



# Transient Osteoporosis of the Hip-a Case Report of an Amateur Athlete

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## Abstract

Transient Osteoporosis of the Hip is a rare, self-limiting clinical entity characterized by bone marrow edema pattern involving the femoral head and neck. The objective of this paper is to describe and analyze a case of Transient Osteoporosis of the Hip that affected a middle-aged patient, amateur athlete, with non-specific complaints, but whose diagnostic suspicion allowed adequate treatment, as well as a favorable clinical evolution. Transient Osteoporosis of the Hip requires a detailed clinical history and physical examination to allow diagnostic suspicion, whose confirmation is done by magnetic resonance, and thus allowing an adequate therapeutic approach.

**Keywords:** Transient Osteoporosis; Transient Osteoporosis of the Hip; Bone Marrow Edema; Hip; MRI

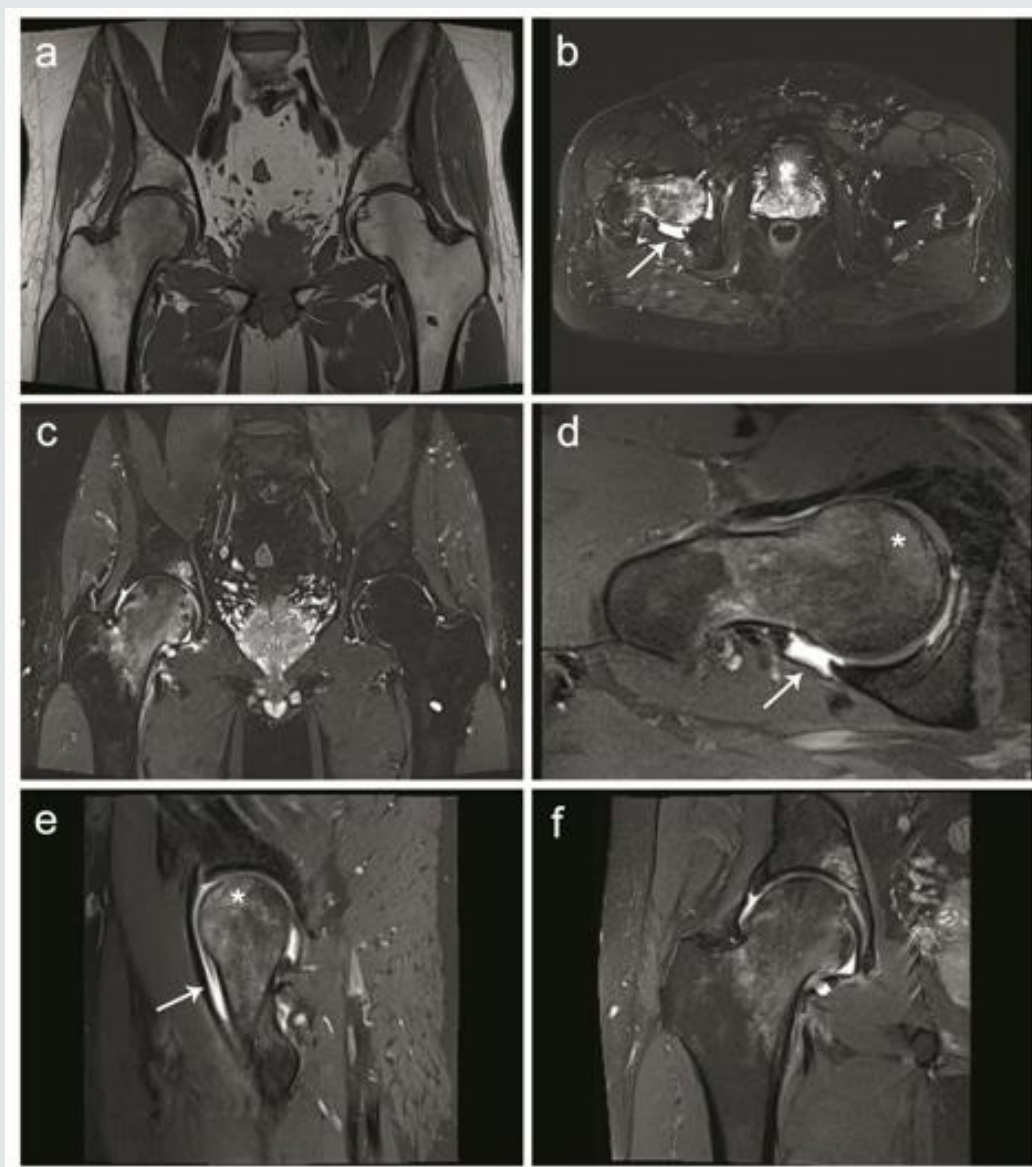
## Introduction

Transient Osteoporosis of the Hip (TOH) is a rare and often overlooked entity [1,2]. It predominantly affects middle-aged men and women in the third trimester of pregnancy [1,3-5]. Clinically, it is manifested by pain located in the hip, whose onset is usually sudden, with no apparent cause and, sometimes, with pronounced functional limitation [1,5]. The diagnosis is based on clinical history, physical exam, and the result of magnetic resonance imaging (MRI), which is currently the most important auxiliary diagnostic test [6]. Treatment consists of conservative measures, and TOH usually has a self-limiting course, with complete resolution of symptoms within 6 to 12 months [4,5].

## Case Report

Male patient, 58 years old, referred to orthopedic consultation in April 2021 due to complaints of pain in the right hip with 1 month

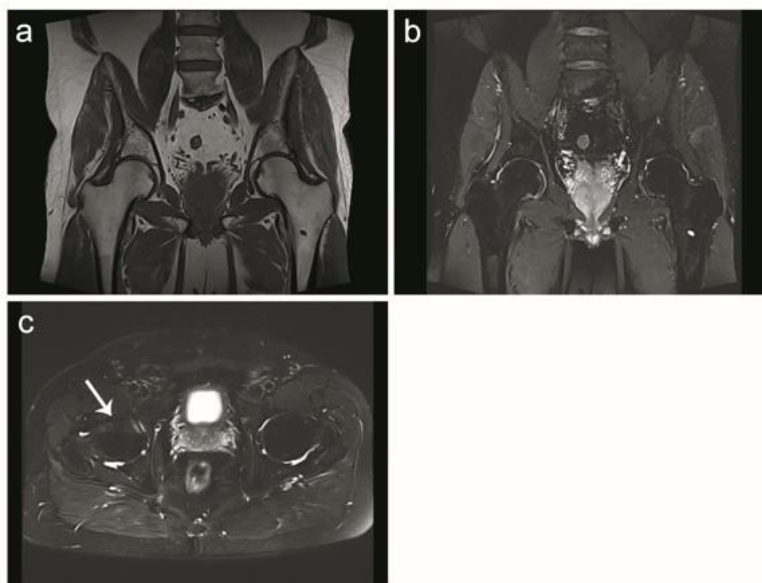
of evolution. He denied trauma and reported that the pain, initially mild, became very intense and prevented walking with load on the limb, but improved with rest and during the night. The patient had no relevant pathological history, did not report smoking or alcoholic habits, denied regularly medication, and practiced padel tennis