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Osteochondrosis of the medial malleolar epiphysis: A case report and review of the literature

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ABSTRACT

INTRODUCTION: Osteochondrosis is characterized by a disturbance of enchondral ossification in skeletally immature patients and should be investigated in children having a history of persistent foot and ankle pain. Involvement of the medial malleolar epiphysis is rarely reported.
PRESENTATION OF CASE: We describe the case of a sporty 12-year-old male with osteochondrosis of the left medial malleolar epiphysis treated with a conservative management.
DISCUSSION: Calcanear, navicular and metatarsal apophysis are the most common locations for osteochondrosis in ankle and foot. Anyway other osteochondrosis should be excluded. Medial malleolar osteochondrosis is occasionally described. We performed a review of the relevant literature and we summarized clinical aspects, radiological characteristics and reported management of this painful and probably underestimated condition.
CONCLUSION: Medial malleolar osteochondrosis is a rare but well recognized condition. Only seven cases are described in literature.

1. Introduction

Foot and ankle pain is a common condition in skeletally immature patients. Sport related and traumatic injuries are the most common causes of foot pain with children and adolescents [1–3]. However several different etiologies could lead to ankle and foot problems with this age group. Tarsal coalition, painful accessory bone, biomechanical problems and alteration of the enchondral ossification should be considered and excluded [4].

The increased involvement of skeletally immature patients in sport practice and the growing awareness for injuries, lead to an increasing detection of foot osteochondral alteration with children and adolescents [5–7]. Osteochondrosis is a focal multifactorial breakdown of endochondral ossification in a region of previously normal endochondral growth. During childhood all ossification centres are likely to develop osteochondrosis and a meticulous clinical examination is essential in the diagnostic process. Osteochondrosis of the medial malleolar epiphysis is a rare situation and few cases are reported in literature [8–12].

We reported a case of osteochondrosis of the medial malleolar epiphysis in a sporty male child. We also reviewed the relevant literature about this alteration of the medial malleolar epiphysis being aware that an increased clinical attention to this painful condition could lead to improved diagnosis and treatment among the pediatric population. For the publication of this case report we have taken into account the SCARE-criteria for good clinical case reports [13].

2. Presentation of case

An eutrophic and previously healthy 12-year-old French boy with a 3-week history of left ankle pain was examined in our outpatient department. The pain which started without traumatic events or sport injury, grew heavier and heavier. No history of trauma or ankle infections were reported. He regularly practiced artistic gymnastic ten hours a week. Examination indicated swelling and tenderness of the medial side of the ankle. Pain was located at the medial malleolus and at the malleolar insertion of the deltoid ligament. Ankle and foot range of motion was completed with painful supination and dorsiflexion at the extreme degrees.

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Fig. 1. Anteroposterior of the 12-year old patient showed a radiolucent alteration at the apex of the left medial malleolus. The rest of the ankle joint is normal.

No lower limb discrepancy or malalignment were observed. The radiography showed a radiolucent focal uptake in the medial malleolus apex and a partially fused secondary ossification center of the medial malleolus (Fig. 1). Thickening of proximal portion of the deltoid ligament was revealed with an ultrasonoghrapy evaluation. Inflammatory and infectious diseases were excluded after laboratory exams and it was decided to treat this ankle by a short leg cast for a four week period. At this time the state of the patient was reassessed but the pain resumed at the medial part of the ankle. A CT scan and a MRI were performed. CT scan showed fragmentation at the tip of the medial malleolus (Fig. 2) and MRI demonstrated the presence of fragmentation and bone-marrow edema at the medial malleolus (Fig. 3) which led to the diagnosis of osteochondrosis of the medial malleolus.

He was treated with a cast immobilization for another four weeks. The pain did not completely disappeared after the second cast but a partial weight-bearing walking was permitted. After another 2 months the patient was asymptomatic with a full range of motion for his ankle. A new MRI showed a healing of the medial malleolus and the boy was allowed to resume all his sport activities. No symptoms were reported at the 2-years follow-up.

3. Discussion

Osteochondrosis of the medial malleolus is a rare condition described occasionally in literature [8–11]. Medial malleolus could show an accessory ossification center as a normal variant in growing children. Different studies report an incidence of this secondary ossification center between 1.6 and 47% [14–17].

Age, gender and sport activity may play a part in the explanation of such a high variation of results. Medial malleolus accessory ossification center usually appear from six to eleven years of age and is more frequent in female patients [10].

Sport activities could influence the formation of this accessory ossification center. Tajima et al. compared ankle x-rays of 292 children of a junior football club to 124 control subjects. He reported an accessory center in 11.2% of young football players and in only 1.6% of the control group [17].

Mechanical repetitive tractions of the deltoid ligament were indicated as a possible etiologic key factor to the accessory ossification center formation [10,17]. On the other hand, a recent study analyzed 550 ankle x-rays observing four specific developmental stages of the medial malleolus. LaMont et al. stressed the concept that secondary ossification centres appears as part of a continuum of a development of the medial malleolus [18].

Different clinical problems as avulsion fractures of the accessory ossification center, traction apophysitis of the medial malleolus and osteochondrosis of the medial malleolus were described with the presence of a pediatric medial malleolus pain [8,10,12].

We reviewed PubMed, Medline, Cochrane and Embase databases to identify all patients who had an osteochondrosis of the medial malleolus. We searched for “osteochondrosis” OR “apophysitis” OR “avascular necrosis” AND “medial malleolus”. All of the articles found were included. Five articles discussing 6 cases of osteochondrosis of the medial malleolus were found to which we add our case (Table 1). The seven cases studied consisted of 5 males and 2 females with a mean age of 11years (range 8–13 years) [8–12]. In all cases medial malleolus alteration were not related to ankle injuries and tibial fractures.

Local and systemic biochemical inflammatory activations, genetic predisposition, local ischemia, and mechanical alteration are etiological key factors in osteochondrosis pathogenesis [19].