

A challenging case of COVID-19 infection presented with isolated acute abdominal pain: A case report and literature review

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Abstract

COVID-19 is an infectious disease, which often presents with fever and respiratory symptoms. However, gastrointestinal symptoms have also been reported to occur in patients with COVID-19. Although abdominal pain was described in some reports of COVID-19, it was uncommon and often associated with other symptoms. We describe a challenging case of a COVID-19 patient who presented with severe isolated abdominal pain initially, then developed pneumonia symptoms which led to the diagnosis of COVID-19 thereafter.

Keywords

COVID-19, novel coronavirus, SARS-CoV-2 infection, atypical presentation, severe abdominal pain, initial manifestation

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Introduction

COVID-19 is an infectious disease caused by SARS-CoV-2 that affects humans over the world. This virus is very contagious between humans, and it transmits via respiratory droplets and direct contact.^{1,2} COVID-19 patients often present with respiratory manifestations. The most common symptoms are fever, dry cough, and generalized fatigability.² Severe pneumonia is a frequent serious association which is diagnosed by chest X-ray findings or sometimes chest computed tomography (CT) scan.³ Gastrointestinal manifestations of diarrhea, nausea, and vomiting are not uncommon and were mentioned in many reports of patients with COVID-19 infection.⁴ Although abdominal pain was described in cases of COVID-19, it was rare and, if occurred, it often coexists with other usual COVID-19 symptoms.^{5,6}

The diagnosis of COVID-19 is usually established using nasopharyngeal swab polymerase chain reaction (PCR) test from suspected patients.³ Many research works have been conducted and many protocols were suggested to treat COVID-19, but no evidence-based definitive treatment is currently available.³

We report a case that presented initially with isolated severe abdominal pain for a few days, and then he developed pneumonia in the setting of COVID-19 infection. In this case, it was very challenging to detect the cause of

abdominal pain before developing other symptoms which led us to the correct diagnosis.

Case report

A 45-year-old male patient with no known past medical history presented to the Emergency Department with a 3-day history of epigastric pain, which was gradual in onset, sharp in nature, progressive in the course, and not relieved by over-the-counter medication. There was no associated diarrhea or fever, and no history of travel or sick contact. The rest of the systemic history was unremarkable for any other symptoms. Upon physical examination, we observed a healthy-looking gentleman with vital parameters of the temperature of 36.2°C, respiratory rate of 16 per minute, blood pressure of 167/90 mmHg, heart rate of 62 beats per minute, and normal oxygen saturation at room air. On systemic examination, he had abdominal tenderness mainly in the epigastric area, but

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Table 1. Laboratory findings of the patient at presentation and during hospitalization.

Laboratory	Day of admission (day 1)	Day of diagnosis of COVID-19 (day 4)	Day of intubation (day 8)	At discharge (day 35)	Normal range
WBC count	$5 \times 10^9/L$	$4.9 \times 10^9/L$	$7 \times 10^9/L$	$6.5 \times 10^9/L$	$4-10 \times 10^9/L$
Lymphocyte	$1.3 \times 10^9/L$	$0.7 \times 10^9/L$	$0.5 \times 10^9/L$	$1.3 \times 10^9/L$	$1-3 \times 10^9/L$
HB	15.1	13.4	11.4	11	13–17 gm/dL
Platelets	$179 \times 10^3/\mu$	$146 \times 10^3/\mu L$	$240 \times 10^3/\mu L$	$223 \times 10^3/\mu L$	$150-400 \times 10^3/\mu L$
CRP	15	–	115.3	0.4	0–5 mg/L
Lactic acid	1	0.6	1.5	–	0.5–2.2 mmol/L
HCO ₃	22	19	16	29	22–29 mmol/L
Urea	11.9	14.9	15.9	7.8	2.8–8.1 mmol/L
Creatinine	416	613	610	155	62–106 μ mol/L
Sodium	140	137	139	139	136–145 mmol/L
Potassium	4.3	4.0	5.1	4.2	3.5–5.1 mmol/L
AST	28	21	240	29	0–41 U/L
ALT	29	20	217	16	0–40 U/L
Alkaline phosphatase	59	52	108	66	13–53 U/L
Bilirubin	15	7	6	14	0–21 μ mol/L
Lipase	21	–	45	–	13–60 U/L
Amylase	38	–	–	–	13–53 U/L
INR	–	–	1.2	–	1
D-dimer	–	–	0.89	–	0–0.49 mg/L
Ferritin	–	–	3216	–	30–490 μ g/L

WBC: white blood cell; HB: hemoglobin; CRP: c-reactive protein; AST: aspartate aminotransferase; ALT: alanine aminotransferase; INR: international normalized ratio.

