Simple end-to-end suture versus augmented repair in acute Achilles tendon ruptures

A retrospective comparison in 98 patients

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ABSTRACT We retrospectively compared the results in 98 patients with an acute Achilles tendon rupture treated with an augmented tendon repair (n = 59) to patients with an end-to-end suture (n = 39) after an average follow-up of 44 (22–69) months. 7 patients were operated on more than 2 weeks after the rupture, all with augmention. The complication rates in the augmentation group were 0.1 and in the end-to-end suture group 0.2. We found no differences in subjective outcome or rerupture rate between the groups. In the augmentation group, the rate of complications was higher in those operated on after 2 weeks than in those operated on before. A simple end-to-end suture seems sufficient.

The surgical treatment of Achilles tendon rupture is still disputed. Tendon adaptation with sutures only (Soldatis et al. 1997) has sometimes been combined with various augmentation procedures (Soma and Mandelbaum 1995). A few authors have also reported success with percutaneous treatment (Webb and Bannister 1999) or use of synthetic materials to strengthen the rupture (Fernàndez-Fairèn and Gimeno 1997). In many cases, the choice of method is based on the surgeon's intuition and tradition. We found no randomized studies comparing the simple tendon adaptation technique and tendon repair with augmentation. Therefore, we retrospectively analyzed the outcome in patients treated with an end-to-end suture or also with an augmented tendon repair.

Patients and methods

Between 1995 and 1998, all patients operated on for Achilles tendon rupture in two Finnish hospitals were selected from the surgical diary and their records checked. Those with an open rupture or a rerupture were excluded, as also were 2 patients who died during the follow-up. The operation was regarded as delayed if the time from injury to surgery exceeded 2 weeks. The method was classified as a simple end-to-end suture if no fascial or tendon reinforcement was used, whereas tendoplasty, according to Lindholm (1959), Lynn (1966) and Silfverskiöld (1941), was considered as augmented.

An augmented repair was used in 59 patients and a single end-to-end suture in 39. Their average age was 45 (25–83) years. The patients treated with an augmented repair were 5 years older than the others ($p = 0.06$, chi-squared test). The times from injury to operation were similar in both groups, 1.5 (0–210) days. 7 operations were delayed and these were all done with a fascial augmentation, using Lindholm's method (1959). In both groups, the ankle was postoperatively immobilized with a below-knee plaster cast with the ankle in plantar flexion. Weight-bearing was allowed after the cast was changed with the ankle in a neutral position 3 weeks later. The average immobilization time was 45 (23–59) days. The augmented repair group was usually immobilized for 1 week longer ($p = 0.001$, chi-squared test).

Table 1. Postoperative complications in 98 Achilles tendon ruptures

Complications	Augmented repair n 59	End-to-end suture n 39
Rerupture (op)	1	2
Deep infection (op)	2	–
Superficial infection	6	–
Partial rerupture	1	1
Insertional tendinopathy (op)	1	–
Stiffness of the ankle (op)	–	1
Paresis of n.peroneus	1	–
Large hematoma	1	–
Deep vein thrombosis	1	–
Total	14	4

op surgically-treated complication

All patients received a questionnaire regarding the subjective outcome and they were invited to attend the hospital's out-patient department for both a reexamination and clinical tests. Of the 98 patients, who were included in the study, 83 answered the questionnaire and of these, 75 were reexamined 44 (22–69) months after the surgery. The subjective outcome was estimated with the scoring scale developed for ankle fractures (Olerud and Molander 1984). A total score of 100 is the best result that could be achieved. The range of motion in the ankle joint and the maximal circumference of the calf were measured bilaterally. The scar, tendon and the ability to do heel raises were examined.

Results

18 postoperative complications occurred (Table 1). End-to-end suture group had fewer postoperative complications (10%) than augmented repair group (24%) with RR = 2.3 (95% CI 0.8–6.5) and p = 0.09 using the chi-squared test. Patients with delayed (> 2 weeks) augmented repair ran a higher risk (4/7) of complications than those operated on earlier (10/52) with RR 3.0 (95% CI 1.3–7.0) and p = 0.03 using chi-squared test. Both deep infections were seen in the delayed repair group. The surgical outcome concerning local tenderness, skin adhesions, scar and tendon thickness was better in the end-to-end suture group than in the augmentation group (Table 2). We found no difference between the two methods as regards the subjective score, the ability to do heel raises or the maximal circumference of the calf (p = 0.4, t-test).

Table 2. Findings at follow-up

Local changes	Augmented repair n 42	End-to-end suture n 33
Minor scar, tendon thickness normal	10	20
Slightly thickened tendon	26	13
Deformed tendon or disturbing scar	7	2
Skin adhesions	4	7
Local tenderness	4	3

Discussion

It has been stated that the increase in the amount of collagen obtained by augmentation can strengthen the Achilles tendon and thus permit earlier weight bearing after the rupture (Zell and Santoro 2000). The disadvantages of this technique are deformation of the tendon and a longer incision. The frequent wound problems are not unexpected, because the commonly used longitudinal incision passes through poorly vascularized skin (Haertsch 1981).

We found no differences in the subjective outcome score between the two groups, although tendon deformations and problems with the scar were more frequent in the augmented repair group. We had an infection rate of 8%, higher than that reported by others (2–7%) (Cetti et al. 1993, Leppilahti 1996, Jozsa and Kannus 1997, Nyyssönen and Lüthje 2000). Infections were commoner in older patients and in those operated on after 2 weeks. The high risk of complications in patients over 65 years has been reported elsewhere (Nestorsson et al. 2000). Our few cases of reruptures indicate no real difference between the groups. Previous authors (Nistor 1981, Bradley and Tibone 1990, Lo et al. 1997, Leppilahti and Orava 1998, Nyyssönen and Lüthje 2000) have reported rerupture rates between 1–3% after surgery. The highest risk of rerupture (21 %) has been reported among patients treated without surgery (Möller et

al. 2001). According to our study, simple end-to-end suture is safe and reliable treatment with low risk for complications.

No competing interests declared.

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