

Articulating Os Intermetatarsium with painful ganglion cyst

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ABSTRACT

Objective: Sesamoid and accessory bones are commonly found in the foot and ankle with varying incidence. The Os intermetatarsium, located between the medial cuneiform and the base of the first and second metatarsal, occurs rarely and is frequently asymptomatic. Few symptomatic cases of this condition are reported in the literature. The development of synovial ganglion cyst over an os intermetatarsium is a more occasional finding not clearly reported in the literature.

Case: Here we report the case of a 22 year old female presenting with pain and localized swelling in the dorsum of the midfoot who was found to have a ganglion cyst emerging from an articulating os intermetatarsium.

Conclusion: Although not a common entity, an Os intermetatarsium, with its associated complications, can be one of the causes of dorsal foot pain.

Keywords: Os Intermetatarsium, Lisfranc joint, dorsal foot pain, ganglion cyst.

INTRODUCTION

The accessory ossicles are most commonly found in the foot (1). Many accessory bones have been described with different incidence (1, 2). The os intermetatarsium is a rare ossicle found in the dorsum of the foot between the first and second metatarsal bases and the medial cuneiform (1, 3, 11). Different sizes and shapes have been described in the literature (1, 3). It is usually asymptomatic (1, 3). However, cases of symptomatic os intermetatarsium have been reported, presenting usually as pain in the dorsum of the foot (1, 3, 11). Symptoms could be due to compression of local structures or painful metatarsus primus or less commonly they could be related to a fracture of the os intermetatarsium. (1, 3, 4, 11). We present in our case, a patient presenting with dorsal foot pain who was found to have an articulating os intermetatarsium complicated by a ganglion cyst.

CASE

A 22-year-old healthy female presented to the orthopedic clinic with a complaint of a foot pain. She stated the pain is mainly in the dorsum of the foot and irradiating between the first and second toe. It has been present for two to three months, and is associated with a focal swelling in the dorsum of the foot. The pain was exacerbated by movement. The patient denies any history of trauma. She is otherwise healthy and does not complain of any comorbidities.

On physical exam, a focal swelling was noted in the dorsal aspect of the midfoot over the first intermetatarsal space. There was tenderness on the palpation of the same area. There was no subjective paresthesia.

The opposite foot showed no abnormality. The remaining of the physical exam was unremarkable. With this clinical presentation, the patient was referred to our center to undergo an MRI of the foot.

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A dedicated MRI protocol of the foot was done on our MRI system (3.0 Tesla MRI GE 750 discovery) using a dedicated foot coil. The MRI showed a 2x1.5 cm lobulated, smooth, well-circumscribed, and homogeneous cystic mass compatible with ganglion cyst overlying an articulating type of Os Intermetatarsium revealing two articulating surfaces with the medial aspect of the base of the second metatarsal and the medial cuneiform. No bony erosion or subchondral trabecular abnormal signal intensity was noted. No enhancing solid lesions or significant synovial enhancement were seen (**Fig 1**)

No signs of nerve compression were seen. No further diagnostic tests were carried out. After the failure of conservative treatment, the patient underwent surgical excision of the ganglion cyst which resulted in complete resolution of the symptoms.

DISCUSSION

Sesamoid and accessory bones are commonly encountered in the foot and ankle (**1, 6**). Sesamoids help to reduce the friction and properly distribute the impaction forces applied to the plantar aspect of the foot, however, ossicle has no definite known role. Both, sesamoids and accessory bones can be associated with pathological conditions (**3, 6**)

The os intermetatarsium, an accessory ossicle, has a rare occurrence and a frequency of 1-13 % with a slight discrepancy between the prevalence reported on imaging compared to anatomical studies, which is caused mainly by the difficulty of its diagnosis it on standard radiographs. (**Fig 2**) (**1, 2, 3**).

