

## AVULSION FRACTURE OF THE ANTERIOR INFERIOR ILIAC SPINE

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**Key-word: Spine, fractures**

**Background:** A 15-year-old boy complained of pain in the right groin after kicking against a heavy ball. He could still walk, but every time he put weight on his right leg he felt a stabbing pain in his groin area. The pain was very localised, he situated it just above the hip joint.

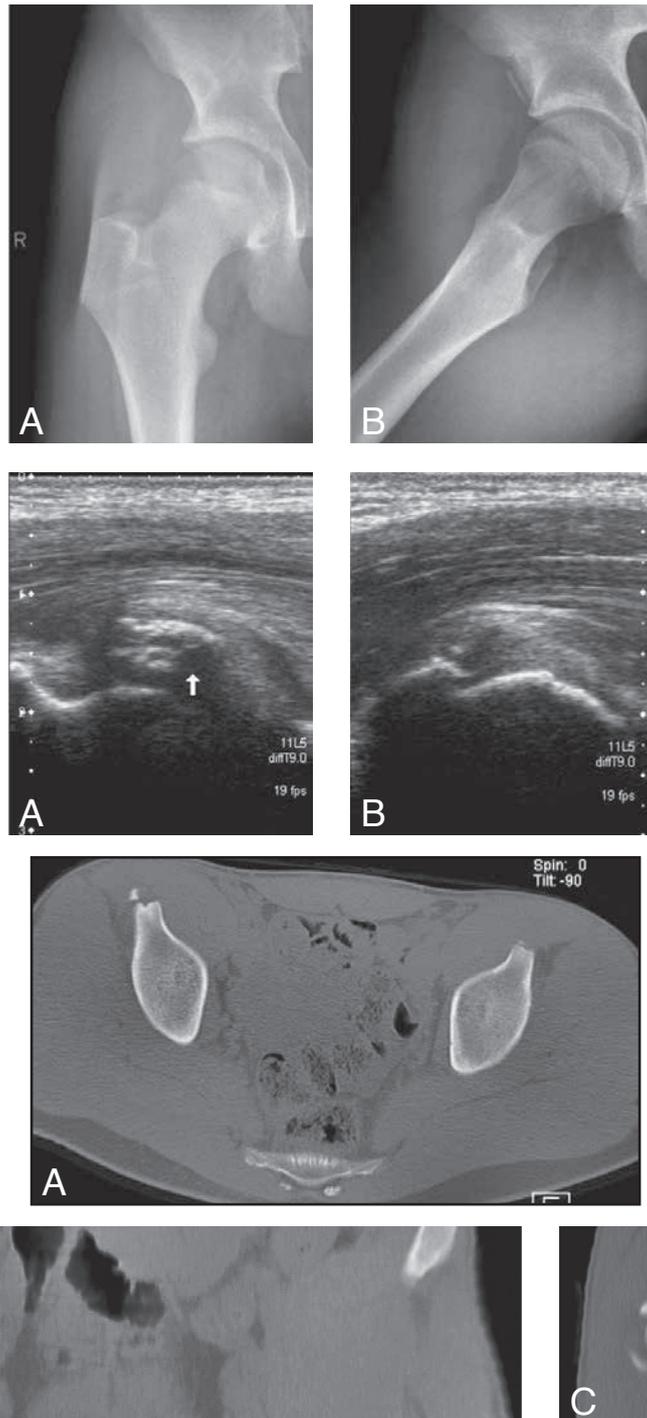


Fig. 

1A	1B
2A	2B
3A	
3B	3C

## Work-up

Conventional radiographs of the right hip (Fig. 1), AP-view (A) and lateral view (B) show an avulsed bony fragment in the region of the anterior inferior iliac spine.

Ultrasonography of the groin region (Fig. 2) consists of a view of the right groin region (A) and a left groin region (shown for comparison) (B) on which no abnormalities are observed.

On a sagittal view cranial to the hip joint, an additional hyperechoic structure with retro-acoustic shadow is seen adjacent to the anterior inferior iliac spine (arrow).

Unenhanced CT scan of the pelvis (bone window setting) (Fig. 3) includes a transverse section (A), a reformatted image in the coronal plane (B) and a reformatted image of the right groin in the sagittal plane (C). These images show the inferiorly displaced avulsed fragment from the right anterior inferior iliac spine.

## Radiological diagnosis

Based on conventional radiography and ultrasonography, the diagnosis of *avulsion fracture of the anterior inferior iliac spine* was made, which was confirmed after CT.

## Discussion

In the literature several cases of anterior inferior iliac spine (AIIS) fractures have been reported. However, these fractures are much less common than avulsion fractures of the anterior superior iliac spine. Just like all avulsion fractures, fractures of the AIIS usually occur in either young people with unfused apophysis, either in older people with weak osteopenic bone. The injury is the result of one single violent contraction or repeated, chronic contractions. The AIIS is the origin of the straight head of the rectus femoris muscle. The rectus femoris is a bicarticular muscle, that plays a role in extension of the knee and flexion of the hip. It's easy to understand that forceful hip extension with the knee in flexion is the cause of this type of avulsion fracture. The condition is therefore commonly seen in soccer players, hockey players, runners and hurdlers.

Patients typically report a sudden severe pain during physical activity, followed by a loss of mus-

cular function. Sometimes a "pop" or "snap" is heard. On physical examination, local swelling and tenderness can be observed. Sometimes the avulsed fragment can be palpated. Walking is still possible, but leaning upon the pathological side can evoke severe pain.

Diagnosis is based on the typical clinical history and radiographic appearance. Radiography is mostly sufficient for diagnosis and shows a bone fragment at the anterior inferior iliac spine. The avulsion has to be differentiated from a 'tug lesion' (metaphyseal fibrous defect, cortical irregularity syndrome) which is a reactive fibrous reaction at the insertion of major muscles, is asymptomatic and shows no correlation with acute trauma. A tug lesion presents radiographically as an irregularity of AIIS with alternating radiolucent and sclerotic areas, on CT scan as cortical thinning and thickening with small cystic areas which are surrounded by sclerotic bone.

CT is only needed when there is no clear traumatic event in the clinical history, in the case of subacute or chronic avulsion fractures, where post-traumatic bone changes can mimic osteomyelitis or even a neoplastic process, and to differentiate from an avulsion fracture of the anterior superior iliac spine. The latter can, if retracted inferior, simulate an avulsion fracture of the AIIS. MRI is useful to differentiate from injuries of the muscles, tendons and ligaments, but is mostly not necessary for diagnosis.

Avulsion of the AIIS is treated with bed rest, with the hips and knees flexed, and analgesia in the acute stage, followed by progressive weight bearing. Recovery time is usually short and varies from 3 weeks to 4 months.

## Bibliography

1. Atalar H., Kayaoglu E., Yavuz O.Y., et al.: Avulsion fracture of the anterior inferior iliac spine. *Ulus Travma Acil Cerrahi Derg*, 2007, 13: 322-325.
2. Stevens M., El-Khoury G., Kathol M., et al.: Imaging features of avulsion injuries. *RadioGraphics*, 1999, 19: 655-672.
3. Tehranzadeh J.: The spectrum of avulsion and avulsion-like injuries of the musculoskeletal system. *RadioGraphics*, 1987, 7: 945-974.