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Case report

Stress fracture in acetabular roof due to motocross: case report☆

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ABSTRACT

One of the first steps to be taken in order to reduce sports injuries such as stress fractures is to have in-depth knowledge of the nature and extent of these pathological conditions. We present a case report of a stress fracture of the acetabular roof caused through motocross. This type of case is considered rare in the literature. The description of the clinical case is as follows. The patient was a 27-year-old male who started to have medical follow-up because of uncharacteristic pain in his left hip, which was concentrated mainly in the inguinal region of the left hip during motocross practice. After clinical investigation and complementary tests, he was diagnosed with a stress fracture of the acetabular roof.

Fratura de estresse no teto acetabular por motocross: relato de caso

Palavras-chave:
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RESUMO

Um dos primeiros passos para se reduzirem lesões, como a fratura de estresse no esporte, é conhecermos e nos aprofundarmos no estudo da natureza e extensão dessa patologia. A seguir apresentamos um relato de caso de fratura de estresse no teto acetabular por motocross. Caso considerado raro na literatura consultada. Descrição do quadro clínico: paciente de 27 anos; masculino, iniciou seguimento médico por dores incaracterísticas no quadril esquerdo, concentradas principalmente na região inguinal do quadril esquerdo durante a prática de motocross. Após investigação clínica e por exames complementares, diagnosticou-se fratura de estresse no teto acetabular.

☆ Study carried out at the Discipline of Orthopedics and Traumatology, Faculdade de Medicina, Universidade de Taubaté, Taubaté, SP, Brazil.

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Introduction

Stress fracture is a bone injury caused by the inability of a bone to withstand chronic overload, among other reasons.[1,2] It differs from traumatic fractures in osteoporotic bones. We can also define stress fracture as an inadequate adaptation of the bone in response to the mechanical loads.[3] Microscopic fissures in bone morphology, without rest from mechanical loads and without adequate time for their repair, may result in stress fracture.[3]

The first clinical description of stress fractures was reported by Breithaupt, a German military surgeon in 1855, *apud* Armstrong et al.[4] Stechow reported, in 1897, *apud* Armstrong et al.,[4] the first radiographic confirmation of stress fractures in military recruits, the fracture of a metatarsal bone. The diagnosis remained only among the military until Pirker *apud* Armstrong et al.,[4] Iwamoto and Takeda[5] reported the first stress fracture diagnosis in athletes, a transverse fracture of the femoral diaphysis in 1934.

There has been an exponential growth of motocross practice throughout the world, with an increase also in the number of amateur practitioners. Due to the extreme physical and physiological demands associated to worse physical fitness, amateur riders often suffer from fatigue. A localized muscle fatigue may result in inadequate function on demands that are specific to the sports modality, thus affecting the performance and resulting in musculoskeletal injuries.[6]

Motocross competitions are usually carried out in closed tracks with distances that can reach 1500 m. These tracks incorporate natural terrain features with varying numbers of jumps and curves. People unfamiliar to the sport often assume that the pilot does nothing more than drive a motorized vehicle around a field. However, motocross places a high degree of physical stress on the upper limbs and gluteus muscles (Fig. 1).

We report a case of stress fracture of the acetabular roof due to motocross practice.

Fig. 1 – Motocross biomechanics, jumps and curves.

Clinical case description

A 27-year-old male amateur motocross rider, searched medical attention due to uncharacteristic pain in his left hip, concentrated in the inguinal region during motocross practice during a month. He denied chronic medication use, previous surgeries or previously diagnosed chronic diseases.

The patient competed in amateur closed-circuit races, with distances ranging from 1200 to 2500 m, including frequent jumps, always while wearing personal protective equipment. He had training sessions three times a week and competitions on the weekends, which lasted between 15 and 30 min.

Physical examination at admission showed weight 70 kg, height 1.75 m, BMI = 22.87, with no abnormal facies.

Physical examination of the left hip:

- *Inspection*: mild limping during gait; without atrophies.
- *Palpation*: no pain on palpation of bone and soft tissue structures of the anterior, lateral, posterior and medial regions of the left hip;
- *Specific tests*: Trendelenburg: negative; Ludloff: negative; Thomas: negative; Ober: negative.
- *Degree of mobility*: extension 0°–30°, flexion 0°–120°, lateral rotation 0°–45°, medial rotation 0°–35°, abduction 0°–50°, adduction 0°–30°.
- *Neurological strength test*: Grade V: full motion against gravity and against great resistance.

Concomitantly, imaging tests were requested: hip radiography on 03/03/2011 disclosed no signs of fracture, no abnormalities in the acetabular version angle, and no deformities. Due to the lack of relevant informations obtained by radiographies, hip MRI was requested and performed on the same day (Fig. 2).

Discussion

Publications on the physical and physiological stress observed in motocross pilots after an official competition and/or technical and tactical training are still scarce. Thus, to understand the neuromuscular and biomechanical variables of this sports modality can be one of the first steps to reduce injuries such as stress fractures.

Stress fractures have been described in many sports modalities, such as athletics, tennis, basketball, volleyball, football and baseball.[7,8] However, we found no articles in the literature on stress fractures in the acetabular roof caused by motocross practice, which demonstrates the rarity of the reported case.

There are several factors for risk of stress fracture. They are divided into intrinsic (gender, age, ethnicity, and muscle strength), extrinsic (training regimen, footwear, training surface and type of sport), biochemical (bone mineral density and bone geometry), anatomical (foot morphology, leg length discrepancy and knee alignment), hormonal (delayed menarche, menstrual disorders and contraceptive use) and nutritional disorders (calcium and vitamin D deficiency).[8]