

## Ischemic Colitis Associated with Mild COVID-19

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## 1. Case Presentation and Clinical Images

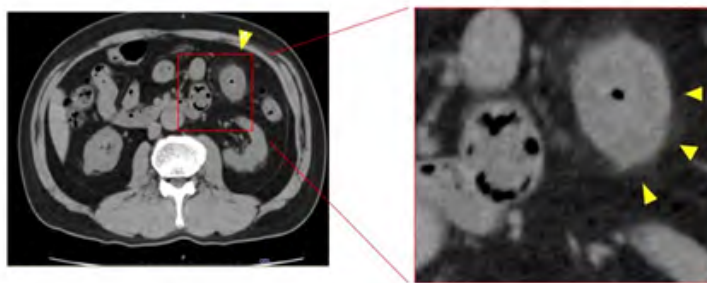
Gastrointestinal (GI) symptoms have been increasingly recognized as a part of the disease spectrum of coronavirus disease 2019 (COVID-19) infection, in addition to the more common pulmonary symptoms.

According to numerous studies, around 50% of patients with COVID-19 present with GI symptoms such as diarrhea, nausea, vomiting, and abdominal pain [1-3]. One of the less frequently encountered GI manifestations of COVID-19 is Ischemic Colitis (IC). Three possible pathophysiological mechanisms in COVID-19-associated IC have been proposed: 1) microthrombi associated with a hypercoagulable state, 2) SARS-CoV-2-induced endotheliitis or direct bowel damage due to Angiotensin-Converting Enzyme 2 (ACE-2) expression, and 3) nonocclusive colonic ischemia due to intense vasoconstriction and decreased mesenteric blood flow secondary to hemodynamic compromise in severe cases [4, 5]. Among the limited number of known cases of IC in COVID-19 patients, nearly half died, even after surgical intervention [6]. The necessity of surgical intervention for COVID-19 patients with IC seemed to be more frequent compared to IC patients without COVID-19. We report here on a patient with IC caused by COVID-19 infection who was successfully treated by a conservative modality.

A 67-year-old man presented with a cough, sore throat, fever, and watery diarrhea for the past day. His past medical history included heart failure and bronchial asthma. His SpO<sub>2</sub> was 98% in room air,

and Computed Tomography (CT) showed no pneumonia. His watery diarrhea turned bloody during the night. The next day he was found to be positive for SARS-CoV-2 and was admitted to our hospital. A review of his CT revealed a circumferential thickening and luminal narrowing of a portion of the transverse colon (Figure 1). Blood tests showed the following: leukocyte count: 7,480 / $\mu$ L, CRP: 2.26 mg/dL, procalcitonin: <0.05 ng/mL, d-dimer: <0.5 $\mu$ g/mL, CEA: 2.2 ng/mL, CA19-9: 45.2 U/mL (normal level is <37). He was treated with remdesivir for three days and was discharged without gastrointestinal symptoms after conservative treatment. One week later, a colonoscopy detected three longitudinal ulcers in the flexure of the spleen (Figure 2). Upon pathological examination, there was disorder in the arrangement and the formation of a crypt abscess was observed. In the subepithelial stroma, inflammatory cell infiltration was observed mainly in lymphocytes and plasma cells with no malignancy. He was diagnosed with COVID-19-associated IC.

The patient was hemodynamically stable with a normal d-dimer, so the IC is suspected to have developed due to ACE-2 expression. The symptoms of COVID-19 patients with IC with sometimes turn serious and diagnosing such cases is not difficult. In mild cases, however, the IC CT findings may be overlooked such as was initially the case for this patient. Vanella et al. reported that 33.3% of COVID-19 patients that underwent a lower GI endoscopy showed an ischemic-like colitis [5]. Thus, proper importance should be given to the GI images of even mild COVID-19 cases that are not in a hypercoagulable state.



**Figure 1:**



**Figure 2:**

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