

Symptomatic bipartite medial cuneiform. A case report

Cuneiforme medial bipartito sintomático. Presentación de un caso

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Summary

The bipartite medial cuneiform is an anatomical variant of the Lisfranc joint in the midfoot, with few cases reported in the literature. This finding is usually incidental; however, it can be symptomatic. We present the case of a 30-year-old patient with right foot discomfort of unclear etiology, with normal initial radiological images, in which an MRI revealed focal medullary edema and a pseudoarticulation in the medial wedge. With a very low incidence of a 0.1 to a 2.4%, it is a very rare entity that is often overlooked, where the radiological diagnosis plays a crucial role.

Resumen

El hueso cuneiforme medial bipartito es una variante anatómica de la articulación de Lisfranc en el mediopié, la cual está descrita en el 0,3 % de la población. Este hallazgo es usualmente incidental; sin embargo, puede ser sintomático. Se presenta el caso de un paciente de 30 años de edad con molestia en el pie derecho de etiología no clara, con vistas radiográficas anteroposterior, mortaja y lateral de dicha extremidad sin hallazgos anormales. No obstante, una resonancia magnética reveló edema medular óseo focal y una pseudoarticulación en la cuña medial. Con una incidencia tan baja como del 0,1 al 2,4 %, es una entidad que muchas veces se pasa por alto, en la que el diagnóstico radiológico juega un papel crucial.

Key words (MeSH)

Bones of lower extremity
Metatarsophalangeal joint
Metatarsalgia
Magnetic resonance imaging

Palabras clave (DeCS)

Huesos de la extremidad inferior
Articulación metatarsofalángica
Metatarsalgia
Imagen por resonancia magnética

Clinical case

A 30-year-old male patient with no significant past medical history. He presented with long-standing pain in the right midfoot. He denied any recent or past trauma. The discomfort is mainly exacerbated by jogging, though it is not disabling.

On physical examination, the patient presented with normal findings, except for mild tenderness in the midfoot on palpation, with no evidence of deformities or skin changes. The range of motion was intact. The initial radiograph (Figure 1) of the right foot, taken in anteroposterior, lateral, and oblique views, was interpreted as normal, with no fractures or bone lesions to explain the symptoms.

A plain computed tomography (CT) scan (Figure 2) revealed two fragments at the level of the medial cuneiform bone, forming a pseudoarthrosis with mild sclerosis; this finding was not described in the radiology report.

Given the persistence of symptoms, a plain MRI of the right foot was performed, revealing focal areas of low signal intensity on T1-weighted sequences and high signal intensity on STIR and fat-suppressed T2-weighted sequences due to medullary edema in the medial cuneus adjacent to the pseudoarthrosis previously described in a CT scan as a bipartite sesamoid, with no involvement of ligamentous structures or soft tissues (Figure 3).

Discussion

At least 24 accessory bones have been described in the ankle and foot, generally as incidental findings. Among them is the bipartite medial cuneiform (*os cuneiforme I perfectum bipartitum*), an anatomical variant of the Lisfranc joint with a very low incidence, estimated to be between 0.1% and 2.4%. It was first identified in an anatomical specimen by Morel in 1757 and subsequently documented in the medical literature in 1934 by Barclay, who described the case of a 34-year-old individual with a navicular fracture and the incidental finding of a bipartite medial cuneiform (1). Furthermore, this anatomical variant is common in primates, not in humans, and has been identified in fossils dating back to the Pleistocene, suggesting its presence throughout human evolution (1-3).

A bipartite medial cuneiform bone is thought to result from a failure of fusion between two or more ossification centers. The condition is bilateral in more than half of cases, with a male predominance of approximately 80%. The typical configuration involves a horizontal division, resulting in a separate dorsal and plantar fragment. The interface between the fragments consists of a cartilaginous synchondrosis or a fibrous syndesmosis, or a combination of both. Its clinical presentation may vary (4). Some patients report foot pain with or without prior trauma, while others report a history of repetitive impact from high-intensity activities (5).

