CASE REPORT

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A case of oligoarthritis juvenile idiopathic arthritis in a 3-year-old male child: challenges in early diagnosis and management

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ABSTRACT

Introduction: Juvenile Idiopathic Arthritis (JIA) is the most common chronic rheumatic disease in children, characterized by persistent joint inflammation. However, early diagnosis is often challenging due to heterogeneous clinical manifestations. Among its subtypes, oligoarthritis is the most common, involving up to four joints within six months of symptom onset. This case is distinctive due to its very early onset at the age of 3 years, prolonged diagnostic delay despite multiple healthcare visits, and diagnostic challenges related to nonspecific initial symptoms. Delayed diagnosis can result in joint deformity, growth retardation, and long-term disability, highlighting the importance of early recognition and timely management.
Case Presentation: A 3-year-old male child presented with progressive joint pain, morning stiffness, and recurrent joint swelling that was initially associated with a history of trauma. Symptoms had been present since the age of 1.5 years, leading to a significant delay in definitive diagnosis. Based on clinical evaluation, imaging findings, and laboratory investigations, a diagnosis of oligoarticular Juvenile Idiopathic Arthritis was established according to the International League of Associations for Rheumatology (ILAR) criteria. The diagnostic process was further complicated by trauma-associated symptom onset and involvement of the temporomandibular joint (TMJ), which underscores the need for heightened clinical suspicion. The patient received multidisciplinary management, including pharmacological therapy, physical rehabilitation, and nutritional support.
Conclusion: This case illustrates the complexity of diagnosing and managing oligoarticular JIA in pediatric patients, particularly in cases with very early onset, delayed diagnosis, and TMJ involvement. A comprehensive multidisciplinary approach, along with increased clinical awareness and early diagnosis, is essential to control inflammation, preserve joint function, and prevent long-term complications in children with JIA.

Keywords: *Early Diagnosis, Juvenile Idiopathic Arthritis, Multidisciplinary Management, Oligoarthritis, Temporomandibular.*
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INTRODUCTION

Juvenile Idiopathic Arthritis (JIA) is the most common chronic rheumatic disease in children, marked by persistent joint inflammation and pain.[1] Despite its prevalence, JIA often remains underdiagnosed due to its varied presentation, which can mimic other conditions.[2] Among its subtypes, oligoarthritis stands out as the most frequent, typically affecting up to four joints within six months of onset.[3] If not detected early, this condition can lead to joint deformities, growth disturbances, and long-term disability.[2,4,5]

Globally, the prevalence of JIA varies widely, ranging from 3.8 to 400 per 100.000 children. This variability may be attributed to differences in geographic regions, population characteristics, and diagnostic criteria.[6] However, reliable data on its prevalence in Indonesia remains limited. Cases like this emphasize the need for greater awareness among healthcare providers regarding the distinctive clinical patterns of JIA, especially in young children, where symptoms can be subtle or resemble other conditions. Delayed diagnosis can have profound effects on a child's physical growth, psychosocial development, and overall quality of life.[6,7] In this case, we present a 3-year-old child with progressive joint pain and stiffness, in whom symptom onset coincided with a history of trauma. What makes this case unique is the complex progression of symptoms, including recurrent swelling and morning stiffness in multiple joints, which began as early as 1.5 years of age. Despite receiving care at multiple healthcare facilities, the definitive diagnosis of Oligoarthritis JIA was only established after an extensive diagnostic workup, emphasizing the challenges in diagnosing JIA in low-resource settings.

This case report highlights the diagnostic journey, clinical presentation, and multidisciplinary management of a young patient with JIA. By sharing this case, we aim to enhance awareness and improve early recognition of JIA among clinicians, ultimately contributing to better outcomes for children facing similar challenges.

