

Statement of Purpose

Scar tissue formation is a common complication of open reduction internal fixation (ORIF) of ankle fractures. In this case study, we document a patient status post ORIF of an ankle fracture leading to hallux interphalangeal joint (IPJ) contracture due to scar tissue formation along the posterior ankle. Our aim in treatment was to provide an efficient and definite surgical option that would relieve pain, and restore and preserve function.

Literature Review

Operative management of an ankle fracture is a complex process with risk of musculoskeletal post surgical complications. After discovering the location of the fracture by radiography, the surgeon needs to select the appropriate approach to properly reduce and fix the joint. The lateral approach is the most common as it provides optimal access and visualization of the lateral malleolus, syndesmosis and fibula for an ORIF procedure; however, anterior, medial, and posterolateral approaches may also be utilized to access different structures (1).

For ORIF procedures of the ankle, some of the major concerns are functional outcome and pain, followed by primary osteosynthesis, soft tissue necrosis, deep venous thrombosis, delayed union, stiffness, tarsal tunnel syndrome and complex regional pain syndrome type 1 (2). Even if all of the appropriate measures are taken (i.e. medications for infection and DVT prophylaxis, rehabilitation through weight bearing exercises and immobilization devices for range of motion), the patient may still exhibit an unexpected complication (2). At these junctures, surgeons are required to determine the best method to relieve pain and maintain quality of life.

Hallux Flexion Deformity and Entrapment of Flexor Hallucis Longus Tendon after **Open Reduction Internal Fixation of Ankle Fracture**

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Patient Information

Patient is a 59 year old female smoker who presents to the office status post right foot Lapidus bunionectomy with second and fifth hammertoe repair on 01/19/18. She also had an ORIF of an ankle fracture in 2015 with hardware removal in 2016. She presents complaining of continued non-reducible flexion at the hallux IPJ. She endorses pain at the posterior medial and posterior lateral aspect of the ankle as well as burning pain to the lateral aspect of her foot. She also reports difficulty with walking. Her right hallux does not purchase the ground.



Figure 1: Pre operatively, hallux IPJ contracture is evident on radiographs, particularly on lateral view. T2 MRI shows build-up of scar tissue along the posterior ankle, affecting the FHL tendon.

Intervention

Dissecting superior to the fat pad, soft tissue plane was appreciated. Medial border of the plantar fascia was visualized and left intact. The muscle belly of the abductor hallucis was noted and further dissection was performed lateral to the muscle. The quadratus plantae muscle belly and the medial plantar nerve and artery were visualized. The underlying septum was transected and the flexor hallucis longus tendons were then visualized crossing each other. At this time the two tendons were tenodesed, repaired for the tenotomy, and sewn together using 2-0 FiberWire.

Outcome

The hallux was put through a range of motion and it was noted there is no flexion contracture when dorsiflexing the hallux. There was appropriate power at the hallux and all lesser toes when pulling at the tenodesed tendons. Patient was placed in a long cam boot. Patient tolerated the procedure well. Patient was neurovascularly intact with brisk capillary refill to the distal digits post procedure.