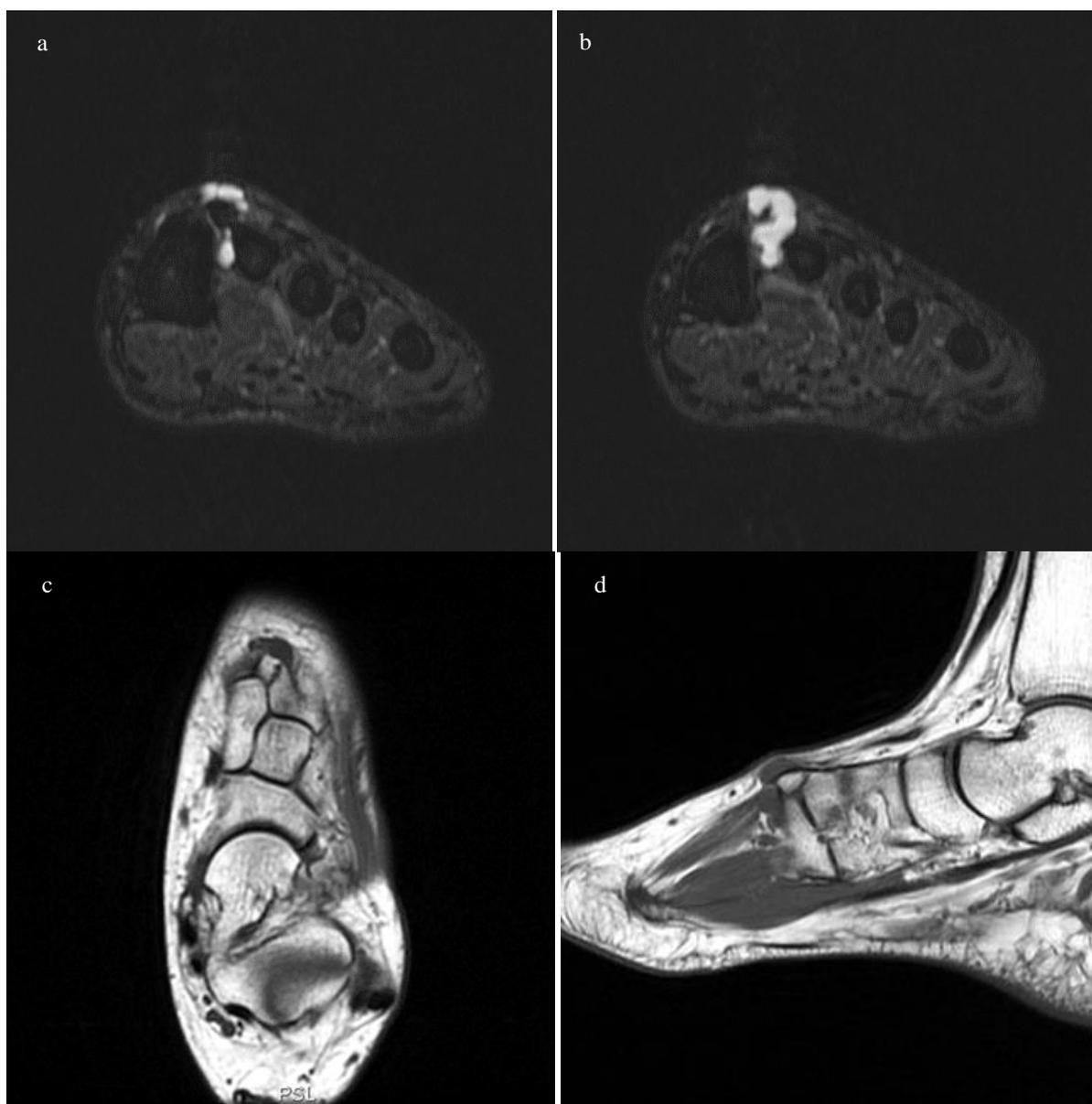


Figure 1: (a) & (b) axial proton density fat sat; (c) & (d) sagittal and coronal T1 sequences of the midfoot reveal lobulated synovial ganglion surrounding an articulating Os Intermetatarsium.

