

# CITRELOCK®

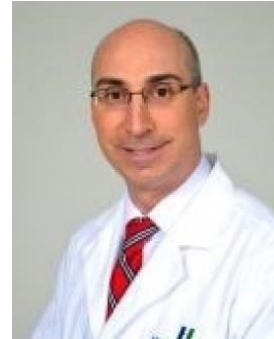
## Achilles Repair and Flexor Hallucis Longus Tendon Transfer

### CASE STUDY

#### Patient history:

The patient is a 38-year-old male construction worker who presented to the office with a chief complaint of left posterior leg pain. He is an avid practitioner of mixed martial arts, and frequently competes as a fighter in tournaments. Three days prior to his visit, the patient was playing soccer when he felt as if “someone had kicked him in the back of the leg”. He was evaluated in the Emergency Department due to pain and swelling. MRI was ordered that showed a complete rupture of the Achilles tendon at its most proximal aspect, likely involving the aponeurosis.

The patient described symptoms of prodromal pain in both Achilles tendons for three months prior to his injury.



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These results are specific to this individual only. Individual results and activity levels after surgery vary and depend on many factors including age, weight, and prior activity levels. There are risks and recovery times associated with surgery, and there are certain individuals who should not undergo surgery.

Case study is a publication of Acuitive Technologies.



### **Physical Examination:**

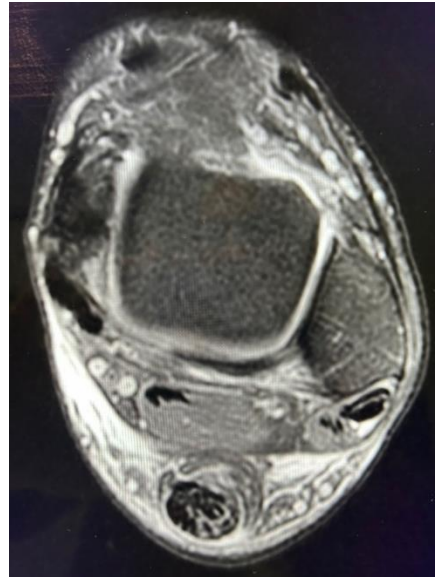
Upon inspection, the patient had swelling of the left ankle and leg. The Achilles tendon was most tender 13 centimeters (cm) proximal to the tip of the medial malleolus and the tendon was not easily palpable along its course. Thompson test was positive on the left.

### **Imaging:**

MRI showed a complete rupture of the Achilles tendon at its most proximal aspect, likely involving the aponeurosis.



*Figure 1: Rupture of Achilles tendon*



*Figure 2: Achilles tendinopathy*

The tendon showed signs of severe degeneration with increased girth, heterogeneity, and loss of anterior concavity.

### **Treatment Plan:**

The patient was diagnosed with an acute rupture of the Achilles tendon at the musculoskeletal junction. This rupture occurred in the setting of severe symptomatic tendinopathy with chronic changes in tendon morphology throughout its length.

The patient being involved in athletic activity was indicated for acute repair of his Achilles tendon rupture. In addition, he was indicated for flexor hallucis longus tendon transfer to his calcaneal tuberosity to augment the repair. The decision to perform the tendon transfer was made for the following reasons:

1. Poor quality of tissue could lead to failure of the repair in this severely degenerated Achilles tendon.
2. The amount of available tendinous tissue in which to place sutures is scant at the musculotendinous junction.
3. Prior to his injury, the patient experienced months of pain in the Achilles tendon and a tendon transfer could serve to alleviate any persistent symptoms of tendinopathy.

### Surgical Procedure:

The patient was placed supine on the operating room table with a thigh tourniquet and gel support under the contralateral hip to externally rotate the left lower extremity. An incision was made on the posteromedial leg just anterior to the border of the Achilles tendon. The incision was carefully carried through the paratenon to expose the site of the rupture. As predicted, the tissue at the proximal stump was of extremely poor quality and quantity.



*Figure 3: Ruptured Achilles aponeurosis*



*Figure 4: Suture in both stumps of Achilles*

After placing a modified Krakow stitch of non-absorbable #2 braided suture into each stump, the sutures were tied to restore the normal length and tension of the Achilles.



*Figure 5: Continuity of Achilles restored*

Due to the very proximal site of the rupture in this case, a decision was made to create an additional distal incision for the flexor hallucis longus tendon transfer, rather than extending the existing incision. A 4 cm incision was made over the medial aspect of the Achilles insertion. The retrocalcaneal fat was removed to access the dorsum of the calcaneal tuberosity. The crural fascia was carefully opened to avoid injury to the tibial nerve and posterior tibial artery. The flexor hallucis longus muscle and tendon were located and dissected distally. With the ankle and great toe in

maximum plantarflexion, the FHL tendon was transected at its most distal extent and brought out into the wound.

A modified Krakow stitch of non-absorbable #2 braided suture was placed into the proximal stump of the FHL tendon. The tendon was sized at 6.0 millimeters (mm) using the sizing tool from the Acuitive Technologies CITRELOCK Tray. A wire driver was used to introduce the 2.4-mm guide pin into the midline

of the calcaneal tuberosity, just anterior to the Achilles insertion. The guide pin was passed through the calcaneus in a dorsal posterior to plantar anterior direction, exiting the plantar skin in the arch, well anterior to the weightbearing aspect of the calcaneal tuberosity. A 6.5-mm cannulated reamer was used to ream over the guide pin from dorsal to plantar. The sutures in the FHL tendon were passed through the eyelet in the guide pin and the guide pin was advanced through the calcaneus by pulling on its tip, delivering the ends of the sutures through the plantar skin.



*Figure 6: Proximal stump of surgically transected FHL tendon*



*Figure 7: Guide pin with sutures through eyelet ready to be pulled through plantar skin*

With tension on the sutures and the ankle plantarflexed, the transected stump of the flexor hallucis longus tendon was fed into the reamed 6.5-mm tract in the calcaneus. A CITRELOCK implant, size 6 x 23-mm, was assembled to the inserter and malleted into place from dorsal to plantar to secure the tendon transfer. The bone tunnel preparation was intentionally oversized by 0.5 mm with regard to the measured tendon size of 6.0 mm and the bone quality, allowing flush insertion of the screw while also providing excellent purchase in the bone.

Protruding sutures were trimmed flush with the plantar skin while retracting it back, allowing the nonabsorbable sutures to subside beneath the skin's surface. Wounds were irrigated with saline and closed in layers. The patient was placed into a compression dressing and splint prior to awakening from anesthesia.

#### **Post-operative Care:**

The patient was non-weightbearing for four weeks in a splint/cast prior to being transferred into a cam walker boot. He then progressed as tolerated to weightbearing ambulation in the boot for eight weeks. Physical therapy was initiated at eight weeks post-operatively. He returned to running at 4.5 months post-operatively and mixed martial arts activities at 6 months post-operatively. He is able to perform a single-heel rise and continues to be pain-free 18 months after surgery.



*Figure 8: Radiographs of (Acuitive Technologies) CITRELOCK implant*



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