STRESS FRACTURE OF THE ACETABULAR ROOF.
CASE REPORT AND VALUE OF MRI

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The authors report the case of an 11-year-old boy with pain in the left leg without history of recent trauma. The diagnosis of a stress fracture of the acetabulum was made based on MRI and bone marrow biopsy. They discuss the role of MRI in the diagnosis of a stress fracture.

Keywords: stress fracture; acetabulum; magnetic resonance imaging.
Mots-clés: fracture de fatigue; cotyle; résonance magnétique nucléaire.

INTRODUCTION

Stress fractures in children may be mistaken for malignant lesions or infections.

We report the case of an 11-year-old boy with a stress fracture of the acetabular roof, an infrequent location of this pathology.

CASE REPORT

An 11-year-old boy, a regular soccer player, came to our emergency room because of pain in the left groin and limping for more than one month. There was no history of recent trauma or increased physical activity.

Physical examination demonstrated pain on palpation of the left inguinal region, with normal mobility of the hip. Standard x-rays of the pelvis and both hips were negative (fig. 1). Since symptoms did not resolve with rest, further examinations were done, including blood analysis, sonography, scintigraphy and magnetic resonance imaging (MRI). The blood analysis was normal. Ultrasound examination of the left hip showed a small hip joint effusion and a hypoechoic image, suggesting tendinitis of the adductor muscles. A standard x-ray of the pelvis and hip was negative. Increased uptake on the left hemipelvis was seen on bone scintigraphy. On MRI, the T1-weighted imaging sequence revealed a low-intensity signal that became high-intensity on the T2-weighted imaging and the short-tau inversion recovery (STIR) sequence (figs. 2, 3). The T2-weighted imaging also showed a low-intensity signal perpendicular to the cortical bone (fig. 4).

Fig. 1. — AP radiograph of the pelvis 2 months after onset of symptoms. (Note the small cortical lesion due to the bone marrow biopsy.)

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Fig. 2.—T1-weighted imaging sequence revealed a low-intensity signal at the left iliac wing, spreading to the ischial region.

Fig. 4.—The T2-weighted imaging sequence showed a low-intensity signal perpendicular to the cortical bone.

Fig. 3.—The STIR sequence showed a high-intensity signal with extension across the growth plate.

Fig. 5.—MRI six months after the diagnosis shows complete resolution of the pathologic image.

Two weeks after the biopsy, the left hip was painless on physical examination. A follow-up MRI six months later showed complete resolution of the pathologic image (fig. 5).

DISCUSSION

Stress fractures result from repetitive physical activity causing muscle fatigue and compensatory altered gait. These cause changes in the stress application on bone, leading to altered bone resistance (2, 4, 6, 7, 9, 11, 12).

A stress fracture in children is most commonly located in the tibial shaft. These characteristics, together with the appearance of stress fractures...
The absence of a soft-tissue mass and bony destruction is helpful in the differential diagnosis, since this is in favor of a stress fracture (11, 13).

The bone marrow edema may extend away from the fracture site (8, 12). As described by Tyrell and Davies, and as is also seen in our case, extension across the growth plate is possible (11).

Very little literature refers to the time period after which the features for a stress fracture seen on MRI are resolved. Horev et al. described a case of a stress fracture of the tibial shaft confirmed on MRI (5). A follow-up MRI at four months was completely normal. In our case, a follow-up MRI was negative at six months. There was no trace of the biopsy. It is possible that the biopsy stimulated the healing process.

CONCLUSION

The diagnosis of a stress fracture in a child is based on the clinical history and standard x-rays. The differential diagnosis with a malignancy or infection has to be considered until excluded, especially if x-rays are negative.

MRI is more and more frequently used in the assessment of bone pathology. It is becoming the key examination in the diagnosis of bone tumors (11). Besides giving an early positive result, it is also more specific than the bone scan. The STIR-sequence, in particular, has an advantage over the conventional T1- and T2-spin echo. Because of the fat suppression, it provides a more detailed image as well as a better assessment of soft-tissue involvement.

In evaluating a child with a hip problem, one should consider the possibility of a stress fracture that might be diagnosed on MRI, avoiding unnecessary complementary invasive examinations such as a bone biopsy. We however think biopsy of the bone marrow is justified in well-selected cases.

REFERENCES


SAMENVATTING

V. POLLET, M. BELLEMANS, N. DAMRY, J. LAMOUREUX. Een stress fractuur van het acetabulum bij een kind: een case report.


RÉSUMÉ

V. POLLET, M. BELLEMANS, N. DAMRY, J. LAMOUREUX. Fracture de fatigue du cotyle chez l'enfant: description d'un cas.

Les auteurs rapportent le cas d'un garçon de 11 ans qui présentait une fracture du cotyle sans notion de traumatisme. Sur base des résultats de la radiographie, de l'échographie, de la scintigraphie et de l'IRM, une fracture de fatigue du cotyle a été suspectée. Une biopsie de la moelle osseuse a cependant été réalisée, qui a permis d'exclure une pathologie maligne ou infectieuse. Les auteurs discutent l'intérêt diagnostique de l'IRM, en particulier la séquence STIR.