

A case of COVID-19 with splenic abscess

Shaghayegh Ashraf-Talesh¹; Mojtaba Gorji²; * Mohammad Reza Abdolsalehi¹

¹ Department of Infectious Diseases, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

² Department of pediatric cardiology, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

Abstract

Coronavirus disease (COVID-19) is affecting millions of people around the world. It is mainly associated with respiratory problems, but extra pulmonary involvement has been described as well (1). During the COVID-19 outbreak, several children developed a severe inflammatory disease, named Multisystem Inflammatory Syndrome (MIS-C). Acute MIS-C can have life-threatening consequences and requires intensive medical care. It is not known how long-term the results of acute MIS-C are. Liver damage, gastrointestinal, endocrine and cardiovascular disorders have been detected [2]. The aim of this article is to consider complications of MIS-C in patients with abdominal pain, due to the fact that despite abdominal pain is also a symptom of MIS-C, it should not distract us from rare complications such as splenic abscess, which as a differential diagnosis can be fatal if left untreated. Herein, we report a COVID-19 patient with no signs of respiratory involvement presented with acute abdomen, and splenic abscess which was seen on the CT-scan later.

Key Words: Abdominal pain, COVID19, Multisystem Inflammatory Syndrome (MIS-C), Pulmonary involvement, Splenic abscess.

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***Corresponding Author:**

Mohammad Reza Abdolsalehi, Department of Infectious Diseases, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran. Email: drmabdosalehi@gmail.com

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1- INTRODUCTION

COVID-19 virus could attack not only the respiratory system, but also almost every single organ in the body, and respiratory symptoms are not always present. Splenic abscess as an extra pulmonary manifestation may be the result of direct invasion caused by the virus [1]. In immunosuppressed patients, a splenic abscess can be fatal, and mortality is possibly related to the underlying immunodeficiency [3]. Herein, an unusual case of COVID-19 manifestations has been reported in a four-year-old boy who had acute abdominal pain. The patient gradually became ill. Spleen abscess was seen on the CT-scan later.

2- CASE PRESENTATION

A four-year-old boy was admitted to our hospital, with severe and worsening abdominal pain that started two weeks ago. Additionally, he had diarrhea and vomiting a day prior to admission. No respiratory symptoms were identified during the initial encounter. On arrival at the hospital, he appeared ill, with pains awakening him at night. His vital signs were as follows: blood pressure of 100/60 mmHg, heart rate of 100/min, temperature of 37 Celsius degrees and respiratory rate of 18/min. On examination, abdomen was soft, but he had periumbilical tenderness and mild splenomegaly. Past medical history and drug history were negative. Initial lab test showed: a white blood cell (34×10^3 / μ l with lymphocyte count 90%), c-reactive protein (CRP) 25 mg/l, hemoglobin(HB) 11.7 g/dl, platelets 556×10^3 / μ l, erythrocyte sedimentation rate (ESR) 46 mm/hr., creatinine 0.6 mg/dl, lipase 11 u/l, amylase 12 u/l, Lactate dehydrogenase (LDH) 1124 u/l, Creatine kinase-MB (CK-MB)86 IU/l, ferritin 236 ng/ml, D-dimer 4878 ng/ml, and normal liver function test (LFT). Wright and the widal test were also negative. The clinical picture persisted for a week despite conservative management. His pharyngeal PCR

