



CASE REPORT

Covid-19-related right hip monoarthritis: A case report and literature review

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Key Clinical Message

This article presents the case of a young patient with severe acute left hip pain who tested positive for COVID-19. The diagnostic approach and management are presented, followed by a review of the literature. This 11-year-old student was admitted for acute left hip pain of abrupt onset, inflammatory, evolving for 24 h in a febrile context with no change in general condition. The initial workup revealed a hyperleukocytosis in the blood count, CRP 198.52 mg/L, and a 95 mm SV. The pelvic X-ray was unremarkable, and the hip ultrasound showed synovial hypertrophy, with no effusion on Doppler examination. The situation worsened 24 h later with the onset of acute respiratory distress syndrome. The chest X-ray showed bilateral alveolar interstitial lung disease, and the CT scan showed hyperdensity and crazy paving. The COVID-19 RDT test on a nasopharyngeal sample came back positive, as did the RT-PCR. Death occurred a few hours later in acute respiratory distress. Our case is consistent with what has been reported in the literature, but requires further study on an international scale to better define the phenotype of the disease.

KEYWORDS

acute arthritis, COVID-19, hip, rheumatology

1 | INTRODUCTION

The pandemic caused by the new coronavirus SARS-CoV-2, which began in late 2019 in Hubei Province, China, has profoundly affected our societies in health, economic, political, psychological, and social terms.^{1,2} Essentially a respiratory disease, COVID-19 can manifest in a variety of ways, ranging from asymptomatic presentation to mild symptoms of upper respiratory tract infection to acute

respiratory distress syndrome (ARDS).^{1,3} SARS-CoV-2 is now known to have numerous extrapulmonary manifestations that go well beyond the typical respiratory nosologic framework.⁴ Indeed, the disease can present a polymorphic, multisystemic, heterogeneous clinical course and a broad spectrum of clinical manifestations that can lead to various complications in different systems, including the musculoskeletal system.⁴⁻⁶ These musculoskeletal or autoimmune manifestations associated with COVID-19 have

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been reported in the literature in varying proportions, but the data are still limited.^{4,6} This article presents the case of a young patient with no known pathological history or comorbidities who presented with acute and severe left hip pain complicated by acute respiratory distress syndrome (ARDS) after testing positive for COVID-19. The diagnostic approach and management are presented, followed by a review of the literature.

2 | CASE REPORT

The case involved an 11-year-old child, the first of three siblings, with no known pathological history and no history of trauma. He was admitted for acute left hip pain of abrupt onset, inflammatory, evolving for 24 h in a febrile context with no change in general condition. Examination revealed a fever of 40°C, tachycardia at 160 bpm, tachypnea at 42 cycles per minute, and painfully limited movement of the left hip. There was no swelling or lymph nodes in the inguinal region. The rest of the examination was unremarkable. The initial blood count showed hyperleukocytosis at 6570/ μ L with neutrophil predominance at 6040/ μ L, lymphopenia at 310/ μ L, anemia at 8.8 g/dL normocytic and normochromic, platelets at 280000/ μ L. A biological inflammatory syndrome was noted with CRP at 198.52 mg/L, SV at 95 mm. Urea 4.38 mmol/L, creatinine 74 μ mol/L, blood glucose 6 mmol/L. HIV, HBV, and HCV serologies were negative. X-rays of the pelvis were unremarkable (Figure 1), while ultrasound of the hip showed synovial hypertrophy on Doppler without effusion. The patient was initially started on bi-antibiotic therapy with third-generation cephalosporin and a macrolide, as well

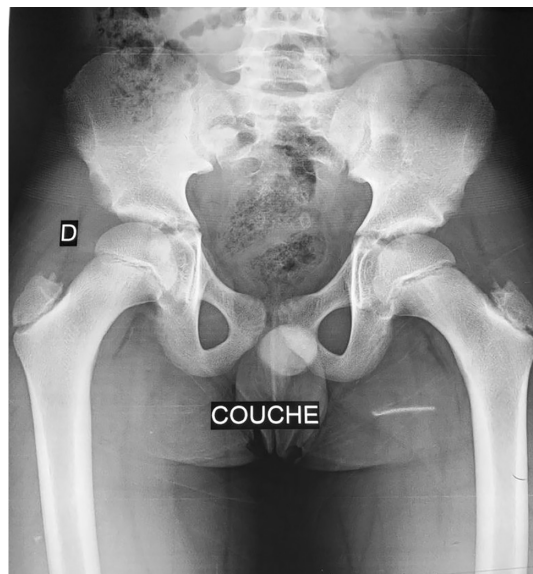


FIGURE 1 Frontal radiograph of the pelvis.

as adjuvant treatment with tramadol and injectable paracetamol. The situation worsened 24 h later with the onset of acute respiratory distress syndrome with SaO₂ 90% on 6 liters of oxygen and diffuse abdominal pain. D-dimer was 10,000 ng/mL. The chest X-ray showed bilateral alveolar-interstitial lung disease, and the CT scan showed hyperdensity, crazy paving (Figure 2), suggestive of COVID-19 disease. Cardiac and abdominal ultrasound were unremarkable. The RDT test for COVID-19 on a nasopharyngeal sample was positive, as was the RT-PCR. Death occurred a few hours later in acute respiratory distress.