regularly (about 2-3x a week). On physical examination, he presented claudication, but without any restriction of hip joint range of motion. He performed hip and pelvis X-rays, and blood tests, which revealed no relevant changes. An MRI was performed in May, which showed the presence of extensive bone marrow edema from the femoral head to the trochanteric region, with the presence of a small area of subchondral hyposignal in the superior and anterior aspect of the femoral head, suggesting an insufficiency fracture (Figure 1).



**Figure 1:** MRI of the hips showing an area of extensive bone marrow edema of the right hip, which covers the femoral head and extends through the neck, virtually to the trochanteric region, translated by hypointense on T1-weighted images (a), and hypersignal on T2-weighted images (b) and STIR (c). Images d) to f) represent Proton Density (PD) weighted sequences in which it is possible to see a small line of subchondral hypointense in the superior and anterior aspect of the femoral head, suggesting an insufficiency fracture. (\*). The fracture has a transverse diameter of approximately 21.5 mm and an anteroposterior diameter of approximately 3 cm, involving less than 30% of the joint surface, with no significant collapse of the joint surface being defined. It is also possible to observe a small amount of joint effusion (white arrow).

In view of these findings and in the absence of risk factors for Avascular Necrosis (AVN), the diagnosis of TOH was more likely, and conservative treatment was proposed. He kept walking with crutch support in complete non-weight-bearing, and vitamin D and calcium supplements were prescribed. He was regularly followed up in an orthopedic consultation and, after 2 months of treatment, a new MRI was performed (Figure 2), which showed

a marked reduction in the extent of bone marrow edema. It was allowed to progressively resume the load, keeping crutch support. At the end of September, after 6 months of evolution, he had been asymptomatic for 3 months and had already started walking with a full load and no support. He resumed his sport activity, which he maintains without any complaints or limitations.



