

## CASE REPORT

# An Unusual Cause of Acute Abdominal Pain in Coronavirus Disease (COVID-19): Report of Two Cases

Sudeepthi Mandala<sup>1</sup>, Rakesh Kodati<sup>2</sup>, Anuradha Tadepalli<sup>3</sup>, Chandana Reddy<sup>4</sup>, Shruthi Kalyan<sup>5</sup>

Received on: 28 May 2022; Accepted on: 31 May 2022; Published on: 31 August 2022

## ABSTRACT

Coronavirus disease-2019 (COVID-19) is an infectious disease caused by coronavirus/2019-nCoV. It primarily manifests as lung infection, with fever and respiratory tract symptoms. Extrapulmonary complications affecting multiple organs are commonly seen, especially in critically ill patients. The reported gastrointestinal (GI) complications include transaminitis, acute pancreatitis, mesenteric ischemia, GI bleed, and ileus. Here, we report two cases of acute abdominal pain in patients with COVID-19 in their second week of illness. One patient had mild COVID-19 disease and the other had severe disease. Both patients had diffuse abdominal tenderness and raised inflammatory markers. The diagnosis of mesenteric panniculitis (MP) was made radiologically, and demonstrated with the presence of increased density of the mesentery with fat stranding (misty mesentery). Glucocorticoid administration resulted in the complete resolution of pain. They remained pain-free at 3 months of follow-up.

**Keywords:** Coronavirus disease-2019, Gastrointestinal complications, Glucocorticoids, Mesenteric panniculitis.

*Indian Journal of Critical Care Medicine* (2022); 10.5005/jp-journals-10071-24310

## HIGHLIGHTS

- Mesenteric panniculitis is inflammation of the fat in the mesentery, a rare cause of acute abdominal pain.
- The association between COVID-19 and MP is rare.
- Early glucocorticoid administration results in complete resolution of the disease.

## INTRODUCTION

Coronavirus disease-2019 is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It usually manifests with respiratory symptoms, the severity of the disease varying widely from asymptomatic infection to acute respiratory distress syndrome (ARDS). Up to one-third of patients present with GI complaints which include anorexia, nausea/vomiting, diarrhea, and abdominal pain.<sup>1-3</sup> Abnormalities in liver function tests are also seen. Gastrointestinal complications ranging from mild transaminitis to life-threatening bowel ischemia have been reported in the literature. These complications are more often seen in critically ill patients than in patients suffering from a mild disease.

Mesenteric panniculitis is a rare inflammatory condition characterized by acute and chronic non-specific inflammation of the adipose tissue of the intestinal mesentery.<sup>4</sup> The pathogenic mechanism of MP seems to be a nonspecific response to a wide variety of stimuli. Although various causal factors have been identified, the precise etiology remains unknown. The diagnosis is usually suggested by computed tomography (CT) of the abdomen which reveals a regional increase in mesenteric fat density.<sup>5</sup> Herein, we report two cases of MP presenting as acute abdomen in patients with COVID-19 illness. We suggest a possible association between COVID-19 and MP, with viral infection as a trigger for mesenteric fat inflammation.

<sup>1-4</sup>Department of Pulmonary Medicine, STAR Hospitals, Hyderabad, Telangana, India

<sup>5</sup>Department of Radiodiagnosis, STAR Hospitals, Hyderabad, Telangana, India

**Corresponding Author:** Rakesh Kodati, Department of Pulmonary Medicine, STAR Hospitals, Hyderabad, Telangana, India, Phone: +91 9781994022, e-mail: kodatirakesh@gmail.com

**How to cite this article:** Mandala S, Kodati R, Tadepalli A, Reddy C, Kalyan S. An Unusual Cause of Acute Abdominal Pain in Coronavirus Disease (COVID-19): Report of Two Cases. *Indian J Crit Care Med* 2022;26(9):1045-1048.