CASE PRESENTATION

A 3-year-and-2-month-old child was referred to Saiful Anwar Malang Hospital (RSSA) due to complaints of difficulty walking since May 2024. The complaint was recorded 2 weeks after the patient fell while cycling. However, the parents stated that the patient had a history of pain and swelling in both knees. In addition, the patient also experiences difficulty bending both wrists since the patient was 1.5 years old. Initially, the patient only complained about the right wrist, but over time both wrists became difficult to bend. Until now, the patient's complaints are still felt, accompanied by joint stiffness every morning for about 30 minutes.

In medical history, in May 2024, the patient was treated at Persada Hospital Malang in the Pediatric Neurology Clinic after falling off a bicycle. Then, the patient was referred to the Orthopedic Department to address walking difficulties. In November 2024, the patient was referred to the Medical Rehabilitation Department of RSSA by an orthopedic specialist who had treated the patient at Persada Malang Hospital, and stimulation was performed using Shortwave Diathermy (SWD) on the hamstring muscles and stretching. It was said that the complaints improved temporarily, but in December 2024, pain in both knees and both ankles reappeared, so the patient was referred to RSSA.

During the physical examination of the patient's extremities, inspection revealed that the right and left knees appeared red. On palpation examination, tenderness was found in both the right and left knees. In the assessment of Range of Motion (ROM), it was found that both knees experienced limitations in both active and passive examinations. In the Paediatric Gait, Arms, Legs, and Spine (PGALS) examination, the patient has limitations in several assessments, specifically in the Arm, including elbow flexion, shoulder abduction, and external rotation of the elbows. In addition to the arm, elbow limitations are also indicated by the patient's inability to perform hip internal rotation and hip flexion. The patient also has limitations in the movement of the temporomandibular joint.

