



**Case Report**

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## Painful Os Intermetatarsium: Abnormal MRI imaging findings

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### Abstract

Accessory ossicles are a common incidental finding on imaging of the feet. Os intermetatarsium is one such ossicle. These mostly remain asymptomatic; however, pain syndromes associated with accessory ossicles are a known entity and the diagnosis of painful os syndrome should be considered in undifferentiated foot pain. Whilst use of imaging in the diagnosis of painful os syndromes of the foot is well substantiated, there is little available literature on the use of magnetic resonance imaging (MRI) in the diagnosis of painful os intermetatarsium. We report a case of painful os intermetatarsium with MRI findings that have not previously been described.

**Keywords:** Os intermetatarsium, Painful os syndrome, Magnetic resonance imaging (MRI).

### INTRODUCTION

Os intermetatarsium, an accessory bone of the foot, is a well-known entity that typically remains asymptomatic. However, there have been reported cases of focal pain (os intermetatarsium syndrome) and compression of the deep peroneal nerve dating back to 1877 and 1980 respectively.[1] Whilst plain film and Computed Tomography (CT) can identify the presence of os intermetatarsium, there are a paucity of positive findings when pain occurs. Magnetic resonance imaging (MRI) can delineate the cause of pain in these patients[2], and we describe a new MRI finding in a patient with a painful os intermetatarsium.

### CASE REPORT

A 73-year-old female presented with sudden onset of right medial midfoot pain following an extended walk. On examination, the patient was tender in the region of the first and second metatarsal bases with overlying soft tissue swelling. MRI examination revealed an os intermetatarsium measuring 6 x 5 x 4 mm (anteroposterior x mediolateral x craniocaudal), with internal marrow edema and prominent surrounding soft tissue edema. Marrow edema was also observed within the adjacent dorsal medial cuneiform. The patient was treated conservatively with a reduction in walking load and alteration in lacing pattern to avoid direct compression.

### DISCUSSION

Os intermetarsaei occur most commonly between the first and second metatarsal, with three distinct types identified: free standing, articulating, and fused.[3] These occur in variable frequency which is genetically linked, with articulating and fused the rarer forms.[3] Whilst these accessory ossicles are mostly asymptomatic, several cases of painful os intermetatarsium have been previously reported, which appears to occur in both traumatic and non-traumatic settings.[1, 4-6]

Imaging is an important element of diagnosing painful os intermetarsium. Plain film and CT scans tend to be benign apart from identification and delineation of the accessory ossicle, although is useful ruling out mimics of painful os intermetarsium, such as bony fragments in Lisfranc injuries.[2] CT can also be useful in the detection of fractures of the ossicle.[7] Previously identified positive imaging findings identified include increased uptake on bone scintigraphy[5] and isolated stress changes within the ossicle on MRI.[2]

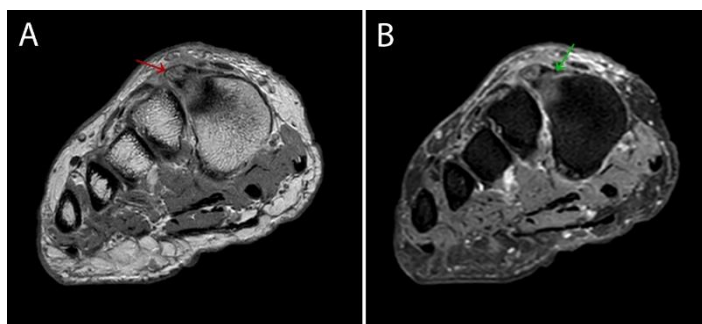
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Our MRI findings show similar changes at the ossicle (Figure 1). However, there is more extensive oedema, including the surrounding soft tissue and the adjacent medial cuneiform. The presence of oedema in both the accessory ossicle and the cuneiform indicates that this os intermetatarsium is likely of the articulating phenotype. Given the acute onset of pain following an extended walk, the marrow oedema may be secondary to synchondritis. Degeneration across the synchondrosis could produce a similar appearance, however there were no supporting findings (marginal osteophytes, subchondral bone plate irregularity or subchondral cystic change). Whilst this has not previously been reported in painful os intermetatarsium, degeneration and/or inflammation across synchondrosis it is a recognized imaging finding in other articulating accessory ossicle syndromes of the foot, such as os naviculare [8].



**Figure 1:** Magnetic Resonance Imaging (MRI) of the right foot of a 73-year-old female with painful os intermetatarsium

Short axis Proton Density (PD) (A) and Proton Density Fat Saturated (PDFS) (B) sequences (TR 2140 ms/TE 26 ms, slice thickness 1.5 mm) of the right foot demonstrate the presence of an os intermetatarsium situated dorsally between the first and second metatarsal bones (red arrow). PDFS sequences (B) display marrow oedema within the os and adjacent medial cuneiform suggestive of a synchondritis (green arrow).

## CONCLUSION

Os intermetatarsium is an uncommon cause of midfoot pain, however it is one that must be considered, particularly when the etiology is otherwise not readily identifiable. MRI may be useful in delineating the cause of midfoot pain in patients with known os intermetatarsium.

## Conflict of Interest

The authors declare that they have no relevant conflicts of interest.

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## Author's Contribution

Dr Callum Narita: Literature search, Drafting, revising, finalising manuscript, Compiling and annotating figures. Dr Paul Marovic: Identification of the case, Literature search, Supervision, final approval of manuscript and Figure legends.

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