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An Interesting Case of Arthritis in a Young Female

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ABSTRACT

Juvenile idiopathic arthritis (JIA) represents a diverse group of arthropathies affecting individuals under the age of sixteen. Enthesitis-Related Arthritis (ERA) is a subtype of JIA that primarily affects the lower extremity joints and entheses and is often associated with HLA-B27 positivity. We present the case of a 17-year-old female with a history of tuberculosis who presented with fever and arthritis and was initially misdiagnosed with septic arthritis. Despite an escalation of antibiotics, the patient showed no improvement. Subsequent investigations, including imaging and synovial fluid analysis, ruled out infectious aetiologies. The patient was ultimately diagnosed with ERA based on the clinical, laboratory, and imaging findings. Treatment with NSAIDs and methotrexate resulted in symptomatic improvement. This case highlights the diagnostic challenges in distinguishing ERA from septic arthritis and underscores the importance of a thorough diagnostic approach in similar clinical scenarios.

Keywords: Juvenile idiopathic arthritis, Enthesitis-Related Arthritis, HLA-B27, Tuberculosis, Septic arthritis

INTRODUCTION

Childhood or adolescent arthralgia can arise from various aetiologies, including systemic diseases, autoimmune disorders, and non-inflammatory conditions [1]. Systemic diseases encompass a broad spectrum, including infections (e.g. tuberculosis and reactive arthritis), neoplastic disorders (particularly acute leukaemia, lymphomas, osteoid osteoma, and neuroblastoma), haematological disorders, immunological disorders, cystic fibrosis, and acute rheumatic fever [1]. Autoimmune disorders such as Juvenile Idiopathic Arthritis (JIA), juvenile dermatomyositis, systemic lupus erythematosus (SLE), systemic sclerosis, and various primary and reactive vasculitis may also manifest as arthritis [1]. Additionally, non-inflammatory conditions, such as chondromalacia patellae, reflex sympathetic dystrophy, and benign joint hypermobility, often associated with chronic pain syndromes, can present with arthralgia [2]. Among these, JIA is the most prevalent chronic rheumatic disease in childhood [3].

JIA is a heterogeneous group of conditions classified by the International League of Associations for Rheumatology (ILAR), characterised by arthritis lasting six weeks or more and commencing before the age of 16 years [3]. Different subtypes were delineated based on the number of involved joints and presence or absence of specific exclusion criteria. Epidemiological data on JIA, primarily derived from Northern European and White American populations, indicate an incidence of 10 per 100,000 and a probable prevalence of 50 per 100,000, highlighting the chronic nature of the disease [4]. However, such data are scarce for the Indian subcontinent [4].

Enthesitis-Related Arthritis (ERA) is a subtype of JIA that predominantly affects the lower extremity joints and entheses with potential later involvement of the sacroiliac joints and spine. Patients with ERA, particularly those with axial involvement, often experience poorer outcomes than those with other JIA subtypes [5]. Septic arthritis, though less common, poses a diagnostic challenge, as it may present with symptoms indistinguishable from more prevalent conditions such as JIA. In our case, we highlight the diagnostic dilemma encountered in differentiating ERA from septic arthritis, particularly in patients with a history of tuberculosis.

CASE REPORT

Case History:

A 17-year-old girl presented with a two-week history of fever, bilateral hip pain, and difficulty walking. Two years prior, she was asymptomatic until she developed pain and swelling in multiple joints, which initially affected the right knee for three months before spontaneously resolving. Subsequently, she experienced similar symptoms in the left hip and knee, which were intermittently managed with painkillers. The fever was described as high-grade and was associated with chills, rigors, and evening temperature spikes. Her parents reported a history of anti-tuberculosis therapy (ATT) for four months at the age of 8 years, the details of which are unclear. Upon examination, the patient walked with a limp, and her right lower limb was abducted and externally rotated. The range of motion of the right hip was restricted and painful.

Lab observations:

Laboratory investigations revealed a haemoglobin level of 9.7 g/dL, total leukocyte count of 14090 cells/cu mm with 71% neutrophilic preponderance, elevated inflammatory markers (ESR 120 mm/hr, CRP 88.3 mg/L), low vitamin D levels (13.5 ng/mL), and normal serum

calcium. The Mantoux test was positive (15 mm), whereas the ANA (immunoblot) test was negative.

