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CASE REPORT

Salpingitis and intra-abdominal abscess due to *Staphylococcus cohnii* in adolescent with COVID-19: case report

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COVID-19, staphylococcal infections, salpingitis, abdominal abscess.

Abstract

Objective: This is a case report of a patient with SARS-CoV-2 infection primarily manifesting gastrointestinal symptoms, but with gynecologic involvement and development of secondary infection by *Staphylococcus cohnii*, an opportunistic pathogen that is uncommon in healthy patients. **Case Report:** A 14-year-old sexually inactive female patient, presented with vomiting, fever, diarrhea and abdominal pain, without associated respiratory symptoms. The patient was admitted to the hospital, where she tested positive for SARS-CoV-2 and a CT-scan revealed a thickened left fallopian tube. After 7 days of increasing pain intensity and fever recurrence, the patient underwent a new CT-scan that showed a large amount of fluid in the pelvis. The abscess was drained and subsequent bacterial culture revealed growth of *Staphylococcus cohnii*. A 14-day course of antibiotic therapy guided by an antibiogram was performed, achieving a good patient outcome. **Comments:** Salpingitis is rarely caused by viruses. It is generally caused by sexually transmitted bacteria. We found no reports of salpingitis related to SARS-CoV-2. Since the patient was sexually inactive and had a positive RT-PCR test, the possibility of a viral etiology was raised. This could be a possible clinical manifestation of coronavirus, although further studies are necessary to characterize this relationship. *Staphylococcus cohnii* infection is commonly opportunistic, but presumably, it occurred due to unsatisfactory immune response elicited by SARS-CoV-2 infection.

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INTRODUCTION

In March 2020, the World Health Organization declared COVID-19 (*coronavirus disease*) a pandemic. COVID-19 is a disease caused by novel coronavirus SARS-CoV-2 infection. SARS-CoV-2 is an enveloped single-stranded RNA virus of the coronavirus (*Coronaviridae*) family, responsible for diseases in humans ranging from the common cold to more severe disease such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS)[1].

Infection may be asymptomatic. Symptomatic cases present with fever, cough, dyspnea, headache and fatigue usually starting in the first week of disease. Alterations such as new loss of smell or taste are also common in infected individuals[1,2]. Despite the predominance of respiratory symptoms, it is not uncommon to observe abdominal symptoms, particularly in the gastrointestinal tract. Symptoms include diarrhea, vomiting and abdominal pain[3]. Furthermore, there are studies that show the immunosuppressive effect of COVID-19, favoring the occurrence of secondary infections[4,5]. However, case reports of gynecological or genitourinary involvement have not been found in the literature.

The aim of this report is to describe a COVID-19 case in an adolescent with predominant gastrointestinal symptoms and diagnosis of salpingitis at the onset of illness. The disease progressed with the formation of intracavitary abscess and the opportunistic bacterium *Staphylococcus cohnii* was isolated from the abscess.

CASE REPORT

A previously healthy 14-year old female patient presented to the emergency room of a secondary hospital with a history of vomiting, non-bloody or non-mucous watery diarrhea, and colicky abdominal pain, initiated that same day. She had no respiratory symptoms and denied having close contact with sick individuals. Mildly dehydrated, with diffuse abdominal pain and no signs of peritoneal irritation, she was hydrated and received symptomatic treatment. After clinical improvement, the patient was discharged from the hospital and instructed to return if her symptoms worsened.

After two days, she returned to the emergency room in the same hospital, complaining of a worse abdominal pain, mainly on the left lower side, vomiting, profuse diarrhea, with nonbloody and nonmucous watery stools. The patient was admitted to the hospital ward for the provision of hydration, maintenance fluid therapy and diagnostic tests for investigation. The patient denied having any sexual activity, previous disease, use of medications and previous hospital admissions.

