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Bowel Necrosis in the Setting of COVID-19 Infection, Report of 2 Cases

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Abstract **Case Report**

Severe respiratory syndrome coronavirus 2 (SARS-CoV-2) is well known for causing respiratory and other extrapulmonary manifestations. Patients infected with coronavirus disease 2019 (COVID-19) may demonstrate atypical presentations with gastrointestinal symptoms. Clinicians managing these patients should reserve a high index of suspicion for the rare complication of acute mesenteric ischemia (AMI). It is a challenging diagnosis that is often missed when presenting symptoms are subtle and nonspecific like nausea, emesis, or diarrhea. Outcomes are typically catastrophic and fatal as bowel ischemia progresses to necrosis but may be averted with timely diagnostic and therapeutic methods to swiftly restore blood flow.

Keywords: Covid-19, Acute Mesenteric Ischemia, Gastrointestinal Manifestations, General Surgery, Bowel Necrosis, Case Report.

INTRODUCTION

The novel coronavirus (COVID-19) is an illness caused by the severe acute respiratory syndrome coronavirus (SARS-CoV). Caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), it has spread globally and evolved into a pandemic.

The coronavirus belongs to a family of RNA viruses that can induce respiratory infections with varying symptoms, usually encompassing cough, fever, tiredness, headaches, and myalgia after an exposure period of 2 to 14 days. This virus infiltrates human cells through the angiotensin-converting enzyme 2 (ACE-2) receptor, also present in the gastrointestinal tract epithelium. Gastrointestinal tract involvement may manifest as abdominal pains, reduced appetite, nausea, and vomiting, with a fluctuating occurrence ranging from 5 to 50% of cases [1, 2].

Moreover, COVID-19 can also make individuals more susceptible to venous and arterial thromboembolic disorders due to excessive inflammation, hypoxia, and diffuse intravascular coagulation facilitated by the triad of hypercoagulation, blood stasis, and endothelial injury. This phenomenon of vascular constriction and thromboembolic illness results in heightened hypoxemia and predictive value of adverse outcomes linked to d-dimer levels [3].

In two case report, we detail a COVID-19 patients who experienced intestinal necrosis necessitating urgent surgical intervention.

PRESENTATION OF CASES

CASE 1:

A 45-year-old man with no past medical history presented to the emergency room with nausea and vomiting and abdominal pain associated with fever that had started 48h earlier without a clear trigger. However, the patient suffered from dry cough in the last 8 days. Other clinical findings included pallor, a heart rate of 115 b/min, respiratory rate of 24 breaths/min, and blood pressure of 105/65 mmHg. COVID-19 was affirmed with a positive rapid antigen testing. Physical examination revealed normal oxygen saturation, abdominal examination found diffuse guarding. Serum lipase, and liver functional enzymes were normal. Other laboratory tests showed the following: hemoglobin level = 12.8 g/dL, white blood cell count = 12.8 x 109/L, platelet count = 188 x 109/L, C-reactive protein = 59 mg/L, blood urea = 2,62 mg/dL, and serum creatinine= 32.1 mg/dL.

Due to the high serum creatinine level, CT-scan was done without contrast showed pneumoperitoneum associated with free peritoneal fluid. The patient underwent emergent laparotomy, intra-operatively, pus peritonitis along with perforation of 1 cm at the jejunum were found, located 40 cm distal to the angle of Treitz (figure 1). Enterorrhaphy was performed with separate stitches using absorbable monofilament suture material and lavage of the cavity. The patient was discharged on 6th day of hospitalization in a good condition.

CASE 2:

A 37-year old male patient, morbidly obese, negative past history, presented to our emergency complained of abdominal pain, marked distension and inability to pass gas or defecate. He reported 14 days history of shortness of breath, dry cough and fever. At clinical examination, signs of peritoneal irritation were detected. COVID-19 was affirmed through a positive result on a rapid antigen test. Laboratory tests were as follows: WBC:12.100; Hb:12.5; CRP 104.

A CT scan showed dilated loops of bowel, bowel wall thickening, and reduced enhancement with free peritoneal fluid. In addition, multifocal ground glass opacity and consolidative lesions typical of covid-19 infection was detected (figure 2).

The patient had persistently worsened abdominal pain, and was taken to the operating room for an exploratory laparotomy revealed gangrenous segmental small bowel ischemia in two locations: first, we found a round necrosis, 3 cm in diameter, yellowish black in antimesenteric site. In the second location, 20 cm whole intestinal necrosis was found at 1 m from the first site (figure 3). We did bowel resection at each site of necrosis and end-to-end anastomoses by using manual suturing. Five days after surgery, both abdominal and lung involvements had improved considerably and the patient was discharged.

