Bilateral osteochondrosis of lateral femoral condyles: case report and literature review

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ABSTRACT

Osteochondrosis is an injury on subchondral ossification with predominance of immature skeleton and whose etiology remains unknown. It may affect the femoral condyles (usually the medial condyle) and the involvement is mostly unilateral. The authors draw the attention to this usually late diagnosis due to its infrequent occurrence and report a child's rare case of bilateral osteochondrosis on lateral femoral condyles, stressing that just one similar case has been described in the orthopaedic literature up to the present time.

Keywords: osteochondrosis, pediatrics, rheumatology, orthopedics, osteochondritis.

INTRODUCTION

Osteochondrosis is a disease characterized by detaching a cartilaginous segment along with the adjacent subchondral bone in a given joint. It can be defined as a breakdown on subchondral ossification.[1] Traumatic,[2] ischemic,[3] hereditarian,[1] metabolic, and nutritional[4] mechanisms have been studied and proposed as causal factors, but its etiology remains unknown.

All joints can be affected. In respect of femurs, the most common osteochondrosis affects proximal femoral epiphysis (Legg-Calvé-Perthes' disease), but it can affect femoral condyles, specially the medial ones. It is mostly unilateral, but could be multifocal in some cases.[5] Bilateral osteochondrosis on lateral femoral condyles is an uncommon finding and for this reason the authors draw the attention to this usually late diagnosis.

We report a child's case having bilateral osteochondrosis on lateral femoral condyles, stressing that just one similar case has been described in the orthopaedic literature up to the present time.[6]

CASE REPORT

An eutrophic and previously healthy, male, 10-year-old patient who presented a blunt trauma on the right knee evolving with a gradual and slow increase of volume in both knees during a year as well as it was associated with local heat and with functional limitation with no response to rest and non-hormonal anti-inflammatory drugs.

After six months of inconclusive diagnostic medical research in another hospital, he was referred to the Rheumatology Service of the Hospital Universitário Clementino Fraga Filho at the Universidade Federal do Rio de Janeiro presenting a peculiar bulky edema in both knees associated with pain and bilateral hallux valgus deformity (Figure 1). He reported neither complaints relating to other joints nor constitutional symptoms such as fever and weight loss. The biopsy of proximal third of the tibia showed no significant bone changes.

The laboratorial medical research revealed an increase in inflammatory markers (erythrocyte sedimentation rate in 74 mm/h and C-reactive protein in 12,71 mg/L). The complete

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Figure 1
A peculiar bulky edema on knees and bilateral valgus in a child affected by osteochondrosis on femoral lateral condyles.

blood count, renal and hepatic functions, protein and hemoglobin electrophoresis, and ferritin results were normal. The search for mycobacterium, fungi, and bacteria in the synovial fluid was negative. Hormonal disorders and osteometabolic diseases have been excluded by the endocrinology unit, as the serum levels for calcium, phosphorus, albumin, alkaline phosphatase, parathormone, TSH, 25(OH)vitamin D, besides 24-hour phosphaturia, and calciuria levels were normal. Syringomyelia and osteochondrodysplasia have been excluded by resonance magnetic imaging of lumbosacral spine, knee x-rays and computed tomography (CT), as well as the hypothesis for juvenile idiopathic arthritis disease.

The CT scan of the knees showed differences in height and sclerosis on lateral femoral condyles, an irregularity on joint surface, joint effusion and suprapatellar bursa bilateral distension, besides synovial thickening with linear calcifications (Figure 2a). The magnetic resonance imaging of the knees showed synovitis, joint effusion and bone erosion specially in femoral lateral compartment.

Due to the fast disalignment progression together with high gait disturbance, the patient was submitted to surgery for correcting bilateral valgus knee (epiphysiodesis performed with cannulated screws, Figure 2b) and a new biopsy has been performed this time from femoral distal epiphyses in which it showed femoral condylar osteochondrosis.

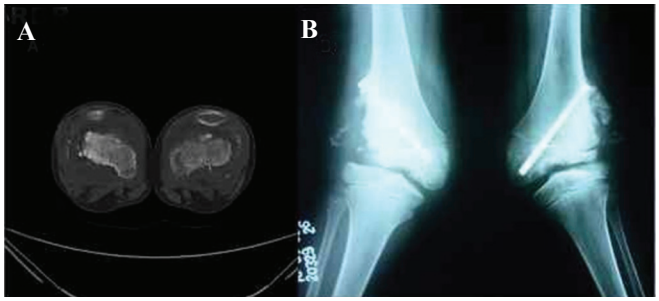

Figure 2
(A) Computed tomography on knees showing sclerosis on femoral lateral condyles, irregularity of joint surface, joint effusion and synovial thickening with linear calcifications. **(B)** Bilateral epiphysiodesis on knees performed with cannulated screws as a first surgical attempt for correcting valgus knee.

