

An unusual cause of medial foot pain: The cornuate navicular

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Abstract

The accessory navicular bone (ANB) is a secondary ossification center of the navicular bone and is rarely observed. Three distinct types of accessory navicular bones have been described. The type III, known as the cornuate navicular, is a rare morphological entity of the accessory navicular bone. We report the case of a patient, 48 years old, who presented with chronic swelling and pain in her left foot. Radiological examination permitted the diagnosis and showed a conflict between the tibial posterior tendon and the cornuate navicular, responsible for the symptoms. Surgical treatment led to symptoms relief.

Keywords: Accessory navicular bone, cornuate navicular, foot pain

Introduction

The accessory navicular bone (ANB), of which three variants have been described, is often considered a normal anatomic variant. The type III, also known as the cornuate, gorilliform navicular, or horned navicular, is a rare congenital anomaly that could cause medial foot pain. It is often asymptomatic but may cause pain and disability in some cases. The diagnosis is based on radiographs and may need surgical treatment to cure refractory symptoms. We report a case of cornuate navicular to describe this unusual cause of foot pain.

Case Presentation

A 48-year-old woman presented with a history of chronic pain and swelling in her left foot occurring at the end of the day. These symptoms were exacerbated by weight bearing, whether simply walking. No history of trauma or foot injury was reported. Pain and swelling were localized on the medial side of the foot. Ankle motion was normal on examination, and plantar flexion was pain-free. Radiographs showed a bilateral cornuate navicular (Figure 1). Ultrasonography helped us to explain the etiology of the swelling, showing posterior tibialis tendinitis (Figure 2). Computed tomography of the feet was performed (Figure 3). Magnetic resonance imaging (MRI) of the left foot confirmed the nature of the conflict. It attributed pain to the cornuate navicular and showed bone edema and conflict with the posterior tibialis tendon (Figure 4).

Because conservative treatment, including physiotherapy and nonsteroid anti-inflammatory drugs, was unsuccessful, surgery was indicated and consisted of resection of the part projecting from the navicular bone with reintegration of the posterior tibialis tendon. Postoperative radiographs showed that the resection was sufficient (Figure 5). The evolution was marked by a relief in symptoms and patient satisfaction.

Discussion

The accessory navicular bone was first described by Bauhin in 1605 (1). It is an accessory ossicle located at the medial edge of the navicular, derived from infused ossification centers. The posterior tibialis tendon (PTT) often inserts with a broad attachment into the ossicle. An accessory navicular bone is present in approximately 10% (range 4%-21%) of the population and first appears in the second decade. Bilateral location occurs in 50%-90% of cases, and there is a higher prevalence in females (2). Three types of ANB have been distinguished (3). Type I is a sesamoid bone, oval or circular (1-6 mm), in the distal portion of the PTT with no cartilaginous connection to the tuberosity. A secondary ossification center of the navicular bone is the cause of type II ANB (50%-60%), which is triangular or heart-shaped with a diameter as large as 12 mm, and it is connected to the tuberosity through cartilaginous synchondrosis or fibrous syndesmosis. Type III, also known as cornuate or gorilliform navicular, is characterized by a very prominent navicular tuberosity resulting from bony fusion of the accessory ossification center with the tuberosity.

Most cases are asymptomatic, but ANB may cause pain and tenderness in a small proportion (<1%). Symptoms may begin after wearing ill-fitting shoes, with weight-bearing activities or athletics, or after trauma to the foot (4). The pain is often linked to posterior tibialis tendinitis due to traction between the ossicle and



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the navicular. The accessory navicular acts as if it were a native navicular, with the bulk of the PTT inserting into the accessory navicular. This leads to more proximal insertion of the PTT. Hereby, the leverage of the malleolus on the PTT is reduced, and therefore, the stress on the tendon increases.

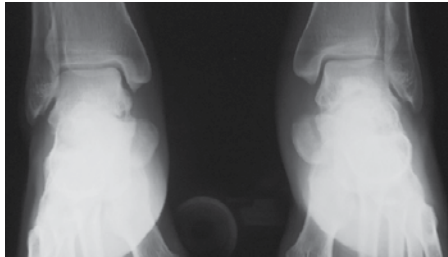


Figure 1. Standard anteroposterior radiographs of the feet showing the bilateral cornuate navicular bone

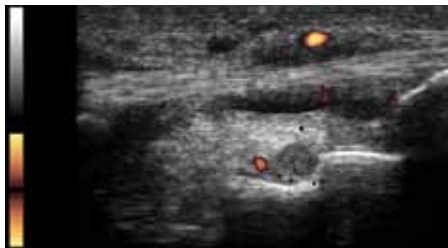


Figure 2. Ultrasonography of the medial compartment of the left ankle showing the posterior tibial tendinitis



Figure 3. Bilateral cornuate navicular on computed tomography



Figure 4. a, b. Coronal T1-weighted MRI image showing edema of the cornuate navicular (a) and sagittal T1-weighted MRI image revealing bone and soft tissue edema surrounding the accessory navicular bone (b)

The diagnosis of cornuate navicular is easy and is based on simple radiographs showing a medial navicular eminence, which is best visualized in the lateral-oblique view. However, the diagnosis may need other investigations, like ultrasonography, to show soft tissue involvement, especially posterior tibialis tendinitis. MRI is considered to have the highest sensitivity and specificity for the diagnosis of painful ANB, demonstrating both bone marrow and soft tissue edema.

Usually, the ANB is associated with a flatfoot deformity. The tibialis posterior has a major role in supporting the medial arch of the foot. This support is compromised by abnormal insertion of the tendon into the accessory navicular bone when present. This leads to loss of suspension of PTT and may cause peroneal spastic pes planus or simple pes planus. But, a cause-and-effect relationship between the accessory navicular and pes



Figure 5. Postoperative radiograph of the left foot demonstrating sufficient resection of the accessory navicular

planus is doubtful and is unproven (5). In our case, we did not note any abnormality in foot posture.

Conservative therapy consists of shoe-wear modification, including use of a softer, wider shoe, and medial arch support for flatfoot. A below-knee cast may be worn for 3-6 weeks for persistent symptoms. Treatment by non-steroid anti-inflammatory drugs and corticosteroid injection can be useful for acute pain. For refractory cases, surgical management can be considered. It consists of the resection of the part projecting from the navicular bone with reintegration of the tendon of the tibialis posterior muscle in a more plantar position. In addition, pes planovalgus deformities need to be addressed concomitantly (6, 7).

In conclusion, rheumatologists should think about the accessory navicular bone, which is a rare entity, to explain medial foot pain and not consider it arbitrarily as a normal anatomic variant. Its diagnosis remains easy, based on standard radiographs. In such cases, when doubt persists in attributing pain to ANB, MRI can be useful. The surgical treatment of symptomatic ANB may be necessary if conservative treatment does not relieve symptoms.

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