Kohler's Disease: Acute Foot Pain and Limping in Pediatric Emergency Department

Anil Er[1], Murat Celal Sozbilen[2], Secil Kantas[3], Ezgi Oguz[3], Aykut Caglar[1], Hursit Apa[1]

[1]University of Health Sciences, Dr. Behcet Uz Child Disease and Pediatric Surgery Training and Research Hospital, Pediatric Emergency Department, Izmir, Turkey
[2]University of Health Sciences, Dr. Behcet Uz Child Disease and Pediatric Surgery Training and Research Hospital, Department of Orthopaedics, Izmir, Turkey
[3]University of Health Sciences, Dr. Behcet Uz Child Disease and Pediatric Surgery Training and Research Hospital, Divison of Pediatrics, Izmir, Turkey

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Anil Er
University of Health Sciences, Dr. Behcet Uz Child Disease and Pediatric Surgery Training and Research Hospital, Pediatric Emergency Department, Izmir - Turkey
ORCID: 0000-0003-3452-5123
anler.278@gmail.com

M. C. Sozbilen 0000-0001-7128-6227
S. Kantas 0000-0002-4874-2025
E. Oguz 0000-0001-9193-0358
A. Caglar 0000-0002-2805-5420
H. Apa 0000-0002-0601-4679

ABSTRACT

Kohler's disease is a rare cause of limping in children which is hypothetically related with impaired blood supply of navicular bone by the compression of other tarsal bones. The clinical manifestations are pain and swelling in the midfoot and limping with typical steps on the lateral aspect of affected foot. As it is an elusive entity for physicians, the lack of clinical suspicion leads to utilization of advanced diagnostic tools and delayed diagnosis. Here we present a case of Kohler's disease as a 5 years-old girl with acute foot pain and limping.

INTRODUCTION

The limping is a frequent symptom in children who admitted to pediatric emergency department (PED) [1-3]. Due to broad spectrum of underlying causes, facing a limping child can be a challenge for physicians. Although the vast majority of final diagnoses were transient synovitis, by the concern about missing out more serious disorders such as septic arthritis and malignancies physicians usually appeal to laboratory tests or imaging methods despite their mostly worthless effects [1,4-6]. But the key part of diagnosis is detailed history combined with a systematic examination, even for uncommon conditions. Kohler's disease (KD) is one of the rare cause of gait abnormality in children which can be easily distinguished by clinical suspicion [1,3,7-9]. Thus we present a case of KD with an aim of pointing out the clinical and radiological clues for diagnosis.

CASE REPORT

A 5-year-old girl admitted to PED with limping and right foot pain for two days. Pain was unresponsive

to appropriate doses of ibuprofen and she refused to walk on last day due to the exacerbation of pain by weight-bearing. Her parents denied any fever, recent or chronic illness, overuse or trauma, even trivial foot injuries. The vital signs were appropriate for her age. Even though she had taken 10 mg/kg of ibuprofen 2 hours before admission, physical examination revealed tender to palpation and swelling at the dorsomedial side of her right foot and antalgic gait with steps on lateral side of the right foot. But, there was no warmth, redness, abrasion or ecchymosis and no abnormal neurological finding. The mobility of her hips and ankles was normal and painless. The radiographs indicated a flattened, fragmented and sclerotic navicular bone of right foot which suggested KD (Fig 1). The orthopedic consultant gave information about KD to her parents and recommended avoidance of weight-bearing and short course administration of ibuprofen for pain relief. Short leg walking cast was applied for immobilization to decrease the duration of symptoms. At the follow-up visits the patient's pain and limping regressed after four weeks.

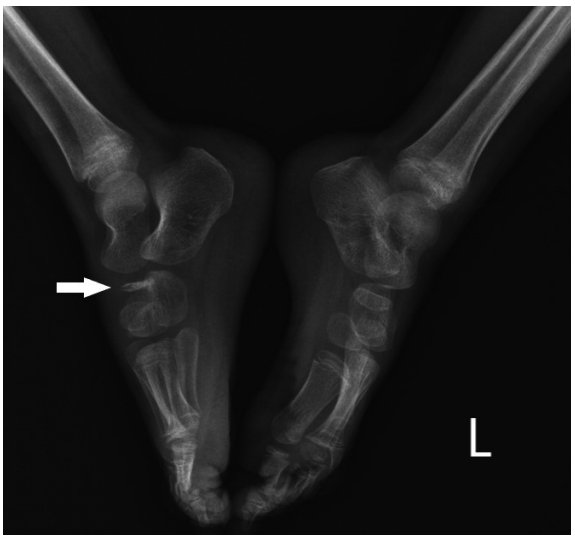

Figure 1. X-ray image of the flattened, fragmented and sclerotic navicular bone (white arrow)

DISCUSSION

Osteochondrosis is the degeneration of growing bones related with the interruption of the blood supply by unknown etiology. The clinical manifestations are pain and disability on the affected part of extremity which are usually hip, knee or foot [8]. Kohler's disease is a scarce one involved navicular in the foot [7,8,10,11]. As reported in our 5 years-old patient, typically it appears between 2-10 years old and boys are affected more and later than girls [7,10,12,13]. As these epidemiological data supported, KD is likely related with the ossification of tarsal navicular that is terminated 18-24 months of age in girls and 30-36 months of age in boys [7,10,12,14]. Although pathogenesis is not clearly understood, navicular bone is the last bone to ossify so it is hypothesized that navicular bone compressed by other earlier ossified tarsal bones while the body weight of child instantly increases. Additionally, the central one third of navicular's blood supply is a watershed zone that increases the incidence of avascular necrosis. Concurrently, the interruption of the blood supply via dorsalis pedis and medial plantar arteries which maintain the perfusion of navicular bone, leads to avascular necrosis [7,14].

The characteristic features of KD are pain and swelling in the midfoot with or without redness, point tenderness localized to navicular and limping. Patients typically step on the lateral aspect of effected foot to avoid exacerbation of pain with weight-bearing on medial aspect [3,7,11]. Accordingly, our patient had tenderness on right midfoot and antalgic gait with steps on lateral side of the right foot. Although KD is usually idiopathic, can also reveal after overuse or trauma [3,7]. The plain radiograph of foot is enough for diagnosis due to its characteristic radiological findings of the navicular in KD. These are flattening called "waferlike or wafer-thin", increased radiodensity related to patchy or uniform sclerosis, fragmentation due to loss of trabecular pattern [3,7,11,14]. Thus, we could easily make diagnosis of our patient due to flattened, fragmented sclerotic right navicular bone on X-ray. But it should be kept in mind that the radiological findings without relevant symptom don't indicate KD [7,14].

As the perichondrial vascular ring of navicular maintains the rearrangement of blood supply, it is a spontaneously resolving condition [14,15]. The treatment of KD is conservative with nonsteroidal anti-inflammatory drugs, rest and avoidance of weight-bearing provided by short leg walking cast, crutches, arch supports, controlled ankle motion (CAM) boots [3,7,11,15]. The symptoms completely resolve within six

weeks to 18 months, but our patient completely recovered within the shorter time period [7,12,13]. Although the duration of symptoms is related with the type and length of therapy, the long-term prognosis is independently favorable [10,12,13].

In conclusion, Kohler's disease is a rare cause of limping in children that is simply diagnosed by radiographs of the foot in case of clinical suspicion. However, the lack of awareness of the physicians physicians may result with underdiagnosis and unnecessarily utilized time-wasting diagnostic tools.

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