

# CMRS Fall 2009 Vision Challenge & Solution

## Case 16

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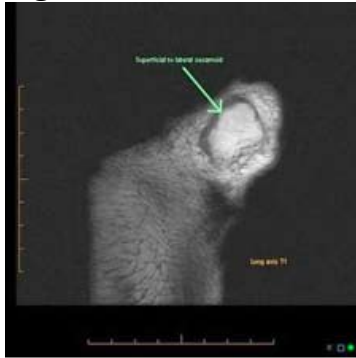
**History:** Benign bone tumor plantar right foot

**Exam:** MRI of the right foot was performed. T1, T2, and T2 fat-suppressed sequences were performed in multiple planes with and without gadolinium. Arrows denote lesion.

**Findings:** Orthogonal long-axis (Fig. 1a) and sagittal (Fig 1b) T1 images demonstrate the distal pole of a 1st/2nd intermetatarsal accessory bone that extends superficial to the lateral sesamoid.

Orthogonal long-axis (Fig. 2a) and sagittal (Fig. 2b) T1 images demonstrate the proximal pole of a 1st/2nd intermetatarsal accessory bone originating in the first interspace.

**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Diagnosis:** Form fruste of os intermetatarsium

**Discussion:** While much is understood about the evolution and refinement of mammalian foot architecture, curiosities do persist. Even the novice radiologist is quick to call out the common os trigonum, os tibiale externum (accessory navicular), os peroneum (actually a sesamoid at lateral aspect of cuboid) and os vesalianum (base of 5th metatarsal). However, a greater number of more obscure centers of ossification confound imaging interpretation.

If not discovered incidentally, the os intermetatarsium very rarely presents with symptoms of deep peroneal nerve impingement. This includes pain over the dorsum of the foot and associated paraesthesias in the first web space (1). Decompression of the deep peroneal nerve following resection of the os intermetatarsium leads to resolution of the symptoms.

While quoted more recently as having an incidence of 1.2% in asymptomatic males (2), the work of Case, et al., demonstrated a range of incidence among populations, supporting heritability of this accessory bone. Overall frequencies ranged from no occurrence among the native Arctic inhabitants to 8% of individuals from Pecos Pueblo. This high frequency among some Native Americans may be due, in part, to a higher degree of genetic relatedness than in other samples (3).

The os intermetatarsium in the present case is an atypical presentation. Its occurrence is usually described as an independent ossicle or an osseous spur projecting from the proximal ends of the first two metatarsals, or the distal end of the first cuneiform. The proximal pole of the os in this case aligns with the proximal ends of the first two metatarsals, but the first intermetatarsal space cannot accommodate the large dimensions of the distal pole. Presumably, it has, over time, migrated into the plantar fat pad to form a pseudarthrosis with the lateral sesamoid.

**Treatment:** Excision of the os intermetatarsium is a clinical decision based on weight-bearing dynamics and symptoms typically referable to the deep peroneal nerve distribution.

## References:

1. Nakasa T, et al. "Painful os intermetatarsium in athletes: Report of four cases and review of the literature." Arch Orthop Trauma Surg, May 2007;127(4):261-4. (E-pub July 19, 2006.)
2. Cilli F, et al. "The incidence of accessory bones of the foot and their clinical significance." Acta Orthop Traumatol Turc 2005; 39(3):243-6.
3. Case DT, et al. "Os intermetatarsium: A heritable accessory bone of the human foot." Am J Phys Anthropol, October 1998;107(2):199-209.