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Case Report

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Acute abdomen caused by multisystemic inflammatory syndrome after COVID-19 in two pediatric patients

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ABSTRACT

During the COVID-19 pandemic, a complex disease presentation known as multisystemic inflammatory syndrome (MIS-C) has been identified in children. This inflammatory condition, which affects multiple organs, poses significant challenges for pediatric surgeons, especially when acute abdominal symptoms are present. This article aims to share the experiences with, aged 11 and 4.5 years, who presented with similar difficulties in our clinic.

Keywords: COVID-19, multisystemic inflammatory syndrome, children

INTRODUCTION

COVID-19 generally causes mild symptoms in children, commonly presenting as respiratory tract infections.[1,2] However, it can manifest in various forms, from mild upper respiratory tract symptoms to more severe conditions such as multisystemic inflammatory syndrome in children (MIS-C).[1,2] Clinical conditions more severe than simple respiratory issues can also occur, and complications or serious clinical processes may arise in pediatric patients.[2,3]

Treatment of MIS-C includes steroids, immunomodulation, immunoglobulin, and aspirin among other therapies.[3] This treatment process can be significantly different depending on whether surgery is required.[3] Therefore, pediatric surgeons must remain cautious when managing these patients, considering the possibility of MIS-C, even when symptoms resemble surgical conditions.

This study presents two cases of pediatric patients with COVID-19 who developed MIS-C, presenting with acute abdominal pain.

CASE 1

An 11-year-old male patient, initially treated for earache and fever at an outside facility, was referred to our clinic with a preliminary diagnosis of acute abdomen. His symptoms persisted, and he developed abdominal pain. Redness in his eyes was also noted in his history. Upon examination, his temperature was 39°C, pulse rate 120/min, respiration 22/min, and there was significant tenderness in the right upper quadrant of the abdomen. Laboratory findings were as follows: leukocytes 5470/µL, urea 68.48 mg/dl, creatinine 1.24 mg/dl, sodium 125 mEq/L, chloride 93.6 mEq/L, ALT 53.6 U/L, AST 50.2 U/L, total bilirubin 2.98 mg/dl, direct bilirubin 2.069 mg/dl, CRP 258 mg/L, fibrinogen 447 mg/dl, albumin 27.3 g/L, procalcitonin 40.54 ng/ml, D-dimer 5.33 µg/ml. Abdominal ultrasound was unremarkable. We began intensive intravenous hydration and administered broad-spectrum antibiotics, as tomography showed suspicious opacity at the distal end of the common bile duct. The patient was hospitalized with a preliminary diagnosis of cholelithiasis and acute cholangitis and underwent magnetic resonance imaging (MRI) cholangiography. Intrahepatic and extrahepatic bile ducts appeared normal, and a 5 mm stone was identified in the gallbladder.

On the third day of hospitalization, pain in the right upper quadrant resolved, but rebound tenderness appeared in the right lower quadrant. Since the evolving clinical condition suggested acute appendicitis, a diagnostic laparoscopy was performed due to the evolving clinical situation. Intraoperatively, the appendix vermiformis was found, appeared slightly inflamed, and approximately 2 liters of serofibrinous fluid were noted in the abdomen. We performed an appendectomy and biopsied the peritoneal and omentum. The biopsy revealed no evidence of granulomatous

disease. Postoperatively, the patient developed rashes, tachycardia, edema in the hands and feet, and conjunctivitis. PCR and antibody tests for COVID-19 and MIS-C were negative. A consultation with pediatric cardiology identified perimyocarditis, pericardial effusion, and echogenicity in the coronary arteries, consistent with Kawasaki disease. The patient was diagnosed as MIS-C and transferred to pediatric infectious diseases for further management. Follow-up care was planned after discharge.

