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Case Report

Fracture of the Medial Sesamoid of the First Metatarsal: A Clinical Case

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Abstract

The two sesamoid bones of the first metatarsal are embedded in a ligamentous complex within the context of the plantar ligament. They have a cartilaginous surface that articulates with the inferior aspect of the head of the first metatarsal, and at this level, each of them is surrounded by a ring-like fibrocartilaginous structure. Fracture of one of these two bones is quite rare, and treatment can be challenging due to the uncertain classification of this type of injury. Often, fractures remain unrecognized or are treated unsuccessfully. We present a unique case of a patient who was treated conservatively for 6 months, with only general indications, and was eventually treated surgically, not without difficulty, but with a successful final outcome. We looked for a method that could alleviate the patient's pain symptoms and promote functional recovery as much as possible. Due to the limited guidance in the scientific literature and the failure of conservative treatment attempts, we used a combination of reduction and osteosynthesis with an interfragmentary screw, with the addition of biological cement. The sesamoid bones of the big toe can cause serious disruptions to everyday life if they are fractured or damaged.

Keywords: *Sesamoid bone ligament; Osteo-fibro-cartilaginous structure; Fracture; Absence of precedents in the literature; Innovative method; Combination of reduction and osteosynthesis techniques; Biological cement*

Introduction

Fractures of the sesamoids of the big toe are included in a group of injuries that affect the so-called sesamoid complex, an osteo-fibro-cartilaginous structure embedded within the plantar ligament and that plays an important role in the propulsive mechanism of walking.

The tibial sesamoid is more commonly injured, bears more weight, and is larger than the lateral sesamoid.

Usually, the fracture is caused by hyperextension and axial loading of the first ray with forced dorsal flexion of the first metatarsophalangeal (MTP) joint. Symptomatically, it presents with generalized pain in the big toe and in the head of the first metatarsal, with swelling and redness, more acute in the plantar region of the big toe, and functional impairment of the metatarsophalangeal joint.

Because these are rare fractures, located in an unusual area, no guidelines for a type of treatment have been described so far, particularly in the most complex cases.

The anatomical study, together with the development of new devices, such as biological cement and the compression synthesis tools now available to us, can represent a step forward in addressing this (and other) types of problems (once underestimated) that can reduce people's quality of life.

The following clinical case represents an example of this and aims to encourage further exploration into the study of small joint pathologies of the foot and possible treatments, even in cases of epidemiologically unusual fractures. [1-4]

Case Presentation

A 42-year-old man presented with pain in the left foot whih had been going on for 6 months. The pain appeared following a hyperdorsiflexion trauma of the first metatarsophalangeal joint of the right foot. The pain worsened during weight-bearing activities.

On clinical evaluation, tenderness was evident on the plantar side of the head of the first metatarsal with slight swelling compared to the normal foot. Pain and sensitivity increased with extension of the big toe and during weight-bearing. Mild distal paresthesia was observed. Initially (at the time of trauma), a clinical diagnosis of soft tissue injury was made and treated with bandaging and rest. Subsequently (about 1 month later), X-rays were ordered to exclude possible bone injuries. Foot X-rays revealed a fracture of the medial sesamoid bone. The patient was treated with functional bandaging, walking with a Talus shoe and magnetic therapy. About 6 months after the trauma, the patient, with persistent pain (VAS score: 9/10), swelling, paresthesia, and marked functional limitation, came to our attention.

Having noted the ineffectiveness of non-invasive treatments, a procedure was proposed, after a thorough explanation, involving osteosynthesis with a compression micro-screw (titanium) of the sesamoid, with the aim of reconstituting the articular surface of the sesamoid itself. After the surgery, a period of offloading the limb for 30 days was followed, then progressive weight- bearing, achieving full weight-bearing in 15 days. During this phase, the pain significantly decreased (VAS score: 1). The swelling persisted for an additional 30 days, gradually subsiding. Paresthesias remained.

After about 6 months of relative well- being, the patient reported the onset of pinpoint pain, likely due to the screw. After another 2 months (8 months from the first surgery), the screw was removed percutaneously. After a convalescence of about 15 days, with the limb unloaded most of the time and gradually bearing weight on the right, there was a period of well-being that lasted approximately 2 years.

Figure 1. First fracture.

Figure 2. First intervention.

The patient was informed about the treatment and the possibility of surgical procedures previously reported in the scientific literature, as well as the reasons for choosing surgery. The patient consented to the treatment.

