



## Hip Synovitis in Dengue – Diagnostic Dilemma

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### Abstract:

Acute onset non-traumatic hip joint pain in children with fever is usually due to septic arthritis or transient synovitis. The association between dengue fever and isolated hip joint inflammation is not known. We present a case of a two-and-a-half year old girl with one week history of right hip pain, fever and inability to walk. She had painful range of hip motion and antalgic gait. Laboratory values were unremarkable, radiographs showed medial joint space widening and ultrasound revealed effusion. She was managed as transient synovitis of hip. During the course of stay, serology was positive for dengue fever. The child was treated symptomatically and recovered in ten days. In endemic zones, awareness of such presentation should be kept in mind to differentiate from benign condition like transient synovitis.

**Key words:** Dengue, Synovitis, Traction, Gait, Hip Joint, Child.

### Introduction

Limping in a child under the age of three years with non-traumatic acute hip pain and fever is due to infection and/or inflammation of the joint [1]. A diagnosis of septic arthritis or transient synovitis befits most clinical scenarios [2]. Dengue infection causes fever, rash, retro-orbital headache, myalgia and arthralgia. However, arthritis is rare [3]. Atypical presentations are the forte of many infectious diseases. We present one case of acute dengue illness associated with unilateral hip joint synovitis, which confounded our working diagnosis of transient synovitis.

### Case Report

A two-and-a-half year old girl from Chennai, Tamilnadu, India presented with a one week history of fever, painful right hip and limp. She was irritable with temperature of 100° F, tachycardic (122 beats per minute), tachypneic (30 breaths/min) with normal blood pressure. Systemic examination was normal. The right hip was in 20° flexion and 30° external rotation. There was fullness of Scarpa's triangle of right hip compared to the left. It was tender with painfully restricted motion. She had an antalgic gait. Neurovascular status was normal. The left hip and other joints were normal. The relevant

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laboratory workup is shown in Table 1.

Hip radiographs revealed increased right hip medial joint space [Fig.1] and ultrasonogram showed minimal effusion. Hence, she was treated as transient synovitis of hip and managed with skin traction, intravenous fluids and analgesics. She had febrile spikes (one spike per day, maximum recorded temperature – 100°F) until sixth day, but her hip range of motion had improved on daily clinical examination. Interestingly, on the same day of her admission, her younger sister, 9 months old, with normal developmental and immunization history, was admitted with high grade fever and cough for a week. Clinically, she was febrile and liver was palpable 2 cm below costal margin. Her laboratory values showed lymphocytosis (differential lymphocyte count – 79.7) and low normal platelet values (1.6 lakhs/mm<sup>3</sup>). She did



**Fig.1:** The right hip medial joint space is widened as compared to left hip. The periarticular fat pads are not displaced, which rules out septic arthritis.

**Table 1: Laboratory Workup.**

Investigations	Report
Hemoglobin	10.4 g/dL
Total leucocyte count	7,300 cells/mm <sup>3</sup>
Differential leucocyte count	N <sub>42</sub> L <sub>47</sub> E <sub>1</sub> B <sub>1</sub> M <sub>9</sub>
Platelet count	3.43 lakhs/mm <sup>3</sup>
Erythrocyte sedimentation rate (ESR)	31 mm in first hour
Urea	13 mg/dL
Creatinine	0.31 mg/dL
Blood culture	Sterile
Urine culture	Sterile
Peripheral smear for malarial parasites	Negative
Dengue Serology – IgM (Immunochromatography via SD card)	Positive
Dengue Serology – IgG (Immunochromatography via SD card)	Negative

not have joint involvement. The similar patterns of fever occurring simultaneously prompted us to perform serological tests for dengue infection, and the results were positive for both siblings (positive IgM, negative IgG).

With supportive therapy, both the children recovered uneventfully. Repeat ultrasonogram of right hip in the older sibling on ninth day revealed no effusion. She began walking normally on tenth day and was discharged. She was reviewed two weeks later and ultrasonogram revealed no effusion. At follow-up visit after four months, the child was healthy with symmetrical hip joint spaces [Fig.2].

## Discussion

Transient synovitis, septic arthritis, osteomyelitis of upper femur, pauciarticular juvenile arthritis, and leukemia are differential diagnoses in a toddler with febrile arthritis [1,4,5]. Post-infectious arthritis follows infection by organisms (Chlamydia, Salmonella) from genitourinary tract, gastrointestinal tract or respiratory tract [6]. In endemic areas, malaria, dengue and chikungunya are known to cause febrile arthritis [7].