Note: The bold values in Table 1 are the abnormal values. Others are within normal limits.

no guarding or rebound tenderness at any other site. Per rectal examination was unremarkable and showed no melena. The chest and heart exams were normal.

The main laboratory investigations at presentation are shown in Table 1. It was remarkable for elevated serum creatinine and blood urea (see Table 1). His urine output was around 600 mL per day, and he had no indication for urgent dialysis. The abdominal CT scan with contrast and chest X-ray at presentation were grossly unremarkable (Figure 1(a)).

The severe abdominal pain required fentanyl initially to subside, and then he was started on regular paracetamol. During days 1–3 of hospitalization, the patient was still complaining of abdominal pain and was treated and investigated for high serum creatinine, which was found incidentally. By day 4, he developed a fever of 38.5°C, non-productive cough, and dyspnea with minimal exertion, exacerbated by coughing fits. Septic workup was requested and in the light of the COVID-19 pandemic and presence of lymphopenia in laboratory workup (Table 1) a diagnosis of COVID-19 was suspected, and the patient was placed in airborne isolation. The same day, nasopharyngeal and oropharyngeal swabs using reverse transcription-polymerase chain reaction (RT-PCR) were positive for COVID-19.

On day 8 of hospitalization, the respiratory status of the patient eventually worsened, and he started to have wheezes. Vital signs were notable for a temperature of 39.3°C, respiratory rate of 33 per minute, heart rate of 115 beats per minute, and he required 5 L of oxygen to maintain 94% oxygen

saturation. Chest X-ray showed bilateral infiltrates affecting the peripheral parts of the lungs (Figure 1(b)).

Blood tests were repeated and revealed lymphopenia with elevated c-reactive protein (CRP), liver enzyme, urea, and creatinine (Table 1). He became then desaturated on 15 L of oxygen on non-rebreather mask (NBM) so was shifted to the medical intensive care unit (ICU) and was intubated after 8 days of admission. The patient was started on COVID-19 treatment as per the local hospital protocol in Doha, Qatar, with **hydroxychloroquine**, **azithromycin**, tocilizumab, and methylprednisolone. He was monitored closely for any deterioration, extubated 3 days after improvement of his respiratory symptoms and his abdominal pain, and was discharged home from the hospital without any further complication. The total length of his hospital stay was 35 days.

Discussion

A large spectrum of diseases can be presented with acute abdominal pain, making the diagnosis sometimes is a real challenge for every physician. With such a broad differential and diagnostic modality, the physician should consider giving priority to a life-threatening condition that may need immediate surgical intervention to avoid any mortality or morbidity as a consequence of the delay. COVID-19 is now considered as a global pandemic.⁷ Fever, cough, and shortness of breath are the main presenting symptoms in COVID-19 patients; however, because of the progressing and evolving of the

