Non Insertional Achilles Tendinopathy:
Avoiding Tissue Resection or Tendon Transfers

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Non insertional Achilles tendinopathy is characterized by pain, local swelling over the Achilles tendon away from its insertion, and limitation in functional activities. It can be seen in recreational athletes and elite ones, and sedentary populations. There is no consensus over its real etiology, but it appears that a failed healing response occurs instead of a healing process, where a process of deterioration and degeneration of the local tissue ensues, leading to pain and malfunction. The histologic evaluation has shown either areas of disorganized fibers mixed with increased levels of glutamate and lactate, which may change pain modulation. Areas of neovascularization have also been observed, mainly on the ventral aspect of the tendon, accompanied by proliferating nerves which are supposed to be integral in the pain disregulation pathway (1). Initial conservative management is recommended as the mainstay of treatment, but no consensus exists as to which is the best method. Conflicting evidence shows that eccentric exercise has a role. Also shock wave therapy may help, although there is insufficient evidence about this therapy. Minimally invasive options have been tried too, as high volume injections or sclerosing injections but evidence is insufficient. Operative management tries to resect the degenerated tissue, stimulate tendon healing and augment the Achilles tendon with a graft. Percutaneous longitudinal tenotomies try to stimulate tendon healing for mild focal tendinopathy and good results have been published. On the contrary, minimally invasive stripping of the tendon tries to denervate the tendon, thus avoiding pain, while allowing a recovery through exercises, and good results are available too.

The etiology of tendinopathy and the origin of pain are not clearly understood. Some patients respond with nodule formation, and others respond mainly with highly vascularized tissue with neovascularization. We do not know which tissue is painful, and no clear inflammation has been found in the diseased tissue. Thus, it is not clear which tissue and in what extent should we resect it when approaching surgically these type of patients. It is accepted that some tissue debridement delivers good results, with success rates greater than 80% (1). It has been suggested that when visually inspecting a diseased tendon, if greater than 50% of the cross sectional area of the tendon is diseased, a tendon augmentation by transfer of the flexor hallucis longus (FHL) is a good option, theoretically providing a
better vascularization and providing more strength of plantar flexion. If we analyze the evidence behind this argument, most of it either deals with chronic Achilles ruptures (2,3), or Achilles tendinopathy patients where satisfactory results are obtained in low physical demand patients, with no real measure of the final physical performance which impedes adequate evaluation of the real consequences of performing a transfer. Martin (4) treated non-insertional Achilles tendinopathy with complete excision of the Achilles tendon and FHL transfer, obtaining good clinical results but less plantar flexion motion and strength, with deficit up to 30%, and this included young patients where no information about their physical or sports activity was given. Different authors have confirmed the resulting deficit in plantar flexion strength after an Achilles debridement and FHL transfer for Achilles tendinopathy, ranging from 26 to 35% (5,6,7) without evident clinical consequence. We do not know how much of this deficit was present preoperatively, how much of it was improved due to the transfer, or how much of a consequence in strength and performance is observed, especially in younger adults. Probably the good AOFAS results and satisfaction relate to the age of the patients and their low physical demand. Besides this conflicting evidence, complications after surgery for Achilles tendinopathy can be as high as 11%, including skin edge necrosis, infections, neuroma, sural neuritis, sensitive scar, etc. When adding FHL transfer, persistent deformities of the hallux can be observed, persistent pain, inability to return to sport and weakness in plantar flexion can be observed too. Richardson (8) did not show any functional significance due to the lack of flexion power at the IF joint of the hallux, as no pressure transfer to the 2nd MTP joint or decrease at the 1st MTP joint was found. No gait asymmetry was found either, but patients were old (average age 56 years) and sedentary. In conclusion FHL transfer is the preferred technique for reconstruction of Achilles tendinosis because of its good donor characteristics (activation, strength, axis of contraction), and MRI proven incorporation to the native tendon. What hasn’t been shown is that if it produces any positive additional result to the debridement alone of the tendinopathic Achilles.

Our approach for non-insertional Achilles tendinopathy has been to improve patient’s pain, maintaining exercises in order to improve long term function and strength of the gastroc-soleus complex, minimizing our surgical approach trying to achieve the greatest functional improvement and avoiding complications. The approach that better fits in this approach is the tendinoscopic approach, where through tendinoscopy as described by Steenstra (9) we remove only the adhered tissue, diseased or inflammatory tissue surrounding the Achilles and Plantaris tendon, specifically on the ventral side. In this way, tissue resection is minimized and no need of tendon transfer is encountered. This method of treatment focuses on the denervation of diseased tendon, lysis of tendon adhesions, and stimulation of healing response (10). Van Dijk has published about tendinoscopy for non-insertional tendinopathy of the Achilles, showing good results in 20 patients followed for 6 years, without complications. In his series, patients resumed sports activities after 4 to 8 weeks, with complete pain relief, and SF36 scores comparable to people without Achilles complaints (9). An early return to sports and physical activities is of paramount importance as it has been shown that it takes a long time to fully recover gastroc-soleus function after pain has resolved (11), which should make us focus our efforts in allowing our patients to return to training and exercising as soon as possible. Our own results (not published) in 11 patients with chronic Achilles non-insertional tendinopathy treated with tendinoscopy, have been good to excellent in most cases. We performed a ventral debridement of the Achilles tendon in the symptomatic area, not resecting the Plantaris tendon and limiting the debridement to the superficial diseased tissue. Complete satisfaction was obtained in 10 out of 11, with a median VISA-A score of 97 points. Full pain relief was observed at 9 weeks on average, and return to same level of sports as preoperatively, was obtained at 3.5 months on average. We are fully satisfied with this approach and it remains our first surgical choice in these type of patients.
More information is needed in this field, with randomized studies with long term follow up which can really evaluate one treatment over the other, in young and elderly patients, comparing functional outcomes and complications.

References

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