

Is acute Appendicitis as an extra Pulmonary Manifestation of Covid-19 infection?

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Abstract

Background; Coronavirus disease-19 (COVID-19) is an infectious respiratory disease. The first confirmed case of 2019-nCoV infection in Albania was reported in Tirana on 08 March 2020, when a patient and his adult son who had come from Florence, Italy tested positive. Patients with COVID-19 can be presented with a series of signs and symptoms. Acute abdomen as a presentation of COVID-19 is rare. The diagnosis of COVID-19 should be suspected and investigated in every case of acute abdomen.

Case presentation: We report a case of a 42-year-old male who presented with features of acute appendicitis. SARS-CoV-2 polymerase chain reaction test result was positive for COVID-19. Abdominal ultrasonography and his computed tomography of the chest and abdomen showed a perforated appendix and no infiltrates or abnormalities of COVID-19. The diagnosis of our case was appendicitis with COVID-19 without pneumonia. He was admitted and treated with antibiotic therapy and supportive care. He had an improvement in his health condition which made it possible to leave the hospital on the third day of hospitalization.

Conclusion: Based on our clinical case and literature data, we suggest that clinicians should suspect the diagnosis of acute appendicitis in patients with COVID 19. So, the case of acute abdomen pain must be completed with a SARS-CoV-2 test. Therefore, we recommend additional studies to reinforce the idea of linking SARS COV 2 infection with acute appendicitis.

Keywords: Abdominal pain; Appendectomy; Appendicitis; COVID-19; Case report.

Introduction:

On December 31, 2019, China reported a cluster of cases of pneumonia in people associated with the Huanan Seafood Wholesale Market in Wuhan, Hubei Province and on

January 7, 2020, Chinese health authorities confirmed that this cluster was associated with a novel coronavirus, 2019-nCoV. [1] This virus spread with dizzying speed all over the world including here and, in our country, becoming a major global emergency. The first confirmed case of 2019-nCoV infection in the Albania, was reported in Tirana on 08 March 2020, when a patient and his adult son who had come from Florence, Italy tested positive. [2] Patients with COVID-19 can be presented with a series of signs and symptoms involving organs and systems such as the pulmonary, cardiovascular, neurological or gastrointestinal. The cytokine storm could be associated with disease severity. Gastrointestinal symptoms are reported in approximately 35% of patients with COVID-19 infections [3].

COVID-19 is a possible diagnosis, even in the event of an abdominal pain syndrome suggesting acute appendicitis. [4] Involvement of the gastrointestinal tract among infected

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patients knows many mechanisms. Angiotensin-converting enzyme 2 (ACE2) is an entry point for SARS-CoV-2 commonly expressed on the cell membranes of the type II pneumocytes in lungs, ileal and colonic enterocytes in the GI tract, arteries, heart, and kidney cells. It is a key mechanism for receptor-mediated cell entry and replication in SARS-CoV-2. Viral infections can induce acute appendicitis in a variety of ways, including lymphoid hyperplasia, which leads to appendix blockage, and mucosal ulcerations resulting in subsequent bacterial infection. [5] Acute abdominal pain in COVID-19 patients poses a diagnostic dilemma to clinicians. Delaying management of the surgical abdomen can result in serious complications and worsen mortality. In contrast, performing unnecessary surgery in COVID-19 patients causes iatrogenic morbidity and mortality, more strain on healthcare resources, and high-risk exposure for healthcare workers involved in operative fields. [6] Therefore, it needs a greater vigilance for rapid diagnosis and intervention in individuals with GI symptoms and concomitant SARS-CoV-2 infection. [4]