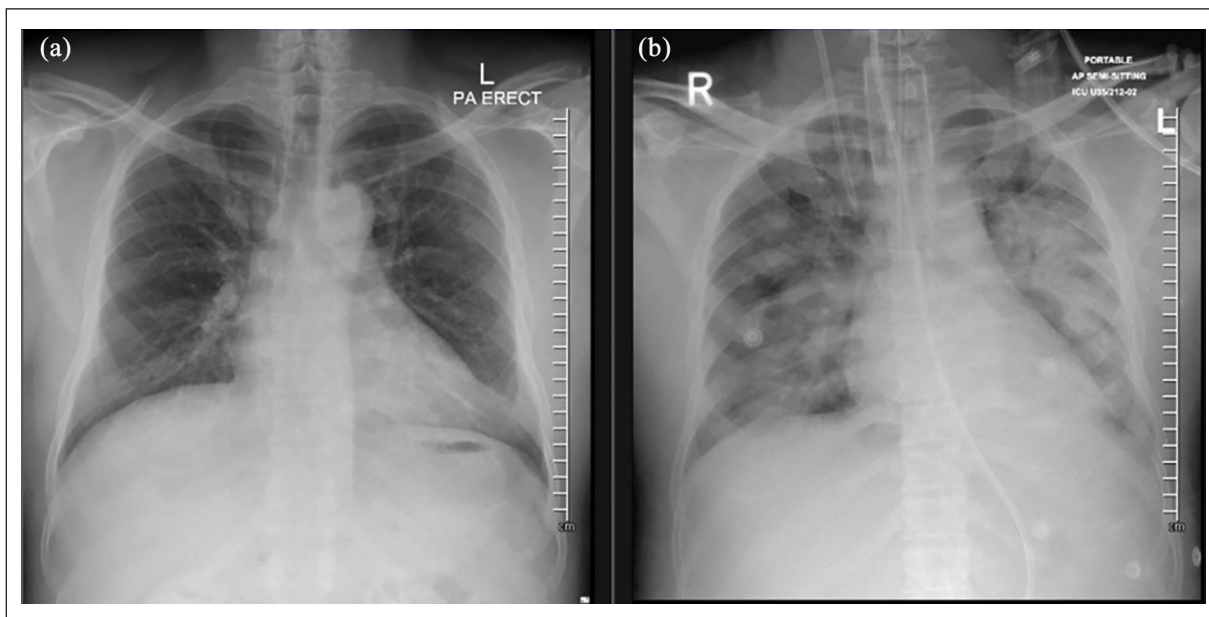


Figure 1. (a) Normal chest X-ray on admission at presentation (first day of admission). (b) Chest X-ray performed after (day 8 of admission) showing bilateral infiltrates affecting the peripheral parts of the lungs.

pandemic, other symptoms have been reported including abdominal pain, vomiting, and diarrhea.⁸

In contrast to diarrhea, nausea, and vomiting, abdominal pain has been associated with illness severity of COVID-19.^{9,10} The pathophysiology of gastrointestinal tract injury in COVID-19 is possibly multifactorial. It has been proposed that the angiotensin-converting enzyme 2 (ACE2) receptor plays a vital role in the mechanism of gastrointestinal tract damage in COVID-19. Although these receptors are highly expressed in alveolar cells in the lungs, they are also abundant in the gastrointestinal tract, especially in the small and large intestines.¹¹ The gastrointestinal symptoms that appear early during COVID-19, as in our case, suggest that the small bowel may be an important entry site for the virus.¹² Furthermore, ACE2 expression on small intestinal enterocytes may mediate the invasion of the virus and activation of gastrointestinal inflammation.¹³ This could be, therefore, a potential mechanism of abdominal in patients with severe COVID-19. Two cases were published recently mentioned COVID-19 that complicated by paralytic ileus [R5]. The histopathology of resected bowel specimen in these cases suggests a role for COVID-19-induced microthrombosis leading to gastrointestinal perforation.¹³ In a recent systematic review and meta-analysis of 47 studies including 10,890 patients with COVID-19, the pooled prevalence of gastrointestinal symptoms was as follows: diarrhea 7.7%, nausea/vomiting 7.8%, and abdominal pain 2.7%.⁶ Isolated gastrointestinal symptoms, including abdominal pain, were reported rarely.⁶

Our case helps offer insight into the clinical course of COVID-19 infection. We shared our experience with one patient who presented mainly with abdominal pain with no

other symptoms of fever or cough and has been rapidly deteriorating to acute respiratory distress syndrome (ARDS) which precipitated by COVID-19 and eventually intubated under medical ICU. It was a dilemma as our patient presented unusually with isolated epigastric pain and COVID-19 was extremely unlikely. He was evaluated by the surgeon and surgical abdomen was excluded clinically, as well as by abdominal CT scan with contrast. Acute pancreatitis associated with COVID-19 infection was also one of the differentials which was reported in case series.¹⁴ However, in our patient, serum lipase and amylase were normal, and the CT imaging was negative for radiological signs of acute pancreatitis, making it unlikely the cause.

The patient was newly diagnosed with hypertension and had chronic kidney disease (CKD) likely due to uncontrolled hypertension. Kidney ultrasound showed a bilateral increase of renal parenchymal echotexture with normal size suggestive of CKD. The acute kidney injury (AKI) on top of CKD was found upon admission most likely due to dehydration giving the improvement by hydration over the course of stay.

After a thorough literature review, we found the number of reported cases of COVID-19 presented atypically with an acute abdomen. Table 2 shows the main clinical and presenting symptoms of different cases who presented with an acute abdomen.

The site of abdominal pain predominantly epigastric was not common among COVID-19 patients who presented with abdominal pain, only five patients presented with a similar epigastric pain (see Table 2). Almost all cases had some associated symptoms like vomiting and diarrhea in contrast to our case which was only isolated epigastric pain.

