

## Purpose

Achilles tendinosis is a chronic inflammatory condition resulting in hypertrophic collagen formation similar to scar tissue. Surgical debridement and advancement of the Achilles with or without flexor hallucis longus (FHL) tendon transfer appears to be prevalent in current literature, but this tendon is diseased and relatively avascular. The purpose of this study is to show the functional outcomes and complications of an FHL tendon transfer after resection of the degenerated Achilles tendon.

## Methodology

Eight patients with symptomatic insertional Achilles tendinosis who exhausted conservative treatment underwent resection of Achilles tendon with FHL transfer were included with an average follow-up time of two years (range 12-36 months). Functional outcomes were measured including return to activity, ACFAOM scores, plantarflexory power loss at hallux and ankle. Complications consisting of wound dehiscence, infection, transfer failure/rupture were also measured. The hypothesis we pose is with the degenerative tendon removed and replaced with a healthy, vascular FHL tendon, there will be minimum complications and little change in function.

## Procedure

Our surgical technique involved all patients in the prone position. A midline incision was made over the Achilles tendon with careful sharp and blunt dissection to expose the tendon. The Achilles was then transected proximal to the degenerative tissue and resected from its insertion. The posterior tuber of the calcaneus where the Achilles inserts was also resected. The FHL tendon was identified and transected as far distal as possible taking care to avoid the neurovascular bundle. The FHL tendon was then whipstitched and passed through a canal in the superior calcaneus that was previously drilled(6). An appropriately sized interferon screw was used to anchor the tendon to the calcaneus while the ankle was in slight plantar flexion and under physiological tension. The proximal stump of the Achilles was not sutured to the FHL. The incision was then closed and patient was splinted in neutral position.

## Literature Review

Degenerative changes in tendons may be common in people older than 35 years, and it seems likely that these changes lead to spontaneous rupture. As collagen degenerates with age, several biomechanical changes have been observed to take place. Arner et al(1) found no inflammatory cellular infiltrations in their patients who had a rupture of the Achilles tendon. This provides evidence that the observed degenerative changes had been present before the rupture and were not secondary to it(2-4).

Martin et al(5) described that persistent pain and functional limitations following Achilles decompression and debridement procedures are thought to result from leaving behind diseased tendon. He further concluded that when augmentation of FHL is incorporated, improper tensioning of tendon may be problematic. If identical tensioning is not achieved, only one of the tendons will absorb most of the stress(5).



Figure 1: FHL tendon harvest



Figure 3: FHL tendon whipstitched for transfer



Figure 2: Securement of the FHL tendon via a biotenesis screw

## Results

All patients underwent the same procedure performed by the primary surgeon (R.F.). Our results show 100% returned to normal daily activity, 100% increase in ACFAS scores, 100% no reduction in plantarflexory power in hallux, and 100% had no reduction in plantarflexory power in the ankle. There were however 2.5% with wound dehiscence (1 patient), 0% infection rate, and 0% transfer failure/rupture.

## Discussion

Wegrzyn et al(7) showed that the FHL as the second strongest plantarflexor of the ankle. It also closely reproduces contractile force of Achilles, fires in same phase, and is in anatomical proximity(7-8). This will maintain normal muscle balance of the ankle while increasing blood supply.

Augmentation may result in increased tissue bulk in the posterior Achilles tendon area which may cause recurrence. In an effort to avoid this, Martin et al(3) completely excised the Achilles tendon and transferred the FHL tendon similar to our procedure. Long term results showed 95.5% decreased pain, 86.4% satisfaction, with no significant difference compared with the general population. Although plantarflexory strength deficits were 30% on average, all but one patient could do a heel raise. As part of our protocol, the Achilles tendon was not sutured to the FHL as the literature shows no significant difference in outcomes and also avoided improper tensioning and decreased tourniquet time.

Wegrzyn et al(7) also resected the diseased portion of the Achilles with FHL transfer in treatment of acute Achilles ruptures. devised a study where 11 patients had modified FHL transfer for chronic Achilles rupture. All patients were able to perform heel rises with no functional weakness in hallux.

## References

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