



There may be a role for hyperbaric oxygen therapy in Transient Osteoporosis of the Hip

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Transient osteoporosis of the hip (TOH) is a rare clinical condition with usually an unknown aetiology and which typically develops in middle-aged men, or in women in the third trimester of their pregnancy. It is characterized by transient osteopenia and by gradually increasing pain associated with a limitation of the range of motion of the hip. Bone marrow oedema is a typical but nonspecific finding in TOH.

A 33-year-old female patient presented with severe hip pain one month after delivery. Her history was unremarkable except for a Hashimoto's Disease of 8 years' duration. Magnetic resonance imaging (MRI) showed significant bone marrow oedema with increased signal intensity in the femoral head on T2-weighted images. A diagnosis of TOH was made and the patient received a total of 30 sessions of hyperbaric oxygen (HBO) at 2.4 ATA, 2 hours each, in a multiplace chamber. Over the course of HBO treatment, her pain was gradually relieved and she became asymptomatic after one month together with a complete recovery of the range of motion of the hip. MRI of the hips 10 weeks after onset of HBO therapy showed normal signal intensity on T2-weighted images.

Keywords : transient osteoporosis ; avascular necrosis ; hip ; bone marrow edema ; hyperbaric oxygen treatment.

INTRODUCTION

Transient osteoporosis of the hip (TOH) is a rare clinical syndrome with usually an unknown

aetiology and which typically develops in middle-aged men, or in women in the third trimester of their pregnancy (5). It is characterized by transient osteopenia and by gradually increasing pain which is associated with a limitation of the range of motion of the hip (5). Bone marrow edema is a typical but nonspecific finding in TOH (3). Fortunately, spontaneous complete recovery usually occurs within 12 months from onset (5).

CASE REPORT

A 33-year-old female patient presented with severe hip pain one month after delivery. Her history was unremarkable except for Hashimoto's disease of 8 years' duration. Her physical examination revealed painful and limited motion of the right

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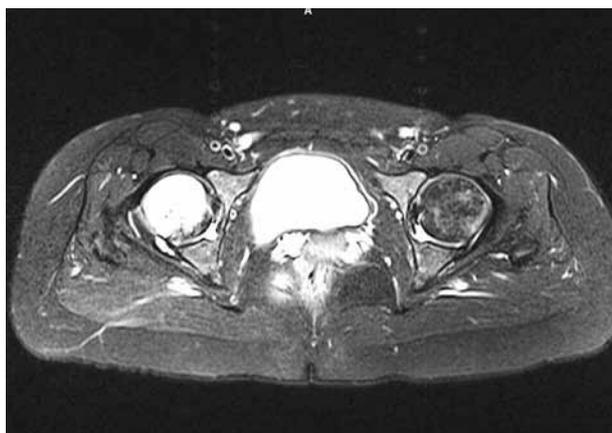


Fig. 1a. — Axial T2-weighted with Fat sat MR image showing increased signal intensity within the right femoral head.

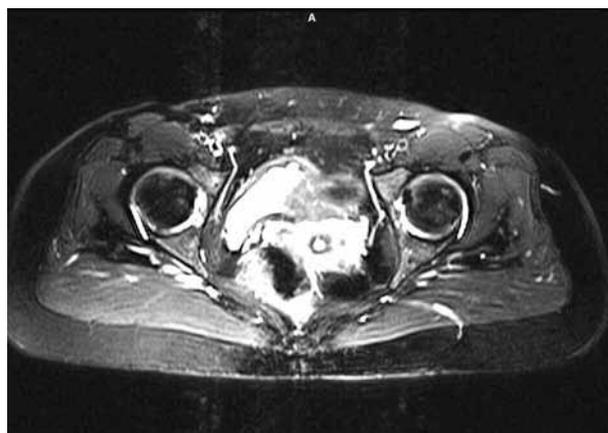


Fig. 1b. — Axial T2-weighted with Fat sat MR image showing the resolution of the hyper-intensity within the right femoral head, 10 weeks after onset of HBO therapy.

