

Artelon® Tissue Reinforcement Reconstruction of a resected Achilles tendon

Case report



Surgery performed in June 2008 and July 2009 by Jan Lidström M.D. Ph.D., Senior Consultant Orthopedic Surgeon, Department of Orthopedic Surgery, Sahlgrenska University Hospital, Mölndal, Sweden.

Introduction

As a consequence of, for example, trauma, infection or as in this case huge infiltrations of calcific masses, a significant length of the Achilles tendon could be missing after the necessary surgical resection. The problem then is to have the surgical means of bridging the gap in the tendon in order to restore its function. A number of different methods are described.

FHL, FDL or peroneal tendons can be used to bridge the gap, alternatively the gastrocnemius fascia can be used in different ways. The proximal part of the Achilles tendon can also be advanced using different techniques to fill the defect. In recent years different graft materials have also been used.

Case presentation

The patient is a 45-year-old male with a history of increasing pain in his right Achilles tendon over a number of years. He has a long history of parallel psychiatric problems, which in part are associated with his disabling pain. An investigation using MRI showed calcifications in his tendon. He has been operated on both at his local county hospital as well as in Italy, where resections of the calcifications and scarifications have been performed.

This only led to temporary relief of his pain and supplementary radiology showed new, widespread calcifications (Image 1).

He was then referred to Sahlgrenska University Hospital, Mölndal for further measures.

Physical examination

The patient could only walk with the use of a stick to relieve the load on his Achilles. The examination revealed a broad and extremely tender Achilles tendon. R.O.M. of the ankle was greatly diminished due to pain when he tried to move his foot.



*Image 1.
The x-ray revealed
calcifications.*

Surgical procedure I

The preoperative plan was to resect all the calcifications seen on x-ray, and then reinforce the remaining Achilles tendon using Artelon® Tissue Reinforcement (ATR).

However, after meticulous resection of all of the calcifications it was found that only useless scraps of tendon tissue were left. In fact there was now a 7 cm long defect in the tendon (Image 2).

The surgical procedure had to be reconsidered and it was decided to proceed with a free gastrocnemius fascial graft reinforced by ATR to bridge the incurred tissue gap. A gastrocnemius fascial graft was used and sutured end to end at both the remaining proximal and distal stumps of the tendon, using 0-0 Vicryl™ in a modified Bunnell fashion (Image 3).

The gastrocnemius graft was reinforced by enveloping it and the tendon stumps with Artelon® Tissue Reinforcement, sutured first at the ends and then through the gastrocnemius graft using multiple, multidirectional sutures (Image 4).

Locally available subcutaneous tissue was used to enclose the tendon and ATR.

Postoperatively, the tendon was protected in a below-knee plaster.

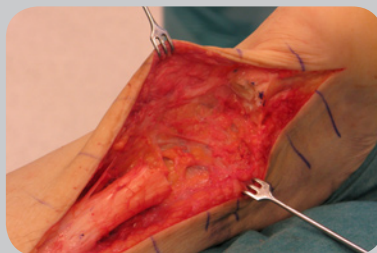
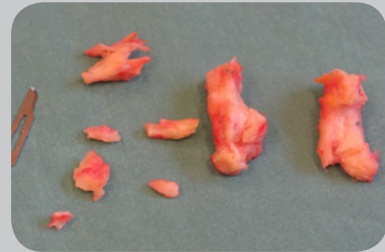
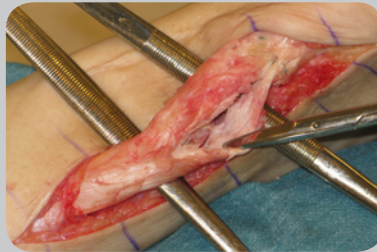


Image 2. Resection of the calcifications left a 7 cm long defect in the tendon.

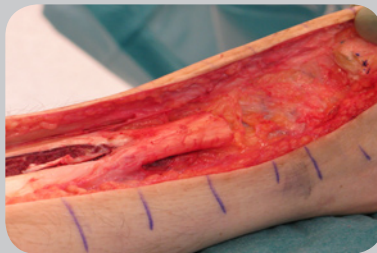


Image 3. A free gastrocnemius fascial graft was used.