(Polymerase chain reaction) test was positive for COVID-19. Due to high levels of inflammatory factors and positive PCR and transient skin rashes with the diagnosis of MIS-C, corticosteroid and intravenous immunoglobulin (IVIG) were administered and echocardiography was requested. Ectasia of the right coronary artery (RCA mid: 4) was seen in echocardiography. In the following days, the patient suffered from severe abdominal pain. Having tried medication without success, a computed tomography scan was done, since there was no improvement in the abdominal pain. CT scan showed about 66×22 mm hypodense mass in spleen, which could be related to laceration and intra parenchymal splenic hematoma. A history of trauma was suspected. He was given the empirical antibiotic regimen of ceftriaxone and clindamycin. Despite antibiotic treatment, the patient's severe abdominal pain persisted periodically and the response was not appropriate. After the abdominal pain continued, bone pain was added, and the ESR increased up to 85. Due to the malignant possibility, a bone scan was recommended according to hematology consultation. An initial bone scan revealed some suspicious foci, prompting a bone marrow biopsy to be performed, and in following bone marrow aspiration, the malignancy was ruled out. While symptoms of the patient diminished over the following weeks in the hospital, we decreased the antibiotics. The patient gradually became ill after reducing the antibiotic, experiencing pain and fever, so re-CT scan was requested and splenic abscess was seen on CT-scan. The antibiotic regimen changed to meropenem and vancomycin. According to the surgical advice antibiotic continued due to the reduction of abscess size and drainage was not performed. The immune profile was also checked, which was reported to be normal. Finally, his fever stopped, and he no longer complained about abdominal pain. The patient was discharged with

cotrimoxazole and metronidazole. The abscess was not seen again in CT- scan follow-up.

3- DISCUSSION

In immunosuppressed patients, splenic abscess can be fatal, and mortality is possibly related to the underlying immunodeficiency [3]. Abscesses of the spleen are often due to hematogenous causes, the most common of which is infective endocarditis [4]. Several contiguous sites of infection, including appendicitis, diverticulitis, perforated bowel or pelvic infection, splenic trauma, or hemoglobinopathies, can lead to developing Abscesses in the spleen. Gram-negative bacilli are the main pathogens isolated; and *Klebsiella pneumoniae*, *Escherichia coli*, and *Staphylococcus aureus* were the most commonly grown organisms. [5] A splenic abscess can be life-threatening, though it is very rare. According to the findings by Altemeier et al., incidence of splenic abscess is estimated at 0.05–0.7%. They reviewed 540 intra-abdominal abscesses, and no splenic abscess was found [6]. With a diagnosis of splenic abscess, a review study by Mei-Chun Lee et al., over a period of 5 years (from January 2012 to December 2016), was performed. They stated that Fever was the most common symptom (11 patients, 68.7%), and other common presentations were as follows: diffuse abdominal pain (6 patients, 37.5%), pain or tenderness in left upper quadrant (6 patients, 37.5%), and pleural effusions in left-sided (8 patients, 50%). Treatment options include antibiotics alone, percutaneous drainage or splenectomy [3]. Noura Alzorooni et al. reviewed three cases of SARS-CoV-2 infection leading to splenic abscesses. According to their analyses, SARS-CoV-2 infection is associated with hypercoagulability, superimposed infections, and immunosuppression. They observed these common factors in these three splenic

abscess cases as a complication of the new pandemic [7]. According to Zhang et al., Lymphoid organs, including the spleen, can be affected by viruses [8]. Another study reported on the case of a 55-year-old male with previous history of type 2 diabetes mellitus, chronic kidney disease, stroke, and ischemic heart disease, who presented to the emergency ward with fever, abdominal pain and diarrhea. He showed a picture of multi organ failure and severe sepsis. His pharyngeal PCR test was positive for COVID-19. CT scan showed splenic abscess and pneumoperitoneum. His condition deteriorated, and he died as a result. A laparotomy revealed a ruptured splenic abscess, and the patient underwent a splenectomy. The researchers stated that in these patients, there is the possibility that splenic immune system collapse has contributed to the clinical outcome and one of the possible risk factors for the patient's unfortunate outcome could have been his splenic abscess and his need for an urgent surgery to remove it [9]. In our case, we considered FMF, typhoid and pancreatitis as differential diagnosis, since the patient complained about severe abdominal pain; but with subsequent tests, these diagnoses were ruled out. The patient was diagnosed with MIS-C due to positive COVID-19 PCR, abnormal echocardiography and high inflammatory markers, but abdominal pain persisted despite the MIS-C treatment. Due to bone pain and continued abdominal pain and increased ESR, even a bone scan was performed, and suspicious foci were detected. Malignancy was subsequently ruled out in bone marrow aspiration. Although a hematoma was seen in CT scan at first, small spleen hematoma did not justify severe abdominal pain. The patient's abdominal pain diminished after receiving empirical antibiotics, but taking antibiotics discontinued; because no specific foci of infection were detected in the patient and also blood and urine culture were negative. With discontinuation of

