Congenital Absence of the Lateral Sesamoid

Yakup Yildirim, MD*
Baransel Saygi, MD†

Congenital absence of the lateral sesamoid is an extremely rare condition. We present a case of congenital absence of the lateral sesamoid in which magnetic resonance imaging was performed. The literature is reviewed regarding the clinical significance of this anomaly. (J Am Podiatr Med Assoc 96(1): 78-81, 2006)

The hallux sesamoids are seedlike bones that lie under the first metatarsal head. They are enveloped in the double tendons of the flexor hallucis brevis and are connected to the base of the proximal phalanx through the plantar plate. Beneath the first metatarsal head, the flexor hallucis longus tendon passes between the hallucal sesamoid bones immediately inferior to the intersesamoidal ligament.

The sesamoids of the first metatarsophalangeal joint play a significant role in the function of the hallux. They protect the flexor hallucis longus tendon and first metatarsal head,[1] facilitate load transmission to the medial forefoot,[2] minimize joint forces by increasing the distance of the flexor tendons from the first metatarsophalangeal joint,[3] and function as a pulley mechanism to increase the effective moment strength of the flexor hallucis brevis muscle.[4]

There is abundant material in the literature dealing with the pathology of the hallucal sesamoids. However, congenital absence of the sesamoids is very rare. The previously reported cases mainly describe the congenital absence of the medial sesamoid,[5-11] with only three reports[12-14] mentioning the absence of the lateral sesamoid. We describe an 18-year-old man with congenital absence of the fibular sesamoid. Radiographic and magnetic resonance imaging (MRI) findings were investigated, and the literature regarding this anomaly was reviewed.

*Department of Orthopaedic Surgery, Acibadem Hospital, Istanbul, Turkey.

†Department of Orthopaedic Surgery, PTT Hospital, Istanbul, Turkey.

Corresponding author: Yakup Yildirim, MD, Department of Orthopaedic Surgery, Acibadem Hospital, Acibade Bagdat Cad. Poliklinigi, 289 Caddebostan, Istanbul, Turkey.

Case Report

An 18-year-old man presented to the Department of Orthopaedic Surgery, Acibadem Hospital, Istanbul, with pain under the first metatarsal head of his left foot that had begun during daily activities 2 days earlier. There was no history of exercise or trauma. Examination of the foot revealed swelling of the first metatarsophalangeal joint localized on the plantar aspect of the foot and moderate tenderness elicited with palpation under the first metatarsal head that increased with passive dorsiflexion of the hallux.

Anteroposterior, oblique, and sesamoid radiographic views revealed the absence of the lateral sesamoid of the hallux, with a bipartite medial sesamoid (Figs. 1 and 2). The intersesamoidal crest and the grooves for the sesamoids were not well developed. There was a moderate degree of hallux valgus deformity. Radiographs of the right foot revealed a bipartite medial sesamoid and an extremely reduced lateral sesamoid (Fig. 3). There was no hallux valgus deformity of the right foot. An MRI examination of the left foot was performed to study the anomaly in more detail. A focal area of calcification at the region of the lateral sesamoid that was not identified on the plain film radiographs was present on MRI (Fig. 4). On the sagittal images, the flexor hallucis brevis tendons on the medial and lateral sites inserted into the base of the proximal phalanx without any deformation. However, the lateral part of the tendon passed closer to the metatarsal head than the medial part (Figs. 5 and 6). The patient's symptoms resolved within a week by avoidance of prolonged walking and the use of nonsteroidal anti-inflammatory medication.

Figure 1. Anteroposterior radiograph showing absence of the lateral sesamoid.

Figure 3. Oblique radiograph of the contralateral foot with an unusually small lateral sesamoid.

Discussion

The congenital absence of one or both hallucal sesamoid bones is exceedingly rare. The very few cases reported in the literature demonstrate that absence of the lateral sesamoid is far rarer than absence of the medial sesamoid. Nine patients have been reported with congenital absence of the tibial sesamoid,[5-11] whereas only three cases of congenital absence of the lateral sesamoid have been reported.[12-14]

Absence of the lateral sesamoid in the present case did not produce long-standing symptoms; this was also the case in previous reports. Jeng et al[13] reported pain of 2 weeks' duration. In the report by Le Minor,[14] absence of the lateral sesamoid was observed incidentally during radiologic evaluation for trauma of the ankle. Aper et al[15] reported that unless both of the sesamoids are excised, hemiresection or total resection of one of the sesamoids is unlikely to compromise the mechanical effect of the flexor hallucis brevis muscle. The presence of the medial sesamoid together with the remnant of the lateral sesa-

Figure 2. Tangential sesamoid view showing absence of the lateral sesamoid.

