



# Transient Osteoporosis of Hip (Migratory)

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## Abstract

Transient osteoporosis of hip (TOH) is a spontaneous resolving skeletal disorder characterized by sudden onset of severe pain which resolves within 6-12 months. It is seen more commonly in middle aged men, though also seen in 3<sup>rd</sup> trimester of pregnancy. MRI is the main diagnostic tool. It is idiopathic in nature. We present a case report of a young adult male who presented with migratory transient osteoporosis of both hip joints separated by a period of around 1<sup>1</sup>/<sub>2</sub> years. He was managed conservatively and recovered completely both times.

## Key Words

Transient, Osteoporosis, Hip, Migratory

## Introduction

Transient osteoporosis of hip is an uncommon disorder. TOH was first described by Curtis and Kinkade in 1959, in women in 3<sup>rd</sup> trimester of pregnancy (1). Later the disease was described in middle aged males (4<sup>th</sup> – 6<sup>th</sup> decade), very rare occurrence described in children and in females not related to pregnancy (2). In 1968, Lequesne coined the term idiopathic TOH (3). Since then, idiopathic TOH has been referred to as bone marrow edema syndrome, hip algodystrophy and transient hip demineralization. The term regional migratory (transient) osteoporosis is used when multiple joints are affected in same individual. TOH has been reported in decreasing frequency in the knee, foot, ankle and hand (4). The etiology of TOH is unclear. Most common accepted theory is microvascular injury which leads to tissue ischemia further leading to marrow edema. Other theories include abnormal mechanical stress leading to abnormal weight bearing, metabolic, neurological, endocrine causes, vasomotor instability and unknown virally mediated insult.

As the name suggests, TOH is a transient disorder which presents with pain in and around hip joint which is increased on weight bearing and regresses clinically as well as radiologically in almost all patients in 6-12 months.

## Case Report

We are presenting here a case of 31 years old male who presented with the symptoms of pain of about 2 weeks duration, in and around right hip, extending mainly over anterior and lateral aspect of the thigh. The pain increased on weight bearing and was of moderate severity. Examination of hip was done which was almost normal. A plain X-ray of bilateral hip joints with pelvis was done which was normal.

Routine blood investigation including Hb, TLC, DLC, ESR, Uric Acid were done which were within normal range. The patient was given analgesics, injectable methylcobalamin and advised for follow up after 2 weeks. On follow up, the condition of the patient had not improved, instead, pain had increased on weight bearing. On examination, abduction and external rotation were quite painful.

A MRI of both hip joints with pelvis was done this time. T<sub>2</sub> weighted sequences and TIR sequence showed hyperintense signal in the region of anterosuperior femoral head extending across the femoral neck into the trochanteric region on right side. No double line sign could be appreciated. Corresponding area of involvement showed hypointense signal intensity on T<sub>1</sub> weighted

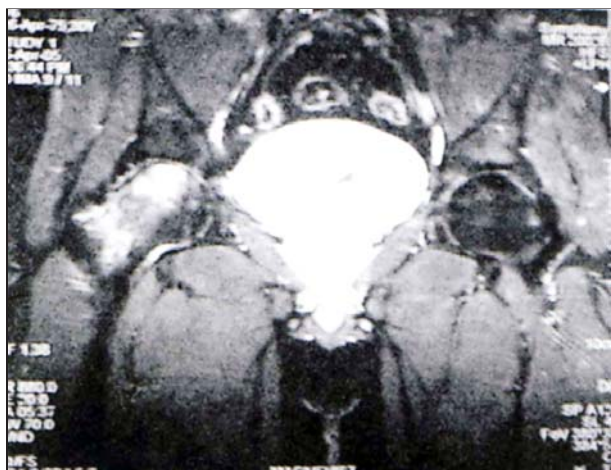
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sequence. Femoral head was grossly normal in outline and morphology.No joint effusion was seen.Postgadolinium enhanced sequence showed heterogeneous contrast enhancement in the involved region (mentioned above). Left hip joint showed structures of normal signal intensity and morphology (Fig 1,2).