antibiotics, the patient became unwell again and the spleen displayed an abscess this time, which finally upon commencing appropriate antibiotics, the patient's condition improved. Drainage was not done for the patient, because when he went under the sonography guide to perform the drainage, due to its small size, the drainage was not done at that moment. The antibiotic response was successful without drainage. In this case, diagnosis was very challenging. Several surgical consultations were conducted for his abdominal pain. It was the atypical symptoms of the patient that led to multiple investigations. According to the presence of fever and abdominal pain, and because we did not have a sample for culture, the initial treatment was empirical. His antibiotic treatment during hospitalization, followed by one month of oral antibiotics continued after discharge. There is limited literature on the COVID-19 with splenic abscess, and Patients with underlying illnesses are more likely to develop it. It seems that in our case, there may be a correlation between abscesses in the spleen and presence of COVID-19 and MIS-C; because our patient had no immunodeficiency and no history of obvious spleen trauma. It is still unclear whether the virus caused the illness directly or whether the patients' underlying illness played a role. Since abdominal pain is also a symptom of MIS-C, this should not distract us from complications such as splenic abscess as a differential diagnosis of abdominal pain. It is then confirmed that despite the rareness of this complication, clinicians should consider it in MIS-C patients with abdominal pain; because, Splenic abscess can cause splenic rupture and result in death if left untreated. Early diagnosis and treatment are therefore essential.

4- CONCLUSION

Development of splenic abscess may be influenced by infection with SARS-

CoV-2; so, health care providers should be on the lookout for atypical presentations of MIS-C like splenic abscess and maintain a high index of suspicion.

6- REFERENCES

1. Thakur, V., Ratho RK, Kumar P, Bhatia SK, Bora I, Mohi GK, Saxena SK, Devi M, Yadav D, Mehariya S., Multi-organ involvement in COVID-19: beyond pulmonary manifestations. *Journal of clinical medicine*, 2021. 10(3): p. 446.
2. Jain, U., Effect of COVID-19 on the Organs. *Cureus*, 2020. 12(8).
3. Lee MC, Lee CM, Splenic abscess: an uncommon entity with potentially life-threatening evolution. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2018. 2018.
4. Kim, H.S., Cho MS, Hwang SH, Ma SK, Kim SW, Kim NH, Choi KC., Splenic abscess associated with endocarditis in a patient on hemodialysis: a case report. *Journal of Korean Medical Science*, 2005. 20(2): p. 313-315.
5. Brook, I. and E. Frazier, Microbiology of liver and spleen abscesses. *Journal of medical microbiology*, 1998. 47(12): p. 1075-1080.
6. Altemeier WA, Culbertson WR, Fullen WD, Shook CD, Intra-abdominal abscesses. *The American Journal of Surgery*, 1973. 125(1): p. 70-79.
7. AlZarooni, N., AlBaroudi A, AlOzaibi L, AlZoabi O, Splenic abscess as a possible sequel of COVID-19: a case series. *Annals of Saudi Medicine*, 2021. 41(5): p. 307-311.
8. Xiang, Q., Feng Z, Diao B, Tu C, Qiao O, Yang H, Zhang Y, Wang G, Wang H, Wang C, Liu L, Wang C, Liu L, Chen R, Wu Y, Chen Y, SARS-CoV-2 induces lymphocytopenia by promoting inflammation and decimates secondary lymphoid organs. *Frontiers in immunology*, 2021. 12: p. 1292.

9. Al-Ozaibi, L.S., Alshaikh MO, Makhdoom M, Alzoabi OM, Busharar HA, Keloth TR, Splenic abscess: an unusual presentation of COVID-19? Dubai Medical Journal, 2020. 3(3): p. 115-118.