

# Spontaneous Bowel Perforation - A Rare and Fatal Complication in COVID-19 Patients: Case Report

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## ABSTRACT

Coronavirus 2019-nCoV (COVID-19) is a global pandemic and highly infectious disease, with most of the symptoms being related to the respiratory tract. However, more extrapulmonary symptoms and complications are evolving and directly associated with COVID-19 pathogenesis. A recognized clinical manifestation of COVID-19 is gastrointestinal and hepatic involvement. We reported a middle-aged man admitted to the intensive care unit (ICU) with severe COVID-19 pneumonia; he developed spontaneous bowel perforation. He had not received tocilizumab as the latter was reported to be associated with bowel perforation.

**Keywords:** Coronavirus 2019-nCoV (COVID-19), bowel perforation

## INTRODUCTION

Since December 2019, the global pandemic caused by the highly infectious novel coronavirus 2019-nCoV (COVID-19) has been rapidly spreading.<sup>1</sup> The outbreak has spread worldwide, with millions of confirmed cases. Oman is one of many countries severely affected by COVID-19.

Respiratory symptoms are the most clinical manifestation of COVID-19, like fever, cough, shortness of breath, and ARDS. Extrapulmonary involvement by SARS-CoV-2 infection has been known and recognized. The extrapulmonary clinical manifestation includes hepatitis, acute renal failure, encephalitis, myocardial injury, gastroenteritis, and coagulopathy.<sup>2</sup>

Here we report a case of a patient who confirmed COVID-19 positive by RT-PCR and a developed bowel perforation.

## CASE REPORT

A 64-year-old man presented to the emergency department on 11th Sep 2020

with four days of cough, fever, and shortness of breath. His Past medical background included type 2 Diabetic Mellitus, hypertension, ischemic heart disease, and dyslipidemia. Clinically, he was hypoxia 91% room air, afebrile 36.7 °C, weight 83Kg, BMI 30.5. On examination, he was tachypnea at a rate of 25 breaths per minute; chest auscultation revealed bilateral crackles with good air entry, no sign of effusion or lung collapse, and the trachea was central. Cardiac examination showed no galloping or murmur, and there was no lower limb pitting edema. His abdominal exam was normal with no organomegaly and normal audible bowel sounds.

Blood investigation revealed a white blood count of  $9.57 \times 10^3$  /ul, hemoglobin of 12.72 g/dl, hematocrit of 43.04%, platelet count of  $209 \times 10^3$  /ul, C reactive protein of 236.62 mg/l, ferritin of 1150 ng/ml, lactate dehydrogenase of 545 u/l and troponin of 0.016 ng/ml. His chest x-ray showed predominantly bilateral diffuse patch

opacities. Subsequently, SARS Cov-2 using polymerase chain reaction resulted in positive. Initially, He had received a usual COVID care according to the local hospital protocol, which included frusemide, methylprednisolone, heparin, and ceftriaxone empirically waiting for cultures. On the third day of admission, his respiratory status progressed, and he initially needed a non-rebreather mask. Eventually, he required high oxygen flow nasal cannula (HFNC), upgraded to piperacillin-tazobactam, and received one unit of convalescent plasma. The Next day, his ventilator support upgraded to non-invasive ventilation (NIV) as his oxygen requirement increased.

He received a second unit of convalescent plasma according to the protocol after 48 hours of the initial unit. In the following few days, the patient respiratory condition improved, and ventilation requirements reduced.

On the 9th day, he developed abdominal distension and pain. He denied any heartburn, nausea, or vomiting. As a result, an abdominal x-ray was requested and showed bowel loop dilatation (Fig.1). The surgery team consulted initially advised

conservative management as likely to be ileus. On the 14th-day patient's general condition worsened with increased abdominal distension with bowel movement despite laxative, and his inflammatory markers went very high. He required vasopressor support to maintain his blood pressure. An urgent abdominal CT scan was obtained and demonstrated massive pneumoperitoneum compressing the abdomen and elevates the diaphragm, compressing the chest along with air-fluid level at the right subphrenic region (Fig.2).

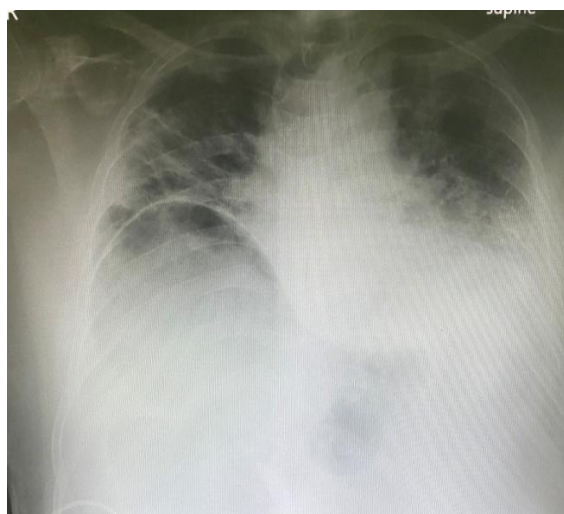


Figure 1: Chest X-ray showed air under diaphragm.

