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Unusual presentation of coronavirus disease 2019 (COVID-19): two cases of acute abdomen

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Abstract

December 2019 SARS-CoV-2 is responsible for the novel coronavirus-infected pneumonia associated with acute respiratory distress syndrome, organ dysfunction and death. Since its discovery, a myriad of clinical presentations have surfaced and the past year has been a learning experience for all. We present two cases of acute abdomen presenting as a "surgical abdomen"; one had a negative laparotomy and negative PCR test, and the other who did not have surgery eventually tested positive on PCR testing. Both were incidentally diagnosed with COVID-19 pneumonia on a chest computed tomography scan and managed accordingly. It is unclear whether reported gastrointestinal manifestations are a direct causal effect of the virus in the gastrointestinal tract. Surgeons should be aware that COVID-19 can present as a "surgical abdomen" which may lead to negative laparotomies.

Keywords: Coronavirus disease 2019, COVID-19, acute abdomen, SARS-CoV-2

INTRODUCTION

In December 2019 there were reports of a new coronavirus. On 11 of March 2020 WHO declared the coronavirus disease 2019 (COVID-19) a global pandemic [1]. By March 2020 the first cases were confirmed in Ghana [2]. SARS-CoV-2 was found to be responsible for the novel coronavirus-infected pneumonia associated with acute respiratory distress syndrome, organ dysfunction and death [3] Since then a myriad of clinical presentations have surfaced and the past year has been a learning experience for all. Unsuspecting abdominal symptoms with or without the typical COVID respiratory symptoms have been reported [4]. The gold standard in making a diagnosis of SARS-CoV-2 is by the polymerase chain reaction (PCR) but in severe cases, computed tomography (CT) scan of the chest has become a reliable diagnostic tool even when PCR is falsely negative [5,6]. Globally it has been established that surgery in patients with SARS-CoV-2 is associated with high mortality of 20% [7]. Thus it is important to avoid unnecessary laparotomies that will expose patients to perioperative challenges. We present two cases of SARS-CoV-2 admitted to the surgical unit with abdominal symptoms and signs.

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CASE 1

A 50-year-old male had a febrile illness but had tested negative for COVID-19 by PCR two weeks earlier. He reported at the emergency room with a week's history of progressive abdominal distension, colicky abdominal pain and absolute constipation with worsening of symptoms over the past 3 days. He had no previous laparotomy. He was acutely ill but not in respiratory distress with oxygen saturation (SpO2) of 96 - 98% on room air and temperature 36.2 ºC. Breath sounds were, however, reduced at the lung bases with coarse crepitations. The abdomen was distended and tense with generalised tenderness, rebound tenderness and guarding, marked in the right iliac fossa. Bowel sounds were markedly reduced. On digital rectal examination, the rectum was empty. A diagnosis of peritonitis from an inflamed appendix causing intestinal obstruction was made and the patient was worked up for exploratory laparotomy. Laboratory investigations revealed a haemoglobin (Hb) of 11.7 g/dL (normal range: 11 -18 g/dL), white blood cell count (WBC) of 9.11 x 10^9/L (normal range: 2.5 - 8.5 x 10^9 /L), lymphocyte count of 0.98 x 10^9/L (normal range: 1-3.7 x 10^9 /L) and platelet count of 182 x 10^9 /L. Just before laparotomy, the patient suddenly desaturated to SpO2 of 80% on room air which improved to 88% on oxygen. Emergency laparotomy showed moderately dilated loops of the small and large bowel with non-obstructing adhesions between the bowel loops. There was no tumour or

peritoneal soiling and the appendix was normal. These abdominal findings were not consistent with the patient's clinical picture. Postoperatively the patient's oxygen saturations remained between 80 – 90% whilst on oxygen by the simple facemask and gradually improved over the following week on a rebreather facemask. A repeat COVID-19 PCR test came in negative after a week. On day 8 postoperation, intestinal obstructive symptoms recurred and were managed expectantly during which CT scan of the abdomen was unremarkable, however, chest CT scan revealed multifocal ground-glass opacities in a peripheral distribution with small areas of consolidation and reticular opacities in the posterior-basal segments of the lower lobes bilaterally and bilateral mild pleural effusion, typical for COVID-19 pneumonia (Figure 1). By the 18th postoperative day, obstructive signs had resolved, oxygen saturations had returned to normal, and he was tolerating a normal diet. He was subsequently discharged.