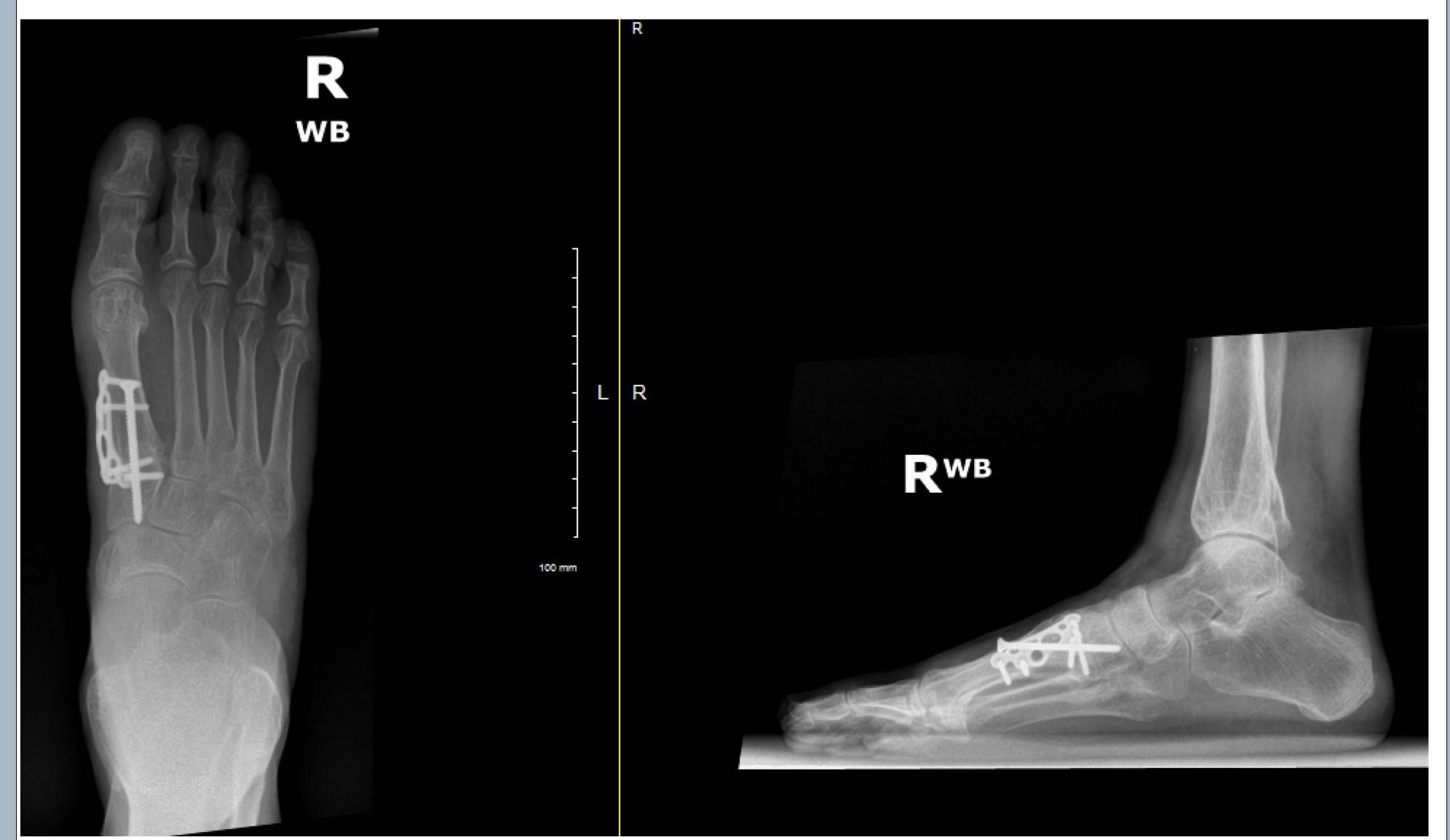


Figure 2: Post-operatively hallux IPJ contracture resolved on radiographs. This is evident particularly on lateral view.

Discussion

The posterolateral approach for ankle ORIF procedures is typically used for access to the lateral and posterior malleolus (1). The surgeon accesses theses structure through a space between the FHL and the peroneal muscles, which are innervated by the tibial nerve and the superficial peroneal nerve respectfully (1). These two structures should protect the nerves from injury during the procedure. Nonetheless, given the close relationship between this procedure and the tibial nerve and FHL, excessive scarring in this area, which is typical of any surgical procedure, could result in this deformity.



Discussion

In our case, the Master Knot of Henry was selected as the midpoint of the foot. Performing the procedure just proximal to the Knot of Henry allowed for the resolution of the deformity and restoration of the function of the hallux. In addition, the lack of scar tissue in this area is less likely to develop a recurrence of adhesion in the future, as supported by Lee et al (2008). This intervention improved function, pain, and quality of life measures. Further review of this procedure in comparison to release of adhesions at the fracture site should be evaluated to institute a standard of care for patients presenting with this deformity.

Financial Disclosures

Nothing to disclose.

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