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Closed treatment of Achilles tendon rupture

In order to minimize rerupture after closed treatment of Achilles tendon rupture, the period of immobilization was prolonged from 8 to 12 weeks and an above-knee plaster cast was used the first 3 weeks. In 37 consecutive patients, followed for an average of 3 years, rerupture had occurred in two patients.
It is concluded that modified closed treatment is a good alternative to surgical treatment.

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Because of a rather high incidence of rerupture, closed treatment of Achilles tendon ruptures has not been generally accepted (Inglis et al. 1976, Jacobs et al. 1978, Persson & Wredmark 1979). In order to minimize reruptures, we have modified the standard method of closed treatment, described by Lea & Smith (1972), in the treatment of 37 consecutive patients with Achilles tendon ruptures.

Patients and methods

The diagnosis was accepted only in cases where all three of the following signs were present: loss of plantar flexion strength, palpation of a gap in the tendon, and a positive squeeze test (Thompson & Doherty 1962).

From October 1978 until October 1982, all patients with total subcutaneous Achilles tendon rupture (10 women and 27 men) were treated by closed methods. The mean age was 38 (25–66) years. Two patients had been treated earlier for rupture of the Achilles tendon in the other leg, and two patients were treated with glucocorticoids because of rheumatic disease. The ruptures occurred during sports activities in 33 patients, 20 playing badminton. Three patients had stumbled, and in one of the patients receiving glucocorticoid therapy the rupture happened during ordinary walking.

Initially, an above-knee plaster cast was applied with the knee flexed 45° and the foot in a relaxed equinus position. The patients were recommended to stay in hospital for the first few days while the leg was elevated. After 2 days the patients were mobilized on crutches without weight-bearing on the injured leg. After 3 weeks, the plaster cast was changed to a below-knee plaster cast with a walking iron incorporated (Lildholt & Munch-Jørgensen 1976), and full weight-bearing was allowed. Every 2 weeks, the plaster cast was changed and the foot gradually dorsiflexed to a neutral position; the plaster cast was used for 12 weeks (16 weeks for the patients receiving glucocorticoid therapy). For an additional 4 weeks a 2.5 cm wedge was applied under the heel of the shoe. Sports activities were not allowed for 6 months after the injury. If rerupture occurred, the treatment was repeated.

The patients were admitted 1 (1–7) days after the injury. One patient refused to be admitted and two older patients stayed for 1 and 2 months, respectively. The other patients stayed in the hospital for 3 (2–7) days.

All patients were subjected to a standard questionnaire and a clinical follow-up examination 3 (1–5) years after the injury. The patients were asked to grade their complaints as none, slight or severe, and finally to evaluate the functional result on a 1–4 scale (Scheller et al. 1980). The examination included measuring the tiptoe distance (distance from the floor to the heel on maximum plantar flexion with equal weight on each leg), calf circumference, ankle motion, thickness of the tendon, and walking ability. Finally, the results were evaluated, according to Arner & Lindholm (1959) as bad, good or excellent. The two patients with an earlier rupture in the other leg and one patient with sequelae after fracture in the other leg were excluded from the clinical examination.

Results

Two patients had rerupture 4 and 8 weeks after removal of the plaster cast. At follow-up these two patients had no complaints. They stated that the functional result was good, the motion of the ankle was normal, the tiptoe distance was decreased 1 cm, and the tendon was thickened by 8 and 10 mm, respectively.

At follow-up, 27 patients had no complaints and 10 had slight complaints (Table 1). Twenty-six patients stated that the functional result was excellent and 11 that it was good, with a mean of 3.5 on a 1–4 scale.

All patients were able to walk normally and could stand on tiptoe, although the tiptoe distance was reduced 1 (0–3) cm. Seven patients had slightly abnormal ankle motion (Table 2). The tendon thickness had increased 7 (0–18) mm. No patients had oedema of the ankle or pain on palpating the tendon. According to the scoring system of Arner & Lindholm (1959), the results were excellent in 16 cases and good in 18 cases.

The duration of absence from work was 12 (1–27) weeks. No patient had to change work. Of 31 patients participating in regular sports activities prior to the injury, five patients gave up their sports activities for other reasons, one patient stopped because of the injury, five patients reduced their activities and 20 patients continued to perform on the same level as before the injury.

Table 1. Main complaints in 10 of 37 patients after closed treatment for Achilles tendon rupture

	No.
Pain	1
Reduced power of the leg	5
Tiredness of the leg	3
Trouble running	1

Table 2. Abnormal ankle motion in 7 of 34 patients after closed treatment for Achilles tendon rupture

	No.
Slightly reduced subtalar movement	1
Dorsiflexion reduced 5°	2
Dorsiflexion reduced 5–10°	1
Plantar flexion reduced 5–10°	3
Dorsiflexion increased 5°	2

Discussion

In a review of the literature on closed treatment (Edna 1980, Lea & Smith 1972, Lildholt & Munch-Jørgensen 1976, Nistor 1981, Persson & Wredmark 1979) the rerupture incidence was 14 (8–35) per cent of 159 cases treated for 8 weeks with a below-knee plaster cast with the foot in relaxed equinus position as described by Lea & Smith (1972). Persson & Wredmark (1979) reported that all reruptures happened after accidental loading of the injured leg within 2 months after removal of the plaster cast, suggesting the need for greater caution during the first months after removal of the plaster cast; they did not find any correlation between treatment delay and rerupture incidence. Nistor (1981) claimed that patients who had undergone closed treatment were perhaps less cautious after removal of the plaster cast than patients with open treatment, because they had fewer complaints and were liable to consider the injury "less serious". In a series treated openly with immobilization as in the present study there were no reruptures (Høgh & Lauritzen 1977).

In a prospective randomized study by Nistor (1981), there was no difference in the functional result after open or closed treatment. The incidence of rerupture in the closed treatment group was the same as the incidence of serious surgical complications and reruptures in the open treatment group. Complaints at follow-up were more common in the open treatment group and absence from work was longer.

The length of absence from work in the present series was the same as found by Nistor (1981) in an openly treated group, but longer than in a group undergoing the standard closed treatment. According to the scoring system of Arner & Lindholm (1959), 4–12 per cent of the results were poor after open treatment (Arner & Lindholm 1959, Høgh & Lauritzen 1977, Jessing & Hansen 1975), while none of the results were poor in our series.

We conclude that modified closed treatment

is a good alternative to open treatment of total subcutaneous Achilles tendon rupture. However, the Achilles tendon should be protected from strain for the first months after removal of the plaster cast.

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