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Case Report

Varicella Arthritis in a Young Patient

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Abstract: Varicella arthritis (VA) is a very rare complication of Varicella zoster virus infection, typically presenting as mainly monoarthritis in pediatric populations. This report describes the case of a previously healthy 12-year-old boy who developed arthritis following varicella infection. Clinical evaluation and laboratory findings confirmed the diagnosis of VA, characterized by arthritis of the right knee, mild anemia, leukocytosis, thrombocytosis, and elevated inflammatory markers. Autoimmune and infectious serologies excluded other etiologies. The patient was treated with meloxicam, leading to the complete resolution of symptoms and normalization of inflammatory markers within six weeks. This case underscores the importance of considering VA in children presenting with varicella infection, confirmed by serology, and develops arthritis and highlights the favorable prognosis with appropriate management. Molecular mimicry, immune complex deposition, and pro-inflammatory cytokine release are possible contributing factors to the development of VA.

Keywords: varicella; arthritis; autoimmunity

1. Introduction

Varicella arthritis (VA) is an uncommon clinical entity secondary to Varicella zoster vírus infection, with limited documentation in the medical literature. The Varicella-zoster virus (VZV), a neurotropic and highly contagious member of the Herpesviridae family, is responsible for two distinct clinical manifestations: varicella (primary infection) and herpes zoster (reactivation of latent virus). Following primary infection, typically during childhood, VZV establishes latency in the dorsal root or cranial nerve ganglia. Reactivation, predominantly in immunocompromised or elderly individuals, leads to viral migration along sensory axons, resulting in a painful vesicular rash localized to a specific dermatome [1]. Most cases are described in children, underscoring the need for heightened clinical awareness in pediatric populations [1]. The condition emerges as a rare complication of varicella virus infection, primarily presenting as monoarthritis or polyarthritis. While the pathogenesis remains unclear, postinfectious immune-mediated mechanisms are strongly implicated. The rarity of VA poses diagnostic challenges, often leading to delayed recognition and management. There is no epidemiological study on VA, but a 2011 study documented 26 cases of VA in children, highlighting its clinical significance and the need for comprehensive characterization [2]. It was the most extensive study on VA already published. No study on the incidence or prevalence of VA is available. This report contributes to the growing body of knowledge by presenting an additional pediatric case of VA, providing insights into its clinical presentation, laboratory findings, and successful management.

The clinical manifestations of VA can vary widely, with arthritis typically presenting shortly after the resolution of the characteristic varicella rash. This temporal relationship underscores the importance of considering VA in patients presenting with new-onset arthritis following varicella infection. Early recognition and

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differentiation from other causes of pediatric arthritis, such as septic arthritis or autoimmune conditions, are crucial to prevent unnecessary interventions and ensure appropriate treatment. Previous studies, including the landmark analysis by Bevilacqua et al. [1], emphasize the generally self-limiting nature of VA, with most cases resolving within a few weeks to months. However, isolated cases with prolonged or chronic symptoms highlight the need for individualized follow-up and management strategies.

The following case illustrates the clinical course of VA in a previously healthy 12-year-old boy, emphasizing the diagnostic process and therapeutic approach. By documenting such cases, clinicians can better understand the spectrum of VA and refine strategies for its timely recognition and management. This report also reinforces the favorable prognosis of VA with supportive care while contributing to the broader understanding of post-varicella complications.

2. Case Report

A 12-year-old Black boy with no significant medical history presented with a diffuse rash and fever (38.3 °C) on 22 December 2023, after 4 days skin vesicles started to appear on his face, trunk and then to the limbs, leading to a diagnosis of varicella. On 3 January 2024, he began experiencing pain in his left lower limb, followed by arthritis of the right knee (tenderness, swelling, and reduction of range of motion) two days later, as observed by his pediatrician. The pain improved with rest and non-steroidal anti-inflammatory medication. He denied fever, skin rash recurrence, eye symptoms, or gastrointestinal and genitourinary complaints. No history of trauma, joint complaints, or recent vaccines was detected. Upon evaluation in our clinic, the patient had a weight of 80 kg, a height of 1.60 m, and a body mass index (BMI) of 31.25 kg/m^2. Physical examination confirmed arthritis in the right knee and residual skin lesions consistent with varicella sequelae (Figure 1). Laboratory findings revealed mild anemia, leukocytosis, and thrombocytosis. Inflammatory markers showed elevated C-reactive protein and erythrocyte sedimentation (Table 1). Autoimmune screening, including antinuclear antibodies (ANA), rheumatoid factor (RF), and anti-cyclic citrullinated peptide (anti-CCP) antibodies, was negative, and complement levels were within normal limits. Serological testing confirmed positive IgM for varicella. Other infectious serologies, including syphilis, human immunodeficiency virus (HIV), human T-lymphotropic virus (HTLV), and hepatitis B and C, were negative. The knee x-ray was normal. The diagnosis of varicella arthritis was established, and the patient was treated with meloxicam (15 mg/day) since taking it once a day improves adhesion, and public health has this drug available. At a six-week follow-up, he was asymptomatic, with the resolution of arthritis on physical examination and undetectable CRP levels.

