Focal Periphyseal Edema Zone on Magnetic Resonance Imaging in the Greater Trochanter Apophysis: A Case Report

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Abstract

Introduction: Magnetic resonance imaging (MRI) has been used to identify focal bone marrow edema or a focal periphyseal edema (FOPE) zone, in the closing growth plates of adolescent knees.

Case Report: In the current case, an 11-year-old boy reported pain in his left hip. He had been participating in gymnastic classes at school, but otherwise, he was not an active athlete. Based on MRI findings, he was diagnosed with a FOPE zone in his greater trochanteric apophysis. Discontinuity of the cartilaginous growth plate at the FOPE zone was indicative of osseous continuity between the metaphysis and apophysis.

Conclusion: This case suggested that a FOPE zone can occur in a non-weight bearing growth plate and through a tethering mechanism at the initial ossification site during skeletal growth plate maturation.

Keywords: Focal periphyseal edema, hip, greater trochanter apophysis, magnetic resonance imaging.

Learning Points for this Article:
Focal periphyseal edema zone on magnetic resonance imaging can occur in a non-weight bearing growth plate of the greater trochanter apophysis.
the current case because chronic physeal injury is characterized by widening of the physis and irregularity of the metaphyseal line [4], which were not seen. Since there was no traumatic episode in the current case, differential diagnosis included neoplastic and inflammatory lesions. A follow-up MRI examination a week later showed the surrounding marrow edema pattern that was decreased on the T1-weighted image and on the fat-suppressed T2-weighted image (Fig. 3). A follow-up MRI examination 6 weeks after the initial MRI revealed that the abnormal signal intensity had almost completely diminished (Fig. 4). Therefore, the diagnosis of neoplastic lesions could be ruled out. As for infected lesions, osteomyelitis at the epiphysis, or apophyseal infection, was a possibility. However, the pain experienced was mild, and the bone marrow edema seemed not to have substantially manifested. On diagnosing, the possibility of an infection as highly unlikely, a wait, and see strategy was adopted. Blood examination was not performed. In fact, the hip pain had subsided 4 weeks after onset, and the MRI abnormality had improved without any treatment and by the patient abstaining from sport activities, including gymnastics. After ruling out the differential diagnoses of neoplastic and infected lesions, FOPE became the final diagnosis.

Discussion

In a previous report, FOPE zones were reported on knee MRI examinations in a series of 12 patients, comprising 7 girls and 5 boys ranging in age from 11 to 15 years old. The size of the FOPE zone ranged from 2 mm to 27 mm, and all lesions were centrally located at the growth plate [1]. The size of the current case was 4.5 mm in diameter and was located at the center of the greater trochanteric growth plate. These MRI findings, the clinical data, and the age of this patient are similar to those in the previous report, with the exception of the anatomical location. Among the reported 12 FOPE cases of the knee, one case involved the fibula in addition to 2 FOPE lesions, one at the distal femur epiphysis, and another at the proximal fibular apophysis. The proximal fibular apophysis bears less weight than the tibia. The current case in
Conclusion

In summary, the case of a FOPE zone in the greater trochanter apophysis is reported. The current case supports a mechanism, whereby a FOPE zone occurs at the initial site of ossification at the growth plate, and the pain occurs as a result of a tethering mechanism.

Clinical Message

MRI findings have been used to identify focal bone marrow edema patterns that are centered at the growth plate and extend into the adjacent metaphysis and epiphysis of adolescent knee joints. The lesion has been referred to as a FOPE zone. In this report, the case of a FOPE zone in the greater trochanter apophysis is reported. The current case supports a mechanism that a FOPE zone occurs at the initial site of ossification at the growth plate.

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