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Case Report

COVID 19 Infection in a Child Manifesting as Acute Appendicitis: A Case Report with Literature Review

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Abstract

Introduction: The aim of this case report is to highlight that COVID-19 can have several presentations including a clinical picture of appendicitis, thus thorough physical examination and investigations are warranted to properly identify the underlying cause even if it is a rare one. Since the emergence of the COVID-19 outbreak in Wuhan, China, the World Health Organization (WHO) declared the COVID-19 a pandemic which is continuing to spread across the globe. The most common clinical presentation of a patient with COVID-19 is respiratory symptoms manifested primarily by dry cough and fever. To date, the full picture of a patient with COVID-19 is still not clear and it can be mistaken with other unusual presentations. The highest mortality rates worldwide were seen among the adult and elderly populations. Moreover, involvement of the gastrointestinal system has been reported as well.

Case Report: We describe a case of a 13 years old male patient known to have behçet disease maintained on colchicine, presented to the emergency department for periumbilical abdominal pain radiating to the right lower quadrant with nausea, anorexia of 1-day duration, and myalgia of 2 days duration. This presentation was not associated with vomiting, fever, and diarrhea. This patients' symptoms were suggestive of appendicitis to which he underwent appendectomy, which appeared to be normal after pathological analysis, but turned out to be COVID-19 positive despite doing the polymerase chain reaction (PCR) and rapid antigen test upon admission which were negative. This patient didn't portray any symptoms suggestive of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.

Conclusion: A positive clinical examination of appendicitis is an important finding and should be further investigated by imaging and lab tests as it could be mistaken by a COVID-19 infection.

Keywords: *COVID-19; Acute Appendicitis; Respiratory Symptoms; Gastrointestinal Symptoms*

Abbreviations

ER: Emergency Department; PCR: Polymerase Chain Reaction; ACE 2: Angiotensin Converting Enzyme 2; CXR: Chest X-Ray; DOH: Day of Hospitalization; CRP: C-Reactive Protein; PIMS-TS: Pediatric Inflammatory Multisystem Syndrome

Introduction

This pandemic began back in December 2019, starting in Wuhan, china and now it has become the number one threat to humans as it caused more than 2,584,912 deaths across the world [3,5]. The most common clinical presentation of a person with COVID-19 infection can manifest by pulmonary symptoms such as dry cough, fever, and shortness of breath [9]. In addition, most infected children usually have

mild clinical manifestations and most recover within a 1-2-week period after the disease onset [8]. In a minority of cases, other symptoms targeting the gastrointestinal system as in diarrhea, vomiting and abdominal pain were reported [2,9]. Although this disease is mostly seen in adults and elderly, it can also affect children on whole new level. These children present with a condition of "acute abdomen" which is usually managed through surgical intervention [7]. It is crucial, that the differential diagnosis in patients with abdominal pain must include COVID-19 infection associated with pediatric inflammatory multisystem syndrome [4]. We report a case of 13 years old boy who presented with an unusual presentation of COVID-19 manifested as an acute abdomen, and more specifically as appendicitis.

Case Report

We report a case of a 13 years old male patient, presented to the ER with epigastric abdominal pain radiating to the right lower quadrant, associated with nausea and headache. Upon physical examination, the patient's abdomen was soft slightly distended. There was a notable positive McBurney's tenderness, whereas Psoas and Rovsing signs were negative. This patient was put on IV hydration, his labs were taken and the pediatric surgeon was consulted. This boy is known to have behçet disease to which he is still taking colchicine, and as for his past surgical history it includes tonsillectomy in addition to right inguinal hernia repair. He was diagnosed with acute appendicitis and he was scheduled for surgery to remove the inflamed appendix.