Transient synovitis is a benign self-limiting condition which involves children between 3-8 years, with a slight male preponderance, acute onset hip pain with inability to bear weight, occasionally low grade fever, antecedent viral illness, absence of specific laboratory markers and spontaneous resolution in 3-10 days [8]. Septic arthritis is diagnosed with 99.6% probability based on presence of all of Kocher criteria (fever over 101.3°F, inability to tolerate body weight, ESR >40 mm/hr, total leucocytes > 12,000 cells/mm<sup>3</sup>) [9,10]. Based on her clinical and investigative profile, osteomyelitis, juvenile arthritis and leukemia were excluded. Septic arthritis was ruled out by fever < 101.3°F, total leucocyte count of 7300/mm<sup>3</sup> and ESR of 31 mm in first hour (probability of septic arthritis in presence



**Fig.2:** At 4 months follow-up, bilateral hip joint spaces are equal.

of one criteria is 3%). Moreover, the radiographic evidence of preserved periarticular fat pads and the day-by-day clinical improvement dissuaded us from performing advanced imaging such as MRI of the hip (which was expensive and not feasible owing to the indolent course of disease) and joint aspiration (which was invasive and unnecessary in the light of low pretest probability).

Dengue, an endemic disease in Chennai which is caused by an arthropod-borne flavivirus, is characterized by fever with rash, myalgia, arthralgia, conjunctival congestion and headache [11,12]. In children, it follows a bimodal pattern with primary cases at seven months of age and secondary infections at three to five years of age [11]. The diagnosis is based on clinical features and serological tests, namely IgM, IgG and NS-1 (non-structural protein-1) detection [13,14]. IgM is detected after five or more days of onset of illness. IgG indicates secondary infection. Hence, in this case, IgM positive and IgG negative indicates primary dengue infection [13]. The NS-1 marker is highly specific, positive upto nine days after illness, and it is useful when the viral load is high,

i.e, if the test is done on the first day of fever or in uncomplicated cases [14]. As the child presented to us after seven days of fever and had no complications, we did not perform the NS-1 assay. The platelet counts were normal in this patient, which is seen in 18-19% of cases [11,15]. Chikungunya, an important differential diagnosis for dengue, is characterized by fever, arthralgia involving small joints for prolonged duration and rash caused by alpha virus, associated with lymphopenia, anemia and elevated serum creatinine levels [16]. Absence of polyarthralgia, rash and presence of relative lymphocytosis made Chikungunya a less likely

diagnosis.

The diagnostic dilemma in this case was to determine whether the hip problem was due to dengue infection or transient synovitis. The presence of fever, arthralgia, seropositivity for IgM, self-limiting nature in two weeks, and simultaneous dengue infection in the siblings hailing from same endemic zone favoured our diagnosis of dengue infection. Our patient was initially managed as transient synovitis of hip, which is a diagnosis of exclusion. Jung *et al*, in their study of 97 cases of transient synovitis showed that probability of

**Table 2: Clinically relevant parameters in transient synovitis, septic arthritis and the present case.**

<i>Clinical and Laboratory profile</i>	<i>Transient synovitis</i>	<i>Septic arthritis</i>	<i>Our Case</i>
General condition	Normal	Irritable, malaise	Irritable, tachycardic, tachypneic
Clinical examination	Painful passive motion range of right hip motion	Painful range of right hip motion, local warmth, erythema, tender joint	Painful range of right hip motion
Maximum Temperature	Rarely >38°C	>38°C, chills, rigor	37.7°C
WBC count (cells/mm <sup>3</sup> )	<12000	>12000	7300
ESR (mm/hr)	<40	>40	31
Dengue Serology	Negative	Negative	IgM +, IgG -
Radiographic joint space difference (mm)	<2, preserved periarticular fat pads	>2, displaced periarticular fat pads	3.6, preserved periarticular fat pads
Ultrasonogram	Mild-moderate effusion	Severe effusion	Mild effusion
Treatment	Bed rest, traction, analgesics	Arthrotomy and drainage, antibiotics	Bed rest, traction, analgesics
Sequelae (if left untreated)	Self limiting in 3-10 days, with no serious sequelae	Destruction of articular/ physeal cartilage, dislocation of hip, ankylosis	Dengue hemorrhagic fever/ dengue shock syndrome ( 5-10% cases)

transient synovitis was low when fever exceeded 37°C (98.6°F), ESR > 20 mm/hr and difference of hip joint space distance > 2 mm, as evident in this case [17]. A careful scrutiny of the important clinical, hematological and radiological features, shown in Table 2, demonstrates that this child had features unlike that seen in transient synovitis or septic arthritis.

Dengue virus infection ranges from asymptomatic infection to dengue fever. 5-10% cases progress to Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS), which can result in death if not managed properly [13]. Atypical dengue presentations such as encephalitis and myositis have been mentioned [11]. Patil and Akki [18] described a case of postviral arthritis of knee joint due to dengue in a 28 month old child. Pyomyositis of obturator internus and gluteus maximus can confound a case of transient synovitis or septic arthritis [19,20]. But, dengue-related unilateral hip synovitis masquerading as transient synovitis of hip has not been reported in literature. Moreover, children are at a higher risk of DHF than adults due to higher baseline microvascular permeability [11].

## Conclusion

This case is an unusual presentation of dengue infection and differentiation from benign condition such as transient synovitis is mandatory. Dengue is a potentially dangerous disease wherein children are more susceptible to its severe clinical forms. Atypical presentation of dengue infection should be considered when treating children with fever and hip pain in endemic zone.

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