A diagnosis of transient osteoporosis/edema involving right hip was made, with a differential diagnosis of early AVN (Avascular necrosis) was kept in mind. The patient was advised avoidance of weight bearing and analgesics as required and was advised follow-up after 8 weeks. After 8 weeks, pain had decreased. Repeat MRI was done which showed almost complete resolution of earlier MRI changes (Fig-3,4).Patient was advised gradual weight bearing and avoidance of activities like jumping, kicking etc. After another 8 weeks of follow-up, patient was completely pain free.That patient presented to us around 1½ years later with similar complaints in left hip region. A plain radiograph of both hip joint with pelvis was done which was normal and routine blood tests as done earlier were also normal.A MRI of the both hp joint with pelvis was done which showed similar changes in left femur as was seen in right femur previously. The right hip this time was perfectly normal.A diagnosis of TOH left hip was made, though a possibility of early AVN was also kept. The patient was advised avoidance of weight bearing and analgesics as required.Repeat MRI done after another 10 weeks showed almost complete resolution of changes in left hip. Pain had regressed to mild severity by this time. Further follow-up showed complete resolution of pain in another 6-8 weeks period.



**Fig-1: Post Gadolinium Weighted T<sub>1</sub> Coronal Image Showing Contrast Enhancing Area Involving Right Femoral Head & Neck**



**Fig-2: TIR Coronal Image Showing Localized Area of Hyperintense Signal Involving Left Femoral Head & Neck**



**Fig-3: T<sub>2</sub> Weighted Coronal Image Showing Normal Marrow Signal of both Femoral Head & Neck**



**Fig-3: T<sub>1</sub> Weighted Coronal Image Showing Normal Marrow Signal of both Femoral Head & Neck**

### Discussion

TOH is a spontaneous skeletal disorder characterized by sudden onset of severe pain which resolves within 6-12 months.The main differential diagnosis of TOH include AVN, stress fracture of neck of femur, septic arthritis, soft tissue injury, radiculopathy, infiltrative marrow



process and inflammatory joint diseases (5). Men in their 4<sup>th</sup>-7<sup>th</sup> decade account for more than  $\frac{2}{3}$ <sup>rd</sup> of reported cases (6). In our patient, the age was 31 years at presentation i.e. early 4<sup>th</sup> decade. As mentioned earlier, it is mainly idiopathic, though microvascular trauma is the most common accepted theory. Moderate to severe pain and difficulty in bearing weight are the most common presentation. Pain with weight bearing progresses and peaks in 4-8 weeks. In our patient, the pain was maximum with weight bearing 4-6 weeks of symptom onset. Plain radiography done early in the course of TOH is usually normal. By 4-8 weeks diffuse osteopenia and cortical thinning in femoral head, neck and intertrochanteric region may be seen.

In case of AVN, sclerosis followed by articular surface flattening, subchondral collapse finally and end stage degenerative joint disease are the changes seen at different stages on plain radiography (8). Bone scanning is often abnormal, earlier than plain X-rays with focal increased uptake (7). In AVN, photopenic lesion is seen. In our patient, X-rays were done early in the course of the disease both times and were normal. MRI changes in TOH include diffuse edema, absence of focal defects, intact articular surface, absence of double line sign which is commonly associated with joint effusion. Decreased signal intensity of bone marrow in femur on T<sub>1</sub> weighted images and increased signal intensity related to intensity of normal bone marrow T<sub>2</sub> is seen typically in MRI of TOH (8).

In case of Avascular necrosis, low signal intensity on T<sub>2</sub> and increased signal intensity on T<sub>1</sub> weighted images is seen (8). Focal subchondral femoral head defect and double line/crescent sign on T<sub>2</sub> weighted image mainly (i.e. high intensity rim inside a low intensity margin surrounding necrotic lesion) is seen classically. In our patient, T<sub>2</sub> weighted sequences showed hyperintense signal in the involved region and hypointense signal intensity on T<sub>1</sub> weighted images in corresponding areas, in both right and left hip involvement. No double line was seen, no joint effusion was seen, femoral head was normal in outline and morphology. In a study of 32 patients (28 males and 4 females) who presented with pain, limping with minimal or no restriction in range of motion, were subjected to plain X-ray, bone scan and MRI. The reports were consistent with TOH. 3 male patients had bilateral involvement 1 to 3 years apart (9). In our patient involvement of other hip occurred around 20 months apart. The management of TOH involves avoidance of

weight bearing mainly as the involved bone is osteoporotic during the course of TOH and a risk of fracture femoral head or neck is always there. Analgesics should be given as and when required. Alderone has been studied to be successful in treating hip pain in a case of post partum bilateral TOH (10). Deflazacort has been used in similar situation (11). A role of calcitonin in TOH is pregnancy has been studied as well (12). Surgical core decompression, for relief of increased intramedullary pressure as advocated for AVN, is sometime used in severe/refractory and protracted cases, although its exact role in idiopathic TOH need to be defined. Some authors report pain relief and early return to function after core decompression (13). However, conservative management of suspected cases of TOH should be advocated with a close eye on follow-up MRI's and symptomatology to avoid necessary surgical intervention.

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