Acta Scientific Orthopaedics (ISSN: 2581-8635)

Volume 8 Issue 6 June 2025

Case Report

Medial Foot Pain Associated with Type II Accessory Navicular Bone

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Received: December 09, 2024

Published: May 23, 2025

Abstract

This case report highlights a 22-year-old female without known comorbidities, undergoing police training, presenting with medial foot pain persisting for three months. Imaging revealed that there is a Type II accessory navicular bone forming synchondrosis along with navicular bone and bone marrow edema. The patient also exhibited mild effusion in the tibiotalar joint and fluid in the tendon sheath of tibialis posterior. This case highlights the importance of identifying this entity in young patients with medial ankle pain.

Keywords: Medial; Foot Pain; Navicular Bone

Introduction

The accessory navicular bone is of three types. Among them, type II is the most symptomatic. Here, we present a case of a young female participant in active sports with medial foot pain. Radiographic evaluation revealed a type II variety of accessory navicular bone. MR imaging revealed bone marrow edema and fluid in the posterior tibialis tendon sheath. This case underlines the importance of identifying this mischievous anatomical variant.

Case History

A 22-year-old young lady participating in active sports activity as part of police training experienced persistent medial foot pain over a 3-month duration. The patient underwent a radiograph of the ankle, which revealed an accessory ossicle adjacent to the navicular bone. (Figure 1A) The patient underwent an MRI study to delineate anatomy and characterize pathology well. MRI study revealed a 6.9 x 9.7 x 7.5 mm sized Type II accessory navicular bone situated posterior to the navicular tuberosity. (Figure 1B) It was seen forming synchondrosis with the navicular bone. (Figure 1 B, C) There is marrow edema involving both accessory navicular bone and navicular bone. (Figure 1 C, E)

Additionally, mild fluid surrounded the tibialis posterior tendon sheath, attached to the accessory navicular bone. (Figure C, D). There was also edema in the subcutaneous plane over the accessory navicular bone and grade I sprain of the posterior tibiotalar component of the deltoid ligament.

Discussion

The findings indicated an accessory bone forming a synchondrosis with navicular bone and bone marrow edema affecting both subarticular aspects. Mild effusion in the tibiotalar joint and fluid involvement in the tibialis posterior tendon sheath were also noted.

The accessory navicular bones are found in 4-21% of individuals [1]. They are of three kinds based upon their relation to the navicular bone as per Geist classification, with Type II representing a secondary ossification center [2].

Type I represents a sesamoid bone of size 2-3 mm size within the tendon of the posterior tibialis. Among accessory bones, type I is present in 30% of cases. Type II accounts for 50-60% of cases. It

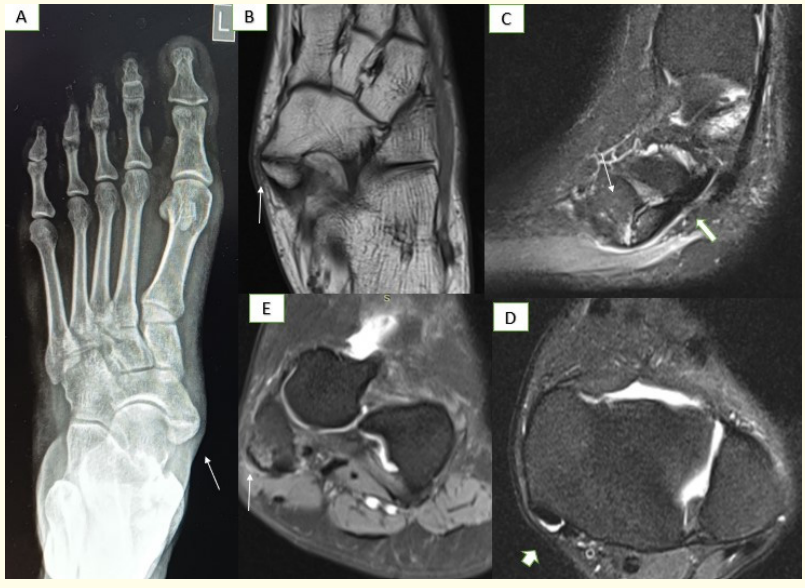

Figure 1: (A) AP radiograph of the foot showing type II accessory navicular bone (shown by thin white arrow) (B) Axial T1 MRI showing synchondrosis between Type II accessory navicular bone (shown by thin white arrow) and navicular tuberosity (C) Sagittal PDFS image showing marrow edema in both sides of synchondrosis in navicular and accessory navicular bone (shown by thin white arrow), attachment of posterior tibialis tendon in accessory navicular bone with mild peri tendinous fluid (shown by thick white arrow) (D) Axial PDFS image showing fluid around posterior tibialis tendon (E) Coronal PDFS image showing marrow edema involving accessory navicular bone (shown by thin white arrow).

is generally found over the navicular bone's medial pole and is first detected between nine and eleven years of age [3].