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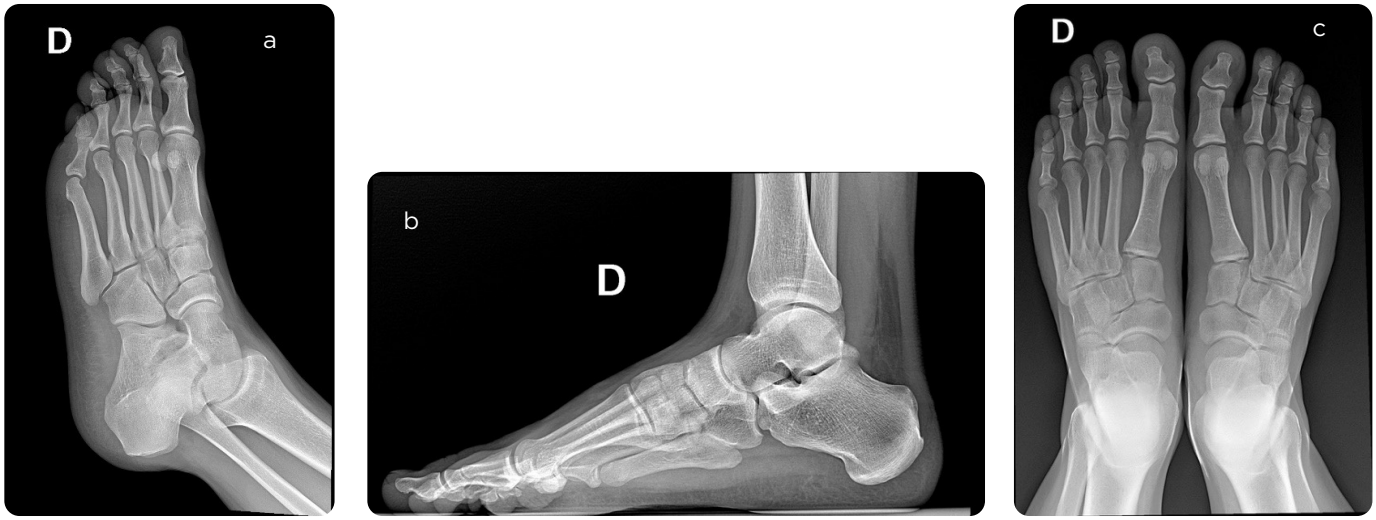


Figure 1. Plain radiographs of the right foot. a) Oblique view; b) lateral view; and c) anteroposterior view for comparison. The presence of abnormalities in the medial sesamoid cannot be clearly identified due to overlapping structures.

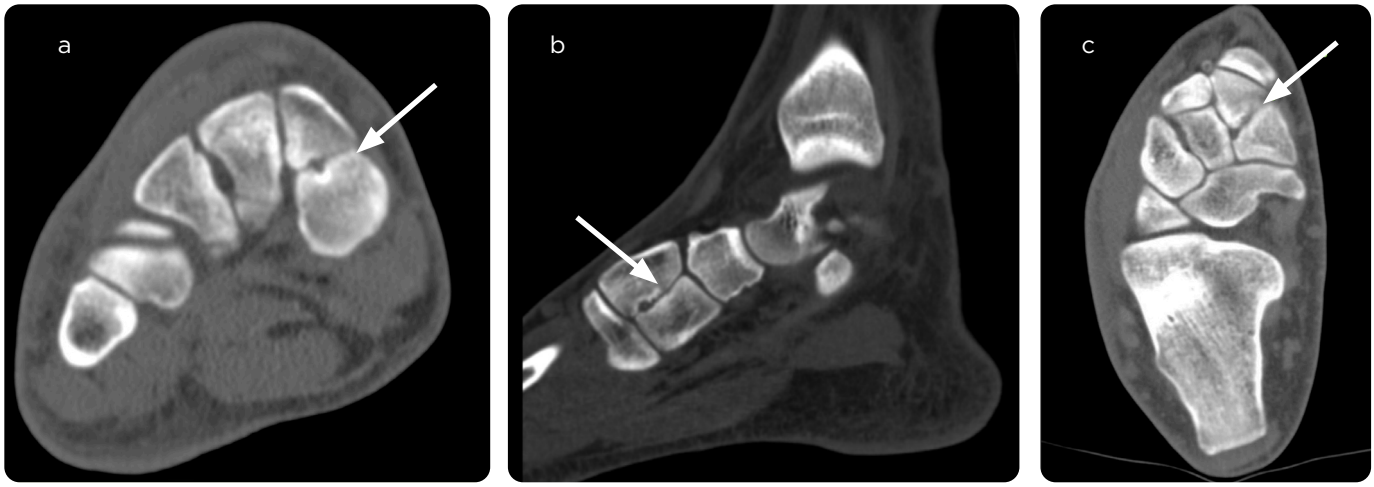


Figure 2. Plain CT scan of the right foot. a) Axial view; b) sagittal view; and c) coronal view, showing the bipartite medial cuneiform bone (arrows).

