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Blount Disease: A Case Report and Review of the Literature

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Abstract **Case Report**

Introduction: Blount disease is an asymmetrical disorder of proximal tibial growth that produces a three-dimensional deformity. Tibia vara is the main component of the deformity. There is general agreement that two clinical forms should be distinguished based on age, infantile and adolescent, with 10 years as the cut-off. ***Case:*** We present a case of 11 year old girl admitted to our radiology department with chronic bilateral gonalgia and genu varum evoluting for a year. The clinical examination reveals bilateral varus deformity of the proximal tibia, a palpable prominence or "beaking" of the proximal medial tibial epiphysis and metaphysic. The diagnosis of blount disease has been confirmed on standard radiography. ***Conclusion*:** Blount's disease remains a rare disease whose etiology is still unknown, seems to involve hereditary and environmental factors explaining its very particular distribution. Radiological investigations are helpful to the diagnosis by showing medial varus malalignment of the tibial metaphysis. Many angles have been described. A mongthem, the mostuseful are the mechanical tibio-femoral angle, metaphyseal-diaphyseal angle (MDA) of Levine and Drennan, and bony tibial slope.

Keywords: Blount disease, standard radiography, Adolescent tibia vara.

INTRODUCTION

Blount disease is an acquired growth disorder of the medial proximal tibial physis and epiphys is that results in a three dimensional deformity of the lower limb dominated by progressive genu varum malalignment [1].

Blount disease exists as twoclinical variants, infantile or early-onset, and adolescent or late-onset, defined based on whether the first manifestations develop before or after 10 years of age.

The exact pathophysiology of Blount disease remains an enigma. The disease is usually viewed as a complication of childhood obesity [2], notably in Afro-Caribbean individuals.

Technical advances in radiography, computed tomography, and magnetic resonance imaging have widely enhanced our ability to detect and characterize the disease and plan the surgical treatment of patients who are senlate and have complex abnormalities with advanced ossification [3].

CASE REPORT

A 11 year old girl was admitted to our radiology department with chronic bilateral gonalgia and genu varum evoluting for a year. The clinical examination reveals a normal body mass index (BMI) of 20, bilateral varus deformity of the proximal tibia, a palpable prominence or "beaking" of the proximal medial tibial epiphysis and metaphysis. The patient presents with no tenderness, knee effusion, or restriction of joint motion.

A Standard antero-posterior radiograph of the knees was performed showing: a medial varus malalignment of the tibial metaphysis, delayed medial ossification of the epiphyseal ossification centre responsible for an increase in bony epiphyseal slope, broadening and contour irregularity of the medial metaphysic producing a beak-like protuberance and lateral subluxation of the tibia.

Many angles have been described. Among them, the most useful are the mechanical tibio-femoral angle, metaphyseal-diaphyseal angle (MDA) of Levine and Drennan, and bony tibial slope [4, 5].

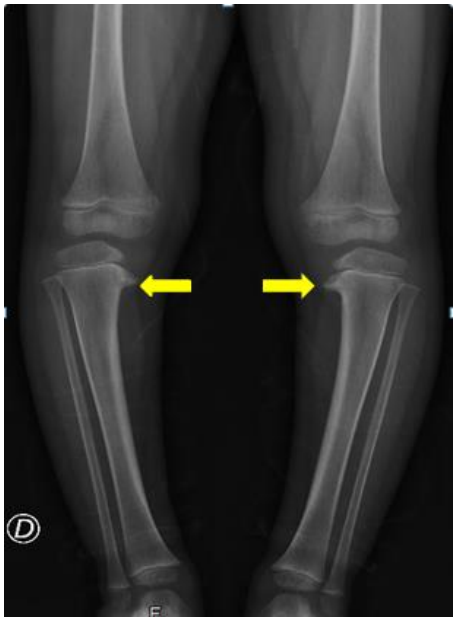

Figure 1: Standard antero-posteriorradiograph of the knees Showing: A medial varus malalignment of the tibial metaphysic, irregularity of the medial metaphysic producing a beak-like protuberance (Arrow)

