

Case Report

Traumatic avulsion of the anterior superior and inferior iliac spines in adult: A case report

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ABSTRACT

Introduction: Avulsion fractures of the anterior superior and inferior iliac spines are rare fractures. They are mostly observed in adolescents during sports accidents, traumatic forms are even more exceptional.

Case report: Here we report a case of simultaneous and homolateral avulsion fractures of both anterior superior and anterior inferior iliac spines in a 35-year-old male adult after a motorcycle accident. Surgical treatment using an open reduction and fixation of the two spines was performed with very good functional outcomes. Surgical management of iliac spine avulsion fractures allows recovery of the subsequent level of sports activity in most cases.

Conclusion: Avulsion fractures of the anterior superior and inferior iliac spines are rare fractures. Surgical management of iliac spine avulsion fractures allows recovery of the subsequent level of sports activity in most cases. Orthopedic treatment is still used for the management of this type of injury, thus comparative studies are needed to refine the criteria for surgery.

Introduction

Avulsion fractures of the pelvic processes are observed more commonly in young adolescents with well-developed musculatures practicing high-intensity exercises such as soccer, gymnastics and triple jumping or sprinting [1]. These fractures are even less likely to occur among adults [2–4]. The simultaneous avulsion fracture of the anterior superior iliac spine (ASIS) and the anterior inferior iliac spine (AIIS) is even rarer [5]. The typical mechanism is generally a severe injury with a forceful extension of the hip and considerable knee flexion, during intense sport that causes severe tension on the insertions of the long bi-articular muscles that attach to the ASIS (sartorius and tensor fasciae latae) and the AIIS (rectus femoris muscle). Here we report a case of simultaneous and homolateral avulsion fractures of both anterior superior and anterior inferior iliac spines in a 35-year-old male adult after a motorcycle accident. Surgical treatment using an open reduction and fixation of the two spines was performed with very good functional outcomes.

Case report

We report a case of a 35-year-old patient, presented to the trauma emergency department with an important inguinal pain and total functional impotence in left limb following a motorcycle accident. The mechanism of injury reported was a fall while the patient sitting with a hyperextension of the hip and a knee flexion.

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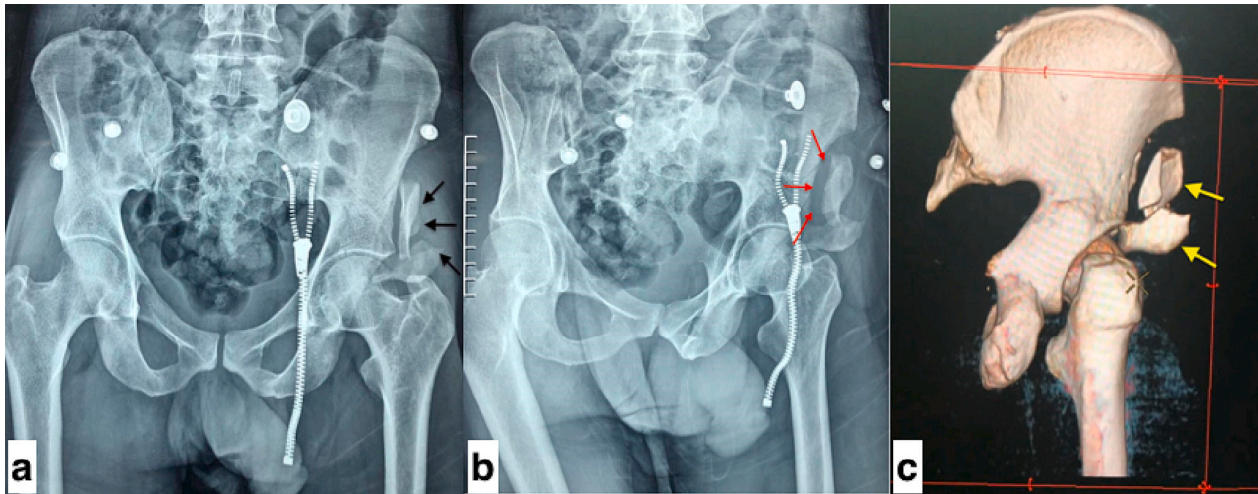


Fig. 1. a, b) Pelvis radiograph showing an avulsion fracture (black arrow) with displacement (red arrow) of the anterior superior and inferior iliac spines, c) 3D reconstruction of tomographic CT scan illustrating avulsion fracture of the anterior superior and inferior iliac spines (yellow arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Clinical findings

Clinical examination revealed a vicious hip and knee posture, bruising over the inguinal region, and painful joint range of motion limitation. Palpation found vivid pain on the anterior aspect of the iliac crest and in the inguinal fold. The rest of the somatic examination was normal.