A pregnancy test was performed and the result was negative. Blood culture and urine culture were negative. Complete blood count showed leukocytosis with neutrophilia, maintaining lymphopenia (17,500 white blood cells, with 1% myelocytes, 13% bands, 79% segmented neutrophils, 6% lymphocytes, 1% monocytes), elevated D-dimer levels (0.8ugFEU/ml, normal <0.5ugFEU/ml), elevated C-reactive protein levels (158.9 mg/L, normal <10mg/L) and a positive RT-PCR (reverse transcription polymerase chain reaction) test for SARS-CoV-2 in oropharyngeal and nasopharyngeal swabs. Imaging tests were also performed. Abdominal ultrasound showed mesenteric adenitis and a CT scan revealed the presence of a small to moderate amount of thick pelvic fluid, associated with a thickened left fallopian tube (salpingitis), in addition to gas and fluid distension of small bowel segments and small right mesenteric lymph nodes (Figure 1). At the time, surgical pathology was ruled out. A diagnosis of COVID-19 with acute diarrhea and salpingitis was made. She received nitazoxanide and probiotics for five days with resolution of fever, vomiting and diarrhea that gradually improved. However, loss of appetite and abdominal pain persisted.

After seven days of hospitalization, fever relapsed associated with abdominal pain. There was also worsening of laboratory tests, with increased leukocytosis, maintaining lymphopenia (23,200 leukocytes, with 5% band neutrophils, 85.1% segmented neutrophils, 0.3% eosinophils, 4.3% lymphocytes and 5.3% monocytes) and increased C-reactive protein (180.9mg/L). Abdominal CT-scan was repeated, revealing a cumulative volume of about 1155cm^3 of apparently encapsulated homogeneous pelvic fluid, extending to the left flank, in addition to ovarian deviation to the side by fluid and homogeneous retrogastric fluid collection (Figure 1). Due to worse clinical and imaging findings, the patient underwent exploratory laparotomy for drainage of intracavitary abscess. Appendectomy was performed, based on tacit knowledge, and no other surgical approach was required. Blood culture tests were negative. Abscess culture identified *Staphylococcus cohnii* ssp. *cohnii*. Intravenous antibiotic therapy was administered for 14 days, based on an antibiogram (ampicillin with sulbactam and chloramphenicol). There was a good treatment response and she was discharged after 20 days of hospitalization. In the follow-up that occurred 1 week after hospital discharge, the patient was asymptomatic.

COMMENTS

More than one year since the beginning of the pandemic, although respiratory symptoms are more common in SARS-CoV-2 infection, gastrointestinal symptoms are prevalent in 3% to 39.6% of the cases[6]. According to a meta-analysis published in July 2020 in the journal Gastroenterology, gastrointestinal symptoms were found in 17.6% of COVID-19 patients and viral RNA was present in 48.1% of stool specimens analyzed by the study[3]. Cardiac, neurological and psychiatric symptoms have also been reported in the literature, leading to the conclusion that much remains to be known about this novel virus.

The etiology of salpingitis is rarely viral, since the disorder is usually caused by sexually transmitted bacteria, and it is extremely rare in women before the onset of sexual activity[7,8]. In the literature, there is a lack of cases of salpingitis related to COVID-19. Nevertheless, studies have shown the

