

A 7-year-old Boy with Orchitis after COVID-19 Infection

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Abstract

Although most manifestations of coronavirus infection in children are mainly related to the respiratory and gastrointestinal organs, involvement of other organs has also been seen with less prevalence. Because of the expression of virus receptors in male genitalia, this system is regarded as a potential target for this virus.

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Abstract : Although most manifestations of coronavirus infection in children are mainly related to the respiratory and gastrointestinal organs, involvement of other organs has also been seen with less prevalence. Although little is known about its impact on male genitalia, because of the expression of virus receptors in male genitalia, the genital system is regarded as at risk for this virus and may be a potential target for this virus. In this case, we reported orchitis following COVID-19 infection in a 7-year-old boy who developed orchitis in the third week of the disease. Orchitis was diagnosed based on clinical and radiological investigations and recovered spontaneously with supportive care. This case highlights this virus can enter testes and cause virus-induced orchitis and orchitis should be considered one of the rare complications of COVID-19.

Keywords : COVID-19, orchitis, scrotal discomfort

Introduction

Coronavirus disease 2019 (COVID-19) is still spreading worldwide and infects all age groups. Initially, fewer children were affected; therefore, many features of this disease, especially atypical manifestations, have not yet been identified in this population, and further time is needed to clarify it. Developed symptoms have changed over time, and the emergence of new strains and virus mutations contribute to these changes (1). In symptomatic children, the most common reported symptoms were fever, upper and lower airway infection, and gastrointestinal symptoms. Genitalia complaints seem to be rare in COVID-19 patients, especially in children and there are few reports of scrotal discomfort (2).

Case presentation

A 7-year-old boy was admitted to our outpatient clinic with a history of fever, myalgia, diarrhea, nausea, vomiting, and severe and nonproductive coughs. Fever ceased after 4 days, but the cough continued, especially at night. Oxygen saturation was 96%, and the respiratory rate was 17 per minute. The only finding in the examination was expiratory wheezing. He had a previous history of asthma that was well-controlled. Regarding the mentioned symptoms, COVID-19 was suspected, and a nasopharyngeal swab polymerase chain reaction (PCR) test for COVID-19 was performed. COVID-19 PCR was positive. Biochemical and hematologic tests showed lymphopenia (WBC: 3400, lymph: 26%) and a mild increase in aspartate aminotransferase (AST), lactate dehydrogenase (LDH), and D-dimer [AST: 65 (NL: < 40 IU/L), LDH: 540 (NL: < 170 Units/lit), D-dimer: 800 (NL: < 500 ng/ml)]. The child underwent outpatient treatment with montelukast 5 mg daily, one puff Symbicort inhaler 160 mcg twice a day, and acetaminophen. At the follow-up visit, the patient's symptoms resolved after 5 days, but erythematous itchy lesions on the palmar and plantar surfaces appeared, which resolved spontaneously. In the 3rd week of the disease, the child was admitted to the emergency department with swelling, pain, and erythema in one of the testicles (Figure 1).

The pain had a gradual onset and became more intense in the next days, woke up the child, and made him uncomfortable while seated. The patient had no history of recent trauma. The right testis was erythematous and tender and was located in the normal position on physical examination. There was no groin lymphadenopathy, and bilateral cremasteric reflexes were intact. Regarding severe scrotal pain to rule out torsion of the testis or testicular appendage, a color Doppler ultrasound (DUS) was performed which shows edematous scrotal wall thickening and extensive hyperemia of the right testicle that all are indicative of orchitis (Figure 2).

The patient was diagnosed with orchitis associated with COVID-19 and underwent conservative treatment. In the periodic follow-up, the pain was reduced, and it was completely resolved approximately two weeks later.