The fracture was transverse, with 2 large fragments and the inner spongy part partially inconsistent.

A titanium cannulated double-threaded “reverse” screw with a smooth shaft was used: this was used to promote compression of the fragments.

We used a medial approach to directly access the fracture and to allow exposure of the articular surface of the sesamoid and its reconstruction.

After reduction with a small Codivilla clamp and having verified the reduction of the articular surface, a provisional 0.8 mm diameter Kirschner wire was implanted.

After verifying the correct positioning of the wire (which included the 2 bone fragments along the major diameter), the entry hole was tapped and a compression screw of the above-described size 10x2 mm was inserted, all under microscopic control. The Kirschner wire was then removed and layered suturing was performed.

In the second reduction procedure (described in this clinical case report), biological cement (BPB)[1] was first injected from a pre-filled syringe through a small cannula about 2 mm in diameter, with visual and fluoroscopic verification (the cement is radiopaque) inside the fracture line, until the internal trabecular void was filled. Subsequently, the screw was applied, repeating the previous procedure.

In both procedures, the patient wore walking a talus-type shoe for walking for the next 30 days and was then subjected to about 30 days of functional rehabilitation and training sessions (3 times a week). Clinical check-ups were carried out at 7, 15, 30, and 60 days, one year, and X-rays at 7, 45 days, and one year after the procedures.

Figure 3. Second fracture.

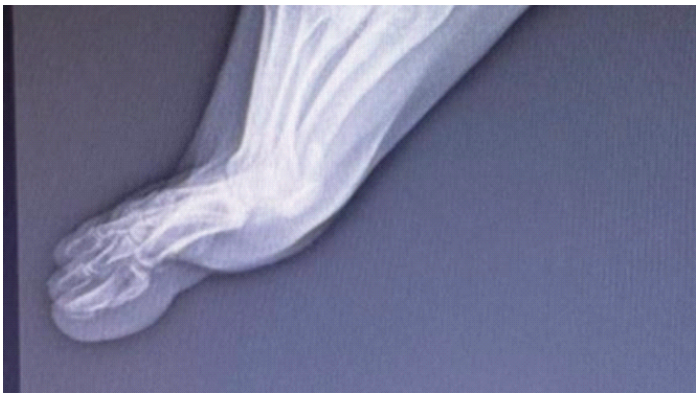

Figure 4. Second intervention.

Currently, the patient has gone from a VAS score of 9 before the therapeutic course to a VAS score of 1. Mild paresthesia remains on the medial side of the big toe and occasional pain flare-ups occur (twice a year), which subside in about 48 hours with the use of anti- inflammatory drugs. Dorsiflexion is complete. There is a slight swelling of the big toe compared to the opposite side. No signs of inflammation. Dorsiflexion is about 15°.

Discussion

The objective regarding the clinical case in question was not only to reconstruct the bone portion but also the articular surface of the medial sesamoid, which is part of a significant fibro-cartilaginous complex. The removal of the sesamoid, which has proven to be a good alternative in extreme cases, can result in significant functional alterations, as an important lever arm in the walking mechanism is lost, and it can promote the development of hallux valgus.

Biological cement, combined with the use of an appropriate synthesis medium, has proved to be an important resource in this case, which could also be used in the event of more complex fractures.

At our center (which is largely dedicated to winter sports), we have successfully expanded the use of this product and will soon make the results known. [1-4]

Conclusions

Despite the rarity of sesamoid fractures, when they occur, these types of injuries should not be overlooked. Conservative treatments can often have positive outcomes, but if not, it is necessary to find effective solutions, as neglected fractures can lead to significant dysfunction and cause persistent pain.

The clinical case in question demonstrates that orthopedic practice, surgery, and medicine in general require continuous progress and new solutions in surgical techniques.

Conflict of Interest

The author declare no conflict of interest.

References

1. Boike A, Schinirring Judge M., McMillin S. Sessamoid disorders of the first metatarsophalangeal joint. Clin Podiatry Med Surg. 2011; 28(2): 269-85. DOI, PubMed Google Scholar
2. Cohen be. Hallux sesamoid disorders. Foot Ankle Clin. 2009;
3. Frankel J., Harrington J. Symptomatic bipartite sesamoids. J Foot Surg. 1990
4. Parra E. Stress fractures of the sesamoid. Clin Orthop. 1960