Diagnosis:

The patient received initial treatment with intravenous antibiotics, antipyretics, and calcium/vitamin D supplements. Pelvic radiography revealed changes in the left and right hip joint spaces (Fig. 1). MRI revealed effusion in both hip joints and bone marrow oedema in the ischial tuberosities and pubic rami (Fig. 2, Fig. 3, & Fig. 4). Despite antibiotic escalation, no further improvement was observed. Joint fluid analysis revealed neutrophilic inflammation with negative cultures. Mycobacterium tuberculosis was not detected in CBNAAT test of synovial fluid. HLA-B27 was sent and reported positive. To rule out latent Tuberculosis, Interferon Gamma Release Assay was done and reported negative.

Management:

After excluding infectious aetiologies, the patient was diagnosed with Enthesitis-Related Arthritis (ERA) and initiated on NSAIDs (naproxen), methotrexate (10 mg once a week), and folic acid. Symptomatic improvement was noted, with resolution of fever spikes and reduced joint symptoms. At the monthly follow-up, the patient continued methotrexate (10 mg/week) with sustained improvement in joint symptoms.

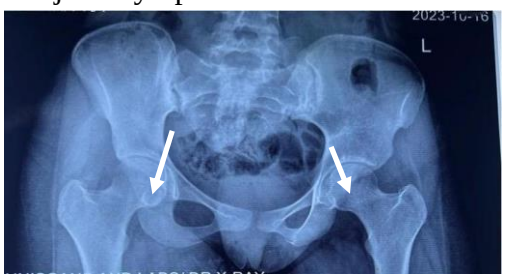

Figure 1: X-ray of patient representing sclerotic changes in the left hip and joint space widening in the right hip