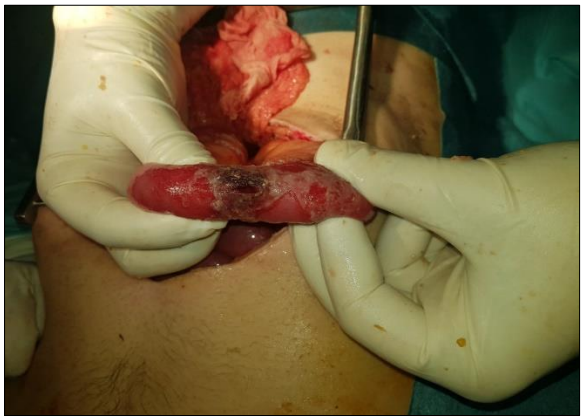

Figure 1: perforation of 1 cm at the jejunum

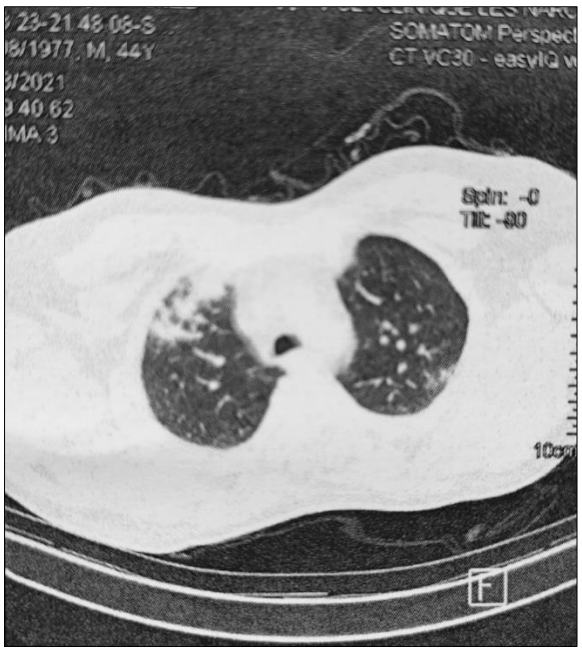

Figure 2: multifocal ground glass opacity and consolidative lesions typical of covid-19 infection

Figure 3: gangrenous segmental small bowel ischemia in two locations

DISCUSSION

COVID-19 is a new coronavirus infectious disease, most often causing severe respiratory disease. Typical symptoms of SARS-CoV-2 include fever, cough and dyspnea. A large and growing number of studies have demonstrated extra-pulmonary manifestations of COVID-19 in hematological, cardiovascular, renal, gastrointestinal and hepatobiliary, endocrine, neurological, ophthalmological and dermatological systems [4].

The gastrointestinal disorders described in international series are highly varied: nausea, vomiting, diarrhea and abdominal pain. The prevalence of gastrointestinal symptoms varies from study to study, with several scientific studies published showing prevalence ranging from 15% to 61.3% [5, 6].

This digestive disease is probably multifactorial. SARS-CoV-2 uses angiotensin-converting enzyme 2 (ACE2) as its main cellular receptor to enter the host cell. ACE2 receptors are expressed in several systems, including the gastrointestinal tract. Therefore, the enterocyte has been identified as the target cell of SARSCoV-2 in the digestive tract [7].

Some authors also believe that the organ damage observed in some COVID-19 patients may be due to severe systemic inflammation caused by the regulation of cellular and natural immunity.

The infection with SARS-CoV-2 triggers T-cell activation and the inflammatory signaling pathway that ultimately leads to the release of several pro-inflammatory cytokines, such as granulocyte-macrophage colonization factor (GM-CSF), interleukin (IL)-2, IL-6, IL-7, IL-10 and tumor necrosis factor-α (TNF-α) [8].

This cytokine cascade can ultimately lead to extensive cellular damage, necrosis and multi-organ injury, and may partly explain the various multisystem symptoms in patients with confirmed viral infections, including gastrointestinal necrosis [8, 9].

Our patients presented with severe, unremitting abdominal pain and fever. They had no history of a similar clinical presentation, no previous surgery and no thromboembolic risk factors. Intestinal necrosis was observed during the operation. Given the growing evidence linking COVID-19 to coagulopathy, and previous reports of COVID-19-associated intestinal ischemia, the role of COVID-19 infection in the occurrence of intestinal ischemia in our patients was highly probable. The exact mechanism of acute mesenteric ischemia is not yet fully understood.

Four mechanisms have been suggested to explain this acute complication, including hypercoagulability induced by systemic inflammation, endothelial activation, hypoxia and immobilization, which may lead to mesenteric vascular thrombosis [10].

CONCLUSION

COVID-19 infection is a disease associated with fever and respiratory symptoms. But it may also manifest itself in extrapulmonary symptoms, such as gastrointestinal symptoms with serious consequences. Therefore, clinicians need to recognize these symptoms and their consequences, to ensure immediate diagnosis and treatment.

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