International Surgery Journal
Bhusakhare N et al. Int Surg J. 2022 Apr;9(4):853-857
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20220933

Case Series

The study of gangrenous large bowel in COVID-19 patient in our institute an observational study

Niraj Bhusakhare[1]*, Rahul Singh[1], Vinod Singh[1], Sanjay Goyal[2], Jogesh Chandra Marhual[1], Samir Kathale[3]

[1]Department of Surgery, [2]Department of Anesthesiology, [3]Department of Radiology, Sparsh Multispecialty Hospital NABH certified Bhilai Nagar, Chhattisgarh, India

Received: 26 February 2022
Accepted: 17 March 2022

***Correspondence:**
Dr. Niraj Bhusakhare,
E-mail: dr.bond303@gmail.com

ABSTRACT

Initially considered to be a respiratory disease, COVID-19 is now recognized as a multisystem disease known to affect all the major organs, including the gastrointestinal system. Based on recent studies, coronavirus 2 causes dysregulation of multiple biological pathways, triggers an exaggerated immune response, and affects multiple organs. The gastrointestinal symptoms in COVID-19 are common but often overlooked. This is an observational study analyzing the clinical characteristics and outcomes of three COVID-19 patients aged 80-year, 75-year, 69-year presented to our institution from April 2021 to June 2021 and were diagnosed with COVID-19 and subsequently develop perforation peritonitis and gangreneos large bowel as a first presentation. All patients tested COVID-19 positive upon admission and received standard care.

Keywords: COVID-19, Gangrenous bowel, Gastrointestinal system

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a multisystem disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It can cause gastrointestinal symptoms such as nausea, vomiting, anorexia, diarrhea, and abdominal pain. It was declared a pandemic by the WHO in March 2020.[1] In recent studies COVID-19 is strongly associated with venous and arterial thrombosis.[2-3] exact pathophysiology, incidence and prevalence have not been precisely described.

COVID-19 associated hypercoagulable state have been described. Severe coronavirus disease 2019 (COVID-19) is commonly complicated with coagulopathy, and disseminated intravascular coagulation (DIC) may exist in the majority of deaths.[4,5] COVID-19 thrombotic complication incidence is 31%; primarily venous, in ICU patients despite anticoagulation therapy.[6] Lodigiani et al described a remarkably increased incidence of arterial and venous vessel. this disease is associated with increased mortality rates.[7] Anticoagulation therapy has been recommended for moderate and severe cases and associated with decreased mortality rates.[8-11]

These gastrointestinal manifestations of COVID-19 are most often self-limiting. In about 10% of cases, gastrointestinal symptoms can be present without respiratory manifestations.[12] Hence, a high index of suspicion is required for timely diagnosis of COVID-19. Additionally, COVID-19 is associated with coagulopathy and vasculitis, which correlate with the disease severity and increase the risk of mortality.[13-17] Involvement of the mesenteric vessels in COVID-19 patients can predispose to development of intestinal ischemia.[18] The aim of our study is to describe characteristics, course and outcomes of patients who are COVID-19 positive and presenting with unexpected or unexplained arterial vessel disease.

CASE SERIES

We reported 3 cases of gangrenous bowel of age 69 to 80 year to our health care services in Bhilai from 1st April 2021 to 1st June 2021. All cases were diagnosed with COVID-19 pneumonia and tested positive via polymerase chain reaction (PCR). All of our patients received airway and breathing support along with recommended regimens of anticoagulation. All patients received anticoagulation and were followed with coagulation markers; international normalized ratio (INR) and activated partial thromboplastin time (APTT). We included patients who did not have a history of coagulopathy. None of the patient had any history of previous thromboembolism, malignancy, long travel or prolonged immobilization.

Case 1

The 80-year-old male admitted in COVID-19 ICU with co-morbidities (DM, HTN, old age), CT severity score-11/25 moderate (Figure 1 A and B), corads-6 grading managed conservatively with IV fluid, antibiotics, steroids, anticoagulant and other supportive. After 3-day patient develop abdominal pain, distention of abdomen, nausea, intractable vomiting and shortness of breath. Examination reveals tachycardia, respiratory distress, and per abdominal finding- all over abdomen tenderness, guarding. Apart from severe leukocytosis (45900) and RBS-(376), D-Dimer (2100), LDL-(645). All other laboratory investigations were normal. patient underwent a (CT) scan of the abdomen with contrast. The scan revealed moderate pneumoperitonium with moderate peritoneal collection (Figure 2). Pt taken for exploratory laparotomy and Intra-operative finding were 15 cm gangrenous sigmoid colon along with transaction of sigmoid colon (Figure 3 and 4), purulent fluid in all quadrants. Followed by resection of diseased segment with double barrel sigmoid colostomy. After few days patient got cardio respiratory arrest and pt died.