Discussion

Although coronavirus mainly affects the lungs, many other organs are involved in the disease (3). Several factors have been involved in the development of COVID-19 infection. Entry of SARS-COV-2 into target cells is a significant determinant of coronavirus infection. Coronavirus first binds to ACE2 (angiotensin-converting enzyme 2) as a cell surface receptor, and after viral attachment, cell surface protease activators such as TMPRSS2 (transmembrane serine protease SS2) activate coronavirus entry (4). ACE2 and TMPRSS2 are expressed in various tissues, including the male urogenital, making it vulnerable to SARS-COV-2 infection (5). ACE2 is present in almost all testis cells, especially Sertoli cells. Xixi Liu et al. through single-cell transcriptome analysis of male germ cells reported ACE2 expression in male testis (6) which reflects that the genital system is regarded as at risk for this virus and may be a potential target for this virus. To date, there are few reports about male genitalia involvement in the setting of COVID-19. The first case of orchiepididymitis associated with COVID-19 was reported in a 14-year-old boy in Italy (7). After that, M.Haydar et al reported a case of epididymitis in the setting of MIS-C (multisystem inflammatory syndrome in children) in a 7- year-old boy from Syria (8). In a systematic review conducted on 575 patients, including 538 males, scrotal discomfort, swelling, pain, and erythema were described in 39 patients, among whom acute orchitis was found in 10 patients and acute orchiepididymitis in 10(3). Other reported cases of genitourinary complications of SARS-COV-2 were mainly adults (9)(10)(11)(12) (Table 1). Scrotal pain is a diagnostic challenge in children that necessitates accurate evaluation. The most common causes of acute scrotal pain in children include testicular torsion, appendix testis torsion, orchitis, and epididymitis. The most important reason for scrotal discomfort is testicular torsion, a surgical emergency that requires immediate diagnosis and treatment (13). DUS is the choice modality for ruling out scrotal torsion from other causes of scrotal discomfort and determining the presence of blood flow (14). Orchitis is a local inflammation associated with abrupt onset of testicular pain and swollen and tender testicles in examination findings and hypoechoic and hypervascular areas in ultrasound. The cremasteric reflex is intact, and the testis is in its normal anatomic location. Orchitis in children usually occurs secondary to viral infections, most commonly mumps virus. Less commonly, it is caused by bacterial organisms, and in these conditions, orchitis occurs as a result of the spreading of infection from epididymitis. Treatment of orchitis depends on the underlying cause, and in viral cases, supportive treatments such as analgesics, bed rest, hot or ice pack, and scrotal elevation are used, and symptoms will go away on their own (15).

Conclusion : This case highlights the importance of follow-up of COVID-19 patients and the consideration of orchitis as a consequence of COVID-19.

Abbreviations:

COVID-19: coronavirus disease 2019

ACE2: Angiotensin-converting enzyme 2

TMPRSS2: Transmembrane serine protease SS2

DUS: Doppler ultrasound

PCR: polymerase chain reaction

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H.A Ghaffaripour and P. Honarpisheh: Writing the original draft

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S.Haseli: Radiologic evaluation of patient

Z. daneshmandi: Gathering data

A.A. Velayati: Conceptualization

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Table 1- Genitourinary Complications of SARS-COV-2

Author	Number of patients	Age of patients(year)	Effects on testis
Whiteley MS, et al. ⁹	1	70	Left testicular vein thrombosis
Xu J, et al. ¹⁰	5	20-58	Apoptosis in spermatogenetic cells and in a few of ley
Duarte SAC, et al. ¹¹	1	71	Ischemic prostatic infraction and acute urinary retent
Bridwell RE, et al. ¹²	1	37	Bilateral orchitis



Fig 1. Testicle involvement after coronavirus infection : erythema and mild swelling in the right testis.

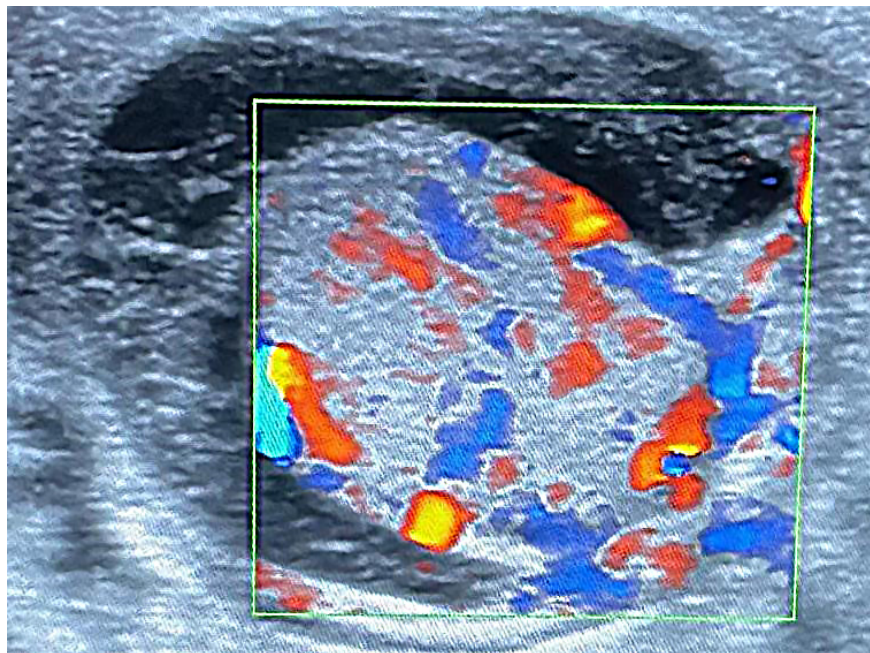


Fig 2. Color Doppler of the testis: Longitudinal ultrasound of the right scrotum shows edematous scrotal wall thickening as well as extensive hyperemia of the right testicle on color doppler which all are indicative of orchitis.