**Source of support:** Nil

**Conflict of interest:** None

## CASE PRESENTATION

### Case 1

A 55-year-old female presented to us with upper abdominal pain associated with a nausea of 4 days duration. Her abdominal pain localized to the epigastric region with no radiation and progressed to severe pain over the past day. It was not associated with vomiting or jaundice. She was tested positive for SARS-CoV-2, 10 days back when evaluated for fever. She was treated symptomatically for mild disease and was afebrile for 5 days prior to admission. She was a known asthmatic for the past 30 years, on inhaled glucocorticoids and bronchodilators. She also had type 2 diabetes mellitus for the past 2 years, on oral hypoglycemic agents. She underwent a total abdominal hysterectomy for uterine fibroids 15 years back without any complications. She was never an alcoholic and never smoker.

On examination, the pulse rate was 114 beats/min, respiratory rate was 20 breaths/minute, temperature was 100°F, blood pressure

was 130/80 mm Hg, and pulse oximetric saturation (SpO<sub>2</sub>) of 96% breathing room air. Abdominal examination revealed tenderness in the epigastric and umbilical areas. The rest of the systemic examination was unremarkable. Her laboratory parameters revealed neutrophilic leukocytosis, raised C-reactive protein (CRP), and D-dimer levels (Table 1). Liver, renal function tests, serum amylase, and lipase levels were within normal limits. She

underwent contrast-enhanced computed tomography (CECT) scan of the abdomen, which revealed smudging of the fat planes surrounding the superior mesenteric vessels and their branches within the root of small bowel mesentery associated with few prominent mesenteric lymph nodes suggestive of MP (Figs 1B and C). The contrast scan did not reveal any mesenteric thrombus. Her previous CT chest had unremarkable lung findings (Fig. 1A).

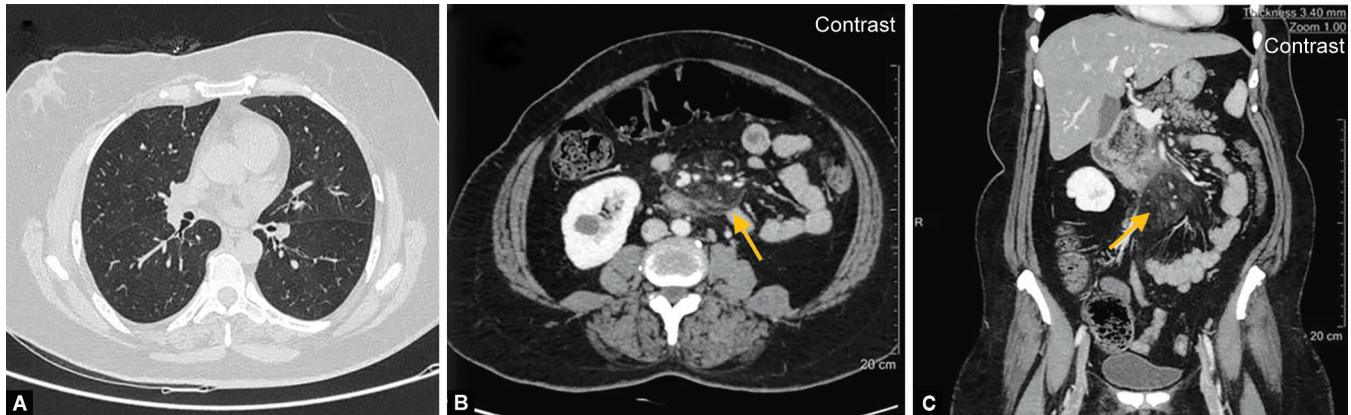
She was treated with intravenous (IV) methylprednisolone 60 mg/day, fentanyl infusion for analgesia, subcutaneous (SC) enoxaparin 40 mg/day, and IV fluids. Pain and tenderness reduced after 72 hours of treatment. She was discharged from the hospital on oral glucocorticoids (methylprednisolone 32 mg), tapered over the next 4 weeks. She remained symptom-free at 3 months of follow-up.