CASE 2

A 30-year-old male presented to the emergency room with a week-long history of acute abdominal pain preceded by an alcoholic binge. The initial epigastric pain became generalised and later associated with fever and chills. He vomited once. Heart rate was 114 beats per minute, blood pressure of 127/78 mmHg, respiratory rate of 20 per minute and a temperature of 37.1^{o}C. He was acutely ill but not in respiratory distress. His abdomen was mildly distended with generalised tenderness, rebound tenderness and guarding worse in the epigastrium, and had reduced bowel sounds. A diagnosis of acute pancreatitis or a possible perforated duodenal ulcer was made. Laboratory investigations indicated Hb of 14.8 g/dL (normal range: 11 - 18 g/dL), WBC of 8.44 x 10^9 /L (normal range: 2.5 - 8.5 x 10^9 /L), lymphocyte count of 0.67 x 10^9 /L (1 - 3.7 x 10^9 /L), platelets count of 200 x 10^9/L, and serum amylase of 44 U/L (normal range: 30 - 110 U/L). A chest x-ray did not show gas under the diaphragm. Abdominal CT scan was unremarkable, but chest CT scan showed posterior-basal focal areas of consolidation and peripherally located areas of consolidation in both lungs (Figure 2). Findings were suggestive of COVID-19 pneumonia and the subsequent PCR test was reported positive for COVID-19. He responded well to COVID treatment protocols and was discharged after 2 weeks.

DISCUSSION

We have summarized two cases of acute abdomen presenting as "surgical abdomen". One had a negative laparotomy and negative PCR test; the other did not have surgery and tested positive on PCR testing. Both showed evidence of COVID-19 pneumonia on a chest CT scan and were managed accordingly. The chief complaint of both cases was abdominal pain and examination findings suggested peritonitis. They did not have respiratory symptoms at presentation. It has been established that the virus is principally transmitted through the respiratory route and classically would present with respiratory and constitutional symptoms. Gastrointestinal (GI) symptoms have also been documented in SARS-CoV-2 infection [3,8,9]. The angiotensin-converting-enzyme 2 (ACE2) receptors has been found to be the point of entry of the SARS-CoV-2 into human cells [4,10,11]. Immunofluorescent data has demonstrated abundance of ACE2 in the glandular cells of gastric, duodenal, and rectal mucosa. SARS-CoV-2 has also been isolated from stool

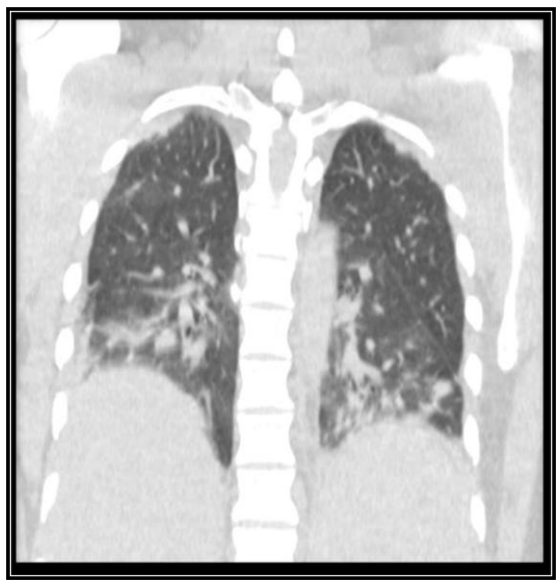

Figure 1: CT scan of 50-year-old male showing peripherally distributed ground-glass opacities

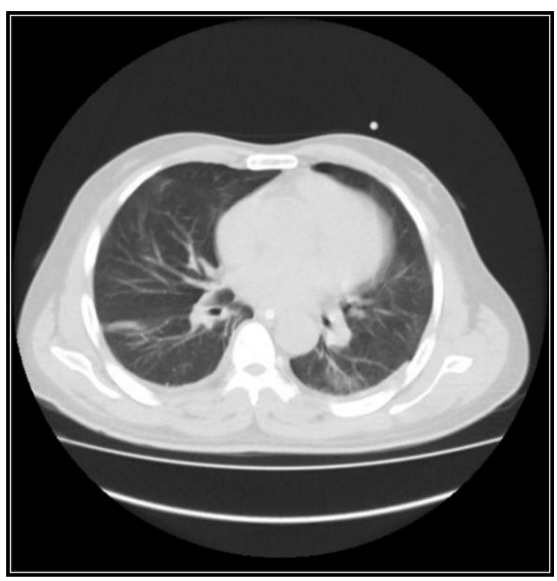

Figure 2: CT scan of 30-year-old male showing peripherally located consolidations

questioning the possibility of faecal-oral transmission, though not yet proven [4,8,10]. Through blockage of the angiotensin-converting enzyme 2 (ACE2) receptor, the virus directly causes gastrointestinal malfunctioning including small bowel inflammation, colitis and alteration of normal flora. There is disruption of the mucosal barrier with translocation of bacteria and toxins to worsen the septic state. Activation of the enteric lymphocytes, dendritic cells and macrophages also contribute to the cytokine storm associated with COVID-19 [4,11]. The literature suggests that gastrointestinal symptoms could be found in 6.8 - 61.3% of COVID-19 patients. The symptoms include diarrhoea (8.1 - 33.7%), nausea and vomiting (1.5 - 26.4%), anorexia (12.1 - 40.0%) and abdominal pain (0 - 14.5%) [4]. In some cases, abdominal symptoms were the initial presentation of COVID-19 in the absence of the typical respiratory symptoms [9,12].

