapeutic follow-up:

During her hospitalization, the patient gradually recovered her transit she expressed that she was satisfied with the result of the treatment.

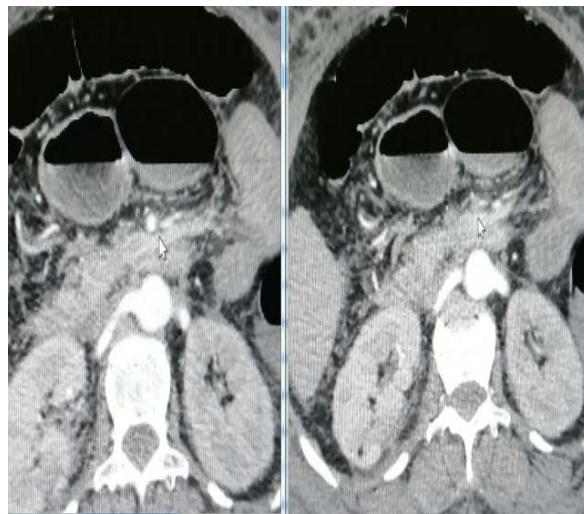


Figure 1. SM artery thrombosis.

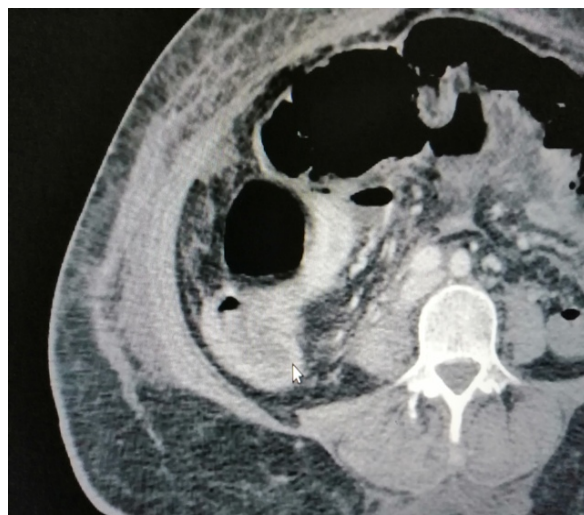


Figure 2. Bowel wall thickening of the small intestine.

Control by abdominal CT showed an improvement in radiological signs.

A biological assessment was requested to detect a complication with the anti-coagulant treatment, which returned to normal, in particular a blood count in search of induced thrombocytopenia.

The patient left well after a hospitalization of 17 days.

Patient's perspective:

The patient expressed her satisfaction with the result of the treatment received and the good evolution.

Informed consent:

Oral and written consent was obtained from this patient to publish her case, with anonymized images and information.

3. Discussion

Gastrointestinal involvement during SARS COVID-19 was resolved either directly by lymphocytic infiltration in the gastric epithelium of the esophagus and small intestine or indirectly by thromboembolic complication.

Until today we do not understand the mechanism of these complications during the disease COVID-19 this is due either to diffuse endothelial inflammation secondary to viral infection of the endothelial cell or to an elevation of pro-coagulant factors (factor VIII, von Willebrand factor, fibrinogen) without forgetting the role of cytokines induced by the virus which causes coagulation and activation of fibrinolysis [6] [7] [8]. In addition to many circulating prothrombotic micro vesicles that supply platelets or monocytes as well as mediators released by activated neutrophils are also hypercoagulable factors [8].

Mesenteric artery ischemia (AMI) during COVID-19 disease is not quite common but its morbidity is generally high. The etiologies often found in AMI are: acute mesenteric artery thrombosis and embolism, acute mesenteric venous thrombosis and severe mesenteric ischemia.

It can manifest itself in an acute or subacute way with or without cardiovascular risk factors as in the case of our patient.

Cheung *et al.* [9] describing a case of a 55 year-old man with no history of thromboembolism who had thrombosis of the superior mesenteric artery.

Fan *et al.* [10] describing a case of a 30-year-old man with radiological and histological evidence of superior mesenteric vein thrombosis.

Both cases required surgical resection of necrosis for upper mesenteric ischemia small intestine and anticoagulation.

The presence of the virus responsible for the COVID-19 disease in the intestinal mucosal layer suggests that the thrombotic state of the superior mesenteric artery and vein may exist in the subacute phase of this disease, thus acute mesenteric ischemia may occur during the recovery phase of COVID-19 and even after recovery.

Father *et al.* [11] also described the case of a COVID-19 seropositive man in his sixties, without co-morbidity and without signs of chronic arterial disease,

who presented with lower limb ischemia due to an embolism of the left popliteal artery.

Goh *et al.* [12] presented in a study the case of a COVID-19 seropositive man who had an eccentric infrarenal abdominal aortic thrombus complicated by an embolism that occluded the right external iliac artery.

During the etiological diagnosis it is necessary to eliminate known thrombophils, in particular antiphospholipid syndrome, paroxysmal nocturnal hemoglobinuria, paraneoplastic syndrome, deficiencies in proteins C, S and antithrombin III, mutation of factor V.

The dosage of D-dimers is the best test for detecting a thromboembolic complication during covid disease, which improves the prognosis.

Thus, risk factors must be sought and anticoagulant treatment is instituted as soon as possible to avoid intestinal ischemia and portal hypertension as well as exploratory surgery, which confers a strong postoperative comorbidity.

In our establishment, we treat patients infected with COVID-19 with curative dose anticoagulants based on the level of dimers.

Tang *et al.* [13] published a series of 449 patients with severe forms of COVID-19; 99 received low molecular weight heparin which gave better results compared to other cases that were treated only for COVID; especially since the D-dimers were high, this increase in D-dimers may also be due to an intense inflammatory response. Since its prothrombotic conditions still exist in patients with COVID-19, we must have a consensus on the administration of anticoagulants and the duration of treatment, something that has not yet been realized.

4. Conclusion

The morbimortality of the COVID-19 infection is strongly linked to the thromboembolic complication. Since there is no specific treatment for this pandemic and in front of an unexplained clinical picture, mesenteric thrombosis should also be suspected. In addition, the dosages of D-dimer as well as radiology allow early diagnosis and improve the prognosis of this disease.

Consent

We published this case after obtaining written consent from the patient.

Authors' Contributions

All authors contributed to the conduct of this work. All authors declare to have read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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