As the patient was diagnosed with acute appendicitis, he was put on IV hydration and was started on a course of ceftriaxone. A rapid antigen test and PCR were done which turned out to be negative for COVID-19 infection. An ultrasound of the abdomen/pelvis was done and was normal. A computed tomography (CT) of the abdomen/pelvis was done showing mild wall thickening of the appendix along with mild fecal loading in the large bowels. In the CT, there were multiple lymph nodes (largest lymph node measuring 2*1 cm), few of which showing conglomeration in the right lower quadrant suggestive of lymphadenitis. Consequently, appendectomy was done, the appendix was removed and was sent for pathology. The pathology report of the appendix came out to be normal, indicating that the removed appendix was normal with no signs of active or chronic inflammation and the patient's pain persisted. Therefore, the PCR was repeated and the patient was detected to be positive.

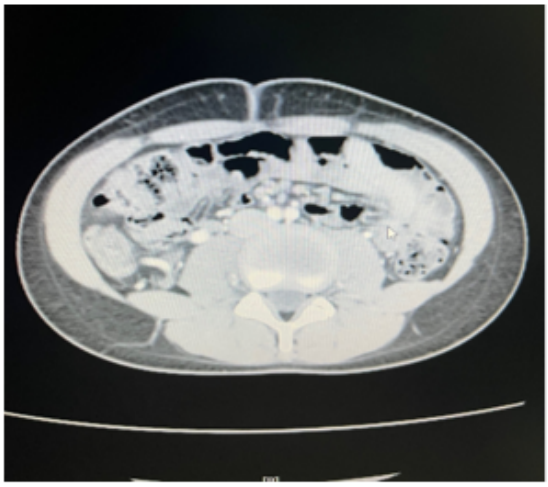

Figure 1: *Computed tomography showing thickening of the wall of the appendix with mesenteric lymphadenitis.*

Differential diagnosis

- Acute appendicitis
- Mesenteric lymphadenitis
- COVID-19 infection.

Discussion

COVID-19 affects multiple organ systems by the virus SARS-CoV-2. It has the ability to bind to the ACE 2 receptors normally present on the cell membranes of the heart, lungs, arteries, kidneys and intestines [1,2]. This is done in order to gain entry into the cell to start its replication [1,2]. These receptors are responsible for the process of regulation of inflammation, and they are present in the airways, the vascular endothelium, and intestinal epithelium [2]. This is the reason behind the appearance of gastrointestinal symptoms (GI) in patients having COVID-19. Moreover, most of the GI symptoms reported in patients (adults and pediatrics) with COVID-19 infection were vomiting, diarrhea, anorexia and abdominal pain, which can precede the respiratory symptoms [1,6]. However, COVID-19 rarely presents as a case of acute appendicitis characterized by nausea, vomiting, anorexia and right lower iliac fossa pain [1].

In our case, the patient presented with typical symptoms of acute appendicitis, where Mcburney's sign was positive and a PCR was negative upon admission. Therefore, a pediatric surgeon was consulted to remove this inflamed appendix. Although, the appendix was removed the pathology came back normal suggesting a non-inflamed appendix and the PCR was repeated. Shockingly, the PCR came back positive and hence this boy presented as COVID-19 infection masked by an acute surgical guarded abdomen.

In the literature, one study reported a case of an 11 years old boy, who presented to the emergency room with abdominal pain and fever of 5 days duration associated with vomiting, three episodes of loose stools and non-pruritic maculopapular rash on both feet. This boy didn't portray any respiratory symptoms. Upon examination, his abdomen was guarded and diffusely tender which was highly suggestive of a case of acute abdomen [3]. This boy was put on IV hydration and ceftriaxone. Labs were taken, his CXR was normal, and the ultrasound revealed a normal appendix. On his first day of hospitalization a PCR was done and negative, but his fever and abdominal pain persisted. Furthermore, on the third doh, this patient showed signs of a compensated shock. Consequently, PCR was taken again and was positive although both of his parents tested negative [3].