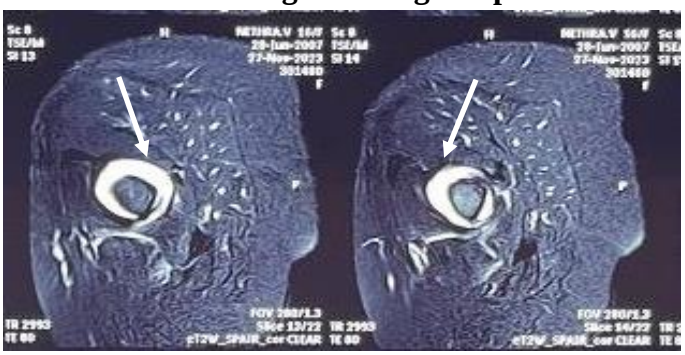

Figure 2: MRI imaging showing effusion in the right hip

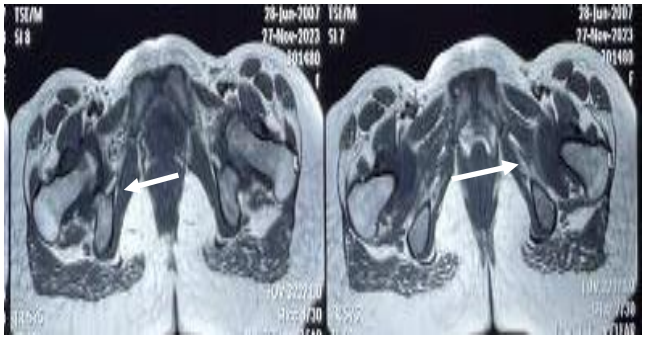

Figure 3: MRI of the bilateral ischial tuberosities

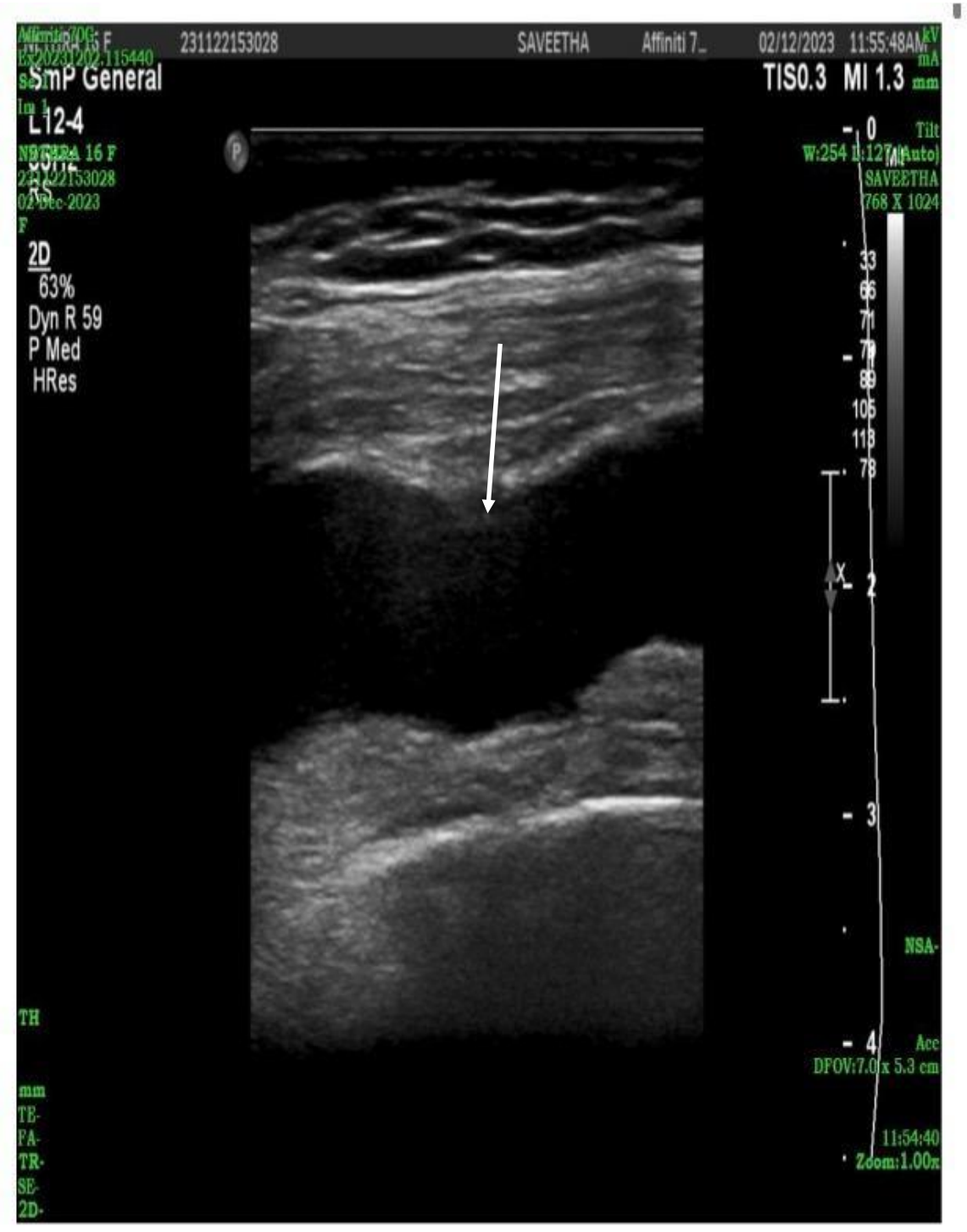

Figure 4: Representing effusion in USG left knee of the patient

DISCUSSION

JIA encompasses a spectrum of arthropathies affecting individuals under 16 years of age, with our patient likely classified as having enthesitis-related arthritis (ErA) due to the presence of the HLA B27 antigen [1]. However, the diagnosis of ErA is often delayed, as evidenced by our case being initially misdiagnosed as septic or tuberculous arthritis [2]. Therefore, maintaining a high level of suspicion is crucial for timely identification. This case underscores the

diagnostic challenges encountered in adolescent spondyloarthritis, particularly the dilemma between septic arthritis and ERA. A thorough evaluation was performed to exclude alternative diagnoses, such as infections and malignancies, with joint aspiration and synovial fluid analysis serving as pivotal diagnostic tools. Despite inflammatory findings in both hip and knee aspirates, the cultures yielded no growth. Further investigation of post-streptococcal sequelae, including acute rheumatic fever (ARF) and post-streptococcal reactive arthritis (PSRA), was undertaken, with normal 2D ECHO findings [3].

Imaging modalities, particularly MRI, play a crucial role in the early detection of axial joint changes [5]. Additionally, the favourable response to NSAIDs further supports this diagnosis. Current treatment recommendations for JIA advocate first-line therapy with non-steroidal anti-inflammatory drugs (NSAIDs) and disease-modifying antirheumatic drugs (DMARDs), such as methotrexate (MTX), leflunomide, and sulfasalazine, based on disease activity [6]. In cases of moderate to high disease activity or treatment failure, biological agents targeting tumour necrosis factor, interleukin-1, interleukin-6, and T-cell regulation are considered [7] [8].

CONCLUSION

In cases of fever and arthritis, various conditions, such as orthopaedic problems, infections, and cancers, should be considered. A detailed medical history and physical examination are vital for accurate diagnosis. A lack of response to treatment warrants reevaluation of the diagnosis.

ACKNOWLEDGEMENT

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