

## Avulsion Fracture of the Anterior-Inferior Iliac Spine in a Young Adolescent

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### ABSTRACT

Sport accidents are very common for children and adolescents. They are among the most frequent traumas that occur in domestic and road accidents. They mainly concern the growth plate and the epiphyseal detachments. Among the avulsion fractures of the apophyses of the pelvis, it is very important to cite those of the anterior inferior iliac spine. Although they are rare, they occur most often for adolescents during sport activities. However, they are quite exceptional for adults. In the case of a 14-year-old adolescent with recent basal trauma happening during a soccer game, there was an inguinal pain and functional impairment of the lower limb. The clinical examination found a pain in the mobilization of the right hip in extension. The standard radiograph of the pelvis showed an avulsion fracture of the anterior inferior iliac spine. The patient was treated orthopedically with a rest and discharged from the traumatized lower limb. It has been noticed the disappearance of the pain in a few weeks later and then resumption of the sport activity for six months. During the observation, all attention of the team was centered on this type of specific fracture of the child and the adolescent athlete both diagnosed and how an early and adapted treatment of growth apophysitis helps prevent its occurrence.

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### Introduction

Avulsion fractures of the anterior inferior iliac spine (EIAI) are very rare. The children and adolescents might be victims between the beginning of the processes ossification and their fusion with the corresponding pelvic tuberosities [1].

It is an accident often encountered during an intense sport activity and is responsible for mechanical hip pain that simulates tendinopathy or muscular origin [2]. The most concerned activities are mainly Soccer, Athletics, skating and gymnastics.

In the clinical case discussed beneath, there is deep description of the case of a 14-year-old sportsman with an avulsion fracture of the anterior inferior iliac spine during a soccer game, treated orthopedically with sort of good clinical and radiological following.

### 2° Clinical Case

H.K. is a 14-year-old sportsman who practices soccer very regularly in the neighborhood with his friends. He went for treatment to the ER for straight inguinal pain and functional impotence of the lower limb suddenly.

Without a special history, during a sudden acceleration within the game, he presented a violent pain on the right side of the pelvis, a few centimeters under the iliac crest.

During the inspection, the examination revealed, the absence of obvious deformation, bruising or hematoma. The 14-year's old boy could not flex the hip and the pain palpation regained immediately below the right EIAI with a

hematoma in sight. Finally, the somatic examination was without peculiarities.

The standard radiograph of the pelvis (Figure 1) showed a fracture tearing of the EIAI. In this line, it has been observed that there was no contralateral lesion.

The patient has been treated orthopedically with rest, prescribing non-steroidal anti-inflammatory drugs, analgesics and suggesting partial discharging of the right lower limb by English canes for six weeks. He did not undergo any anticoagulant therapy or put into rehabilitation

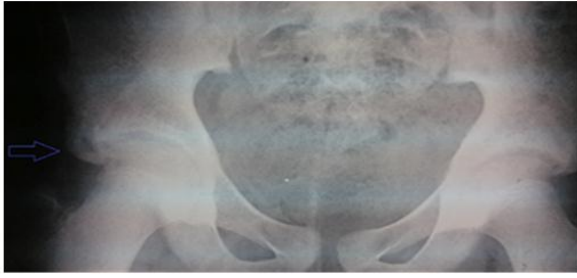


**Figure 1.** Xray of the frontal pelvis showing the fracture-avulsion of the right anterior inferior iliac spine (red arrow).

The results were good with disappearance of pain after a few weeks and a resumption of sports activities after six months. No complications resulted in that period.

Consulted after one year, the clinical examination of the patient was quite normal.

The radiological control balance after 12 months displayed a consolidation of the fracture with significant changes in the right EIAI (Figure 2).



**Figure 2. Radiography of the frontal pelvis after one year showing the avulsion, defect-avulsion of the right anterior inferior iliac spine (blue arrow).**

### 3. Discussion

Avulsion fractures of the pelvic processes are rare lesions. Often observed with children and adolescents practicing intense and violent physical activity, these post-traumatic avulsions mainly concern the anteroposterior iliac spine followed by the anterior inferior iliac spine [1].

The pathophysiological mechanism of avulsion of the anterior inferior iliac spine is often indirect, and is explained by the occurrence of a sharp contraction of the anterior right muscle during the extension of the hip with a flexed knee. An immaturity of this area of muscle insertion can be observed during this period of growth [2].

The clinical situation is characterized by the sudden onset of mechanical pain localized in the area of tearing associated with lameness and functional impotence. These functional signs may be confused with those of tendinopathy or muscle tear. The clinical examination finds pain in the mobilization of the hip accentuated with the palpation of the avulsed fragment and the passive stretching of the former right can trigger the pain.

According to some authors [3], the diagnosis of these lesions is often delayed and the lesion is discovered during a radiological assessment, which shows a hypertrophic callus or a pseudarthrosis. A pelvic radiography facing with occasional incidences 3/4 confirms the diagnosis in showing the removal and possible displacement of the spine according to the stage of ossification [4].

Ultrasound may be useful in early diagnosis. The computed tomography of the hip allows the accurate analysis of the fracture and makes it possible to measure the displacement [5]. In general, a radiological consolidation is achieved by filling the inter-fragmentary space, resulting sometimes in the appearance of exostosis without functional impairment [6].

According to a lot of authors [7], a better treatment is essentially orthopedic based on bed rest, land filling associated with an analgesic treatment. The recovery of activity is performed gradually using a pair of canes in the first weeks.

A surgical treatment should be discussed in displacements greater than 2 cm, in particular in the anterior superior iliac spine according to the literature [8].

Most of the time, the orthopedic treatment gives good functional results, unlike the surgical treatment which does not prevent exostosis or shorten the period of landfill and the resumption of sporting activity.

### 4. Conclusion

In conclusion, the avulsion fracture of the EIAI constitutes a rare and specific pathology of the child, whose early diagnosis, based on clinical and radiology, makes it possible to distinguish them from muscle-tendinous lesions. The main goal is to introduce a therapeutic protocol, obtain a good functional result and consequently avoid complications and sequelae. It is obvious that orthopedic treatment remains based on our experience the best treatment for this type of fracture [7, 9].

### 5. Disclosure of potential conflicts of interest

The authors have no conflict of interest.

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