Four months after the epiphysiodesis procedure it was still possible to be observed the progression of limb axis deviation, when a new procedure was performed for reducing valgus knee by placing a bilateral external fixation. After 11 months two other orthopedic surgical procedures were needed for releasing the left knee adherences along with the right femur ostetomy following Ilizarov's device femorotibial transarticular mounting as well as the common fibular nerve neurolysis. Four months later the osteosynthesis was performed by using external fixation on left tibia.

Currently, 36 months after the beginning of clinical picture, the patient is asymptomatic, using bilateral external fixation on lower limbs and walking with the aid of crutches.

DISCUSSION

The diagnosis of osteochondrosis is extremely important for the physician and particularly for the pediatrician. It is well known that osteochondrosis is a heterogeneous clinical condition regarding its clinical presentation and severity. However, osteochondrosis have been described in medical literature for a long time.

The first reports on *Osteochondritis deformans juvenalis* date from the early decades of 20th century and they are posterior to descriptions by Legg, Perthes and Calvé as to defining a defect on epiphyseal closing line at proximal femurs.[7] Later on, other anatomical sites which shared similar clinical features have been identified and named according to the writers who studied and reported them as follows: the involvement of the second metatarsal head was the so-called Freiberg's Disease; the involvement of calcaneum was the so-called Sever's Disease, among others.[1]

The term osteochondrosis then arises for the purpose of unifying and describing a group of disorders including the predominance of immature skeleton as well as the preferential involvement of epiphyseal bone, besides fragmentation, bone collapse, and reossification along with the reconstitution of the bone contour.[8] Most recent scientific publications choose to classify osteochondrosis based on the involvement anatomical sites which lead to the traditional divisions in axial skeleton osteochondrosis and apendicular skeleton upper and lower ends.[9]

Its etiology was a reason for several studies, but it still remains unknown. In 1915, Allison believed that a circulatory disorder would explain the defect on the epiphyseal closing line at proximal femurs[7] and the poor blood perfusion was demonstrated by several studies using animal models.[3] In the 30's it was described a possible association to hypothyroidism with delay in the epiphyseal closing and osteochondritis in boys[10] and nowadays it is well known the importance of endocrine, metabolic, and nutritional factors both in physiology and pathology of cartilage.[4]

In the 60's it was raised some reports on osteochondritis of humeral head similar to Perthes Disease on hips with no etiological association to traumas,[11] but the history has showed that the repetitive efforts and traumas play a definite role on the pathogenesis of osteochondrosis.[2]

Regarding the involvement sites, the osteochondrosis of distal femur affects more frequently the femoral medial condyles unilaterally (85% of cases),[1] but it can evolve in varied sites – the reports are from bilateral patella osteochondrosis[12] to multiple osteochondrosis.[5]

The deforming and progressive, chronical clinical presentation towards the reported case has been showed to be a challenge. It was needed to be considered diverse differential diagnoses such as: juvenile idiopathic arthritis, chronical infectious diseases, falciform anaemia, osteometabolic diseases, and syringomyelia.

Although comprising hundreds of clinical entities, osteochondral lesions and bone dysplasias present specific features which have not been observed in our patient. The spondyloepiphyseal dysplasia, for example, affect multiple bones; the achondroplasia courses with short limbs and the increased lumbar lordosis; the enchondromatosis is a disorder usually unilateral in growth plate and affects the development of long bones.[13]

Other important differential diagnosis which also affects the femoral condyles is the osteochondritis dissecans.[14] However, it preferentially reaches the medial condyles, it is usually limited to the femoral epiphysis,[15] it is also associated to repetitive trauma (as it happens in jogging), and both the bone necrosis and the clinical aggression are not frequent, such as in the presented report. It may still have association with meniscus and/or ligamentous abnormalities like looseness.[15] The magnetic resonance imaging is the selection diagnostic method for demonstrating earlier bone and cartilaginous changes when compared to the conventional radiography.[16]

The treatment for osteochondritis dissecans and for femoral condyles osteochondrosis is similar. There is a good response when it is proposed a conservative maneuver (maintenance of daily activities and strengthening of quadriceps) for those lesions which have been identified before surgical and epiphyseal closing related to the cases presenting evidences of free intra-articular fragments and functional impairment.[14]

The present study reports a child's clinical case with histopathological, radiological and clinical findings compatible to the diagnosis of bilateral osteochondrosis on femoral condyles, which has been diagnosed after 12 months of evolution, evolving with a presence of severe deformities and it is in need of multiple surgeries due to a long diagnostic delay. Up to the present time, just another case of bilateral and deforming femoral osteochondrosis has been described in medical literature, but affecting predominantly the hips.[6]

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