Case report

Surgical treatment of ischial tuberosity avulsion in teen athlets – a case report

Patrícia Pires, João Valadas, Marco Pato, Ricardo Rocha, Pedro Beckert
Department of Orthopedic Surgery, Hospital Professor Doutor Fernando Fonseca (Amadora, Portugal)

Abstract

Avulsion fractures of ischial tuberosity are traumatic lesions relatively rare that occur mainly, in the following sports: soccer, sprinting and gymnastics.
The authors report a clinical case of a 13-year-old boy with an avulsion fracture of the ischial tuberosity by indirect trauma during a soccer game, describing its surgical treatment with two sponjy cannulated screws and the respective clinical outcome.

Keywords

Ischial tuberosity; avulsion; trauma; surgery

Introduction

The ischial tuberosity constitutes the insertion of the harmstring muscles (long portion of femoris biceps, semitendinous, semimembranous) and the adutor magnus. The first group acts in knee flexion and hip extension.[2] The ossification timing of this apophysis during skeletal development is not well defined, but usually fuses until 25 years-old. Since these lesions occur more frequently in non-ossified apophysis, these are less common in adults.[3] Although they are rare, these avulsions constitute the most severe type of lesion of the harmstrings,[4] dividing is two categories: traumatic and non-traumatic.[3] When these lesions happen after a traumatic event, they manifest as: a sudden pain posterior to the hip or thigh with an abnormal gait or inability to walk, oedema or buttock ecchymosis, inability to seat, changes in the mobility of hip or knee with intense pain na extension, adduction and external rotation of the hip.[2] Apophysitis result in less complications and occur at a lower mean age, in comparison to the avulsions that may lead to chronic pain referred to the posterior aspect of the thigh.[3] The incidence of acute lesions seem to be higher between 15 and 17 years of age,[3]

Corresponding author

Patrícia Pires
patriciapires19@hotmail.com

Figure 1. *Antero-posterior and postero-anterior radiographs of the hip with identification of the avulsed fragment (blue arrow in both radiographs)*

Figure 2. *(a, b) – Coronal view with the inverted comma sign (a) and sagital view og the right hip (b)*

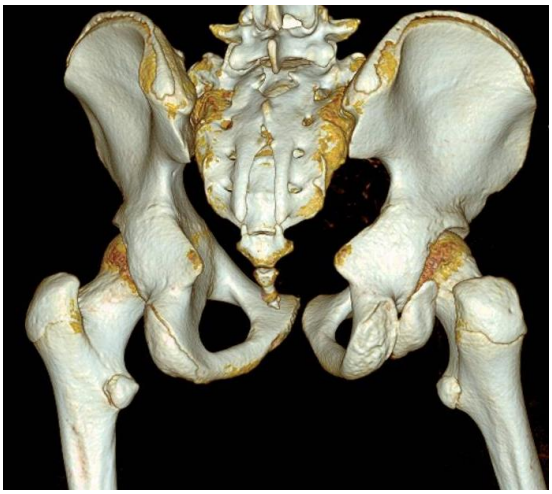

Figure 3. *3D reconstruction of the fragment showing a displacement of about 25 millimeters.*

since it is from that period that starts the ossification of the tuberosity, diminishing its elasticiy and strength (2 to 5 times weaker) in comparison to the normal tendon.[2]

The first description occurred in 1912 by Berry, with the emergence of various case reports, but there is no consensus about the treatment of these fractures.[2] The degree of dislocation of the fragment is usually a decisive factor. In fractures with a slight deviation, conservative treatment is frequently adequate, with indication to movement restriction in an early phase and rehabilitation in a later stage. Starting from 2 cm of deviation, especially in athlets and manual workers with need to a rapid return to previous activity, the most consensual treatment is surgical,[1] since the risk

Figure 4. *Positioning of the patient and demarcation of the subgluteal crease and incision.*

of non-union in complete avulsions might be the double of those seen in partial avulsions.[5]

Despite the conservative treatment has worked in some situations in the past, more recently have emerged analysis about its complications, such as fibrosis, harmstrings shortening, sciatic nerve compression, ischium pseudarthrosis with persistente gait pain.[6] Surgical options include fixation with cannulated screws, anchor sutures, plating or fragment excision,[5,7,8] comprising open or endoscopic techniques.[9]

Case report

A thirteen year-old boy, presented in the emergency room with hip pain after doing a split during a soccer game. After the hyperextension movement of his right hip he described a "pop" sound with a sudden localized pain with inability to walk.[4] He was diagnosed radiographically (Figure 1) with an avulsion fracture of the ischial tuberosity. For better characterisation and planning the patient underwent a computed tomography (CT) scan (Figure 2) with 3D reconstruction. (Figure 3)

The patient right after the Surgery noted a slight hypoestesia in the genital area, but recovered completely. The antero-lateral displacement of the fragment indicates an intense contraction of the harmstring and adutor tendons after the sudden flexion and abduction of the hip and extension of the knee.[1] During the procedure, the patient was positioned in prone position with support of the trunk, pubic symphysis, antero-superior iliac crests with the right knee in flexion in combination with the abduction and internal rotation of the hip. (Figure 4)

It was performed a posterior subgluteal approach, with na incision about 10 cm on the gluteal crease, followed by the subcutaneous dissection and identification of the inferior border of the gluteus maximus muscle.[5,10,11] Its fascia was seccioned and it was lifted away from the work window. Below the gluteus maximus it was possible to feel the avulsed fragment. The surgeon isolated the sciated nerve, protecting it carefully with slightly damp wads and moving it laterally to avoid its contact with the fragment and fibrosis. With hohmann retractors it was bordered the fragment and the fracture bed, allowing the reduction and temporary fixation with 1.4 mm kirschner wires. (Figure 5)