**Table 1:** Laboratory parameters at the time of diagnosis of MP

Investigations	Case 1	Case 2
Hemoglobin (gm/dL)	12.5	12.1
Total leukocyte count (cells/mm <sup>3</sup> )	15,400	9,300
Platelets (per mm <sup>3</sup> )	155,000	216,000
Absolute neutrophil count (cells/mm <sup>3</sup> )	13,244	8,742
CRP (mg/L)	232.49	108
D-dimer (ng/mL)	2,931	462
Serum amylase (U/L)	15	50
Serum lipase (U/L)	40	09
Total bilirubin (mg/dL)	0.6	0.6
Serum albumin (gm/dL)	3.1	3.2
Aspartate aminotransferase (U/L)	15	27
Alanine aminotransferase (U/L)	23	21
Alkaline phosphatase (U/L)	82	107

**Case 2**

A 69-year-old male presented to us with fever, cough, and dyspnea of 7 days duration. On examination, his blood pressure was 130/80 mm Hg, his pulse rate was 130 beats/minute, respiratory rate was 30 breaths/minute, and SpO<sub>2</sub> of 86% breathing room air. He had bilateral crackles on lung auscultation. The CT scan of the chest revealed bilateral diffuse subpleural ground-glass opacities (GGOs), consistent with COVID pneumonia (Figs 2A and B). The diagnosis was confirmed by a positive SARS-CoV-2 polymerase chain reaction test. He was initiated on antivirals (IV remdesivir 100 mg/day), s.c. enoxaparin 40 mg/day, IV methylprednisolone 60 mg/day and



**Figs 1A to C:** High-resolution computed tomographic scan (HRCT) of thorax (A) showing normal lung parenchyma. The CT scan of abdomen with contrast – Axial (B) and coronal (C) sections showing smudging of the fat planes surrounding the superior mesenteric vessels and their branches within the root of the small bowel mesentery. Band of soft tissue surrounding the inflamed mass, pseudocapsule sign (yellow arrows)



**Figs 2A to C:** The HRCT of thorax – Axial (A) and coronal (B) sections showing diffuse GGOs predominantly involving the lower lobes. The CT scan of abdomen (C) showing increased density of the mesenteric fat associated with fat stranding, misty mesentery (yellow arrow)

supportive care. He required 6 L/minute oxygen supplementation initially. He had symptomatic improvement with the above therapy along with improvement of hypoxia.

On his seventh day of hospitalization, he complained of severe epigastric pain associated with poor oral intake. He had diffused tenderness all over the abdomen on clinical examination. His lab investigations showed raised CRP levels; normal serum amylase and lipase levels (Table 1). The CT abdomen revealed fat stranding in the central mesentery suggestive of MP, with no evidence of bleed or mesenteric ischemia (Fig. 2C). He also had worsening hypoxia, and was started on high flow nasal oxygen with FiO<sub>2</sub> 0.60. He was shifted to the intensive care unit; methyl prednisolone dose was increased to 125 mg once daily. His pain abdomen subsided gradually over the next 48 hours and was able to take orally after 5 days. There was a slow improvement in hypoxia and he was weaned off from oxygen support after a week. He was discharged from the hospital on oral glucocorticoids (methylprednisolone 32 mg), tapered over the next one month. At 3 months of follow-up, he had exertional breathlessness and had no recurrence of abdominal pain.

## DISCUSSION

This article reports two cases of MP presenting with abdominal pain during the course of COVID-19 illness. The diagnosis of MP was made on the basis of clinical and radiologic findings. The association between the two diseases is less common.

Gastrointestinal symptoms in COVID-19 have been commonly reported in patients diagnosed with COVID-19, the most common being anorexia and diarrhea.<sup>6</sup> Also patients with preadmission digestive symptoms in severe COVID-19 are shown to have a high proportional mortality rate.<sup>7</sup> Severe GI complications are seen in critically ill subjects which include paralytic ileus, bowel ischemia/bleed, acute pancreatitis, and elevated aminotransferase levels. Patients with COVID-19-related ARDS had higher rates of GI complications as compared to non-COVID-19 matched ARDS.<sup>8</sup>

