

Case Report

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# Sacral Ala Stress Fracture in a Child

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## Abstract

Difficulties in the diagnosis of stress fractures arise from the nonappearance of radiographic abnormalities in the early stage after the fracture has happened. We report the case of a previously asymptomatic 11-year-old child with no intense physical activity background who presented a stress fatigue fracture of the right sacral ala. Clinical examination disclosed an elective pain located near the right sacro-iliac joint. Neurological examination was normal. All biological tests; spine, pelvis and hips X-Rays were also normal. Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) confirmed a fatigue fracture appearance of the right sacral ala. The total healing of the patient was obtained after 4 months of orthopedic treatment. Sacral fatigue fractures remain a rare event, especially in the pediatric non athletic group. Only five cases have been reported so far in the literature. This can lead to multiplying supplementary examinations and delaying diagnosis.

**Keywords:** Stress fractures; Radiographic abnormalities; Sacro-iliac joint; Sacral fatigue

## Case Report

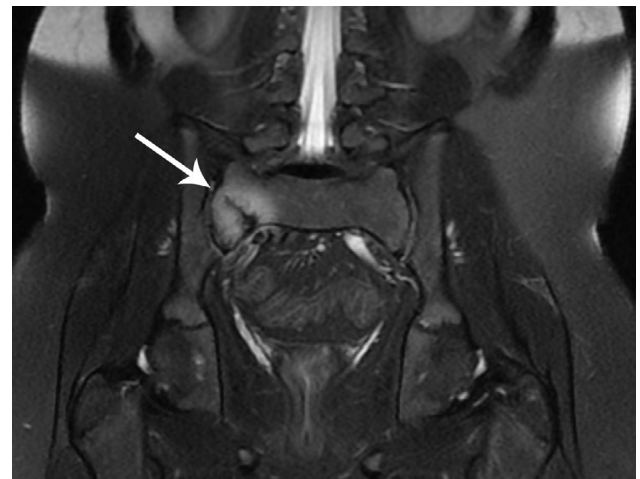
We report the case of an 11 year old child who was referred because of a lameness, low back and right buttock pain with anterior thigh irradiation. He had no medical history except a right hip transient synovitis at 7 years old which has been resolved after three days of rest and analgesia. Patient never had any corticosteroid. The patient's symptoms had insidiously started three weeks prior and he reported no traumatism or intensive physical activity. Clinical examination disclosed an elective pain located near the right sacro-iliac joint. Neurological examination, spine, pelvis and hips X-Rays were normal. Biological results were also cited normal (Ca : 99 mg/l or 2.47 mmol/l ; Ph : 51.8 mg/l or 1.67 mmol/l, 25-OH-vitamine D : 32.5ng/ml or 81.3 mmol/l). The immunological and calcium level analysis were reported normal.

The patient underwent a spine and pelvic MRI that showed no evidence of infectious or malignancy process, nor vertebral or lumbar disc pathology. Nevertheless it disclosed a high T2 signal, corresponding to an oedema, surrounding an oblique signal void line passing by the first sacral foramen on the right side area of the first sacral vertebrae (Figure 1). MRI conclusion was a stress fatigue fracture appearance of the right sacral ala. One month later, a CT scan was performed, showing the overall appearance of sclerosis at the fracture line (Figure 2). The patient became progressively painless after rest, analgesics, and non-weight bearing. MRI at 4-months follow-up showed the absence of any sign of fracture. He went back to normal activities four months after the diagnosis.

## Discussion

Stress fractures are usually sub-grouped in insufficiency fracture and fatigue fracture. Sacral insufficiency fractures are the result of a loss in bone mineral content and elasticity, and occur under normal stress. Risk factors are osteoporosis, pelvic radiotherapy, prolonged glucocorticoid treatment, rheumatoid arthritis and metabolic bone diseases [1], and as a consequence they mostly affect elderly people, especially women. Conversely, sacral fatigue fractures occur under a repetitive or abnormal stress on a normal bone, and they mostly affect young people, especially athletes who practice long-distance running, or gymnastics [2]. Although standard X-Rays are first-line exams, they are often pointless in the diagnosis of fatigue fractures. According to the literature, MRI associated with a CT scan seems to be the most

powerful combination [3,4], allowing positive diagnosis by showing the fracture line itself or sclerosis at the fracture line and ruling out differential diagnoses which are osteomyelitis and malignancy process in the case of chronic bony pain in childhood. Bone scintigraphy could be a useful tool for detecting these fractures for it is as sensitive as MRI, but non-specific and requires further imaging when positive. In our case, MRI was fully contributive, and both clinical and imaging follow-up had led to the diagnosis of fatigue fracture without performing a scintigraphy. In the literature, these fractures appeared to be a rare event but they should be considered as a differential diagnosis in case of chronic low back pain in a child, especially those involved in



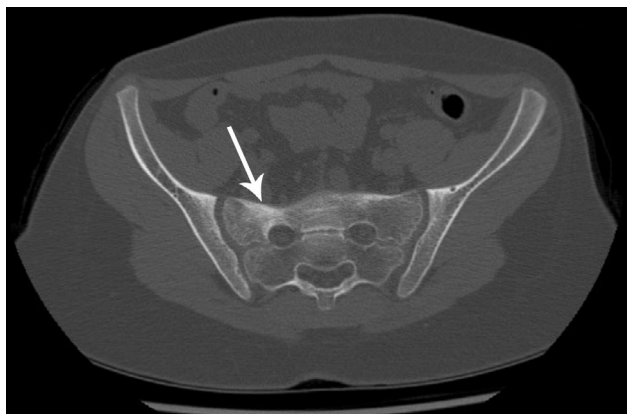
**Figure 1:** Coronal T2 FATSAT MRI showing an oblique signal void line on the right sacral ala surrounded by a high T2 signal.

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**Figure 2:** Axial CT scan showing an oblique linear sclerosis on the right sacral ala passing by the first foramen.

athletic training [2,5,6]. To our knowledge, only five similar cases [7-9] have been reported regarding children that don't undertake intensive physical activity. The context in which they occur and their low incidence can lead to multiplying supplementary examinations and delaying diagnosis.

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