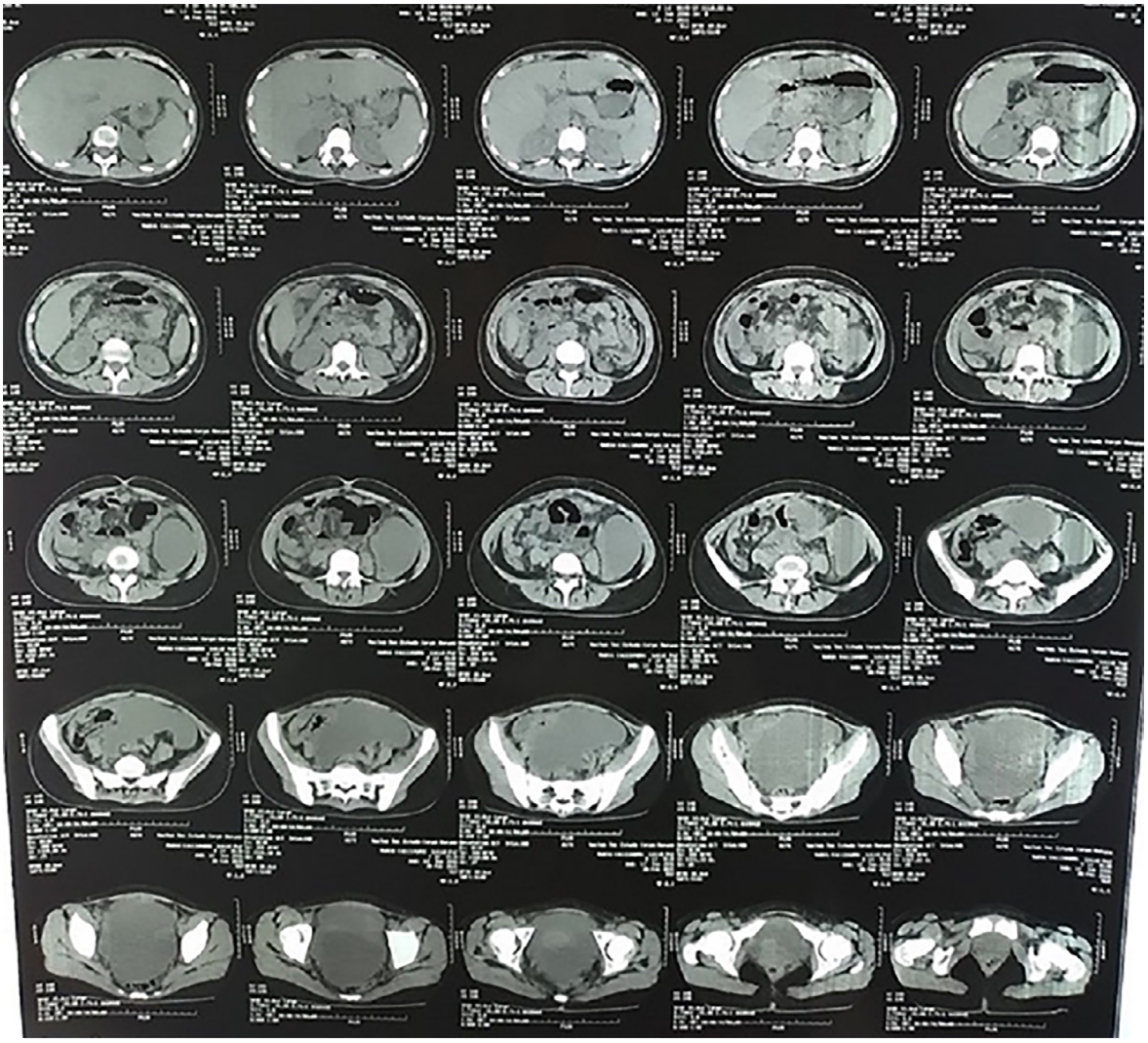


Figure 1. Computed tomography of the abdomen showing intracavitary abscess.

presence of receptors to the coronavirus in the fallopian tubes, ovaries and uterus[9]. Given that the patient was sexually inactive, had symptoms consistent with COVID-19 diagnosed by RT-PCR and salpingitis revealed on the initial CT-scan, it was presumed that SARS-CoV-2 was the causative agent of the disease. Nevertheless, there may have been an association between COVID-19 and salpingitis, since the presence of SARS-CoV-2 in other organs was not confirmed by PCR test. Therefore, we can neither ascertain that the virus actually caused salpingitis nor affirm that *Staphylococcus* infection was secondary to inflammation produced by COVID-19.

Another atypical aspect of the case described is *Staphylococcus cohnii* infection. *S. cohnii* is a bacterium commonly found in the human skin, belonging to the class of coagulase-negative *Staphylococcus*, which is generally an opportunistic pathogen[10]. Few cases infected with this pathogen have been reported in the literature and are usually associated with infections observed in immunocompromised patients[4].

It has been reported that secondary infection occurs in COVID-19 cases worldwide. In part, it is attributed to the immunosuppressive action of the virus[5,11,12]. In the current case report, lymphopenia was observed since the first test. Lymphopenia may decrease the efficiency of the immune system against viral infections, triggering a more exacerbated inflammatory process and facilitating secondary bacterial infections[11].

