Letter to the Editor

KOHLER DISEASE

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To the Editor,

INTRODUCTION

Kohler's disease (KD) is a rare pediatric condition that primarily affects the tarsal navicular bone in the foot. It is named after the German radiologist Alban Kohler, who first described it in 1908 (1, 2). This condition typically occurs in children between the ages of 5 and 10 and is more common in boys. Key features of KD include pain, swelling and limping or favoring one foot. Radiographic imaging, especially X-rays, plays a crucial role in diagnosing KD. X-rays often reveal changes in the affected navicular bone, such as fragmentation, sclerosis, and flattening. KD is generally self-limiting, meaning that the symptoms tend to resolve on their own over time as the affected bone undergoes a healing process. The condition is usually benign, and the long-term prognosis is favorable. Management of KD is typically supportive. This may involve relieving pain through over-the-counter pain medications, providing supportive footwear, and advising reduced weight-bearing activities until the condition resolves.

Etiology

The exact cause of KD remains unclear, but several factors may contribute to its development (1-18). One theory suggests KD results from temporary disruption of blood supply to the tarsal navicular bone, leading to avascular necrosis. Trauma or repetitive microtrauma, particularly in active children engaged in high-impact activities like running or jumping, is considered a potential factor. Developmental factors may also play a role, as the navicular bone undergoes ossification during childhood, and abnormalities in this process could contribute to KD. Though unproven, a genetic predisposition has been speculated. KD is a self-limiting condition, and treatment focuses on symptom management, including pain relief and restricted weight-bearing, until it resolves.

Clinical presentation

KD typically between the ages of 5 and 10. The clinical presentation of KD involves a set of characteristic signs and symptoms related to the foot, particularly the tarsal navicular bone (1-18). The most common and prominent symptom of KD is localized pain and tenderness in the midfoot, specifically over the tarsal navicular bone. The pain may be exacerbated by activities that involve pressure on the affected foot, such as walking, running, or jumping.

Due to the discomfort and pain associated with the affected foot, children with KD may develop a limp or an altered gait. They may avoid putting full weight on the foot to minimize pain. Swelling around the midfoot area may be observed. This swelling is often localized to the region overlying the tarsal navicular bone and may contribute to the

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overall discomfort. Children may experience a reduction in the normal function of the affected foot. This can include difficulty with activities that require normal foot movement, such as running or participating in sports. Radiographic imaging, especially X-rays, plays a crucial role in diagnosing KD.

X-rays typically reveal characteristic changes in the tarsal navicular bone, such as fragmentation, sclerosis, and flattening, confirming the diagnosis. KD is generally considered a self-limiting condition, meaning that the symptoms tend to improve and resolve spontaneously over time. As the blood supply to the tarsal navicular bone improves and the bone undergoes healing, the pain and other symptoms typically diminish.

Diagnosis

The diagnosis of KD involves a combination of clinical evaluation, imaging studies, and the exclusion of other possible causes of foot pain in children (1-18). A thorough medical history is obtained, with a focus on the onset, duration, and characteristics of foot pain. Information about recent activities, trauma, or any developmental concerns is crucial. Clinical assessment includes a physical examination of the foot, with specific attention to the midfoot region overlying the tarsal navicular bone. The physician evaluates for tenderness, swelling, and any signs of altered gait or limping. Radiographic imaging, particularly X-rays of the foot, is a key diagnostic tool for KD.

X-rays can reveal characteristic changes in the tarsal navicular bone, such as fragmentation, sclerosis, and flattening. These findings are crucial in confirming the diagnosis. Other potential causes of foot pain in children, such as trauma, stress fractures, inflammatory conditions, or infections, need to be considered and ruled out through careful evaluation and sometimes additional tests. Blood tests or other laboratory investigations may be ordered if there is suspicion of an underlying systemic condition contributing to foot pain. However, these tests are not typically required for the diagnosis of KD.

Given the self-limiting nature of KD, close clinical follow-up is often recommended. Regular assessments help monitor the progression of symptoms and healing of the tarsal navicular bone over time.

Differential diagnosis

The differential diagnosis of KD involves considering other conditions that may present with similar symptoms of foot pain in children (1-18). It's crucial to differentiate KD from various potential causes to ensure appropriate management.

Freiberg's disease is a condition characterized by avascular necrosis of the metatarsal head, particularly the second metatarsal. Like KD, it can cause pain and swelling in the foot. Stress fractures, sprains, or other traumatic injuries to the foot can mimic the symptoms of KD. A careful history of recent activities or trauma is essential to differentiate between these conditions. Conditions such as juvenile idiopathic arthritis can cause foot pain in children. Inflammatory arthritis may present with joint swelling, stiffness, and other systemic symptoms.

Osteomyelitis or septic arthritis can cause localized pain and swelling. Infections should be considered, especially if there is a history of trauma or breaks in the skin. Inflammation of the tendons around the foot, such as Achilles tendonitis or posterior tibial tendonitis, can lead to foot pain. These conditions may be associated with overuse or repetitive stress. Conditions affecting the growth plates, such as apophysitis or Sever's disease, may cause foot pain in children. These conditions typically involve the heel or other growth plate areas. Although rare, benign or malignant tumors affecting the foot bones can cause localized pain and swelling.

Imaging studies, including X-rays and possibly advanced imaging like MRI, may be necessary to rule out such conditions. Systemic conditions affecting bone health, such as vitamin D deficiency or metabolic bone disorders, may present with foot pain. Laboratory tests and clinical evaluation are essential for diagnosis. Overuse or repetitive stress on the foot can lead to stress fractures, which may present with pain and swelling. This condition is more common in athletes or individuals engaged in repetitive activities.

Therapies

The treatment of KD is generally conservative and focuses on managing symptoms while allowing for the natural healing of the affected navicular bone (1-18). Nonsteroidal anti-inflammatory drugs may be prescribed to alleviate pain and reduce inflammation associated with KD. These medications can help improve the child's comfort during the healing process. Restriction of weight-bearing activities on the affected foot is commonly advised to reduce stress on the navicular bone. This may involve using crutches or other assistive devices to limit pressure on the foot during the initial stages of treatment.

Providing supportive footwear with cushioning and arch support enhances comfort and reduces pressure on the navicular bone, aiding healing. Orthotic devices or insoles may help by redistributing pressure and addressing

biomechanical issues. Regular follow-ups with pediatric orthopedic specialists are crucial for monitoring progress through clinical assessments and, if needed, imaging studies. Physical therapy can maintain joint mobility, strengthen muscles, and improve foot function with tailored exercises. Educating the child and caregivers about KD's self-limiting nature, expected recovery timeline, and treatment adherence fosters compliance and satisfaction.

CONCLUSIONS

In conclusion, KD is a rare condition first documented by Alban Kohler. Diagnosis involves clinical evaluation, imaging studies, and ruling out other causes of foot pain in children. A detailed medical history and X-rays help narrow the diagnosis. KD is typically benign with a favorable prognosis. Management focuses on symptom relief through pain medication, supportive footwear, and reduced weight-bearing activities until recovery.

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