Table 2. Summary of reported COVID-19 cases presented in the literature as acute abdominal pain.

Case/author	Abdominal pain region	Other GI symptoms	Fever	O ₂ saturation (%)	C-reactive protein (mg/dL)	WBC count	CT abdomen	CT chest (at presentation)	Follow-up days
1. Saeed et al. ¹⁵	Epigastric	Nausea, vomiting	No	94	67	3.4	Normal	Bilateral ground-glass opacities	18
2. Saeed et al. ¹⁵	Epigastric	Nausea, vomiting	Yes	95	123	4.3	Normal	Bilateral ground-glass opacities	17
3. Saeed et al. ¹⁵	Global	Nausea	Yes	95	140	7.2	Normal	Bilateral ground-glass opacities	17
4. Saeed et al. ¹⁵	Left iliac fossa	Nausea, vomiting	Yes	94	111	7.4	Normal	Bilateral ground-glass opacities	16
5. Saeed et al. ¹⁵	Right iliac fossa	Nausea	Yes	97	43	7.6	Normal	Bilateral ground-glass opacities	21
6. Saeed et al. ¹⁵	Global	Nausea, vomiting	No	97	7.7	2.6	Normal	Bilateral ground-glass opacities	9
7. Saeed et al. ¹⁵	Right iliac fossa	Nausea, vomiting	No	90	350	23.8	Cholecystitis	Normal	8
8. Saeed et al. ¹⁵	Right iliac fossa	Diarrhea	Yes	100	82	4.6	Appendicitis	Normal	9
9. Saeed et al. ¹⁵	Umbilical	Nausea	No	99	<0.6	7.7	Ileus	Normal	12
10. Ashraf et al. ¹⁶	Right iliac fossa	Nausea, vomiting	Yes	99	14.4	3	Normal	Upper cut bilateral basal lung consolidation	31
11. Ashraf et al. ¹⁶	Right upper quadrant	None	No	98	35	9.6	Right hypochondria epiploic appendagitis	Normal	38
12. Ashraf et al. ¹⁶	Epigastric	Nausea, vomiting, diarrhea	Yes	98	82	6.5	Normal	NA	29
13. Abdalhadi et al. ¹⁷	Right iliac fossa	Nausea, vomiting	No	100	14.4	3	Normal	Bilateral patchy peripheral lung basal consolidations and ground-glass attenuations	14
14. Pazgan-Simon et al. ¹⁸	Global	None	No	94	29	19	Normal	Interstitial consolidations in the lower lobes of both lungs	20
15. Voutsinas et al. ¹⁹	Right lower quadrant abdominal	None	No	–	–	3.1	Normal	Hazy ground-glass opacities in the dependent portions of both lung bases	–
16. Voutsinas et al. ¹⁹	Flank pain	Nausea, vomiting	Yes	–	–	3.9	Normal	Peripheral ground-glass opacities with associated increased interstitial markings in both lung bases	5
17. Voutsinas et al. ¹⁹	Abdominal pain	Diarrhea, bloody stool	No	–	–	–	Mild sigmoid colitis	Ground-glass opacification with a rounded morphology in the periphery of the right lung base	–
18. Voutsinas et al. ¹⁹	Epigastric and flank pain	Nausea	No	–	–	5.3	Pyelonephritis	Rounded ground-glass opacities in the periphery of the imaged right lower lobe	4
19. Mahan et al. ²⁰	Periumbilical pain	None	No	84% on room air	–	–	None	Abdominal aorta showed thromboemboli, diffuse bilateral ground-glass opacities in the lungs	–
20. Present case	Epigastric pain	None	No	100%	15.5	5	None	Normal	35

GI: gastrointestinal; WBC: white blood cell; CT: computed tomography; NA: not available.

Conclusion

Isolated acute abdominal pain might be the initial presenting symptom of COVID-19 before other clinical (such as fever and respiratory symptoms), laboratory (such as lymphopenia), and radiological (i.e. chest X-ray) manifestations. Physicians, especially in the Emergency Department, should pay attention and consider COVID-19 infection in patients presenting with severe acute abdominal pain with no clear reason.

Author contributions

The first author (M.A.), corresponding author (M.B.H.), and the senior author (A.-N.E.) contributed equally to the writing and preparation of this article. M.A. and M.B.H. have written the initial draft of the manuscript and attempted the literature review. The draft was revised and updated by A.-N.E. All the authors critically reviewed the initial and the final draft of the manuscript and approved it for submission.

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

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