In COVID-19 cases that have proven abdominal pathologies it is plausible this may be due to the inflammation caused directly by the SARS-CoV-2. For instance, a case of enterocolitis diagnosed after CT scan findings of thickening of ascending colon and ileum could have been from COVID-19 or perhaps due to an intestinal co-infection [12]. In a report of gastrointestinal bleeding, SARS-CoV-2 was isolated from bleeding oesophageal ulcers, another possible direct cause [8]. Yet another report has been made of ischaemia of the bowel with perforations in the sigmoid which could be attributed to possible hypercoagulable states known to be associated directly or indirectly with SARS-CoV-2 [13]. Ten cases of abdominal pain were reported with unremarkable abdominal CT scan findings but with chest findings of typical COVID-19 peripheral and basal ground-glass opacities, with septal thickening and thin reticulation, sparse consolidations and subpleural curvilinear lines [12]. In Ghana, 43 cases of COVID-19 pneumonia were initially diagnosed by CT scan — except for one, all cases later had a confirmatory positive PCR test [14]. Several similar cases are routinely observed, but it is unclear whether these abdominal findings are a direct causal effect of the virus in the gastrointestinal tract.

The first case presented had non-obstructing adhesions and on the background of no previous surgery or known abdominal inflammatory condition, the question remains as to whether this was a manifestation of COVID-19 or an incidental finding. Perhaps the patient who had a negative laparotomy was truly PCR negative at the time and the CT scan findings and intra-operative findings were a sequela of the disease. In Ghana, abdominal CT scans are not routinely requested for cases of "acute abdomen". Our reports raise the question of whether in this COVID-19 era abdominal CT scans should become routine or at least more frequently done for "acute abdomen". In any case, particular attention should be paid to the lung bases and a full chest CT scan done if indicated. The literature indicates that the sensitivity and specificity of chest CT scan in diagnosing COVID-19 range from 80 - 87% and 82 - 92% respectively [5,6]. The routine use of CT scan to screen suspected cases has been suggested considering the high false-negative rate of the PCR test [14]. The literature does report purely abdominal cases [9,12] for which the diagnosis would most certainly have been missed without CT scan imaging of lung bases. Consequently, should abdominal CT scans be done routinely for surgical cases? What would be the yield and would it be justifiable? Of concern will not only be cost and risk-benefit analysis but it could delay timely surgical interventions. Routine use of CT scans in resource-limited settings may not be practical but should be encouraged because when promptly done and immediately interpreted it would clinch the diagnosis. A minimum of a chest x-ray which is less sensitive but more affordable and more accessible has been considered but unfortunately, the yield is as low as 11% in mild to moderate COVID-19 [15].

Should PCR testing also be routinely performed for patients with acute abdomen especially when the diagnosis is not certain? This could be a consideration because the current availability, cost and waiting time for PCR has improved. Another clue is lymphopenia which was present in both cases presented in this report. Lymphopenia has been reported in up to 80% of COVID-19 cases but with significant variations in the total white blood cell counts [16]. Mild thrombocytopenia has also been reported as a common finding but was absent in our observed cases [17]. The two cases described in this report did not have a fever or respiratory symptoms but were quite ill at presentation and it may be prudent to add COVID-19 to the list of differential diagnoses of acute abdomen in such cases. Because clinical and PCR diagnosis for COVID-19 may show false-negative results for COVID-19, we advise that all protocols and precautions should be strictly adhered to in the management of acute abdomen presentations.

Conclusions

Surgeons should be aware that COVID-19 can present as a "surgical abdomen" which may lead to negative laparotomies. Clinicians should be alert to clues in the history and look out for lymphopenia in the full blood count. Abdominal CT scans may incidentally diagnose COVID-19 pneumonia and avoid unnecessary laparotomies.

DECLARATIONS

Ethical considerations

Informed consent was obtained from the patients for this report. This report does not contain information that could lead to the traceability of the patient.

Consent to publish

All authors agreed to the content of the final paper.

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Competing Interests

No potential conflict of interest was reported by the authors.

Author contributions

JN, FD, BF and DO all contributed to the management of the cases, drafting and final review of the manuscript. JCL contributed to the drafting and final review of the manuscript. All authors agreed on the final content of the manuscript

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Availability of data

All relevant information is provided in the manuscript. The published information is available from the corresponding author upon a reasonable request.

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