Sclerosing mesenteritis is a broadly given term for a group of three similar clinical entities including MP, retractile mesenteritis, and mesenteric lipodystrophy. The nomenclature is based upon the pathologic findings found on biopsy which vary from fatty necrosis, and inflammation to fibrosis.<sup>9</sup> It is not clear whether these three patterns are a part of the progressive disease process or separate entities. The etiology and pathogenetic mechanisms are not well known till now. The pathologic processes proposed as etiologies include abdominal surgery/trauma, autoimmune phenomenon, paraneoplastic process, and ischemia/infarction. Infections triggering the mesenteric inflammation are very rare, reported in association with abdominal tuberculous lymphadenitis, cholera, schistosomiasis, HIV infection, and cryptococcosis.<sup>10</sup> There is a case report published previously showing an association between mild COVID-19 disease and MP.<sup>11</sup> Our first case underwent abdominal surgery 10 years back, unlikely to correlate with the current illness.

Mesenteric inflammation either could be due to direct viral infection of the adipose tissue or inflammation secondary to immune system activation. The human angiotensin-converting enzyme 2 (ACE2) has a remarkably high affinity binding to SARS-CoV-2. The level of ACE2 expression in adipose tissue was found to be higher than that in lung tissue, indicating the adipose tissue might be vulnerable to SARS-CoV-2 as well.<sup>12</sup>

The clinical features in symptomatic individuals can be acute or chronic in nature. The common presenting symptom is abdominal pain seen in up to 78% of patients.<sup>10</sup> Other symptoms include fever,

weight loss, diarrhea, vomiting, constipation, anorexia, and malaise. Abdominal tenderness, palpable mass, and distended abdomen are the examination findings. An abdominal CT scan is the best modality for the diagnosis of this condition. The findings include increased thickness of mesentery, increased fat density due to infiltration of inflammatory cells (misty mesentery sign), a halo of fat surrounding the mesenteric vessels (fat halo sign), pseudocapsule of peripheral band limiting the inflammatory mass, and displacement of bowel loops with variable degrees of bowel obstruction.<sup>13</sup> These radiologic findings when incidentally diagnosed on abdominal CT scans have debatable clinical significance.

Misty mesentery has also been detected incidentally in abdominal cuts of CT thorax in patients with COVID-19 infection. These patients seem to have a high level of inflammation when compared to those without misty mesentery.<sup>14</sup> Although biopsy of the lesion is confirmatory, it is not usually indicated in every patient. It is considered in cases with strong clinical suspicion of malignancy. Both our cases presented with abdominal symptoms (pain and tenderness) and had increased fat density of the mesentery, one case had a pseudocapsule sign on CT.

There are no standard treatment protocols followed in the management of the disease. The evidence comes primarily from the previous case reports and case series. Asymptomatic cases usually do not require any treatment. Glucocorticoids and tamoxifen are the commonly used drug in medical therapy. Surgical resection or debulking is indicated in extensive fibrosis and bowel obstruction.<sup>10,15</sup> The clinical outcomes of the disease are usually good. However, few patients have a chronic debilitating course with a fatal outcome.<sup>15</sup> Both index cases had a good clinical recovery after a course of steroids.

## CONCLUSION

Mesenteric panniculitis complicating the course of COVID-19 disease is rare. It is an acute or chronic inflammation of the fat in the intestinal mesentery. The diagnosis is usually suggested by an abdominal CT scan and ruling out other causes of abdominal pain. Early initiation of glucocorticoids in symptomatic cases results in prompt clinical response.