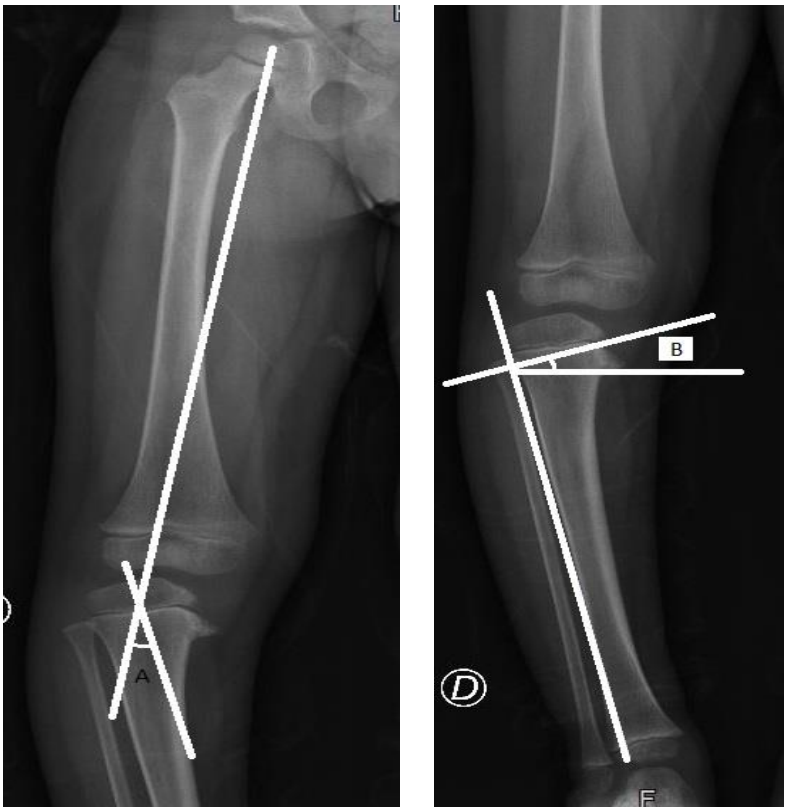

Figure 2: Standard antero-posterior radiograph of the right knee; A): Mechanical tibio-femoral axis (lines through the middle of the tibial and femoral epiphyses): 27° of varus. B): Metaphyseal-diaphyseal angle of Levine and Drennan (MDA) is 20°; this angle is subtended by the line perpendicular to the lateral edge of the tibial shaft and the line through the apex of the right angle and tip of the metaphyseal beak. The MDA is abnormal if greater than 16◦

DISCUSSION

All the authors are unanimous on the lesser frequency of the adolescent forms of Blount disease, compared to the infantile tibia vara [6].

Relatively precise characteristics can be noted in this form: there is a clear male predominance, and the black race seems to be electively affected [6]. Obesity is present in the majority of cases [7], so much so that some authors have expressed alarm at the increasing prevalence of the disease in the black American obese population.

The association of increased body weight with Blount disease is well known and is most likely related to the effect of increased compressive forces on growth inhibition around the knee. A study of 45 children and adolescents with Blount disease noted a strong association between body mass index (BMI) and varus malalignment of the affected extremity in patients with the disease and patients with BMI greater than or equal to 40 kg/m2, irrespective of age of disease on set [2, 4].

However, contrary to what has been observed in infantile tibia vara, no familial form has been observed. This adolescent form is therefore not an infantile form which would start late [6].

The diagnosis is typically considered in a patient older than 10 years of age who presents with painful genu varus deformity. Whe thermild pre-existing bow-leggedness is present remains debated [6].

Our case report is about an 11 year old Moroccan female, with no similar case in the family history, and a normal BMI. She was admitted for chronic bilateral gonalgia and genu varum.

The main radiographic sign is broadening of the medial tibial physis, indicating delayed ossification [8]. The deformities of the medial tibial epiphysis are moderate. The delay in proximal tibial grow this confined to the postero-medialregion. Epiphysiodesis is rare. Varus malalignment is the earliest proximal tibial deformity, but procurvatum and medial tibial torsion develop subsequently [9].

The main concomitant abnormalities are femoral participation to the varus malalignment, of up to 30% in untreated patients, and adaptive valgus of the ankle. Preoperative 3D CT provides accurate information on the bone abnormalities [1, 10].

In advanced forms, lateral ligament laxity results in joint instability. At the end of the course of the disease, the deformities are clearly apparent in all three dimensions [9].

CONCLUSION

Blount's disease remains a rare disease whose etiology is still unknown, seems to involve hereditary and environmental factors explaining its very particular distribution [1-3].

In the adolescent form, the evolution is shortened by the early fusion of the growth plate, and this form has a good bone prognosis.

Technical advances in radiography, computed tomography and magnetic resonance imaging have widely enhanced our ability to detect and characterize the disease and plan the treatment of patients [7, 8].

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