Case presentation

A 50-year-old male presented to the emergency department with fever and acute abdominal pain. He had 4 days with fever 38 °C, myalgias, fatigue, anorexia and the last 24 hours with severe abdominal pain, nausea, sparse non-biliary vomiting, and diarrhea. SARS-CoV-2 polymerase chain reaction test result positive for COVID-19. He was transferred to our service for further diagnosis and follow-up. The patient had no preexisting comorbid conditions. The patient was in good general condition with vital signs within normal limits on examination. During the examination, a superficial and deep tenderness was noticed in the lower right quadrant of the abdomen. He had temperature of 38.1°C, blood pressure of 127/82 mm Hg, pulse of 109 beats per minute, respiratory rate of 17 breaths per minute, and oxygen saturation of 97% while the patient was breathing ambient air. Laboratory research included: a complete blood count, serum biochemical test (renal function, lactate dehydrogenase, creatine kinase, electrolytes, liver function) and coagulation profile. From the data we had discerned leukocytosis 11 200/mm³ (4000-11000/mm³), neutrophilia 89% (40-72%), lymphopenia 16.4% (25-45%) and monocytosis 9.8% (3-9%). Liver function tests, renal function tests, amylase/lipase test and electrolytes were normal but noticed increase of Lactate Dehydrogenase (LDH) 297 U/L (125-220) and Creatine Phosphokinase (CPK) 284 U/L (30-200). C-reactive protein (PCR) was elevated at 5.7 mg/dL (normal range: 0-0.5 mg/dL) as well as Fibrinogen 518 mg/dL (200-400) and D-dimer 0.78 ug/mL (0.2-0.5). Urine analysis was normal. Abdominal ultrasonography and abdominal CT scan showed an inflamed appendix with thickened walls, a diameter of 1.2 cm and peri-appendiceal fat stranding (Fig.1, 2). The chest CT didn't show any abnormalities of COVID-19. Thus, the diagnosis of acute appendicitis

was confirmed in a patient infected with COVID-19, but without pulmonary involvement. The patient underwent appendectomy, respecting the entire SARS protection protocol COV2, under generalized anesthesia, and a swollen appendix was observed macroscopically (about 1.5 cm) with fibrin around it (fig.3) Treatment with antibiotic therapy (Ceftriaxone 2 gr/IV/once daily, Metronidazole 500 mg/IV/

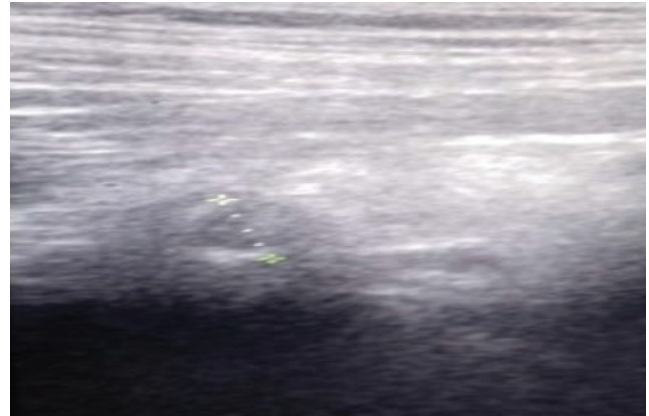


Figure 1 Ultrasound image showing appendix with a diameter of 1.2 cm, with thickened walls and peri-appendiceal fat stranding.

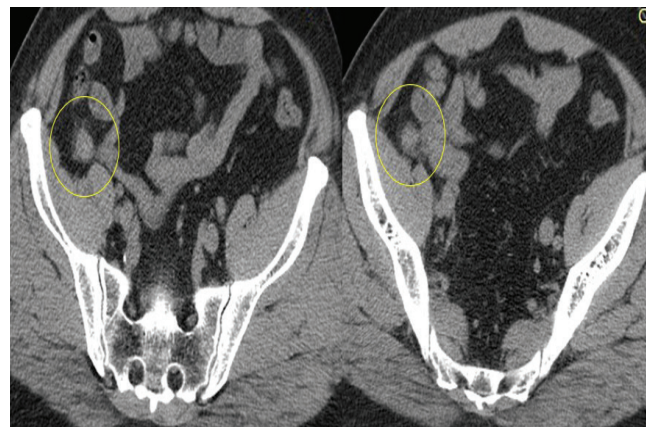


Figure 2 Axial CT scan image showing thickened appendix with peri-appendiceal fat stranding (yellow square).