CASE 2

A 4.5-year-old male patient, with a history of fever and abdominal pain for three days, was referred with an ultrasound showing a 7.5 mm appendicitis. The patient also tested positive for COVID-19. On examination, the general condition was moderate, temperature 38.4°C, pulse 120/min, respiration 23/min, and there was diffuse tenderness in the abdomen. Laboratory findings included leukocytes 23.000/µL, neutrophils 20.000/µL, and CRP 115 mg/L. The patient was hospitalized for observation due to acute abdomen and COVID-19 infection. The control ultrasonography measured free fluid in the retrocecal region and an appendix size of approximately 8 mm. As the symptoms did not improve on the third day of hospitalization, a laparoscopic appendectomy was performed with a preliminary diagnosis of acute appendicitis. Intraoperatively, the appendix was perforated, and a localized abscess was found. Broad-spectrum antibiotics were started, and the patient was discharged on the sixth postoperative day in good condition.

DISCUSSION

The symptoms of MIS- resemble those of Kawasaki syndrome, Toxic Shock syndrome, or Macrophage activation syndrome.[4] In MIS-C, the exaggerated immune response occurs, typically 2–4 weeks after a COVID-19 infection, causing vasculitis and potentially damaging organs such as the gastrointestinal tract, myocardium, coronary arteries, skin, brain, kidneys, and lungs.[1,2] Gastrointestinal symptoms may persist persist longer than in adults.[3] It is believed that viral excretion in feces lasts longer in children, contributing to prolonged gastrointestinal symptoms.[3] A critical indicator for diagnosing MIS-C is a positive COVID-19 test 2–6 weeks prior to symptom onset.[3,4] Elevated levels of CRP, D-dimer, IL-6, procalcitonin, ferritin, and lactate dehydrogenase, along with persistent fever and signs of systemic inflammation, are commonly observed.[2] The CDC recommends diagnosing MIS-C in cases of fever lasting more than 24 hours, systemic organ involvement, and positive inflammatory markers.[3]

Abdominal pain and other gastrointestinal symptoms are common in MIS-C, making the diagnosis challenging and treatment complex.[1] In the study by Rouva et al.,[1] various diagnoses were observed in patients, including mesenteric adenitis, paralytic ileus, ascites, appendicitis, terminal ileitis, and ileocolitis. In our experience, one patient was initially thought to have cholecystitis, while the other presented with appendicitis, complicating the diagnosis due to the patient's concurrent COVID-19 positivity.

The most common problem in MIS-C cases is inflammatory bowel disease.[3] This rate is around 75%.[3] It most commonly manifests itself with abdominal pain.[3] The probability of other diseases and gastrointestinal complaints is around 25%.[3] There are also cases involving the liver and pancreas.[3] In addition to abdominal pain, specific complaints such as vomiting and diarrhea may be present and may be confused with diseases that cause acute abdomen, especially acute appendicitis.[1] In our experiences, we thought one of our patients might have cholecystitis, but the complaints, especially abdominal pain, changed its features. In the second case, appendicitis was considered, but since the patient was simultaneously COVID-positive, there was hesitation as to whether we were challenged with a MIS-C picture.

The broad spectrum of MIS-C symptoms can delay diagnosis. A study involving 55 patients reported that the time to diagnosis ranged from 3 to 8 days.[3,4] In our patients, this period was approximately 3±1 days.

CONCLUSION

In cases of abdominal pain associated with COVID-19 infection, the differential diagnosis of acute abdomen becomes difficult. In patients presenting with systemic disease findings and worsening abdominal pain, the possibility of MIS-C should not be ignored. Early recognition of this condition and planning appropriate treatment and surgery are essential to minimize morbidity. When deciding on conservative or surgical treatment, the surgeon's experience is as crucial as the patient's clinical and laboratory findings.

ETHICAL DECLARATIONS

Informed Consent
Parents of all patients signed a free and informed consent form.

Referee Evaluation Process
Externally peer-reviewed.

Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Financial Disclosure
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Author Contributions
All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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