



Bilateral patellar Köhler's disease in an eleven-year-old child with growth retardation *A case report*

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Osteochondrosis of the primary ossification centre of the patella (Köhler's disease) has been reported as a rare cause of anterior knee pain in children between 5 and 9 years of age. The aetiology remains unclear. This is the first case report presenting a late bilateral patellar osteochondrosis with unilateral involvement of the proximal pole in an 11-year old boy with documented growth retardation. This case highlights the importance to thoroughly investigate young patients with patellar osteochondrosis for growth retardation. This case might indicate that growth retardation rather than growth spurt is an important aetiological factor of osteochondrosis.

Keywords : Köhler's disease ; patellar osteochondrosis ; growth retardation.

INTRODUCTION

Osteochondroses are self-limiting disturbances of endochondral ossification characterised by radiological fragmentation and sclerosis of the involved bone. In 1908, Köhler reported about a concurrent osteochondrosis of the tarsal navicular and the primary ossification centre of the patella (5). Moffat presented in 1929 the second case in a 7-year old child (7). The secondary ossification centre of the patella is much more frequently affected by osteochondrosis, a condition also known as Sinding-Larsen-Johansson syndrome (2,6). Osteochondrosis

of both ossification centres has been reported as well (1).

The aetiology of osteochondroses remains uncertain and rather speculative. Growth spurt, catch-up growth or strenuous sports activities have been postulated to be the cause of this benign disease in children between 5 and 9 years of age (1, 4,7-9). This paper is the first to report a case of bilateral osteochondroses of the patella in an eleven-year-old patient with documented growth retardation. This might shed new light on this patellar pathology with unknown aetiology.

CASE REPORT

An 11-year-old boy was referred by the paediatric nephrology department for anterior knee pain

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Fig. 1. — Initial standard radiographs (a) with the axial view of the left patella (b). Note the right bipartite patella on the AP view, and the superior pole involvement of the left knee (c).

on the left side. He had been treated for four years with recombinant human growth hormone (Genotorm® Pfizer) for growth retardation secondary to chronic obstructive nephropathy. At time of consultation, the initial growth hormone treatment had been discontinued for two years but it had been resumed since one month for recurrent growth retardation.

The boy was a competitive soccer and handball player and presented with a history of left anterior knee pain for 5 months. He stated that only sports activities worsened the pain, which had kept him from playing for one month at time of consultation. Clinical examination revealed a normal range of motion and a normal patellar glide test, passive patellar tilt test and Q angle. There was only slight effusion in the left knee. Palpation and provocative tests of the patella were negative. The proximal pole of the patella was not tender. He did not have tight hamstrings or quadriceps. No abnormal clinical findings were noted at the right knee.

Standard radiographs with an axial patellar view were performed. The left patella showed fragmentation and sclerosis of the primary and secondary ossification centre in combination with superior pole radiodensities and irregularity (fig 1). The asymptomatic right patella was bipartite and had similar radiographic findings but without superior

pole irregularities (fig 1). MRI scan of both knees confirmed the diagnosis of osteochondrosis without any evidence of articular cartilage damage (fig 2 & 3). A whole body Tc^{99m}-bone scan was performed which did not show any abnormalities at the knees or other joints.

The patient was allowed full weight bearing. He resumed competitive soccer playing two weeks following the initial consultation despite advice about discontinuation of sports activities. He continued playing and at 7 months following the initiation of symptoms he was completely pain free.

Follow-up at 19 months revealed normal clinical findings for both knees. The patient was asymptomatic. Radiographs and MRI showed progressive osseous maturation, more so on the right side than on the left. There was no complete consolidation yet on either side (fig 3 & 4). No evidence of lesions of the articular cartilage was present.

DISCUSSION

Osteochondroses represent a heterogeneous group of self-limiting disturbances of endochondral ossification of the epiphyses and apophyses of children or adolescents (1,6,8,9). Osteochondrosis of the patella can be the cause for chronic anterior knee pain. Rarely the primary ossification centre of the



Fig. 2. — Left knee T2 weighted sagittal MR image showing oedema in the primary ossification centre and at the superior pole.

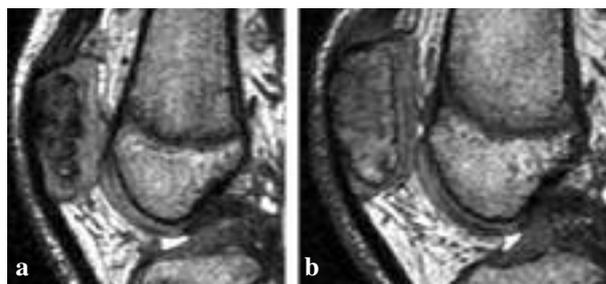


Fig. 3. — Sagittal T1 weighted image of the right knee. a : shows the osteochondrosis at initial presentation ; b : same view 19 months later. The patellar bone has not completely matured at 19 months.



Fig. 4. — Lateral radiograph at 19 months follow-up, showing the extension of the upper pole of the patella due to the proximal pole osteochondrosis (a). Compared to the left side, the right patella appears more sclerotic (b). Axial patellar view showing that the osteochondroses have not completely healed at 19 months (c).

patella is affected between the ages of 5 and 9 (Köhler's disease) (1,4,7,8). More frequently, the secondary ossification centre, usually at the distal pole, is involved between the ages of 9 and 11 (Sinding-Larsen-Johansson) (1,2,6). Why osteochondrosis so rarely develops at the superior pole of the patella remains unknown. This patient is apparently the first case being reported with bilateral involvement of both ossification centres but with unilateral involvement of the proximal patellar pole on the symptomatic side. Both patellae were not painful at clinical examination, and the left knee had only been symptomatic during sports activities. If traction apophysitis of the quadriceps insertion would have been the cause for the complaints, then one would expect the superior pole to be symptomatic at clinical examination and with less strenuous activities, like descending stairs, as well. Therefore, the authors hypothesise that osteochondrosis of the primary ossification centres was the cause of his mild symptoms.

This case challenges the current hypotheses about the causative factors of osteochondroses (1,4,7-9). Histologically, extensive osteonecrosis and reparative changes (granulation tissue, new bone and cartilage) have been found (10). Most frequently, growth spurt or overuse and repetitive micro-trauma due to sometimes strenuous sports activities have been suggested to be the key factors for this cause of anterior knee pain (1,8,9). The question remains whether sports activities really are the cause of the disease rather than the key factor for the osteochondrosis to become symptomatic. Keats presented almost asymptomatic cases and concluded that the irregular ossification, fragmentation and sclerosis of the patella could be a normal developmental variation (3). This might as well have been the case in our patient who was only complaining during sport activities. Second, not growth spurt or catch-up growth but a documented growth retardation was present in this patient with patellar osteochondrosis at an atypical "old" age of eleven years.

Self-limitation is a feature of osteochondroses. This is not different for patellar osteochondroses which can be expected to have a benign course and a favourable prognosis (1,8). When faced with a radiographic irregular ossification centre of the patella, conservative and symptomatic treatment is warranted and the patella can be expected to heal radiographically within two years (1,8).

Orthopaedic surgeons are often faced with symptomatic osteochondroses in patients without having a history of their growth curve. In this particular case the growth curve had been followed extensively prior to his symptoms, leading to the detection of a drop in the growth curve simultaneously with a patellar osteochondrosis that had become symptomatic. This might shed some new light on the aetiology of this pathology and might indicate that patients presenting with this cause of anterior knee pain should at least be more thoroughly investigated by a paediatrician for any causes of growth retardation. The authors acknowledge that further research about this finding is warranted.

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