Figure 1. The knee patient showed erythema, edema, and varicella lesions on the skin.

Table 1. Laboratory parameters of the patient.

Laboratory Parameters	Results	Normal Range
Hemoglobin	11.1 g/dL	11.5 a 15.5 g/dL
White blood cell count	11,820/µL with 7895 neutrophils and 2919 lymphocytes	5.000 a 13.000/µL
Platelet count	600,000/µL	150,000 to 400,000 µL
C-reactive protein	12 mg/L	<3 mg/L
Erythrocyte sedimentation rate	25 mm/1st hour	<15 mm/1st hour

3. Discussion

This article presents an additional rare case of arthritis following varicella infection. It contributes to the medical literature since only about 26 cases of VA are described.

A 2011 study by Bevilacqua et al. [1] analyzed 26 pediatric VA cases, providing valuable insights into the disease. The median age was 5.5 years (interquartile range: 1.5–11 years), with a slight female predominance (61%). All patients were immunocompetent, and monoarthritis was the most common presentation (77%), predominantly affecting the knee, followed by the ankle, shoulder, and foot. The median time to arthritis onset was 3.5 days (interquartile range: 1–11 days). Most cases were resolved within one month (73%), while others required two months (8%) or up to six months (11%) for complete resolution. Two cases developed a chronic course accompanied by moderate skin rash [1]. Our patient is 12 years old, male, immunocompetent, and developed monoarthritis.

The pathophysiological mechanisms underlying VA remain an area of active inquiry. The temporal association between varicella infection and arthritis strongly suggests a postinfectious immune-mediated process. Molecular mimicry, immune complex depossition, and pro-inflammatory cytokine release are potential contributors to the development of joint inflammation. Understanding these mechanisms is critical for advancing diagnostic accuracy and therapeutic interventions, particularly in cases with atypical presentations or prolonged disease courses [2]. Interestingly, no patient in the largest cohort of VA had any previous immune impairment [2].

From a diagnostic perspective, the differentiation of VA from other pediatric arthritic conditions is essential but challenging. Septic arthritis, for instance, requires prompt intervention to prevent joint damage, necessitating a high degree of clinical suspicion and appropriate laboratory investigations. Similarly, autoimmune conditions such as juvenile idiopathic arthritis (JIA) can present with overlapping features, further complicating the diagnostic process. Comprehensive evaluation, including a detailed history, physical examination, and targeted laboratory testing, is indispensable for accurate diagnosis [3,4]. However, in any patient with varicella who develops arthritis, VA is the major diagnosis. VA looks like other post-viral arthritis patients, with a limited course and favorable prognosis.

The management of VA predominantly involves supportive care, with non-steroidal anti-inflammatory drugs (NSAIDs) serving as the cornerstone of therapy. The rapid resolution of symptoms observed in most cases underscores the effectiveness of this approach. However, the potential for chronicity in a minority of patients necessitates ongoing monitoring and, in some instances, the consideration of alternative therapeutic strategies. These might include intra-articular corticosteroid injections or disease-modifying antirheumatic drugs (DMARDs) for refractory cases [1–4]. Regarding chronic complications, there is no description of long-term problems in the described cases of VA.

Varicella vaccination was described in 1960, although it was used for the first time in the United States in 1995. The literature does not describe VA after the varicella vaccine [5].

In conclusion, this case report contributes to the broader understanding of VA by highlighting its generally favorable prognosis and the importance of individualized management. By expanding the body of literature, future research can aim to elucidate the precise pathogenesis of VA, identify risk factors for chronicity, and develop targeted therapeutic interventions. Further studies, including surveillance of VA cases, should be done in the literature. Collaboration across pediatric and rheumatology specialties will be instrumental in achieving these goals, ultimately improving patient outcomes. Then, when a pediatrician sees a patient who develops arthritis, VA should be considered in this context.

Author Contributions

J.F.C.: conceptualization, methodology, data curation, writing—original draft preparation; A.T.A.M.: writing—reviewing and editing. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Ethical review and approval were waived for this study, due to be a case report. An informed consent was obtained from the patient's relatives.

Informed Consent Statement

Informed consent was obtained from the patient's relatives.

Data Availability Statement

Not applicable to this article. It is a case report.

Conflicts of Interest

The authors declare no conflict of interest.

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