Diagnostic assessment

X-rays (Fig. 1: a, b) and CT-Scan (Fig. 1: c) revealed an avulsion fracture of the two iliac spines ASIS and AIIS with bone fragments of considerable size and a displacement of more than 2 cm.

Therapeutic intervention

The patient was treated surgically, using an anterior approach centered on the both iliac spines. Reduction and then osteosynthesis were performed using compression screw fixation supported by washers (Fig. 2).

Follow-up and outcomes

Temporary hip immobilization at 60° flexion was maintained for 3 weeks. A passive and active rehabilitation protocol was then initiated. The functional results were satisfactory with a full return to normal activity after 4 months (Fig. 3).

Discussion

The anatomy and biomechanics of the pelvis are very complex and vary with age [6]. Pelvic processes do not appear until puberty and occur in late adolescence and early adulthood, between the ages of 20 and 25 years [7]. During this period, the epiphyseal plate is the weakest point of the muscle-tendon-bone complex, which makes it vulnerable to avulsion fractures, particularly during intense sports activity.

In the pelvis, the Ischial tuberosity avulsion is the most common, followed by the ASIS and then the AIIS. Iliac spine lesions are

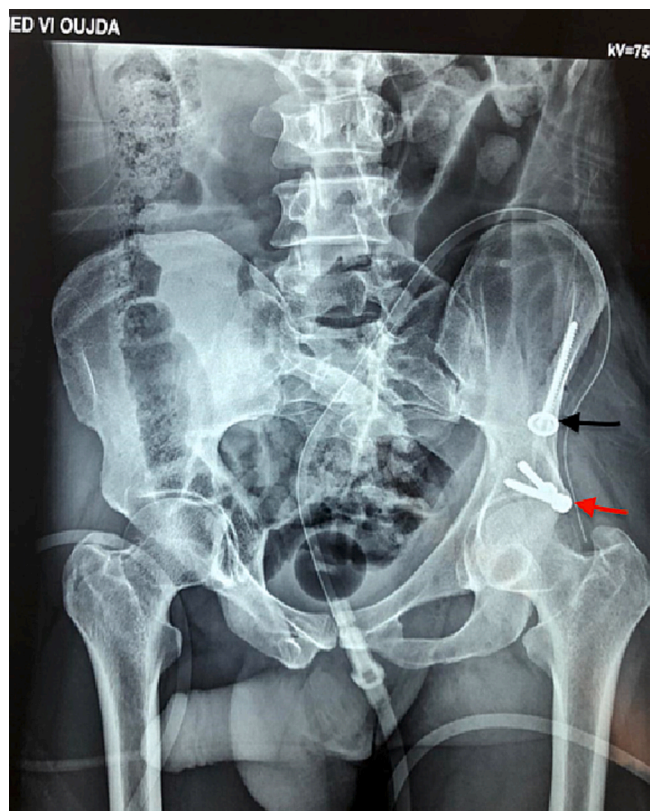


Fig. 2. Postoperative radiography showing osteosynthesis by screwing of the anterior superior (black arrow) and anterior inferior (red arrow) iliac spines. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



Fig. 3. Pelvis radiograph at 02 years showing consolidation and presence of ossification around the anterior inferior iliac spines screw heads (black arrow).

uncommon and usually unilateral [5]. The literature mentions a few cases of iliac spine avulsion fractures in young adults while participating in particular activities [2–4]. Our patient is an athlete with well-developed musculature, and the avulsion fractures of the ASIS and AIIS were caused by a motorcycle accident, according to an indirect mechanism involving stresses in violent tension on the bi-articular muscles that are attached to it. This explains the potential of iliac spine avulsion fractures outside of severe athletic activity, yet with the same implications of these muscles during movements well known in the literature. The tearing of the AIIS is consecutive to an attack of the anterior right muscle during an extension of the thigh associated with a significant knee flexion or during hyper extension of the hip during a jump or the posterior push during a sprint for example.

Conservative treatment used to be the gold standard for these avulsion fractures of the pelvic process [8], whereas full and early resumption of sports activity was not obtained in cases of exostosis pseudarthrosis, which are the main complication of conservative treatment [9]. The restitution of the anatomy obtained by the surgery allows a faster and complete recovery of the pre-fracture sports activity [10]. According to the literature, most authors indicate that surgical treatment is recommended in the management of iliac spine fractures in young active patients and in cases where the fragments are large and the displacement is greater than 2 cm [11]. Open reduction and fixation with a compression screw used on our patient is a reliable and solid technique allowing a complete and rapid recovery of the level of sports activity but sometimes responsible for complications with a variable functional impact such as paresthetic meralgia, sepsis, effraction of the material as well as heterotopic ossifications [12].

CRedit authorship contribution statement

All authors analyzed data and wrote the manuscript; all authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Institutional ethical committee approval

The ethical committee approval was not required give the article type (casereport).

However, the written consent to publish the clinical data of the patient was given and is available to check by the handling editor if needed.

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