## ORCID

Sudeepthi Mandala  <https://orcid.org/0000-0003-0948-8949>

Rakesh Kodati  <https://orcid.org/0000-0002-2967-408X>

Anuradha Tadeballi  <https://orcid.org/0000-0002-2543-3625>

Chandana Reddy  <https://orcid.org/0000-0003-2627-6462>

Shruthi Kalyan  <https://orcid.org/0000-0002-1110-3537>

## REFERENCES

1. Cha MH, Regueiro M, Sandhu DS. Gastrointestinal and hepatic manifestations of COVID-19: A comprehensive review. *World J Gastroenterol* 2020;26(19):2323–2332. DOI: 10.3748/wjg.v26.i19.2323.
2. Zhou Z, Zhao N, Shu Y, Han S, Chen B, Shu X. Effect of gastrointestinal symptoms in patients with COVID-19. *Gastroenterology* 2020;158(8):2294–2297. DOI: 10.1053/j.gastro.2020.03.020.
3. Adukia SA, Ruhatiya RS, Maheshwarappa HM, Manjunath RB, Jain GN. Extrapulmonary features of COVID-19: A concise review. *Indian J Crit Care Med* 2020;24(7):575–580. DOI: 10.5005/jp-journals-10071-23476.
4. Issa I, Baydoun H. Mesenteric panniculitis: Various presentations and treatment regimens. *World J Gastroenterology* 2009;15(30):3827–3830. DOI: 10.3748/wjg.15.3827.

5. Hussein MRA, Abdelwahed SR. Mesenteric panniculitis: An update. *Expert Rev Gastroenterol Hepatol* 2015;9(1):67–78. DOI: 10.1586/17474124.2014.939632.
6. Redd WD, Zhou JC, Hathorn KE, McCarty TR, Bazarbashi AN, Thompson CC, et al. Prevalence and characteristics of gastrointestinal symptoms in patients with severe acute respiratory syndrome coronavirus 2 infection in the United States: A multicenter cohort study. *Gastroenterology* 2020;159(2):765–767.e2. DOI: 10.1053/j.gastro.2020.04.045.
7. Karna ST, Singh P, Revadi G, Khurana A, Shivhare A, Saigal S, et al. Frequency and impact of preadmission digestive symptoms on outcome in severe COVID-19: A prospective observational cohort study. *Indian J Crit Care Med* 2021;25(11):1247–1257. DOI: 10.5005/jp-journals-10071-24020.
8. El Moheb M, Naar L, Christensen MA, Kapoen C, Maurer LR, Farhat M, et al. Gastrointestinal complications in critically ill patients with and without COVID-19. *JAMA* 2020;324(18):1899–1901. DOI: 10.1001/jama.2020.19400.
9. Emory TS, Monihan JM, Carr NJ, Sobin LH. Sclerosing mesenteritis, mesenteric panniculitis and mesenteric lipodystrophy: A single entity? *Am J Surg Pathol* 1997;21(4):392–398. DOI: 10.1097/00000478-199704000-00004.
10. Sharma P, Yadav S, Needham CM, Feuerstadt P. Sclerosing mesenteritis: A systematic review of 192 cases. *Clin J Gastroenterol* 2017;10(2):103–111. DOI: 10.1007/s12328-017-0716-5.
11. Alyousef IA, Alsaileek ZA, Alabdulsalam MA, Almohanna MA, Alshaqhaa NA, Alqahtani MM, et al. Mesenteric panniculitis and COVID-19: A rare association. *Cureus* 2022;14(1):e21314. DOI: 10.7759/cureus.21314.
12. Jia X, Yin C, Lu S, Chen Y, Liu Q, Bai J, et al. Two things about COVID-19 might need attention. *Preprints.org*; 2020:2020020315. DOI: 10.20944/preprints202002.0315.v1.
13. Daskalogiannaki M, Voloudaki A, Prassopoulos P, Magkanas E, Stefanaki K, Apostolaki E, et al. CT evaluation of mesenteric panniculitis: Prevalence and associated diseases. *Am J Roentgenol* 2000;174(2):427–431. DOI: 10.2214/ajr.174.2.1740427.
14. Giraudo C, Fichera G, Motta R, Guarnieri G, Plebani M, Pelloso M, et al. It's not just the lungs: COVID-19 and the misty mesentery sign. *Quant Imaging Med Surg* 2021;11(5):2201–2203. DOI: 10.21037/qims-20-1406.
15. Akram S, Pardi DS, Schaffner JA, Smyrk TC. Sclerosing mesenteritis: clinical features, treatment, and outcome in ninety-two patients. *Clin Gastroenterol Hepatol* 2007;5(5):589–596; quiz 523-4. DOI: 10.1016/j.cgh.2007.02.032.