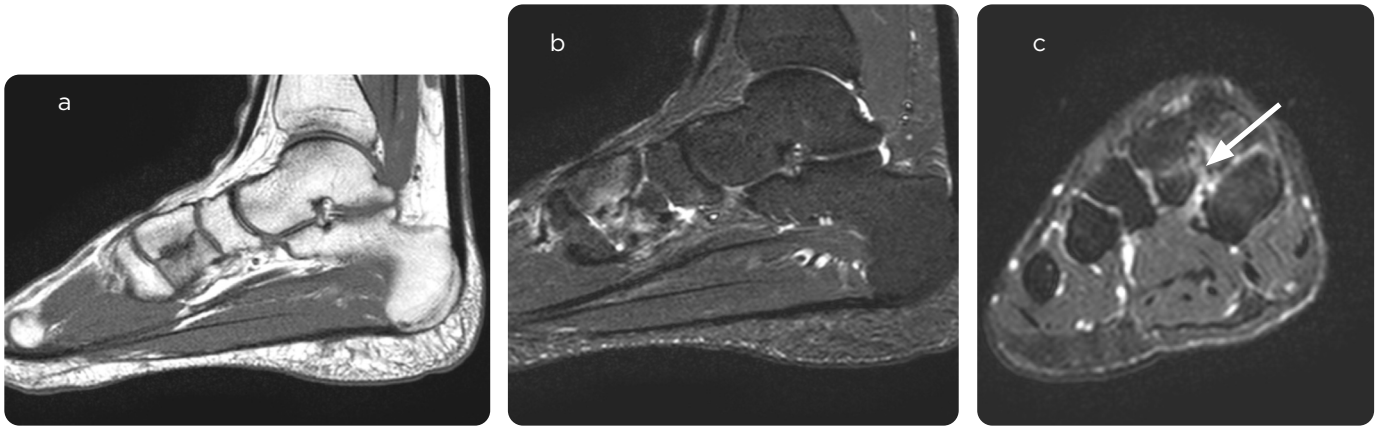


Figure 3. MRI. a) T1-weighted sequences in the sagittal plane. b) STIR sequence in the sagittal plane. c) T2-weighted fat-suppressed sequence in the coronal plane. High signal on the STIR sequence and T2-weighted fat-suppressed sequence, and mild low signal on the T1-weighted sequence due to medullary edema. Irregularity in the contours of the pseudoarthrosis, as well as scant fluid adjacent to the Lisfranc ligament.

A bipartite medial meniscus can be overlooked on conventional imaging if this diagnosis is not considered. It is usually best visualized on a lateral or 30-degree external oblique radiograph. CT or MRI scans are useful for confirming the diagnosis. Elias et al. (6) described in a case series the "E sign," a characteristic appearance of the bipartite medial cuneiform on sagittal MRI images, which consists of the configuration of the joint spaces between the head of the first metatarsal and the distal aspect of the two bipartite medial cuneiforms, as well as a well-defined horizontal joint space between the two bipartite segments. The main differential diagnosis is a cuneiform fracture, which, when acute, facilitates differentiation, as the clinical context of recent trauma and its regular contours, as well as the orientation of the fracture line, make this differentiation possible; but not so in the context of a patient with prior trauma, in whom a hidden fracture or one not seen in previous studies, with non-union or pseudoarthrosis, would be difficult to identify (7, 8).

This condition is managed with conservative measures: the use of oral pain relievers and a short period of weight-bearing restriction can lead to the resolution of symptoms. Several studies report pain relief following ultrasound- or CT-guided corticosteroid injections. If conservative treatment fails, surgical options include excision of a small fragment or arthrodesis of both fragments (5, 8).

Conclusions

We report the case of a male patient with a symptomatic bipartite medial cuneiform bone, a rare anatomical variant that, although typically asymptomatic, can cause pain in the midfoot, after contusions, fractures, and tumors had been ruled out. Given its low incidence and the subtlety of its conventional radiological findings, it is essential to consider this condition within the differential diagnosis in this clinical context. The use of advanced imaging allows for better characterization and differentiation from fractures, which is crucial for guiding appropriate management. The scarce available literature, limited mainly to case reports, highlights the value of sharing this experience as an academic and clinical contribution.

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