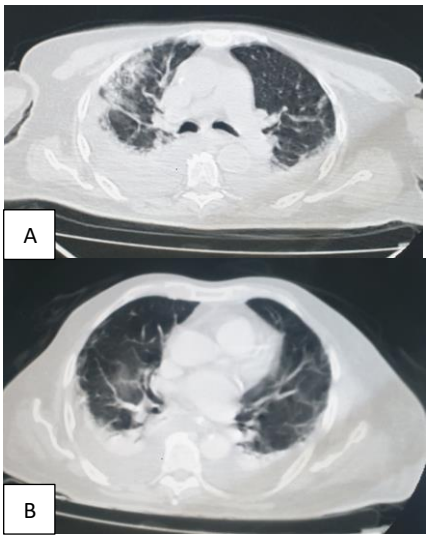

Figure 1 (A and B): Moderate pneumonia (CT value-11/25).

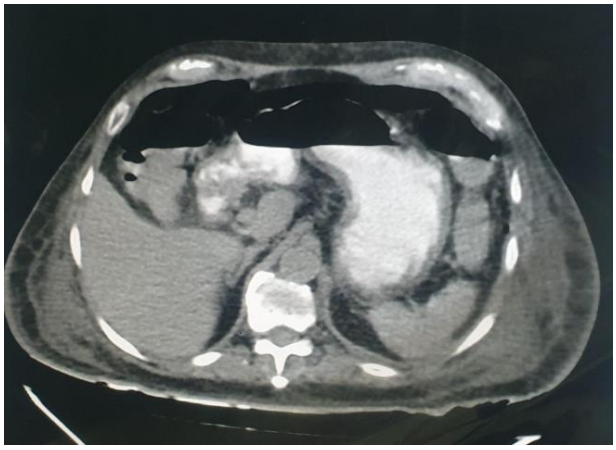

Figure 2: CT abdomen-pneumoperitonium.

Figure 3: CT abdomen-gangrenous sigmoid colon.

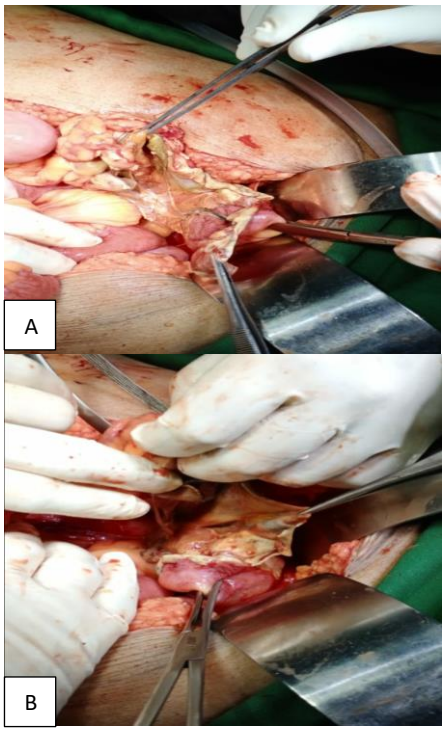

Figure 4 (A and B): Intraoperative gangrenous sigmoid colon.

Case 2

A 75-year-old male admitted in COVID-19 ward with co-morbidities (DM, HTN), CT severity score-14/25 moderate (Figure 5 A and B), corads-6 grading managed with IV fluid, antibiotics, steroids, anticoagulant and other supportive. After 5-day patient develop lower abdominal pain, distention of abdomen, vomiting and breathlessness. On exam tachycardia, per abdominal finding- all over abdomen tenderness, guarding. Investigation-leukocytosis (19200), platelet (40000) and RBS-(167), D-Dimer (1200), LDL-(435), low sodium (118). patient underwent a (CT) scan of the abdomen with contrast. The scan revealed pneumoperitonium with peritoneal collection (Figure 6). Pt taken for exploratory laparotomy and intra-operative finding gangrenous sigmoid colon along with 3×2 cm sigmoid colon perforation, (Figure 7). Followed by resection of the diseased segment with double barrel sigmoid colostomy. After few days patient develop septic shock with cardiac arrest and patient died in 7th post operative day