Here are the attached results of the supporting examinations for this patient,

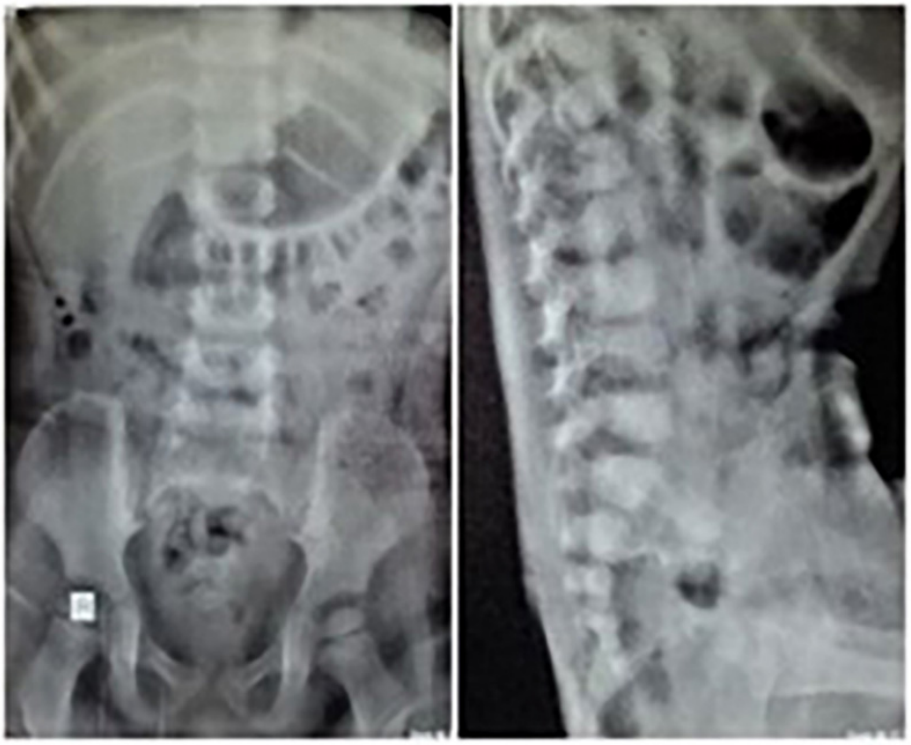

Figure 1. Lumbosacral X-Ray (06/12/24) Within normal limits

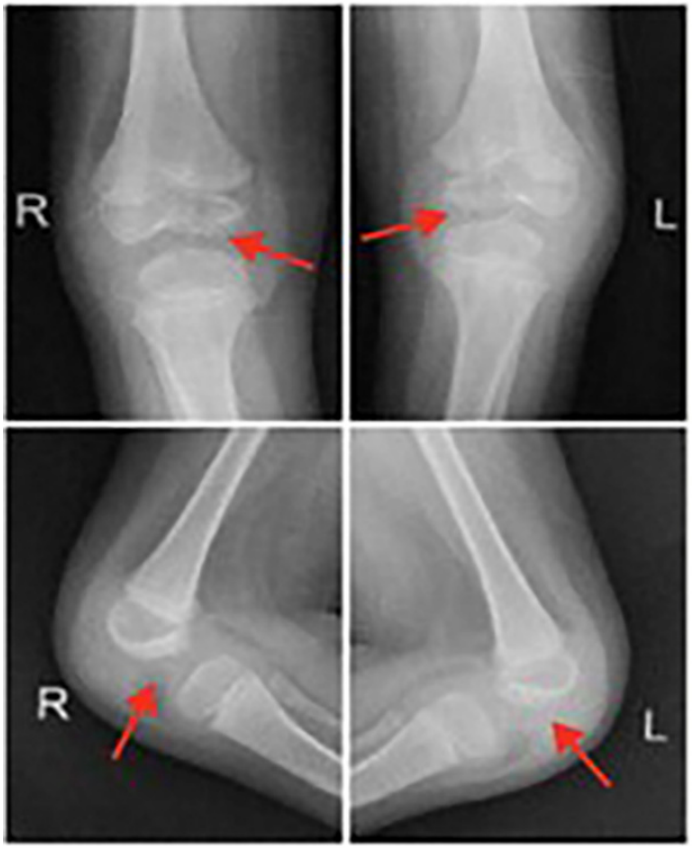

Figure 2. X-Ray of the Right and Left Knee (27/12/24) showing soft tissue swelling with widened joint space and irregularity of the medial femoral joint surface.