hip. Laboratory investigations revealed normal complete blood count, routine serum biochemistry, and urinalysis. Serum calcium, phosphorus, serum alkaline phosphatase, and parathyroid hormone levels were within normal ranges. Magnetic resonance imaging (MRI) showed significant bone marrow oedema with increased signal intensity in the femoral head on T2-weighted images (Fig. 1a). The patient was recommended to use a walking aid without putting weight on the extremity involved and was prescribed NSAID (100 mg/day diclofenac sodium). A diagnosis of TOH was considered, although AVN could not be ruled out. She received a total of 30 sessions of HBO, five days a week, with a break over the weekend at 2.4 ATA, 2 hours each, in a multiplace chamber. Over the course of HBO treatment regimen, her pain was gradually relieved and she became asymptomatic at one month together with a complete recovery of the range of motion of the hip. MRI of the hips carried out 10 weeks after onset of HBO therapy showed normal signal intensity on T2-weighted images (Fig. 1b).

DISCUSSION

In the diagnostic workup of a painful hip, some clinical conditions such as joint inflammation, infection, malignancy, fractures which should be considered in the differential diagnosis, may be

excluded by history, clinical examination, laboratory investigations, and imaging. However, the differential diagnosis between TOH and Steinberg stage-I avascular necrosis (symptomatic painful hip, normal radiograph, positive bone scan, positive MRI) (6), is challenging. Some authors have suggested that TOH may be the initial phase of avascular bone necrosis (1,2). Though difficult it is imperative to discern between these two entities because the prognosis of this last condition can be unfavorable and may need further medical and surgical consideration. Furthermore, a delay in diagnosis of AVN may cause a progression towards the collapse of the femoral head. The acute onset of the complaints, the absence of common risk factors for AVN and the absence of clinical progression favors the diagnosis of TOH. However, even so, the early resolving (10 weeks) of symptoms and signs with HBO compared to the longer duration (6-12 months) of healing with conservative treatment may encourage the use of HBO in cases with early bone marrow oedema.

HBO therapy involves the administration of 100% oxygen at pressures higher than atmospheric pressure to the entire body. The treatment is provided in a monoplace or multiplace hyperbaric chamber. The patient also breathes 100% oxygen through a mask or head tent. By means of its vasoconstrictive effect, HBO reduces tissue

oedema. The most rapid action of HBO is the suppression of oedema, thereby lowering the intraosseous pressure, restoring venous drainage, and rapidly improving the microcirculation (4). Because in either TOH or AVN, the earliest finding is bone marrow oedema, HBO may hold some promise ; however, its role in the management of TOH and AVN should be further confirmed in randomized controlled trials.

REFERENCES

1. **Froberg PK, Brunstein EM, Buckwalter A.** Osteonecrosis, transient osteoporosis and transient bone marrow edema. *Radiol Clin North Am* 1996 ; 34 : 273-291.
2. **Guerra JJ, Steinberg ME.** Distinguishing transient osteoporosis from avascular necrosis of the hip. *J Bone Joint Surg* 1995 ; 77-A : 616-624.
3. **Hayes CW, Conway WF, Daniel WW.** MR imaging of bone marrow edema pattern : transient osteoporosis, transient bone marrow edema syndrome, or osteonecrosis. *Radiographics* 1993 ; 23 : 1001-1011.
4. **Nylander G, Lewis D, Nordstrom H, Larsson J.** Reduction of postischaemic edema with hyperbaric oxygen. *Plast Reconstr Surg* 1985 ; 76 : 596-603.
5. **Schapira D.** Transient osteoporosis of the hip. *Semin Arthritis Rheum* 1992 ; 22 : 98-105.
6. **Steinberg ME, Hayken GD, Steinberg DR.** A quantitative system for staging avascular necrosis. *J Bone Joint Surg* 1995 ; 77-B : 34-41.