The definitive fixation was performed under direct control by fluroscopy with verification of the trajectory of the implants – Figure 6 – three 3.5 mm cannulated screws (Asnis III, Stryker). Hemostasis and closure were carried out, using vicryl 1-0 in fascia, vicryl 2-0 subcutaneous tissue and vicryl rapide 3-0 to the intradermal suture. The patient was imobilized with an hinged knee brace with extension limitation starting from 50º and free flexion. He was discharged with unloading orders for the operated side with the usage of crutches until 6 weeks, removing the brace and

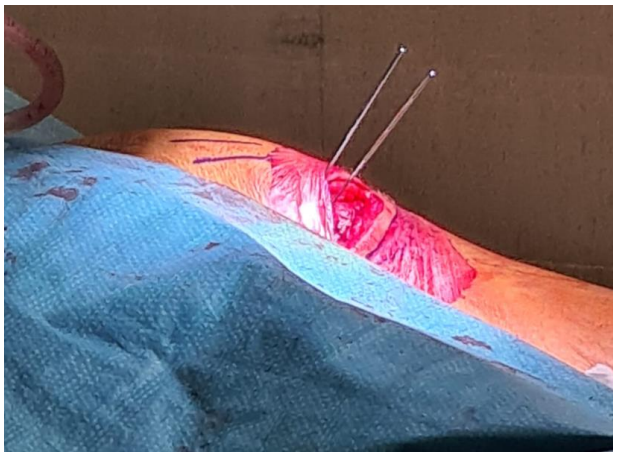

Figure 5. *Positioning of the kirschner wires.*

keeping the crutches for another extra month for protection, but physioteraphy to muscle strenghtening as tolerated. At 3 months he was clinically well with material in situ (Figure 7) but the surgeon mantained his indication of sports inhibition until 6 months after the intervention. The parents of the patient gave written informed consent for the patient's details to be included in this paper.

Diagnosis and Treatment

Early diagnosis of these lesions is important to secure the most appropriate and earlier treatment leading to a faster recovery. In chronical painful non-unions, surgery is the prefered option with good results.[1] The pelvic radiograph allows the diagnosis, but the fragment´s orientation, outline and dimensions are better defined by CT scan. Magnetic resonance reveals the hematoma volume and muscle contusion, such as the ultrasound in experiente hands, but there are not always necessary. Electromyography might have a place in chronical cases with sciatic nerve entrapment.[3] Some authors defend in one hand, the use of magnetic resonance in the occult avulsions, due to the signal intensity in the soft tissues and tuberosity caused by edema and subperiosteal fluid; and in the other hand, the use of ultrasound in the identification of nervous lesions.[2] Avulsion fractures of the ischial tuberosity may be confounded with piriformis syndrome, spinal disc disease, bursitis and bone tumours. Furthermore in some cases, when the treatment occurs after a long time, a pseudoarticular structure with the avulsed fragment may develop, resembling a tumour.[12]

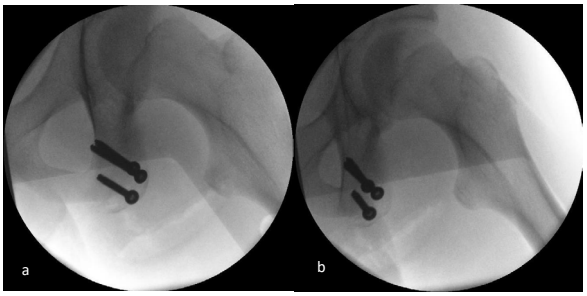

Figure 6. *(a, b) – Postero-anterior (a) and alar oblique view radiographs of the right hip (b)*

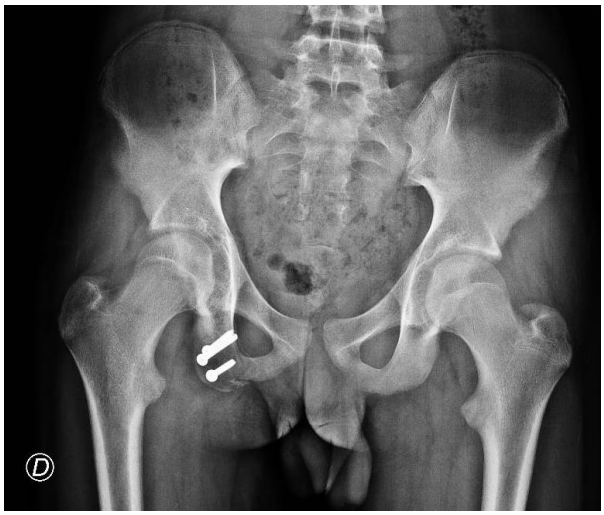

Figure 7. *Antero-posterior radiograph of the pelvis 3 months after surgery*

Conclusion

We consider that an early diagnosis is of utmost importance, such as a detailed histoy and physical exam, with resource of the appropriate complementary diagnostic exams. The degree of suspection as to be high. There is no consensus in the treatment of these situations due to it slow incidence, but na individual plane based on patient´s expectations must be favoured. More and more has been accepted the decisive cut-off to surgery of displacements above 1.5-2 cm [6,13,14,15,16,17], or the persistence of pain after months of conservative treatment.[9]

Conflict of Interest

The authors declared no conflicts of interest.

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