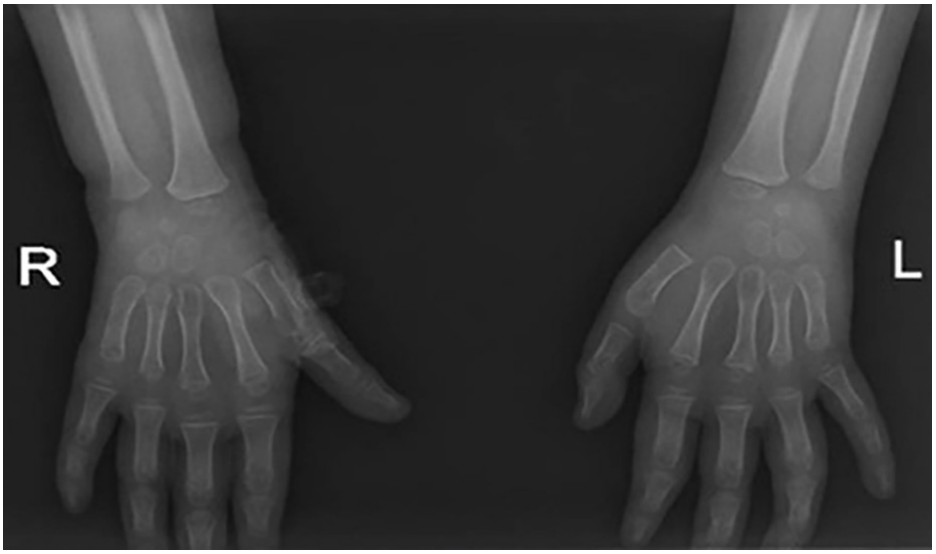

Figure 3. X-Ray Wrist Right and Left (10/01/25) Within normal limits

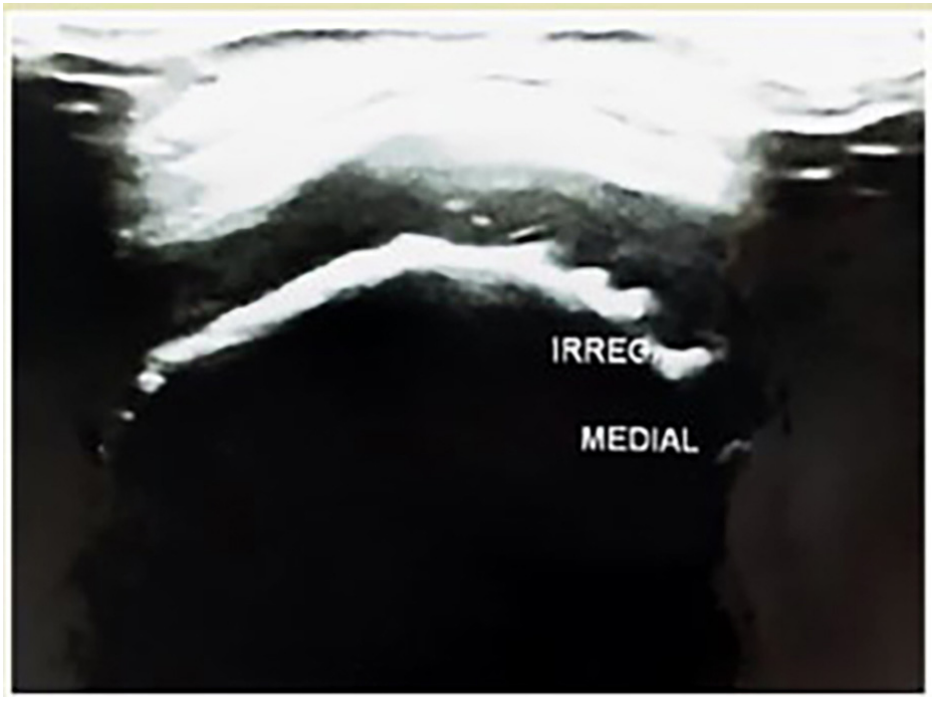

Figure 4. USG Genu (10/01/2025) Synovitis with irregularity of the medial condyle cortex of the bilateral femur.

which consist of lumbosacral x-ray, right-left knee x-ray, right-left wrist, as well as the complete laboratory results of the patient.

Figure 3 demonstrates anteroposterior radiographs of the right and left wrists, showing post-therapeutic changes. Figure 4 presents ultrasonographic evaluation of the knee, illustrating the musculoskeletal soft tissue and joint structures following treatment.

The laboratory findings in this patient are consistent with oligoarticular Juvenile Idiopathic Arthritis. Complete blood count showed hemoglobin, leukocyte, and platelet levels within normal ranges, indicating the absence of significant anemia, infection, or systemic inflammation, which is typical in oligoarticular JIA compared to systemic subtypes. The differential count revealed relative lymphocyte predominance without marked neutrophilia, further

Table 1. Laboratory result 24/12/2024

Laboratory	Result
Haemoglobin (HGB) (g/dL)	12
Eritrosit (RBC) x10^6	4.68
Hematokrit (%)	35.80
Leukosit x 10^3	10.100
Thrombosit (mcL)	298.000
Neutrofil (%)	31.60
Limfosit	53.80
LDH (U/L)	232
Ferritin (ng/ml)	55
Rheumatoid factor total (IU/ml)	5.73 (negatif)
ANA test (AU/mL)	15.00 (negatif)
Phospor (mg/dL)	4,9
Vitamin D 25-OH (ng/mL)	32,40

supporting a non-infectious inflammatory process. Normal ferritin and LDH levels help exclude macrophage activation syndrome and other hyperinflammatory conditions. Negative rheumatoid factor and antinuclear antibody results are also in accordance with oligoarticular JIA, which is commonly seronegative. Overall, these laboratory findings are important in oligoarticular JIA as they help exclude infectious, malignant, and systemic inflammatory conditions, while supporting the diagnosis in conjunction with clinical presentation and imaging findings rather than serving as definitive diagnostic markers.