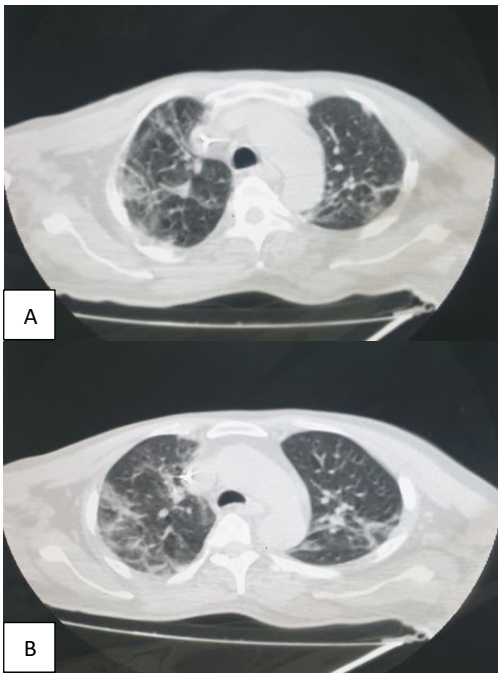

Figure 5 (A and B): Moderate pneumonia (CT value-14/25).

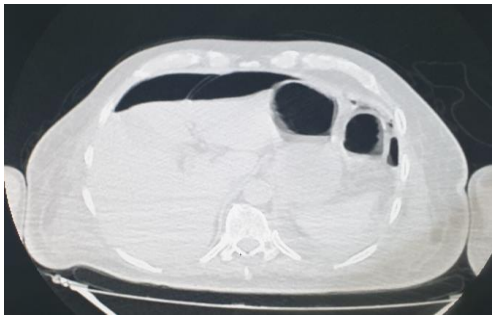

Figure 6: CT abdomen-pneumoperitoneum.

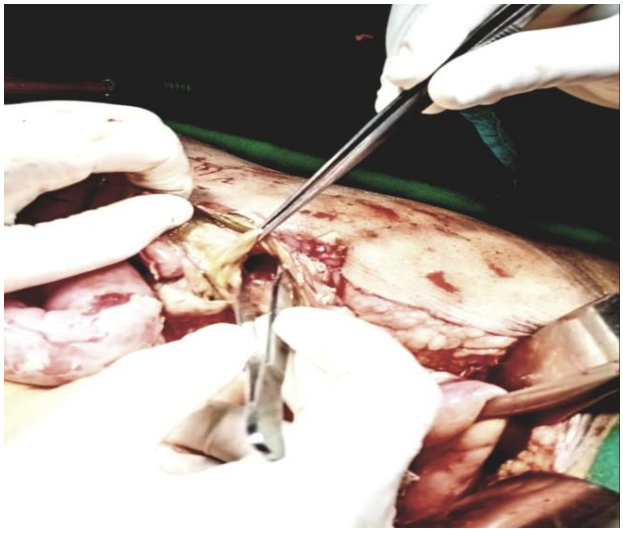

Figure 7: Intraoperative abdomen-gangrenous sigmoid colon (Case 2).

Case 3

A 69-year-old male admitted in COVID-19 ward with no significant co morbidity, CT severity score-21/25 severe (Figure 8), corads-6 grading and managed conservatively with IV fluid, antibiotics, steroids, anticoagulant and other supportive. After 2nd day patient develop abdominal pain, not passing flatus and motion, distention of abdomen, vomiting and breathing difficulty. Examination reveals tachycardia, per abdominal finding- all over abdomen tenderness, guarding. A part from leukocytosis (18000) and D-Dimer (1800), LDL-(850). All other laboratory investigations were normal. patient underwent a (CT) scan of the abdomen with contrast. The scan revealed pneumoperitoneum (Figure 9). Pt taken for exploratory laparotomy and intra-operative finding 20 cm gangrenous sigmoid colon along with perforation of sigmoid colon, purulent fluid in all quadrants. Followed by resection of the diseased segment with end colostomy. next day patient got cardio respiratory arrest and patient died

Figure 8: Severe pneumonia (CT value-21/25).