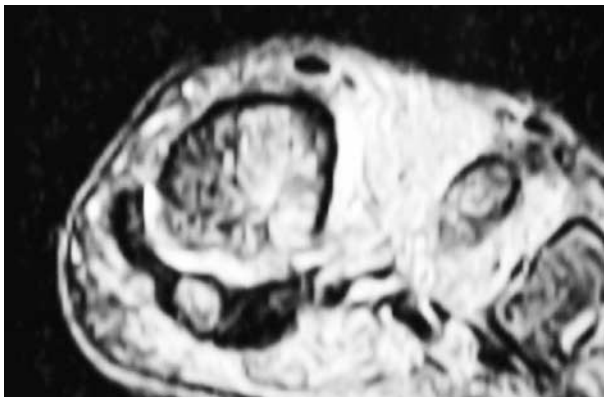

Figure 4. Magnetic resonance image showing a focal area of calcification located at the region of the lateral sesamoid.

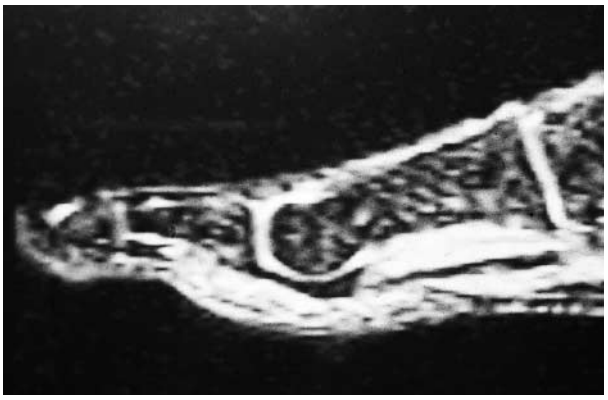

Figure 5. The lateral head of the flexor hallucis brevis tendon is passing closer to the metatarsal head.

moid probably ensures a functioning sesamoid–flexor hallucis brevis complex, resulting in a symptom-free foot.

The presence of a cartilaginous structure was noted on MRI. This structure was not identified on the plain films. This is in accordance with a study by Jeng et al[13] in which a focal area of calcification was confirmed by computed tomography. This finding was not reported in the other studies because neither MRI nor computed tomography was performed. Inge[8] noted that both of his patients with unilateral congenital absence of the tibial sesamoid had diminutive sesamoids on the contralateral foot. This finding seems to be consistent with the theory that both bones had been arrested at different points of maturation or ossification. This theory is also valid for the patient described here, whose contralateral foot had an unusually small lateral sesamoid, indicating cessation of ossification at different stages.

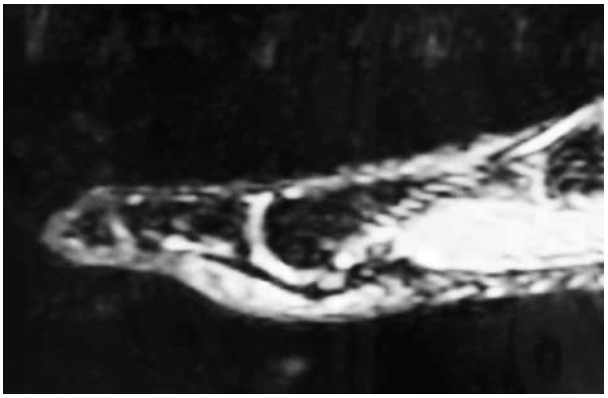

Figure 6. The medial head of the flexor hallucis brevis tendon is passing on its normal route.

Unlike in the previous reports, the patient described here had a moderate amount of hallux valgus deformity. This is an unexpected finding because excision of the lateral sesamoid is known to cause hallux varus deformity.[16] In the patient with congenital absence of the fibular sesamoid, similar abnormal biomechanics are expected to lead to hallux varus deformity. Jahss[17] presented a case in which bilateral absence of the lateral sesamoids caused bilateral hallux varus deformity. The MRI findings in the present case showed that the lateral head of the flexor hallucis brevis tendon was intact and enveloping the remnant of the lateral sesamoid. The only difference from the medial tendon was that the lateral one passed closer to the metatarsal head. This may tether the tendon and pull the proximal phalanx where it inserts, resulting in hallux valgus deformity.

Le Minor[14] reported absence of the normal intersesamoidal crest and both grooves as a sign of congenital absence of the sesamoids, which distinguishes it from absence due to excision or infectious resorption. We agree with Le Minor[14] because in our patient the intersesamoidal ridge and sesamoidal groove for the lateral sesamoid also were not well developed.

Interestingly, in the two previously reported cases of congenital absence of the lateral sesamoid, both of the patients were women and 47 years old. In our case, the patient was an 18-year-old man. According to Bizzaro,[18] patients aged 15 to 45 years have the potential for ossification of the sesamoids. Although the patients in the previous reports are unlikely to experience ossification owing to their older ages, the patient in our report may have the potential for ossification of the lateral sesamoid in the future.

Conclusion

Congenital absence of the lateral sesamoid is extremely rare. In the case reported here, a cartilaginous structure was present on MRI, although it was not detected on plain film radiographs. Also, a well-formed sesamoid–flexor hallucis brevis tendon complex in its usual anatomical place was detected by MRI. These findings explain the asymptomatic state of patients with congenital absence of the lateral sesamoid. To determine whether the lateral sesamoid will ossify in the future requires further follow-up of the patient.

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