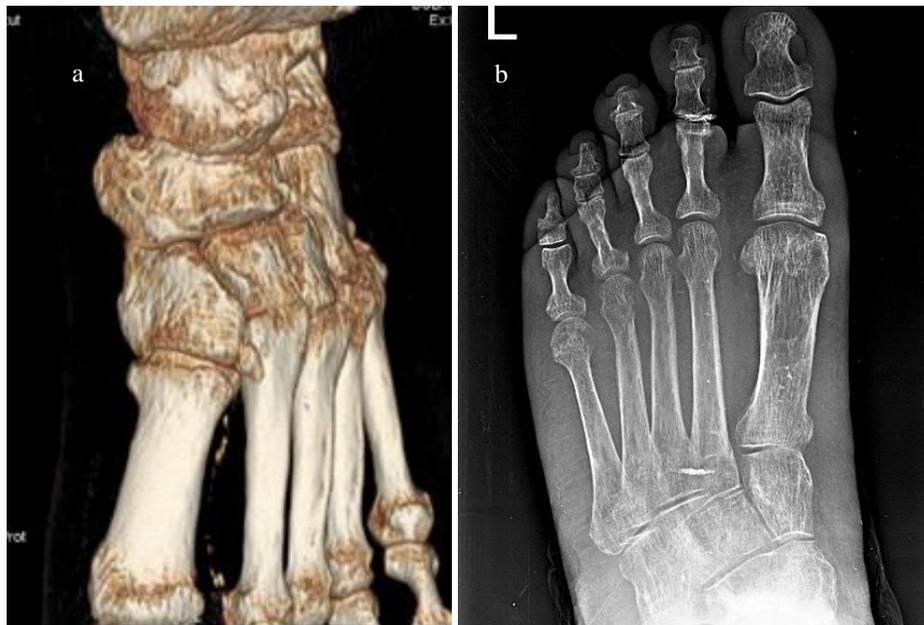


Figure 2: (a) & (b) Volume Rendered images and simple radiographic film of a 70y old patient reveals an articulating Os Intermetatarsium not seen on.

It is located at the dorsal aspect of the foot, in the space between the medial cuneiform and the first and second metatarsal bones. (1, 3, 6).

Historically, it was first described by Wenzel Gruber in 1977 and further detailed characterization was done by Pfitzner (1, 12). It might present with different shapes and is usually round, but can be oval, kidney-shaped, linear, spur-like or may even look like a rudimentary ossicle (1, 6).

Three different types are described, the free-standing, the articulating, and the fused. (2, 3). The free-standing type is completely independent without any connection with the adjacent bones.

It is the most common type (11). The articulating type shows cartilage covered synovial articulations with either the first or second metatarsal or cuneiform. The fused variety are considered as bone spurs and is the least common type (1).

Its association with hallux valgus deformity has been described by some authors (1, 5, 11). The accessory ossicle acts as a wedge that spreads apart the first two metatarsals producing deviation between them thus promoting the formation of metatarsus primus varus (11).

Although usually asymptomatic and found incidentally, few cases of painful os intermetatarsium have been reported (3, 4, 6) presenting as painful metatarsus primus (11) or with dorsal foot pain associated with paresthesia between the first and second toe exacerbated by weight-bearing, tight shoes, and activities like ball kicking. (1, 3, 6).

Compression of the deep or superficial peroneal nerve by the ossicle has been reported as a source of the pain (1, 3, 5, 6).

Another described cause of painful os intermetatarsium is caused by fracture of the ossicle. It is important to distinguish this entity from an avulsion fracture of the Lisfranc joint as both cases usually present after a trauma (11).

A Lisfranc injury is defined as an injury of the foot x where one or more metatarsals are displaced from the tarsus (11). The os intermetatarsium can be misinterpreted as small bone fragment between the first and second metatarsal bases (termed the Fleck sign) (11, 12). An accurate diagnosis is essential for the proper management and to prevent complications associated with a Lisfranc fracture such as osteoarthritis and deformity (11).

What seemed interesting in our case, is the appearance of a ganglion cyst arising from an articulating os intermetatarsium which has not been well described in the literature.

A ganglion is a common benign cystic lesion containing mucoid material encapsulated with fibrous tissue (6, 7, 9). The pathophysiology of ganglion cysts remains unclear, but they occur frequently in association with osteoarthritis and less frequently with chronic or acute joint stress, trauma, rheumatoid arthritis or other inflammatory joint diseases. (8, 9)

Other theories of cyst genesis can also be considered. Joint stress, whether acute or chronic, is the common root cause. Joint stress can cause either a small rent in the capsule with subsequent fluid leakage or mucoid degeneration of adjacent extra articular connective tissue with subsequent fluid accumulation or finally it may also stimulate mucin production (9).

Conservative management is preferred as an initial treatment for symptomatic os intermetatarsium as well as ganglion cysts (1, 11). The treatment of painful os intermetatarsium consist of rest and non-steroidal anti-inflammatory, however if there is failure of the conservative treatment or evidence of nerve compression, a surgical exploration is warranted (1, 11). The same applies to the ganglion cyst, for which surgical excision is recommended after failure of the conservative treatment. However, surgical removal showed a significantly lower recurrence rates as compared to non-surgical interventions. (11)

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