**Figure 2:** Control MRI of the hips performed three months after initiation of treatment. A marked reduction in bone marrow edema is observed, with only a small area of bone marrow edema remaining on the anterior aspect of the femoral head (white arrow). a) T1-weighted images; b) STIR-weighted images; c) T2-weighted images.

## Discussion

The first reference to TOH is assigned to Curtiss and Kincaid, who, in 1959, reported 3 cases of pregnant women who developed hip pain during the third trimester of pregnancy [6]. Since then, various designations have been used to describe TOH as regional migratory osteoporosis, transient bone marrow edema syndrome, and reflex sympathetic dystrophy [2,3]. Its cause is unknown, but it is believed that it may have a trauma or inflammatory process as triggering factor, which leads to increased bone remodeling, venous hypertension and/or micro fractures that cause bone marrow edema [4]. About 2/3 of cases occur in middle-aged men, with the remainder being in pregnant women during the third trimester of pregnancy [7,8]. Usually, patients report sudden-onset pain located in the hip with no traumatic history. It can be located in the groin, anterior aspect of the hip and thigh or buttock region and is characteristically exacerbated by load, improving at rest and during the night [3]. It can be extremely debilitating, even preventing any load on the limb. Paradoxically, physical examination is relatively innocent and there is no limitation of joint mobility [1,8,9].

The spectrum of differential diagnoses is broad, encompassing AVN, septic arthritis, neoplasms, inflammatory arthritis, and pigmented villonodular synovitis [7]. Distinguishing between TOH and AVN is particularly difficult, especially at an early stage of AVN. Although there are some differences in what concerns their clinical presentation, such as the absence of significant improvement in pain at rest and limitation of joint movement, auxiliary diagnostic tests are essential for the correct diagnosis and treatment of these

diseases, whose evolution and prognosis are significantly different [7,9]. Blood tests are usually normal [8] and plain X-rays do not show any change before 3 to 6 weeks, at which point they may show diffuse osteopenia [4,9]. MRI is the primary exam with the highest sensitivity for the diagnosis of TOH, as early as 48 hours after the onset of symptoms [6,7]. It's essential in the exclusion of other pathologies such as neoplasms, osteomyelitis and septic or inflammatory arthritis, particularly AVN. Typical findings are the presence of bone marrow edema located in the femoral head and neck, which appears hypointense on T1 sequences and hyperintense on T2 sequences and Short-TI Inversion Recovery (STIR), with a homogeneous, diffuse pattern and ill-defined limits [4]. Klontzas et al published a study in which they observed the MRI of 155 patients with TOH, whose results reinforced the distinction regarding AVN [10]. Like the MRI findings concerning the referred patient, the presence of subchondral areas of hypointense signal is frequent (up to 50%), consisting of subchondral insufficiency fractures [10]. Its appearance is different from the joint collapse present in AVN and its occurrence does not seem to lead to a worse prognosis or to change treatment [10]. The treatment of TOH is based on conservative measures such as non-weight-bearing gait with crutch support, rest, passive joint mobilization exercises and analgesic and anti-inflammatory drugs [1,4]. Drugs such as bisphosphonates, calcitonin or teriparatide seem to reduce recovery time. However, research is little and not very sound, with the use of these drugs remaining controversial. Similarly, surgical treatment with core decompression, unlike AVN, does not seem to bring benefits over conservative treatment [1,4,6].

## Conclusion

This case emphasizes the importance of a high index of suspicion for the diagnosis of TOH, whose rarity leads to it being little known among clinicians. Previously reported as more common in pregnant woman, in fact it may be more prevalent MRI plays a pivotal role in diagnosis and follow-up, with well-defined characteristics that allow for the exclusion of AVN. Treatment is conservative with rest, non-weight-bearing gait with crutch support, joint mobilization exercises and analgesic and anti-inflammatory medication. Moreover, further studies are needed to support other pharmacological or surgical measures.

## Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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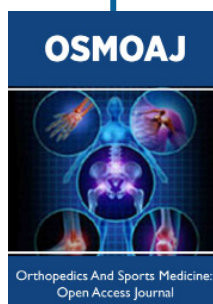


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