The weight of this patient is 13 kg. The patient was given treatment in the form of Holiday-Segar fluid 1150 ml per day adjusted to the patient's needs. Administered IV Methylprednisolone 2x15 mg (2mg/kg/day), IV neurotropic 1 ampule per day. IV Ranitidine 2x15 mg (1 mg/kg/day) is also administered if the patient complains of pain and is fussy. Oral methotrexate was initiated as a disease-modifying antirheumatic drug (DMARD) and administered once weekly at a dose of 10–15 mg/m^2,, Calcium carbonate 2x500 mg, Vitamin C 1x100 mg, and also sodium phosphate 3x200 cc, along with a High Calorie High Protein diet 3 times ½ portion.

DISCUSSION

The patient in this case is a patient suffering from JIA. Based on the International League of Associations for Rheumatology (ILAR) classification of subtypes of JIA, this patient is one with oligoarthritis, which is the most commonly encountered type according to reports worldwide.[2] Based on findings from 2020, JIA is categorized as a chronic disease found in children under the age of 16, with the highest prevalence being in girls aged 1-3 years.[8] Here, we present a case of a boy who developed early symptoms at the age of 18 months, with symptom onset temporally associated with a history of patellar trauma.

JIA in the oligoarthritis type often affects the lower extremities, primarily the knee joint (30-50% of cases), followed by complaints in the ankle.[9] JIA oligoarthritis in this patient's condition is diagnosed based on anamnesis, physical examination, and additional examinations. The onset found in this patient is under 16 years old and lasts longer than 6 weeks, thus meeting the ILAR criteria. If a child is suspected of having JIA, then investigations related to a family history of autoimmune diseases and trauma history need to be further explored.[10] In our case, the patient experienced swelling, redness, and limited ROM in both knee joints and fingers, indicating the oligoarticular subtype of JIA after ruling out other causes. The correlation between the patient's trauma history and the occurrence of autoimmune diseases is predicted to have a strong relationship and is supported by several literatures.

Many studies shown that post-traumatic stress has a wide-ranging impact on immune function. Other literature also supports the idea that stress plays a role in the initiation and exacerbation of autoimmune diseases.[11] Research conducted by Muhsen et al., showed that out of 3673 patients treated for RA, 60 of them were initiated by physical trauma.[12] Another study conducted by Al-Allaf et al., showed a significant relationship between a history of trauma 6 months before being diagnosed with RA and the common occurrence of sero-negativity in RA patients with a history of physical trauma.[13] The study aligns with the clinical condition of the patients in this research, which describes arthritis with sero-negativity. The clinical presentation of the patient, which includes knee joint pain and wrist pain, is also explained in this study as being caused by an inflammatory reaction involving key cytokines such as TNF, IL-1, and IL-6, which promote inflammation in the synovium. This inflammatory cascade also triggers leads to cartilage degradation and bone erosion mediated by osteoclast activation. Observational data show that triggers causing tissue damage can induce and expose neoepitopes on connective tissue proteins, potentially leading to an autoimmune response that activates and stimulates arthritis.[9]

A history of trauma from falling off a bicycle, as experienced by this patient needs to be excluded if the cause is a toddler fracture from the examination of definitive fracture signs until imaging is performed in the form of the right and left knees x-ray. A history of trauma was carefully evaluated, as joint pain following injury may mimic inflammatory arthritis; however, the persistence and progression of symptoms despite long-term conservative management, along with recurrent joint swelling and morning stiffness, were not consistent with trauma-related pathology.

