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Case Report

Kohler's disease presenting as acute foot injury☆

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ABSTRACT

Kohler's disease is rare cause of foot pain and limping in the pediatric population. The exact etiology of Kohler's disease is unknown. It usually presents as sudden and unexplained foot pain and limping. We report a case of a 5-year-old male who presented to the Pediatric Emergency Department with foot pain and inability to bear weight for two days after overactivity and acute foot injury. The patient was eventually diagnosed with Kohler's disease (avascular necrosis of the navicular bone). Although Kohler's disease is not very common, it should be considered in the differential diagnosis of foot pain in the pediatric population, as it may prevent unnecessary tests and treatments.

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1. Background

Foot pain and limping are common complaints in children who present to the Pediatric Emergency Department (PED). There are several causes such as trauma, infections, and osteochondrosis. Osteochondrosis is a term used to describe disorders that affect the growing skeleton. These disorders result from abnormal growth, injury, or overuse of the developing growth plate and surrounding ossification centers [1]. Kohler's disease (KD) is a rare and self-limiting osteochondrosis (or avascular necrosis) of the navicular bone in children. The condition was first described by Kohler in 1908 [2,3]. It usually affects boys more than girls and classically occurs between the ages of 3 and 7 years [3].

We present a case of a 5-year-old child who presented to the PED with foot pain and inability to bear weight for two days after overactivity and minor foot injury.

2. Case

A 5-year-old male with no significant past medical history presents to the PED with left foot pain and inability to bear weight for two days. The patient's grandmother reports that he had been jumping on the bed and has hit his foot against the bed railing. His symptoms briefly improved after a few hours, but then he started limping and complaining of pain. He was given an inadequate dose of acetaminophen which did not help. He continued to complain of pain and was unable to bear weight on his left foot. His grandmother decided to bring him to the PED for further evaluation.

The grandmother denied any history of fever, weight loss, or any current or recent illness. On physical exam, he was afebrile, and with age-appropriate vital signs. He was not in any distress. Examination of his feet was remarkable for swelling of the dorsomedial aspect of his left foot. The area was warm and tender to palpation. There was no erythema or ecchymosis. The patient had difficulty ambulating. He received a 10 mg/kg dose of liquid ibuprofen, and radiographs of the left foot were obtained. The patient's radiographs revealed a diminutive appearing navicular bone which appeared fragmented and with extensive underlying osteosclerosis, suggestive of KD (Fig. 1).

Podiatry service was consulted. The patient's foot was wrapped in a Jones dressing and placed in a short leg posterior splint. He was advised to avoid weight bearing and to use ibuprofen as needed for pain. The patient's family were educated about KD and advised to follow up with podiatry. A follow up phone call with the patient's family conducted one month after diagnosis concluded that the patient has very minimal discomfort, and is ambulating well.

3. Discussion

Although the exact etiology of KD is unknown, several hypotheses have been put forward as possible etiologies. The most logical of those, is that the position of the navicular bone in the arch of the foot, in addition to the fact that it is the last tarsal bone to ossify, makes it susceptible to mechanical compression by the already ossified talus and cuneiform bones once the child becomes older and more active. The blood vessels supplying the navicular bone become compressed which results in ischemia and avascular necrosis [4].

Signs of KD on exam include tenderness and swelling of the dorsal aspect of the foot, with or without redness. Diagnosis can be made by

Abbreviations: KD, Kohler's disease; PED, Pediatric Emergency Department.

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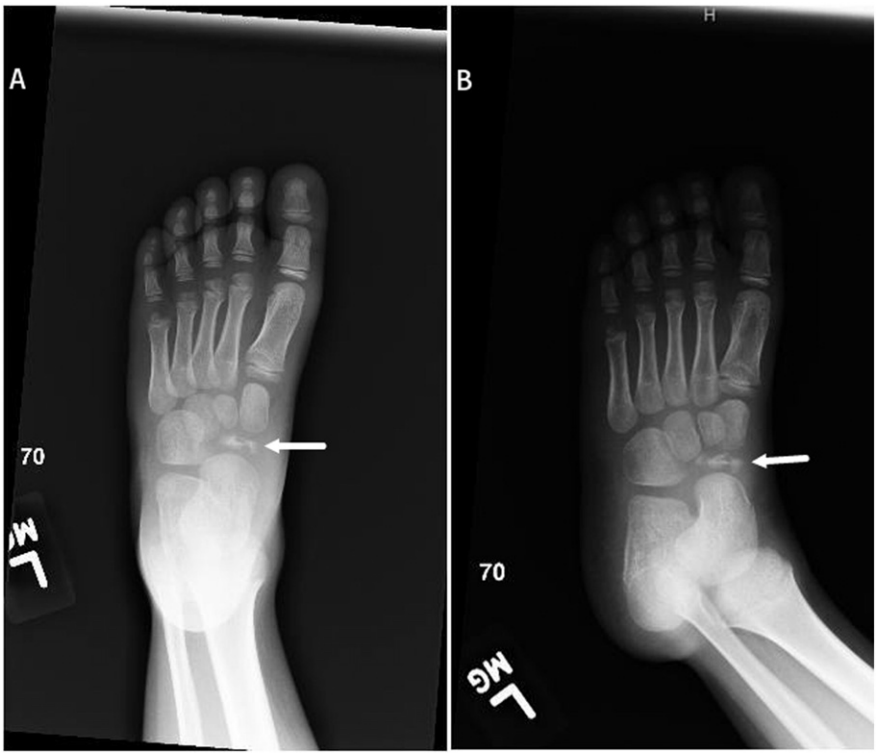


Fig. 1. Frontal (panel A) and oblique (panel B) X-ray views of the left foot showing a diminutive appearing navicular bone which appears fragmented and with extensive underlying osteosclerosis, suggestive of osteonecrosis i.e. Kohler's disease.

simple foot radiographs which will show irregularity, flattening, sclerosis, and fragmentation of the navicular bone [5].

Treatment consists of rest, pain control, and limited weight bearing, or temporary avoidance of weight bearing. A short leg cast applied for a brief period has been shown to help in several cases, and may also decrease duration of symptoms [4,5].

Patients with a cast applied had complete resolution of symptoms at 3 months while patients without a cast had resolution of symptoms at 10 months. The prognosis is generally good, as almost all patients have complete restoration of bone structure between 4 months and 4 years [6]. Patients with persistent pain beyond the expected time for resolution of symptoms need to be examined for other causes such as talocalcaneal coalition or an accessory navicular bone [6]. The patient in our vignette was initially thought to have a tarsal bone fracture due to the history of minor foot trauma. But the patient's symptoms, signs, and radiograph findings were consistent with KD, likely exacerbated by over activity and acute trauma to the foot.

4. Conclusion

KD is a benign and generally self-limiting cause of pain and limping in children. Although it is considered a rare diagnosis, physicians should consider this diagnosis, especially when the pain is in the dorsomedial aspect of the foot. Kohler's disease can present as a sudden unexplained onset of pain and limping, or pain after over activity with or without history of acute trauma. Recognition of this diagnosis may prevent additional unnecessary tests and treatments.

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