Surgical Treatment of Hallux Varus Secondary to a Traumatic Avulsion Fracture

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Purpose

Hallux varus secondary to avulsion of the tendon of the lateral head of the flexor hallucis brevis with fibular sesamoid subluxation has not previously been mentioned in the literature. This case report details our initial evaluation of the injury with a novel surgical treatment allowing for pain free ambulation without deformity.

Clinical Presentation

Figure 1. Initial clinic radiographs demonstrating subluxed fibular sesamoid with avulsion fragment to lateral hallux proximal phalanx.

A 50-year old female presents with an injury to the right hallux. Patient reports hearing a loud "pop" while forcibly plantarflexing the right hallux and then feeling immediate pain. She presented to the office after noticing an increased medial drift of the right hallux. Physical exam revealed pain localized to the fibular sesamoid with significant pain with range of motion of the right 1st metatarsophalangeal joint A visible splay was also noted between the right 1st and 2nd digits.

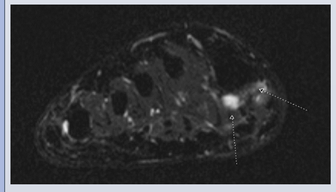

Figure 2. Coronal plane STIR MRI with increased signal intensity to the lateral head of the flexor hallucis brevis tendon and fibular sesamoid indicating tendinous disruption.

Figure 3. Transverse plane STIR MRI demonstrating increased varus drift of the hallux

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Treatment and Surgical Technique

Surgical intervention was performed with a plantar approach for adequate visualization of fracture fragment and tendon. Intra-operatively, the non-healing fracture fragment was excised and measured 10 mm in length. The lateral head of the flexor hallucis brevis tendon was anchored into the base of the proximal phalanx using a 2-0 bone anchor with care to avoid the joint space of the 1st metatarsophalangeal joint. The toe was held in an abducted and plantar-flexed position utilizing a 0.062 in K-wire. Patient was placed in a surgical boot post-operatively and instructed to remain non-weightbearing.

Figure 4. Avulsed fragment of the proximal phalanx measuring 10 mm in width

Figure 5. Final position with K-wire to maintain abducted and plantarflexed position.

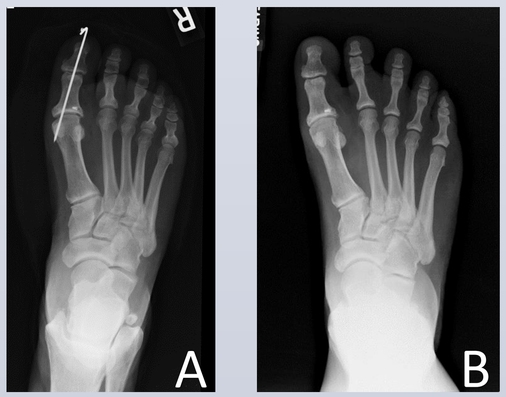

Figure 7. Immediate post-operative (A) and 3-month post-operative (B) radiographs of the patient. Improved position of the hallux noted without varus deformity.

Figure 6. Reattachment of the lateral head of the flexor hallucis brevis with the proximal phalanx base utilizing a 2-0 bone anchor. Adequate visualization of the tendon and base provided by a plantar approach.

Results

Immediately post-operatively, hallux was in rectus position. Patient was compliant with post-operative non-weightbearing instructions. The patient was subsequently enrolled in physical therapy for improved range of motion to the 1st metatarsophalangeal joint. She did require follow-up in pain management clinic. At 9 months, patient was able to achieve the full range of motion without pain to the first metatarsophalangeal joint and retention of the hallux anatomical position.

Discussion and Literature Review

The presence of hallux varus secondary to fibular sesamoidectomy is well documented in the literature, but discussion hallux varus secondary to the traumatic disruption of the fibular sesamoid or lateral flexor hallucis brevis tendon is sparse. Cadaveric studies of the insertion of the lateral head of the flexor hallucis brevis has a mean width and length of 7.0 x 9.0 mm, respectively. In this case, the removed fracture fragment was approximately 10 x 10 mm, allowing for the conclusion that the attachment of the lateral tendon was disrupted to the proximal phalanx resulting in fibular subluxation.

Two case studies have discussed fibular sesamoid dislocation with or without hallux varus. Both focused on conservative care or sesamoidectomy. Irwin et al. documents a lateral subluxation of the fibular sesamoid treated with serial casting. The patient was asymptomatic at a one-year follow-up without hallux varus/valgus and full range of motion without pain. A case series from Graves et al. documented four separate cases of sesamoid subluxation or sesamoid fracture leading to hallux tendon imbalance. Three of these cases were treated conservatively with rest and stiff-soled shoes and one case required eventual sesamoidectomy. A sesamoidectomy would have been inappropriate in this case resulting in increased varus drift of the hallux.

Conclusion

The first metatarsophalangeal joint is a complex structure, with the biomechanics easily altered with disruption of tendinous attachments. Conservative treatment has been periodically described in the literature with no surgical options offered outside of sesamoidectomy for subsequent sesamoiditis. This case presents a unique case of fibular sesamoid retraction secondary to disruption of the tendon of the flexor hallucis brevis and a novel and effective treatment of option of removing the fracture fragment with reattachment of the lateral flexor hallucis brevis.

References

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