Another study, reported a case of 14 years old girl, previously healthy presented with abdominal pain of 4 days duration that was localized in the right iliac fossa, associated with vomiting (non-bilious) and high-grade fever. The mother of this girl was having high grade fever and dyspnea 2 weeks prior to their presentation, but her mother hasn't done the PCR [4]. The physical examination revealed a positive Rovsing's sign with right lower quadrant tenderness. The labs were taken, which depicted an elevated CRP, D-Dimer, ferritin along with lymphopenia. An ultrasound was performed for this girl revealing mesenteric adenitis, whereas her CXR was normal. Following 12 hours of admission, this girl started to have palmar rash and then she entered into a state of shock. An urgent CT was done for this patient, which revealed intra-lobar thickening highly suggestive of COVID-19 infection without any pathology in the abdomen, although she was negative for corona virus infection on PCR. Therefore, this patient was treated for PIMS-TS [4].

Although, COVID-19 infection usually manifests primarily as respiratory symptoms, it can also start to appear as GI symptoms by stimulating an acute abdomen [2,6,7]. This was seen in our case, where our patient presented with symptoms of an acute surgical abdomen highly suggestive of acute appendicitis to the extent that a normal appendix was removed. Therefore, careful clinical examination along with additional tests must be done and COVID-19 infection should be taken into consideration even though the PCR is negative. And even

though COVID-19 in children masks itself as appendicitis, it is crucial to do the PCR, and the necessary imaging modalities, especially CT along with the ultrasound in order to rule out appendicitis (as in our case) and to avoid surgical intervention [5,10].

Conclusion

During the pandemic, the manifestations of COVID-19 infection was mostly seen as respiratory symptoms, but this doesn't rule out the fact that it can manifest by other wide presentations. This confusing case requires a collaborative teamwork between pediatricians and surgeons in order to differentiate between acute appendicitis and PIMS-TS caused by COVID-19 infection in pediatric patients. To our knowledge, our case is the fourth report among other few reported cases in the literature that presented as acute appendicitis and turned out a corona virus infection. To date, there is no proven correlation between acute appendicitis and COVID-19. It is a tough challenge for clinicians and frontline workers to differentiate between a case of acute abdomen, a multisystem involvement and an atypical presentation of COVID-19.

Authors' Contributions

Conception and design: JH, AN and NS; Acquisition, analysis and interpretation of data: JH, AN and NS; Drafting the article JH, AN and NS Revising it critically for important intellectual content: AN; Approved final version of the manuscript: AN and MR.

Conflict of Interest

The authors declare that they have no conflict of interest.

Bibliography

1. Abdalhadi A., *et al*. "Can covid 19 present like appendicitis?" *ID Cases* (2020): 21.
2. Rico Espiñeira C., *et al*. "Acute abdomen in COVID-19 disease: the pediatric surgeon's standpoint". *Cirugia Pediatrica* 34.1 (2021): 3-8.
3. Muthiah Periyakaruppan., *et al*. "COVID Abdomen: SARS-CoV-2 Infection presenting as". *Acute Abdomen' in a Child* (2020).
4. Harwood R., *et al*. "Paediatric abdominal pain in the time of covid-19: A new diagnostic dilemma". *Journal of Surgical Case Reports* (2020).
5. Tullie L., *et al*. "Gastrointestinal features in children with COVID-19: An observation of varied presentation in eight children". *The Lancet Child and Adolescent Health* (2020): 4.
6. Song Y., *et al*. "SARSCoV-2 induced diarrhea as onset symptom in patient with COVID-19". *Gut* 69.6 (2020): 1143-1144.
7. Pautrat K and Chergui N. "SARS-CoV-2 infection may result in appendicular syndrome: Chest CT scan before appendectomy". *Journal of Visceral Surgery* (2020).
8. Shen K., *et al*. "Diagnosis, treatment and prevention of 2019 novel coronavirus infection in children: experts' consensus statement". *World Journal of Pediatrics* (2020).
9. Li L., *et al*. "Digestive system involvement of novel coronavirus infection: prevention and control infection from a gastroenterology perspective". *The Journal of Digestive Diseases* 21 (2020): 199-204.
10. Sayed AO., *et al*. "Diagnostic reliability of pediatric appendicitis score, ultrasound and low dose computed tomography scan in children with suspected acute appendicitis". *Therapeutics and Clinical Risk Management* 13 (2017): 847-854.

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