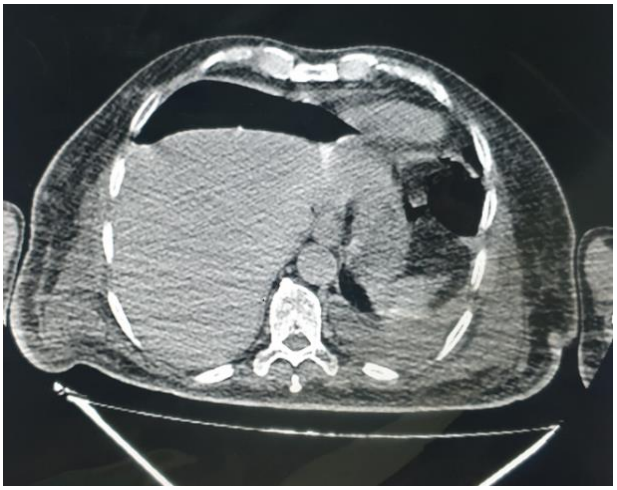

Figure 9: CT abdomen-pneumoperitoneum (case 3).

DISCUSSION

COVID-19 has multifaceted presentation, with symptoms ranging from asymptomatic to rapid multiple organ dysfunction, and has high mortality with case fatality rate. In addition to pulmonary symptoms, gastrointestinal symptoms of abdominal pain, nausea, vomiting, non-bloody diarrhoea have also been identified. ACE-2 receptor a well-recognised receptor of COVID-19 virus is also found in the epithelial cell of the GI tract apart from pulmonary alveolar cells. Ischemic colitis caused due to decreased blood supply to the colon leading mucosal injury, ischemia and necrosis has been attributed to multiple aetiologies of which occlusive causes like thrombotic occlusion of mesenteric vessel has been described apart from hypoperfusion due to shock, pancreatitis and cardiac failure. Hypercoagulable states causing thrombosis have been recognised as one of the risk factors for ischemic colitis due to COVID-19 associated coagulopathy. Treatment of ischemic colitis mainly involves supportive care, with bowel rest and close observation for evidence of perforation, necrosis and gangrene. Surgical intervention with colonic resection is indicated, if imaging shows colon infarction and gangrene.

Our patient had risk factors for hypercoagulability due to underlying co-morbidities, diabetes mellitus and hypertension, which was exaggerated by the COVID-19 associated coagulopathy.

Our all patient are old aged admitted in covid ward/ICU after few days patient not passing flatus and motion with abdominal pain, which is associated with raised inflammatory markers, D-dimer level and high CT severity score. The fact that this ischemic colitis occurred in few days of his illness with COVID-19 infection when his inflammatory and hypercoagulable state were evident, makes this association very likely to be related.

Table 1: Summarizing patient history, laboratory and radiological findings, management and outcome.

Variables	Case 1	Case 2	Case 3
Age (Years)	80	75	69
Gender	Male	Male	Male
Comorbidity	DM/ HTN	DM/HTN	No comorbidity
COVID-19 RT-PCR	positive	Positive	positive
D dimer	2100	1200	1800
CT severity score	11/25	14/25	21/25
Prophylactic anticoagulation	Heparin infusion	Heparin infusion	Heparin infusion
Management	Resection and colostomy	Resection and colostomy	Resection and colostomy
Outcome	Death	Death	Death

CONCLUSION

Gangrenous bowel does seem to be a rare complication of COVID-19. This case series underscores the importance of placing acute mesenteric ischemia in the workup of such a patient with COVID-19 presenting with

manifestations of the gangrenous bowel, most commonly acute abdomen. Elevated LDH, and d-dimer levels can be considered while assessing a patient of COVID-19 with abdominal pain for mesenteric ischaemia. Ultimately, CT abdomen helps clinching the diagnosis. However, more prospective studies are required to assess, the laboratory diagnosis to help suspect as well as confirm bowel ischemia in a patient with COVID-19. Immediate intervention may help provide better outcomes. It is important to acknowledge that adequate thrombolysis and hemodynamic support should be implemented as they may help maintain homeostasis there by aiding in early diagnosis or even preventing this complication.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Bhusakhare N, Singh R, Singh V, Goyal S, Marhual JC, Kathale S. The study of gangrenous large bowel in COVID-19 patient in our institute an observational study. Int Surg J 2022;9:853-7.