3 | DISCUSSION

The fact that the signs and symptoms of COVID-19 extend beyond the respiratory tract may be explained, at least in part, by the ubiquitous expression and tissue distribution of angiotensin-converting enzyme 2 (ACE2), the main entry receptor for SARS-CoV-2.⁷ In particular, ACE2 is also present in intestines, small vessel endothelium, smooth muscle, skeletal striated muscle, cartilage, fibroblasts and even synovial tissue.⁸ Joint involvement in COVID-19 can occur at different stages of the disease.⁹ However, it is less clear whether SARS-CoV-2 infection can also induce inflammatory joint disease. It is well established that several viruses are associated with the development of acute and/or chronic arthritis. Virus-induced arthritis may be associated with the acute phase of viral infection and may be accompanied by other symptoms such as rash, fever, myalgia, and arthralgia. Arthritis associated with acute viral infection is usually self-limiting, but some viral arthritis can become chronic. Some viral infections can induce



FIGURE 2 Chest CT scan, axial section, parenchymal window. Crazy paving hyperdensities.

TABLE 1 Summary of different arthritis cases in COVID-19 from literature.

Study	Gender	Age (year)	Onset of disease	Involved joint	Imaging/Pathology
De Stefano et al. 2020 ¹¹	M	30	Sub-acute	Right elbow	US: synovite avec épanchement et signal Doppler positif
Yokogawa et al. 2020 ¹²	M	57	Acute	Right knee	None
Alivernini et al. 2020 ¹³	M	61	Acute	Polyarthritis (joint affected NP)	US: effusion, thickened synovium, increased vascularity Synovial biopsy: stromal activation, edema, inflammatory perivascular and diffuse infiltrates composed of CD68pos, CD3pos, and CD138pos cells
Parisi et al. 2020 ¹⁴	F	58	Subacute	Ankle	US: synovial hypertrophy in the tibiotarsal anterior and lateral recess, positive power Doppler signal
Talarico et al. 2020 ¹⁵	M	45	Acute	Symmetrical, MCP, and PIP joints; right wrist	US: slight effusion of the right wrist, bilateral effusion of the fifth proximal interphalangeal joint, no synovial hyperplasia or power Doppler signal
Dimitrios et al. 2023 ¹⁶	F	20	Acute	Left hip	MRI: Large collection in the hip joint with no other abnormalities
Our case	M	11	Acute	Left hip	US: synovial hypertrophy taking Doppler

Abbreviations: MCP, Metacarpophalangeal; NP, Not precise; PIP, Proximal interphalangeal; US, Ultrasonography.

chronic, self-sustaining arthritis. The immunopathogenic mechanisms of viral arthritis are not well understood.¹⁰ Three main mechanisms are thought to contribute to the development of viral arthritis:

- Direct viral pathology: There may be evidence of viral presence in synovium and synovial fluid with or without evidence of virus-mediated pathology.
- Immune complex-mediated inflammation: There are older observations suggesting virus infections may trigger an immune complex-mediated arthritis.
- Immune activation: It is possible that ongoing inflammatory disease due to persistent viral infection may predispose towards autoimmune-mediated arthritis.¹⁰

Furthermore, acute arthritis in COVID-19 is rarely reported; to our knowledge, only six cases of acute or subacute arthritis without a history of other rheumatic diseases have been reported in the literature.^{11–16} Of these, only one reported hip arthritis.¹⁶ Therefore, to our knowledge, the case presented in this article is the first case of COVID-19-associated acute monoarthritis in a child reported worldwide (Table 1). Although the causal relationship between a viral trigger and rheumatic disease is well known to rheumatologists, the identification of an infectious etiology in the evaluation of patients with musculoskeletal disorders can be extremely complicated because of the often-equivocal findings. Given that potentially rheumatologic symptoms have been frequently reported in patients with COVID-19, the new viral epidemic represents a novel differential diagnosis that should now be considered.⁶ Indeed, the fact that we did not think of

it early on may explain the delay in diagnosis in our patient, which was the cause of the worsening clinical picture with the onset of acute respiratory distress syndrome, leading to the patient's death. Further studies are needed to understand the pathogenesis of COVID-19 and its different clinical phenotypes, as it is important to recognize its correlation with arthritis by analyzing the presence of virus and antibodies in synovial tissues; the incidence and evolution of inflammatory manifestations should also be studied.¹⁴

4 | CONCLUSION

To date, there are insufficient data on the relationship between COVID-19 and the onset of acute arthritis. However, it is important to keep this in mind as cases are being published, especially since COVID-19 disease can be life-threatening, even though arthritis of viral origin remains a diagnosis of exclusion and emphasizes the importance of performing all tests to rule out arthritis of other etiologies. However, further international studies are needed to clarify the phenotype of the disease and its semiology in order to facilitate the diagnosis for practitioners.

AUTHOR CONTRIBUTIONS

Ayoub Tinni Ismael: Conceptualization; methodology; supervision; validation; visualization; writing – original draft; writing – review and editing. **Kossi Odjo Dogbe Yves-Zakari:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; software; visualization; writing

– original draft; writing – review and editing. **Bayala Yannick Laurent Tchenadoyo**: Supervision; validation. **Boulama Malam Boulama Mamadou**: Resources; software. **Yameogo Wendyam Nadège**: Supervision; validation. **Abdoul Aziz**: Resources; software. **Aboubacar Rachidou**: Supervision; validation. **Moussa Fanata**: Supervision; validation.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

CONSENT

The patient's family has given written informed consent to the publication of this report, in accordance with the journal's patient consent policy.

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