Some hematologic alterations that may also be caused by SARS-CoV-2 infection, despite its rarity in the pediatric age group, correlate with a worse prognosis when infection is present. These alterations become evident mainly after the onset of the first symptoms, with pronounced release of inflammatory mediators and cytokines, characterized as "cytokine storm" [12]. In this context, a reduction in the number of NK cells, B-lymphocytes, CD4+T lymphocytes and CD8+T lymphocytes is observed. The latter plays a critical role in viral clearance and protection against secondary or opportunistic infections[11,13]. In the case reported, it was not possible to

measure CD4 and CD8, but we consider that in similar cases, measurement of these markers may contribute to a better understanding of SARS-CoV-2 infection in the human body.

In view of the above-mentioned considerations, and given that *Staphylococcus cohnii* is typically an opportunistic pathogen, this infection possibly resulted from an unsatisfactory immune response elicited by SARS-CoV-2 infection, even in a previously healthy child.

REFERENCES

1. Lipsky MS, Hung M. Men and COVID-19: a pathophysiologic review. Am J Mens Health. 2020 Sep/Oct;14(5):1557988320954021. DOI: https://doi.org/10.1177/1557988320954021
2. Velavan TP, Meyer CG. The COVID-19 epidemic. Trop Med Int Health. 2020 Mar;25(3):278-80. DOI: https://doi.org/10.1111/tmi.13383
3. Cheung KS, Hung IFN, Chan PPY, Lung KC, Tso E, Liu R, et al. Gastrointestinal manifestations of SARS-CoV-2 infection and virus load in fecal samples from a Hong Kong cohort: systematic review and meta-analysis. Gastroenterology. 2020 Jul;159(1):81-95. DOI: https://doi.org/10.1053/j.gastro.2020.03.065
4. Stefano M, Del Rosso A, Saldutto P, Galatioto GP, Vicentini C. Intrascrotal abscess, propionibacterium acnes and Staphylococcus cohnii ssp. cohnii: a case report and review of the literature. Case Rep Urol. 2012 Nov;2012:313694. DOI: https://doi.org/10.1155/2012/313694
5. García LF. Immune response, inflammation, and the clinical spectrum of COVID-19. Front Immunol. 2020 Jun;11:1441. DOI: https://doi.org/10.3389/fimmu.2020.01441
6. Schmulson M, Dávalos MF, Berumen J. Beware: gastrointestinal symptoms can be a manifestation of COVID-19. Rev Gastroenterol Mex (Engl Ed). 2020 Jul/Sep;85(3):282-287. DOI: https://doi.org/10.1016/j.rgmx.2020.04.001
7. Van Der Putten ME, Engel M, Van Well GT. Salpingitis. A rare cause of acute abdomen in a sexually inactive girl: a case report. Cases J. 2008 Nov;1(1):326. DOI: https://doi.org/10.1186/1757-1626-1-326
8. Dogan E, Altunyurt S, Altindag T, Onvural A. Tubo-ovarian abscess mimicking ovarian tumor in a sexually inactive girl. J Pediatr Adolesc Gynecol. 2004 Oct;17(5):351-2. DOI: https://doi.org/10.1016/j.jpag.2004.07.002
9. Salamanna F, Maglio M, Landini MP, Fini M. Body Localization of ACE-2: on the trail of the keyhole of SARS-CoV-2. Front Med (Lausanne). 2020 Dec;7:594495. DOI: https://doi.org/10.3389/fmed.2020.594495
10. Rogers KL, Fey PD, Rupp ME. Coagulase-negative staphylococcal infections. Infect Dis Clin North Am. 2009 Mar;23(1):73-98. DOI: https://doi.org/10.1016/j.idc.2008.10.001
11. Azkur AK, Akdis M, Azkur D, Sokolowska M, Van de Veen W, Brüggen MC, et al. Immune response to SARS-CoV-2 and mechanisms of immunopathological changes in COVID-19. Allergy. 2020 Jul;75(7):1564-81. DOI: https://doi.org/10.1111/all.14364
12. Li T, Lu H, Zhang W. Clinical observation and management of COVID-19 patients. Emerg Microbes Infect. 2020 Dec;9(1):687-90. DOI: https://doi.org/10.1080/22221751.2020.1741327
13. Wang F, Nie J, Wang H, Zhao Q, Xiong Y, Deng L, et al. Characteristics of peripheral lymphocyte subset alteration in COVID-19 pneumonia. J Infect Dis. 2020 May;221(11):1762-9. DOI: https://doi.org/10.1093/infdis/jiaa150