

Patient with Two Left Cuneiform Bones Only: A First Documented Case Report

Abstract

The cuneiforms are three wedge-shaped bones, forming the tarsus of the foot along with the talus, calcaneus, navicular, and cuboid. We present the case of a 70-year-old Caucasian woman with a left unique lateral cuneiform instead of second and third cuneiform bones. Additional cuneiform bones are rare anatomical variants which have been well described in the literature. Conversely, a lesser number of cuneiform bones have never been previously reported. To our knowledge, our article represents the first documented case of this anatomical variation.

Keywords: *Anatomical variation, cuneiform bones, first case, foot, radiology*

Introduction

The lateral, intermediate, and medial cuneiform are three wedge-shaped tarsal bones. They form with navicular and cuboid the midfoot, a section of the foot between the Chopart joint line proximally and the Lisfranc joint distally. The lateral cuneiform is smaller than the medial cuneiform and larger than the intermediate one. The lateral and medial cuneiforms are longer than the intermediate one, so that the base of the second metatarsal bone recesses between them, giving great stability in the frontal plane. These three bones articulate between each other, with the navicular bone proximally and each of them with their respective metatarsal base distally. The lateral one articulates with the cuboid. The tibialis posterior muscle attaches to all of the cuneiforms. Other musculotendinous attachments are flexor hallucis brevis for the lateral cuneiform and third plantar interosseous muscle, peroneus longus, and tibialis anterior for the medial one. Strong but small interosseous ligaments connect the nonarticular surfaces to adjacent cuneiforms. The vascular supply to medial and intermediate cuneiform originates from the branches of the dorsal arterial network, whereas lateral cuneiform receives blood from the lateral tarsal artery. The draining veins correspond to the arterial supply. The deep peroneal and medial plantar

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nerves provide innervation. Endochondral ossification in the extremities begins by the end of the embryonic period, and ossification centers arise from the first to the third year of life. Abnormalities with an excessive number of bones are mostly bilateral, whereas a lesser number is usually unilateral. In some cases, the bones actually fuse.^[1-5]

Case Report

We present the case of a 70-year-old Caucasian woman with nocturnal diffuse lower limb and left foot pain. At the remote anamnesis, she was affected by hypercholesterolemia, treated with statins and left shoulder prosthesis was implanted. Inspectively, there is no remarkable difference of the anatomical profile between the right and left foot, and a hallux valgus tendency is present in both of them. The patient does not refer to pain during the deambulation, but tenderness is positive in the left tarsal region.

The left frontal radiograph [Figure 1] demonstrates a unique cuneiform bone instead of the second and third cuneiform bones, and synostosis of this one with the second and the third metatarsal bones. Figure 2 shows lateral foot projection.

Discussion

Additional cuneiform bones are rare anatomical variants which have been well-described in literature, such as the

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Figure 1: Left foot – Weight bearing



Figure 2: Left foot – Non-weight bearing

bipartite medial cuneiform or small accessory ossicles. On the contrary, a lesser number of cuneiform bones have never been previously reported. It is important to be aware of these variations as they can alter the already complex biomechanics of the foot and cause symptoms, such as midfoot pain, which may be overlooked or misdiagnosed due to the vague disorder or chronic condition.

Recognizing such anatomical anomalies is essential also for preoperative planning of arthrodesis or open reduction and internal fixation procedures in this anatomical location.^[6-9]

Although the presence of this couple of cuneiform seems congenital radiographically – And not an acquired synostosis – The nature of such variation needs further investigations.

Conclusion

To our knowledge, this is the first documented case of a human foot with only two cuneiform bones, which could be considered an additional contribution to the description of its other anatomical variations, with potential implications for foot pathology, radiology, diagnosis, and surgery.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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