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Non-operative management of acute appendicitis in a pediatric patient with concomitant COVID-19 infection

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ABSTRACT

Introduction: In late December 2019, reports emerged from Wuhan, China of a novel coronavirus SARS-CoV-2, which caused severe acute respiratory distress syndrome referred to as COVID-19. As the virus spread, reports of severe perioperative complications, including fatalities, began to emerge in the literature. We present a case of a previously healthy patient who developed classic symptoms of appendicitis. The patient was also found to be positive for COVID-19. Given the risks to both the patient and surgical team, we elected to pursue a non-operative management strategy for this patient with appendicitis.

Materials and methods: A 13 year old female with COVID-19 presented with a day of right lower quadrant abdominal pain. A computerized tomography (CT) scan diagnosed uncomplicated appendicitis. The patient was successfully treated non-operatively with antibiotics and discharged home.

Conclusion: To our knowledge, this case illustrates the first report of a pediatric patient with concomitant appendicitis and COVID-19 infection. We have been able to utilize a non-operative management strategy to effectively treat the patient's acute appendicitis, while protecting her from the risks of undergoing a general anesthetic as well as the operative team. We hope this report can provide others with a potential management strategy for similar patients.

1. Introduction

In late December 2019, reports emerged from Wuhan, China of a novel coronavirus SARS-CoV-2, which caused severe acute respiratory distress syndrome referred to as COVID-19 [1]. This illness quickly spread to the United States [2]. As the virus spread, reports of severe perioperative complications, including fatalities, began to emerge in the literature [3]. Some of these complications occurred in patients who had no respiratory symptoms prior to their operations. In addition to the post-operative risks to the patients, the operating room was identified as a potential site of virus transmission to healthcare providers. Endotracheal intubation and laparoscopy were identified as potential aerosol generating procedures that could spread virus from the patient to healthcare providers. Additionally, shortages in personal protective equipment (PPE) were reported throughout the United States. The American College of Surgeons issued recommendations that elective operations should be minimized or cancelled altogether [4].

Traditionally, surgical removal of the appendix was considered the standard management for appendicitis. Recently, multiple studies have

shown that non-operative management of acute appendicitis is a safe and effective means of treatment [5–7]. A combination of intravenous antibiotics and oral antibiotics can be used to successfully treat appendicitis.

We present a case of a previously healthy patient who developed classic symptoms of appendicitis. The patient was also found to be positive for COVID-19. Given the risks to both the patient and surgical team, we elected to pursue a non-operative management strategy for this patient with appendicitis.

2. Case report

The patient is a 13 year old female with no past medical history who presented with a one day history of right lower abdominal pain as well as nausea and emesis. She did not have any respiratory symptoms, such as cough or shortness of breath. She did have an exposure to COVID-19 as her mother was diagnosed five days earlier. There was no significant family, surgical, or other social history. On exam, the patient was afebrile with normal vital signs. There was moderate tenderness to

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palpation in the right lower quadrant. Laboratory examination was notable for an elevated white blood cell count of 13.4. A computerized tomography (CT) scan was performed demonstrating a dilated appendix measuring 1.3 cm in diameter with periappendiceal stranding and no evidence of perforation or abscess. There were several appendicoliths within the appendix (Fig. 1A and B). A nasopharyngeal swab was collected for COVID-19 testing and was found to be positive. The patient had a mask on during testing and healthcare providers used appropriate personal protective equipment throughout her hospital course.

The patient was treated with intravenous antibiotics (ceftriaxone and metronidazole) based on the hospital's historical antimicrobial susceptibility testing and fluid resuscitation. Her symptoms improved and she was advanced to a regular diet. By the next day, her clinical symptoms and abdominal exam had significantly improved and she remained afebrile. She was discharged home to self-quarantine on an oral antibiotic regimen of cephalexin and metronidazole. On phone call follow-up two weeks later, she was afebrile, without pain, and able to tolerate a normal diet.

3. Discussion

The COVID-19 pandemic is affecting all aspects of medical care in the United States. Efforts to reduce the number of operations being performed have been instituted to preserve PPE and minimize exposure of healthcare workers to aerosol generating procedures. Unfortunate perioperative complications in patients with COVID-19 have alerted surgeons to the dangers of anesthetizing patients with COVID-19. Given the known risks to patients and providers, our pediatric surgical division has been making a concerted effort to minimize non-emergent operations during the pandemic.

The nonoperative management of uncomplicated appendicitis has been considered an acceptable approach in adults in which there have been published randomized, controlled studies [8,9]. The success rate for nonoperative treatment in these reports have been approximately 65–90%. There has been some evidence in the pediatric population that treatment with antibiotics for acute appendicitis has also been safe and feasible [5–7]. The recurrence rate of appendicitis for patients that have undergone nonoperative management is difficult to calculate due to the relatively short follow-up for these limited studies in children. However, the studies indicate that if an appendectomy is required in the future, the operation is not more difficult afterwards. Whenever surgical treatment for a disease process is considered, the risk benefit ratio must be evaluated. Given that the risks of operation in this patient with COVID was higher than a typical healthy pediatric patient and treatment with antibiotics has a high success rate, the nonoperative approach was chosen.

To our knowledge, this case illustrates the first report of a pediatric patient with concomitant appendicitis and COVID-19 infection. Our group has been able to utilize a non-operative management strategy to effectively treat the patient's acute appendicitis, while protecting her from the risks of undergoing a general anesthetic as well as the operative team. We hope this report can provide others with a potential management strategy for similar patients.

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Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

Authorship

All authors attest that they meet the current ICMJE criteria for



Fig. 1. A, B – Representative axial and coronal CT scan images demonstrating acute appendicitis. White arrows indicate the inflamed appendix with appendicolith present.

Authorship.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Dr. Bethany Slater is a consultant for Boulder Surgical. This is not relevant for this manuscript. Dr. Jones has no financial or personal competing interests.

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