Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Non-operative management of acute appendicitis in a pediatric patient with concomitant COVID-19 infection

Brian A. Jones, Bethany J. Slater *

University of Chicago Medicine, USA

ARTICLE INFO

Keywords:
Appendicitis
COVID19
Nonoperative
Pediatric

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
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. Unfortunately 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 has 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 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.

Funding source

No funding or grant support.

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

References

[1] Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020;395:497–506.
[2] Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. N Engl J Med 2020;382:929–36.
[3] Aminian A, Safari S, Razeghian-Jahromi A, Ghorbani M, Delaney CP. COVID-19 outbreak and surgical practice: unexpected fatality in perioperative period. Ann Surg March 26 2020;10. PMID: 32221177.
[4] COVID-19: recommendations for management of elective surgical procedures. https://www.facs.org/covid-19/clincial-guidance/elective-surgery.
[5] Svensson JF, Patkova B, Almstrom M, et al. Nonoperative treatment with antibiotics versus surgery for acute nonperforated appendicitis in children: a pilot randomized controlled trial. Ann Surg 2015:261:67–71.
[6] Tanaka Y, Uchida H, Kawashima H, et al. Long-term outcomes of operative versus nonoperative treatment for uncomplicated appendicitis. J Pediatr Surg 2015;50:1893–7.
[7] Minneci PC, Mahida JB, Lodwick DL, et al. Effectiveness of patient choice in nonoperative vs surgical management of pediatric uncomplicated acute appendicitis. JAMA Surg 2016;151:408–15.
[8] Varadarajan KK, Humes DJ, Neal KR, Lobo BN. Antibiotic therapy versus appendectomy for acute appendicitis: a meta-analysis. World J Surg 2010;34:199–209.
[9] Wilms IM, de Hoog DE, de Visser DC, Janzing HM. Appendectomy versus antibiotic treatment for acute appendicitis. Cochrane Database Syst Rev 2011;CD008355.