

# Review article: Treatment of Achilles tendon ruptures

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Spontaneous rupture of the Achilles tendon is uncommon but increasing in recent years due to an increase in the elderly population and an increase in recreational sporting activity by the middle aged. The great majority of cases are sport related.<sup>18</sup> The treatment of complete rupture of the Achilles tendon remains controversial despite an extensive literature. There are 2 main therapeutic regimes, one conservative and the other surgical and both have their strong advocates. Most of the reported series are small or have been gathered from multiple centres where the treatment has been variable and the assessment lacking objectivity.

Since the advent of safe aseptic surgery, operative repair of divided or ruptured tendons has become the accepted method of treatment with such success that there has been little incentive to consider alternative approaches. Many different techniques of surgical repair have been described however which by itself suggests that there may be difficulties. One of these is that when spontaneous rupture occurs the tendon is frequently degenerate and the torn ends can be ragged and not ideal for a neat suture. The loads transmitted through the Achilles tendon are so great that even the most perfect suture cannot be relied upon until healing is advanced and therefore the repair must be supplemented by some method of splintage for several weeks as in conservative management. Even with this protection studies in which radio-opaque markers have been inserted at the time of suture have

consistently shown that some separation of the tendon ends occurs following surgical repair.<sup>5,14</sup>

The incidence of complications following surgical treatment can be high. Wounds tend to heal poorly in this area and problems of wound infection, delayed wound healing, adherence of tendon to scar, calf vein thrombosis and embolism, rerupture of the repaired tendon and damage to the sural nerve have been reported. In a review of 25 papers reporting a total of 2,647 ruptures treated surgically, Nistor found the following incidence of major complications — deep infections 1%, fistulae 3%, necrosis of skin or tendon 2%, rerupture 2% and an unquantified percentage of minor complications.<sup>15</sup> Another study of 86 surgically treated cases reported that 63 patients suffered one or more complications.<sup>1</sup> A recent meta-analysis of all relevant publications in English from 1959–1997 found the incidence of minor and moderate complications to be 20 times higher in surgically treated patients than in those treated nonoperatively. The rerupture rate however was only 2.8% for the surgically treated group compared with 11.7% in the conservatively treated group.<sup>13</sup>

It has been known for many years that tendons which are ruptured or divided outside synovial sheaths have a strong tendency to undergo spontaneous repair. The collagen fibres in the scar which grows between the ends becomes organised and orientated to resemble closely the structure of tendon.<sup>12</sup> Provided the tendon ends are held in close apposition

this natural repair will occur without lengthening and virtually normal function can be restored. The great pioneering surgeon, John Hunter, in 1767 suffered a spontaneous rupture of the Achilles tendon while dancing and described a successful method of treatment which involved bandaging the calf and raising the heel of his shoe for a few weeks with excellent recovery.<sup>9</sup> If the divided ends of the tendon are allowed to retract, healing will still take place but with lengthening and consequent loss of power in the affected muscles.

When operating on a fresh rupture of the Achilles tendon it can be observed that placing the foot in full planter flexion brings the ruptured ends together. The conservative school argues that if the ankle is splinted in this position for a sufficient period, healing will take place without the need for surgery while the surgical school argues that suturing the tendon will improve the strength of the repair. The sporadic reports of conservative management in the early years of this century were not impressive and were the justification for the observation the 'Patients with a rupture of the Achilles tendon should be operated on and operated on without delay'<sup>16</sup> but in these early cases of conservative treatment immobilisation had been inadequate and only for short periods.

In 1968 Lea and Smith<sup>10</sup> published a series of 8 cases of Achilles tendon rupture or laceration which had been treated conservatively with adequate immobilisation and reported good results. In a later paper<sup>11</sup> they confirmed a satisfactory outcome of conservative treatment in 66 cases. These authors laid down the essential principles of conservative management — immobilisation in equinus had to be maintained for a full 8 weeks and for a further month the patient should walk with the shoe heel raised. The likelihood of rerupture was increased if the period of immobilisation was shortened.

Since these reports a number of papers have attempted to compare the results of conservative and surgical treatment but the results of these studies have been variable. One of the earliest of these studies found no significant difference in measured functional outcome in a small series treated in one centre<sup>7</sup> while a larger series gathered from multiple centres reported less satisfactory results of conservative treatment.<sup>8</sup> In this latter study however there were many variables both with regard to details of treatment and the duration of time between injury and the commencement of treatment.

Carden et al.<sup>3</sup> reported a retrospective review of 104 cases of ruptured Achilles tendon treated in 2 centres. 51 had been managed conservatively and 53 surgically. These authors found that patients treated

within 48 hours of injury had comparable results in terms of strength of plantar flexion and range of movement. In those patients treated later than 48 hours after injury the strength of plantar flexion was reduced in the conservatively treated group (79.9% compared with 91.2%). There were no reruptures in either group treated within 48 hours and one rerupture in the conservative cases treated later than 48 hours. In a larger group of cases culled from the hospital records the incidence of rerupture was similar in both groups — 1.3% in the conservative group and 3.9% in the surgical group.

The first controlled prospective trial comparing surgical and conservative treatment was reported by Nistor from one hospital in Sweden. 105 patients were assigned randomly for one or other treatment. No statistical difference was found in the range of movement or plantar flexion strength between the 2 groups. Rerupture occurred in 4% of the surgical group and in 8% of the conservative group. Apart from rerupture there were 29 secondary complications in the 44 patients treated surgically and none in the conservatively treated group. The conservative group returned to work on average 4 weeks earlier than the surgical group. Other subsequent controlled trials have confirmed the similarity of functional outcome between surgically and conservatively treated groups while emphasising the earlier return to activity and relative lack of complications in the conservative cases.<sup>17</sup> Cetti et al. in a controlled trial involving 111 patients found a slight advantage in the surgically treated group in terms of a higher rate of resumption of sports activities but again emphasised the fewer complications of conservative treatment although the rerupture rate was higher — 7/55 compared with 3/56 in the surgical cases.<sup>4</sup>

## CONCLUSION

In the past 30 years there have been many publications confirming the effectiveness of conservative treatment in acute cases of rupture provided that the principles of treatment recommended by Lea and Smith are strictly observed. While a slightly higher incidence of rerupture has been noted in some, but not all reports, any disadvantage on this account is offset by the avoidance of the complications noted in most of the surgical series. Conservative treatment allows an earlier return to employment and avoids the costs of hospital admission.

In cases in which the diagnosis has been delayed, and unfortunately there are still too many of these, surgical repair appears to give better results and is well

indicated and new techniques of percutaneous repair may reduce the incidence of complications.<sup>2</sup> In early cases the continued use of surgical treatment is hard to justify although still widely practiced. Traditions in medicine die hard! In 1973 an editorial in the *Lancet* concluded that 'In view of the excellent results

obtainable by conservative treatment it is doubtful whether surgical repair in closed rupture of the Achilles tendon can still be justified.'<sup>6</sup> The weight of evidence published since that time appears to justify the validity of that conclusion.

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