

Artelon® Tissue Reinforcement

Tibialis anterior tendon repair

Case report



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Introduction

The tibialis anterior muscle passes along the front of the lower leg. It acts as a dorsiflexor and inverter of the foot by elevating all the structures of the medial arch.

The tibialis anterior tendon can tear partially or completely as a result of trauma and/or degeneration. In some cases, the tendon can be overstretched to the breaking point if the patient takes a wrong step or twists their ankle. A partial or complete tendon rupture can result in an incorrect gait pattern and secondary problems in the knee, hip and spine.

Case presentation

The patient was an 81-year-old male with a two-year-old neglected rupture of the left tibialis anterior tendon at the level of the ankle joint. The rupture had resulted in hypertrophic callus formation with tendon elongation and functional insufficiency.

Physical examination

At presentation in March 2011, the patient had a drop foot as well as pain in his back and ipsilateral hip due to the limping gait pattern. Normal walking was only possible with a drop foot brace. There was a marked reduction in strength in the left anterior tibial muscle compared to the uninjured side. The rupture site was at the level of the tibial plafond, and at this level the tendon was widened. Distal to the widening, the tendon was thin although still palpable.

Surgical procedure

The tendon was exposed and divided at the level of the rupture. Approximately 1.5 cm of widened tendon tissue was removed, leaving a proximal normal tendon stump and a distal thin tendon stump.

A 7 mm strip of Artelon® Tissue Reinforcement (ATR) was used to reinforce the repair. The ATR was soaked in saline solution for five minutes before use.

A No. 2 absorbable osteosuture was used to secure the ATR to the 1st cuneiform bone beneath the insertion of the remaining tendon distally (Figs 1, 2a, 2b). This part of the tendon was folded back over the strip (Fig 3). A No. 0 running absorbable suture was then used to secure the strip to the distal tendon stump (Fig 4)

In this case, the ATR was placed under the tendon in order to obtain secure fixation to bleeding bone distally and to minimize friction between the strip and the overlying fascia (Fig 3 and 4).



Fig 1
An osteosuture was applied to the 1st cuneiform bone.



Fig 2a
The ATR was secured to bone beneath the insertion of the remaining tendon distally, as well as to the tendon.



Fig 2b



Fig 3
The tendon stump was folded over the ATR



Fig 4
The ATR was secured to the tendon stump by running sutures

Distal and proximal tendon stumps were approximated to each other by gently loading the ATR and pulling it through a slot proximal to the resected portion of the tendon (Fig 5). The repair was secured with No. 0 and No. 2-0 absorbable sutures (Fig 6). The preoperative elongation of the tendon had been eliminated (Fig 7).

The repaired tendon was covered with peritenon and fascia.

Postop rehabilitation

In order to keep the tendon reconstruction unloaded, the foot was placed in a plaster cast for three weeks in a 90° position.

Gentle range of motion exercises commenced three weeks postoperative with the foot in an orthosis, which allowed for passive dorsiflexion. Supervised active exercises commenced seven weeks postoperative. At this point, the orthosis was replaced by a drop foot brace, used daily for two months. A night splint was used for six months.



Fig 5
The ATR and tendon stump was loaded gently



Fig 6
The distal and proximal tendon stumps were approximated to each other.



Fig 7
The repair was completed with the preoperative elongation of the tendon being eliminated.



Fig 8
At seven weeks the patient was able to find his anterior tibial muscle and dorsiflex the foot actively.

Results

Already at the seven-week post-operative check-up, the patient was able to find his anterior tibial muscle and dorsiflex the foot actively. The foot held its position during the swing phase when he walked. At the six-month follow-up, the patient was brace-free except on occasions when wearing heavy shoes. There was little restriction in passive range of motion in the left ankle joint – differing 5 degrees in plantar- and dorsiflexion respectively – compared with the contralateral side. The patient was happy with the result.



Fig 9.
The patient was
brace-free at six
months

Conclusion

Anterior tibial tendon insufficiency following a degenerative tendon rupture is a disabling condition because of the resulting drop foot gait pattern. Neglected ruptures may cause treatment difficulties due to tendon elongation and impaired quality of tissue. In this case, a 7 mm strip of Artelon® Tissue Reinforcement (ATR) was used to reinforce the repaired tendon. The reinforcement method eliminates the need for tendon grafting, using either a tendon transfer or a free tendon graft. The benefit to the patient is decreased morbidity from the donor site. Subjectively and objectively, the result following the ATR reinforcement was very promising.

Note

This case report shows an example of the use of Artelon® Tissue Reinforcement. The surgery was performed by Martin Ålund, MD, PhD, Sahlgrenska University Hospital, Mölndal, Sweden.

Artelon® Tissue Reinforcement is manufactured and marketed by Artimplant, and is intended to be used for reinforcement of soft tissue where there is weakness, and for reinforcement of repaired soft tissue, including the rotator cuff, the Achilles, the patellar, the biceps and the quadriceps tendons. It is not intended to replace normal body structure or to provide full mechanical strength.

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