Type III is a fused type of accessory navicular bone [2]. (Figure 2) Type II is most symptomatic. When symptomatic, it causes me-

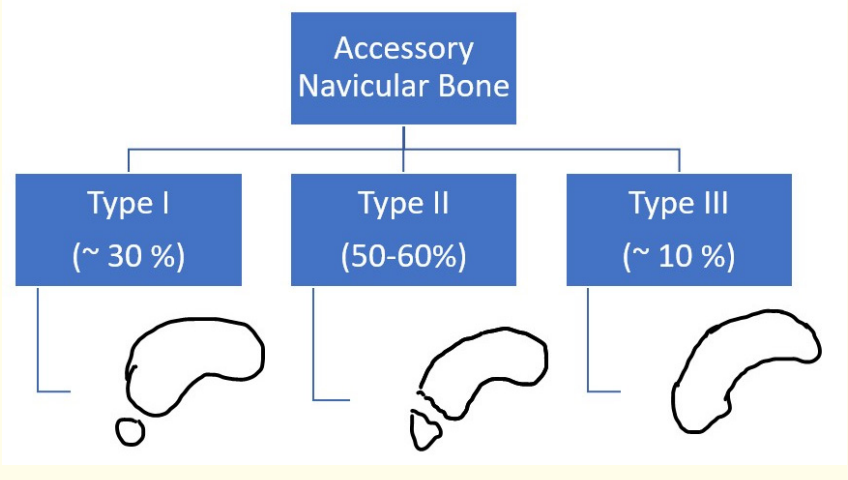

Figure 2: Classification of accessory navicular bones and line diagrammatic representation.

dial foot pain [4]. A plain radiograph can depict its presence sometimes, but it cannot confirm whether this anatomical variation is the culprit lesion. There comes the role of MR imaging, which helps to demonstrate bone marrow edema patterns or features of osteonecrosis. Other radiological findings, such as tendinosis or tear of the posterior tibialis tendon, are also shown in MR imaging [5].

The posterior tibialis tendon predominantly attaches to the accessory bone; when it is present – the orientation of inferior fibers becomes more horizontal given the more proximal attachment of fibers – this leads to more weight being transmitted through the posterior tibialis tendon, which is a crucial muscle forming a medial arch, instead of the medial malleolus [6]. This leads to tendinopathy of the posterior tibialis tendon, as in our case. This can also lead to flat foot deformity, as this tendon is crucial for medial arch formation.

The first-line treatment option is symptomatic pain management. If symptoms are not controlled, surgical treatment includes removal of the bone and realignment of the tendon [7].

Conclusion

This case underscores the importance of recognizing and evaluating accessory navicular bones, particularly Type II variants, in individuals with medial foot pain. The biomechanics of this anatomical variant help to understand why this condition predisposes to posterior tibial tendinosis and tear and flat-foot deformity.

Conflicts of Interest

The authors declare no conflicts of interest

Funding Source

None.

Acknowledgement

None.

Bibliography

1. Romanowski CA and Barrington NA. "The accessory navicular-an important cause of medial foot pain". *Clinical Radiology* 46.4 (1992): 261-264.

2. Geist ES. "Supernumerary bones of the foot-a röntgen study of the feet of one hundred normal individuals". *JBJS* 2.3 (1915): 403-414.

3. Choi YS., *et al*. "MR imaging findings of painful type II accessory navicular bone: correlation with surgical and pathologic studies". *Korean Journal of Radiology* 5.4 (2004): 274.

4. Mosel LD., *et al*. "Imaging of the symptomatic type II accessory navicular bone". *Australasian Radiology* 48.2 (2004): 267-271.

5. Miller TT., *et al*. "The symptomatic accessory tarsal navicular bone: assessment with MR imaging". *Radiology* 195.3 (1995): 849-853.

6. Bernaerts A., *et al*. "Accessory navicular bone: not such a normal variant". *JBR BTR* 87.5 (2004): 250-251.

7. Chi LT., *et al*. "Surgical treatment of the accessory navicular syndrome with simple excision". *Zhongguo gu Shang = China Journal of Orthopaedics and Traumatology* 22.12 (2009):933-934.