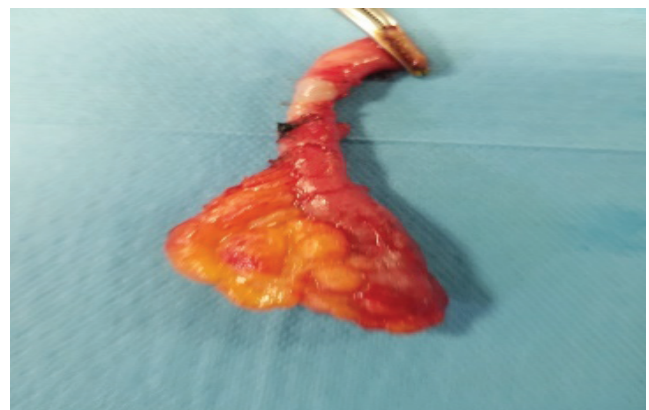


Figure.3 Macroscopic view showing swollen appendix.

three times daily), vitamin therapy (Thiamin, Pyridoxine, L-ascorbic acid), intravenous fluids and supportive therapy was started immediately. He came dynamically stable, had an improvement of health condition which made it possible to leave the hospital on the third day of hospitalization.

Discussion

In this description we present the case of a 42-year-old male who presented with features of acute appendicitis and where SARS-CoV-2 polymerase chain reaction test result positive for COVID-19. COVID-19 is a global pandemic. SARS-CoV-2 could be one of the possible causes of acute abdominal cases such as acute appendicitis. SARS-CoV-2 infection may contribute to the pathogenesis of acute appendicitis. Prichard et al support an association between SARS-CoV-2 and acute appendicitis. [7]

Patients with SARS COV 2 show a range of clinical manifestations ranging from mild to moderate to severe. Symptoms and signs are frequently non-specific, and they might conceal life-threatening diseases. (4) Our patient in their disease course presented with acute abdominal pain, non-bilious vomiting, diarrhea, fever. Nausea and vomiting as symptoms of acute abdomen are known to occur in the background of SARS-CoV-2 infection. [8] The presentation of gastrointestinal symptoms can vary according to the population, presenting as mild symptoms and prior to respiratory symptoms in some cases. [9]

Abdominal ultrasonography and his computed tomography of the chest and abdomen showed a perforated appendix and no infiltrates or abnormalities of COVID-19 although the lungs are the main organ involved in this disease. The diagnosis of our case was appendicitis with COVID-19 without pneumonia. Few cases of Covid-19 presenting with acute abdomen with features of pancreatitis and appendicitis have also been reported. [5, 10]

Laboratory research included: a complete blood count, serum biochemical test (renal function, lactate dehydrogenase, creatine kinase, electrolytes, liver function) and coagulation profile. From the data we had discerned leukocytosis $11\,200/\text{mm}^3$ ($4000\text{--}11000/\text{mm}^3$), neutrophilia 89% (40-72%), lymphopenia 16.4% (25-45%) and monocytosis 9.8% (3-9%). Liver function tests, renal function tests, amylase/lipase test and electrolytes were normal but noticed increase to LDH 297 U/L (125-220) and CPK 284 U/L (30-200). C-reactive protein was elevated at 5.7 mg/dL (normal range: 0-0.5 mg/dL) as well as Fibrinogen 518 mg/dL (200-400) and D-dimer 0.78 ug/mL (0.2-0.5). Analytically, it is common to find lymphopenia, which has been described in more than 60%. [9] Treatment with antibiotic therapy (Ceftriaxone 2 gr/IV/once daily, Metronidazole 500 mg/IV/three times daily), vitamin therapy (Thiamin, Pyridoxine, L-ascorbic acid), intravenous fluids and supportive therapy was started immediately in our patient. He came dynamically stable, had an improvement of health condition which made it possible to leave the hospital on the third day of hospitalization. The

diagnosis of COVID-19 cannot be ruled out and should be investigated in every case. Furthermore, delaying the treatment of the surgical abdomen can lead to serious complications and increased mortality. [4]

Conclusion

Based on our clinical case and literature data, we suggest that clinicians should suspect the diagnosis of acute appendicitis in patient with COVID 19. On the other hand, we can say that the cases presented in the emergency units must be completed with SARS-CoV-2 test. Therefore, we recommend additional studies to reinforce the idea of linking SARS COV 2 infection with acute appendicitis.

List of abbreviations

LDH- Lactate Dehydrogenase; CPK- Creatine Phosphokinase; PCR- C-reactive protein

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Availability of data and materials

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

EM conceived and drafted the manuscript. AK designed and revised the work. EP participated in the sequence alignment and performed statistical analysis. ES participated in the design of the study and performed the laboratory analysis. PP participated in its coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

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