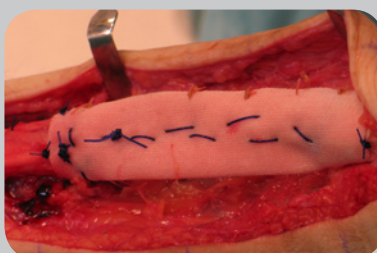
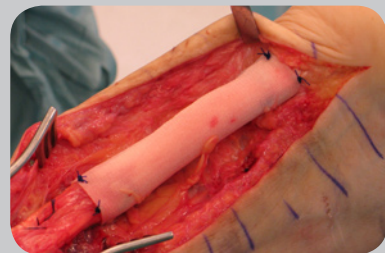
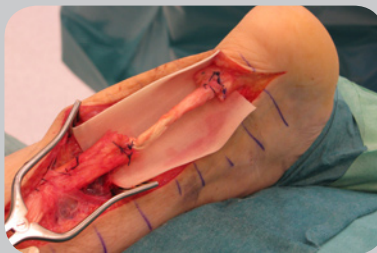


Image 4. The graft was reinforced using Artelon® Tissue Reinforcement.

Rehabilitation I

The patient had his below-knee plaster with full weight bearing for six weeks (no guidelines could be found in the literature for this procedure and the time was chosen to be on the safe side). After six weeks a below-knee orthose with free R.O.M. of the ankle was used. At the six-week control he had good, painless motion of his ankle and the operating wound was well healed.

Postoperative follow-up I

As the patient lived a fairly long way from the hospital performing the surgery, follow-up was continued at the county hospital after the first postoperative visit. At three months postoperatively the patient had a clinical erysipelas in the calf on the operated side and he had a deep venous thrombosis and a pulmonary embolus treated at his county hospital. This occurred despite of a peri- and post-operative anti-thrombotic regimen. His pulmonary embolus was treated successfully but the leg continued to be thickened and he began to experience pain in his leg.

The pain gradually increased and now also included pain in his left Achilles, where only moderate tendinosis had been revealed. At his county hospital the patient had asked the orthopedic surgeon in charge to either amputate his legs or resect his aching Achilles tendons. After extensive discussion with the patient, his orthopedic surgeon and the psychiatrist in charge, the surgeon reluctantly agreed to totally remove the Achilles tendon and the ATR on the right side.

Surgical procedure II

The second operation was performed approximately one year after the first.

The incision was made in his old operating scar. The tendon was easily detached from the surrounding tissue and had the macroscopic appearance of almost normal tendon, with only a faint pattern of the Artelon® Tissue Reinforcement on small parts of the tendon. The tendon had good elasticity and normal tension when tested manually.

The thin pseudoperitoneum was sutured in cylinder-like fashion although no other reconstructive measure was taken.

A histology sample showed ingrowth of fibrous tissue in the Artelon® Tissue Reinforcement.



Image 5. The patient demonstrated good motion of his ankle at six weeks.

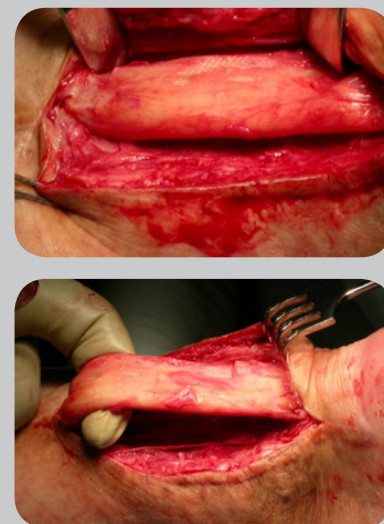


Image 6. The healed tendon had good elasticity and normal tension when tested.

Rehabilitation II

The patient had a below-knee plaster for wound healing for two weeks and then a below-knee orthosis with full R.O.M. at the ankle (and long-standing anti-thrombosis treatment).

Late follow-up

Six months after the revision surgery the patient also had his less affected Achilles tendon on the left side removed.

Conclusion

The use of a gastrocnemius graft, reinforced with Artelon® Tissue Reinforcement, was highly successful. The graft operation had created a tendon that was virtually normal at the second operation one year after the initial procedure.

However, from the patient's point of view the treatment was not successful. In the surgeons opinion the reason for this is the considerable overlap of psychiatric problems. The surgeon considers the erysipelas and the thrombosis to be less attributable to the graft operation per se, although more aggressive rehabilitation and a shorter period of immobilization might have been of value.