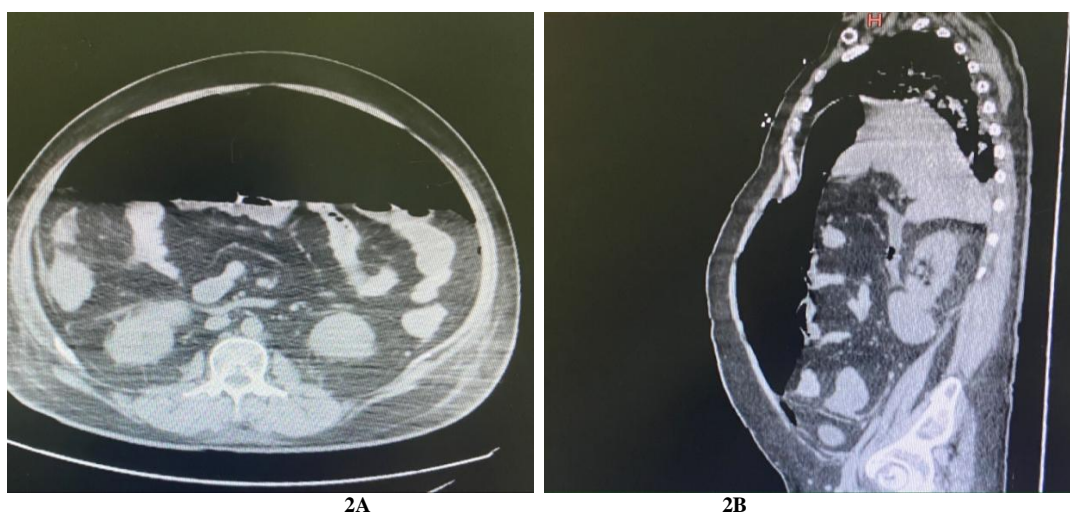


Figure 2: Computed Tomography (CT) show pneumoperitoneum, 2A: axial view and 2B sagittal view

The patient was taken urgently to the operating room for exploration and subsequently intubated. Upon exploration, found to have two large perforations near the proximal part of the transverse colon

with gross contamination of the abdominal cavity. In addition, there were multiple flakes present over the caecum ascending transverse and sigmoid colon.

The histopathology reported a hemorrhage and inflammatory exudates in the lumen. In addition, there was mucosal ulceration, perforation, and transmural infiltration by lymphocytes, histiocytes, eosinophils, and few neutrophils. Also, there was serositis and fibrinoid necrosis.

He required mechanical intubation and remained in critical condition. On the 18th-day patient developed extensive subcutaneous surgical emphysema, resolved with conservative management. Unfortunately, he died one week later.

## DISCUSSION

Extrapulmonary manifestation of COVID 19 is recognized. Approximately up to 50% of COVID-19 patients have gastrointestinal symptoms. Most common symptoms, Loss of appetite and diarrhea and less often vomiting and abdominal pain.<sup>3</sup> COVID-19 virus enters enteric epithelial tissue through ACE 2 and transmembrane protease, serine 2.<sup>4</sup> ACE2 highly expression in the lung alveolar epithelium, enterocytes of the small intestine, and vascular endothelium. Indicate a SARS-CoV-2 infection could be susceptible to infect the bowel and vasculature.<sup>5,6</sup>

Demonstrated SARS-CoV-2 RNA in the cytoplasm of gastrointestinal epithelial cells and the stool.<sup>4,7</sup>

There were a few reports of suggestive bowel perforation related to the COVID-19 virus. In our case patient was in ICU developed bowel perforation during hospitalization for COVID-19. Images confirmed pneumoperitoneum and treated initially conservative; however, he deteriorated and needs urgent operation.

Rajesh et al.<sup>8</sup> By reviewed 412 reports of patients demonstrate a 31% of bowel-wall abnormalities were in CT images and were associated with ICU admission. In addition, pneumatosis or portal venous gas was in 20% of bowel images. The surgical finding revealed unusual yellow discoloration of the bowel and bowel infarction. Furthermore,

pathologic showed ischemic enteritis with patchy necrosis and fibrin thrombi in arterioles.

In our patient, CT images could not appreciate any bowel wall abnormalities due to massive pneumoperitoneum.

The pathophysiology mechanism of perforation in COVID could be: 1. A direct injury direct insult to the colonic cells by the coronavirus 2. An autonomic innervation injury of the colon leads to affect colonic motility 3. hypercoagulable state in COVID-19 lead to intravascular coagulation, which manifests as generalized small-vessel vasculitis and extensive microthrombi.<sup>9,10</sup>

Studies demonstrate that tocilizumab and accumulative glucocorticoid are participating risk factors in developed bowel perforation.<sup>11</sup>

Our patient had never received tocilizumab. He was on a short course of methylprednisolone as follow local guidelines. Consider SARS-Cov-2 infection the only reason for bowel perforation.

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