

Osteopathy seminar series

Clinical outcomes in surgical versus non-surgical treatment of acute Achilles tendon rupture.

Summary

Acute Achilles tendon rupture is characterized by symptoms of pain on movement, inability to move, swelling in the calf and often patients hear a popping sound when the tendon ruptures. This case study reports a male patient who presented to the office with an acute Achilles tendon rupture. As there are varying treatment options for Achilles tendon ruptures, a literature review was conducted to see if a surgical or a nonsurgical approach is best to treat lost function and pain in the shortest time possible. The patient was treated with conservative therapy due to his accompanying illnesses. Full range of motion in the ankle joint with a minor deficit in repeated strength exercises after long walking distances was achieved with conservative therapy after one year. This case shows that conservative therapy achieves good results in patients with acute Achilles tendon rupture and accompanying illnesses where surgery cannot be performed.

Introduction:

The Achilles tendon consists of the tendinous portions of the gastrocnemius and the soleus muscles. The function of it is to transduce the force or buffer the energy. Lesions to the tendon can either occur from excessive loading or degeneration. The optimal treatment for acute Achilles tendon rupture is still a subject of debate. An Achilles tendon rupture can be treated surgically or non-surgically, with different alternatives in terms of mobilization versus immobilization. The prevalence is approximately 18 per 100000 per year and is thought to be rising, possibly due to the increasing keep-fit culture (1).

Case report:

A 59-year-old male farmer presented to the office with an acute onset of calf muscle pain on the right side two weeks ago. The patient explained the pain came on suddenly while walking, but without any specific movement or sport activity. He never experienced calf muscle pain before this episode and he never had an injury to his leg in the past. The patient can walk without pain, but feels weak while climbing stairs. He twists his ankle quite often. The patient noticed a swelling in the calf muscle. No popping sound was heard by the patient.

Upon examination, the gait analysis showed a limping on the right with a minor lack of propulsion during toe off on the right. Walking on the toes was painful and standing on the toes was reduced due to reduced muscle strength on the right hand side. A swelling at the junction between the gastrocnemius and soleus muscle belly and its tendon could be seen. No hematoma could be seen. The neurological examination of the lower limb was unremarkable, as well as the examination of the pulses at the foot with Doppler ultrasound.

After examination in the office, he was sent out to do an MRI of the calf on the right. The radiologist diagnosed an almost complete tear of the Achilles tendon on the right.

The patient started radiation therapy for prostate cancer a few days prior to coming to the office. He has chronic obstructive pulmonary disease due to heavy smoking in younger age.

Since he was already in treatment for radiation therapy at the university hospital in Zurich, he was sent there to the orthopedic department to get a walking cast and physical treatment.[^](pic.a)

Achilles Tendon Problems



The clinical question:

In patients with acute injury to the Achilles tendon, do clinical outcomes differ in surgical versus non-surgical treatment of acute Achilles tendon rupture?

Search strategy:

The Pubmed database was used as a search engine. The search strategy used was RCT's only, not older than five years of age and only studies with human beings. The search terms entered were « treatment outcomes » AND « Achilles tendon » AND « surgery ». The literature search resulted in seven hits, of which three articles were found relevant.

References:

1. Kahn, R.K., Fick, D., Brammar, T.J., Craford, J., Parker, M.J., 2004, Surgical interventions for treating acute Achilles tendon rupture. The Cochrane Library, 1-48
 2. Olsson, N., Silbernagel, K.G., Eriksson, B.I., Sansone, M., Brorsson, A., Nilsson-Helander, K., Karlsson, J., 2013. Stable surgical repair with accelerated rehabilitation versus nonsurgical treatment for acute achilles tendon ruptures. The American Journal of Sports Medicine, 41(12), 2867-2875.
 3. Jielille, J., Badalihan, A., Qianman, B., Satewalede, T., Wuerliebiede, J., Kelamu, M., Jialihasi, A., 2016. Clinical outcome of exercise therapy and early post-operative rehabilitation for treatment of neglected Achille tendon rupture: a randomized study. Knee Surg Sports Traumatol Arthrosc, 24, 2148-2155.
 4. Lantto, I., Heikkinen, J., Flinckila, T., Ohtonen, P., Siira, P., Laine, V., Leppilahi, J., 2016. A prospective randomized trial comparing surgical and nonsurgical treatments of acute achilles tendon ruptures. The American Journal of Sports Medicine, 44(9), 2406-2413.
- Picture a) <http://www.excelphysicaltherapy.com/blog/graston-and-eccentric-exercises-help-achilles-tendon-pain/>
Picture b) <http://lerrmagazine.com/article/return-of-strength-after-achilles-tendon-surgery>

The evidence:

All three articles retrieved were RCTs. All three studies found similar results. Some results, contrasts and similarities need to be pointed out.