In addition, we also need to exclude the possibility of the patient experiencing joint pain caused by Lyme Disease with a duration of weeks to months and caused by an infection due to *Borrelia burgdorferi*.[14] However, the absence of epidemiological exposure, lack of systemic infectious symptoms, and the chronic progressive course made Lyme arthritis less likely. Therefore, after excluding infectious and trauma-related causes, the clinical, laboratory, and imaging findings supported the diagnosis of oligoarticular Juvenile Idiopathic Arthritis.[15]

In the initial diagnosis of JIA, a musculoskeletal assessment in children using pGALS is necessary. In this patient, the patient's gait showed limitations when asked to tiptoe or walk on their toes with heels raised. Meanwhile, in the Arm, there are limitations in elbow flexion, shoulder abduction, and external rotation of the elbow. Legs also experience limitations in hip internal rotation and hip flexion. Research shows that pGALS has a sensitivity of 97-100% and a specificity of 98-100% in detecting joint abnormalities in children with.[16] With pGALS, doctors can determine the severity of the disease and identify early joint involvement so that treatment can be initiated promptly to prevent long-term complications. Then, pGALS can also be used for periodic evaluations by monitoring disease progression and response to therapy. This is important for adjusting the treatment plan, including adjusting medication dosages and providing additional therapy.[17]

The involvement of the temporomandibular joint (TMJ) in JIA is often overlooked in the initial evaluation, yet TMJ involvement in JIA has a significant impact on the child's quality of life. Early detection of TMJ involvement in JIA can prevent more serious problems. Delayed treatment of TMJ due to JIA can cause problems with the child's facial growth. Prolonged TMJ inflammation can disrupt normal jawbone growth, causing asymmetry and potentially leading to facial deformities such as retrognathism or malocclusion. Additionally, limited movement in the TMJ affects the ability to chew and speak properly, which can impact overall quality of life and child development.[18]

Management of TMJ arthritis therapy in JIA requires a multidisciplinary approach, including rheumatology, dentistry, and orthodontics.[18] Controlling inflammation through pharmacological therapy, such as NSAIDs and DMARDs combined with physical therapy to improve range of motion, reduce stiffness, and the use of occlusal splints to reduce pressure on the TMJ can be effective.[19]

Predicting relapses must identify potential triggers that can worsen the disease, such as infections, stress, or changes in physical activity levels. Research shows that several biomarkers such as CRP and ESR correlate with the risk of relapse. Additionally, symptoms that appear at a young age can increase the risk of recurrence.[20] By understanding the triggers and clinical predictors during routine evaluations, it will be possible to anticipate potential exacerbations and adjust treatment accordingly. This case report has limitations, including the lack of long-term follow-up and its inability to establish causality between trauma and disease onset.

CONCLUSION

This case report highlights the diagnostic and therapeutic complexities of JIA, specifically the oligoarthritis subtype, in a pediatric patient. Using the ILAR criteria, the diagnosis was established through a comprehensive evaluation. The delayed diagnosis underscores the pressing need for enhanced clinical awareness and timely recognition of JIA. Multidisciplinary management proved essential for controlling inflammation, preserving joint function, and preventing long-term complications. The early detection TMJ involvement further emphasized the importance of prompt intervention to mitigate the risks of deformities and functional impairments, highlighting the critical role of holistic and timely care in optimizing outcomes for children with JIA.

ETHICAL APPROVAL

Ethical approval was not required for this case report in accordance with institutional policies.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient's parents for the publication of this case report and any accompanying clinical data. The patient's identity has been anonymized to protect confidentiality.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article

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AUTHOR CONTRIBUTIONS

All three authors contributed to the conception and design of the study, manuscript preparation, critical revision, and approval of the final version.

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