Lantto and his colleagues looked at clinical outcomes and calf muscles strength recovery in their prospective randomized control trial. 60 patients were randomized to either surgery or conservative care. The surgery group received the same rehab treatment after surgery then the conservatively treated group. Surgical and nonsurgical treatments of acute Achilles tendon ruptures have similar results in terms of the Achilles tendon performance score. Calf muscle strength recovery takes place mostly during the first year after injury with minimal improvement thereafter. They found that surgery restores calf muscle strength earlier over the entire range of motion of the ankle joint, with a difference of around 15% more strength favoring surgery at eighteen months after surgery. Furthermore, better health-related quality of life in domains of physical functioning and bodily pain was found in the surgery compared to the nonsurgical group.

Early post-operative rehabilitation was also found to superior to post-operative cast immobilization in terms of better clinical outcomes and faster overall tendon regeneration. These results were found by Jielille and colleagues in a randomized study. Complications such as osteoporosis and ankle joint ankylosis only occurred in the post-operative cast immobilization group. However, this study was limited to the small sample size and the unblinded patients and doctors. Last but not least, the conclusion that post-operative cast immobilization is an important reason for potential complications.

In another unblinded RCT, Olsson and colleagues evaluated whether stable surgical repair and early loading of the tendon could improve patient-reported outcome and function after an acute Achilles tendon injury. One hundred patients with tendon rupture were randomized into either surgical treatment, including an accelerated rehabilitation protocol, or a nonsurgical treatment. The patients were observed over a period of one year and were evaluated for symptoms, physical activity level and function. The authors found no significant differences between the groups in terms of symptoms, physical activity and quality of life. However, they found significantly superior results in the group who had surgery when looking at the drop countermovement jump and hopping. Symptoms, reduced quality of life and function deficits still existed twelve month after injury on the injured side in both group. The conclusion that stable surgical repair with accelerated rehabilitation was not significantly superior to nonsurgical treatment in terms of functional results, physical activity or quality of life. Complications they observed included reruptures, deep vein thrombosis and superficial wound infection in both groups in about the same numbers. However, the surgical group had six times (26%) more brace induced temporary problems with macerated skin and pain- and pressure-induced nerve disturbances compared to the nonsurgical group.

The strength of all papers was the study design (RCT), homogenous group of patients and widely used outcome measures. In Lantto's study only one surgeon treated almost all patients. In the other two studies, different surgeons operated the patients.

One limitations of the study done by Lantto was the fact that a lot of eligible patients refused to participate in the study. Moreover, in all studies all patients and observers doing the tests were not blinded. The sample sizes were small in the study done by Jielille and Lantto.

All studies agree that no treatment is superior to the other.

The best treatment for the patient has to be made on an individual basis. Furthermore, they all agree on the fact that surgery opens up the possibility of an early and aggressive rehabilitation protocol. Thus, demanding patients might prefer surgery.

However, a larger number of patients is needed to find out the best treatment for each individual with a torn Achilles tendon, depending on their demands.(pic.2)



Answering the clinical question:

Recent RCTs suggest that nonsurgical treatments result in similar outcomes in patient satisfaction and in terms of clinical scores. However, better calf muscle strength my result with surgical repair, which should be considered when treating athletes or young and active patients. Similar rerupture rates and Achilles tendon functional scores have been reported with early rehabilitation in the surgical compared with the nonsurgical group. Both groups will most probably return to their previous activity level within one year after injury. However, not even half of the patients will be able to resume their preinjury level of sports. Deficits appear to be similar irrespective of the selected treatment. Patient's age has no effect on objective or subjective results when comparing treatment methods.

Applying the evidence:

In choosing the optimal treatment for the patient with an Achilles tendon rupture, the decision has to be made individually in regards to patient needs and risk factors. Early loading of the tendon and early mobilization of the patient have been shown to be beneficial to recovery.

The patient started with wearing the brace two weeks after the diagnosis has been made. Due to his ongoing radiation therapy and his COPD, the decision was made not to operate him. Physical therapy with weight bearing and mobilization was started as soon as the physical therapy department at the university hospital in Zurich was available.

More than a year after the injury, full range of motion in the ankle joint with a minor deficit in repeated strength exercises after long walking distances was achieved after the therapy. The patient was very satisfied with the results of the treatment. No complications have occurred.

Generally speaking, athletes and demanding patients without comorbidities who need a faster recovery and more calf strength after the injury might profit from surgery, whereas less active patients or patients with comorbidities will chose the conservative treatment without surgery. One major factor for success of a treatment is the rate of reruptures. Rerupture rates of around three percent in the surgical group and thirteen percent in the nonsurgical group are reported. The infection rate in the surgical group is minimal and only superficial tissue infections occurred.

Conclusion:

The optimal rehabilitation protocol in nonsurgical treatment or after surgical repair remains controversial, since both groups achieve similar results in the Achilles tendon performance scores. However, surgical treatment results in faster and better recovery of calf muscle strength, although both ways fail to restore muscle strength to that of the contralateral side. The literature read supports the statement that no treatment is superior to the other in regard to quality of life, functional results and physical activity. The treatment of choice has to be made on an individual basis.