Operative versus nonoperative treatment of acute Achilles tendon ruptures: a quantitative review

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Authors' objectives
To determine the optimal treatment (conservative/immobilization or surgical) of acute Achilles tendon ruptures.

Searching
MEDLINE was searched from 1966 to 1997 using the search terms: 'Achilles tendon', 'Achilles', 'calcaneal', 'tendon', 'Injuries', 'tear', 'rupture'; Index Medicus (1959-1997) was searched using the terms: 'Achilles tendon', 'Heel', 'Calcaneus'. Also handsearching of major orthopaedic surgery and sport medicine textbooks, bibliographies of articles already retrieved and discussion with colleagues in orthopaedic surgery, sport medicine, physical medicine and rehabilitation and epidemiology was undertaken to obtain a list of published studies. The search was limited to English language studies published after 1953.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), cohort studies with matching for major variables and case series with no patient selection prior to treatment.

Specific interventions included in the review
Immobilization, using casts and surgery. Experimental treatments, such as external fixation or percutaneous repair, were excluded.

Participants included in the review
Patients with a primary acute spontaneous rupture of the Achilles tendon, who were treated within 4 weeks of injury. In the operative treatment group the age range was 14-79 years and 83% were male. In the non-operative treatment group the age range was 23-81 years and 72% were male.

Outcomes assessed in the review
Functional outcomes, including: strength, time to return to work, frequency of return to sports, rerupture rate and complications.

Complications were divided into major (e.g. death), moderate (e.g. delayed wound healing) and minor (e.g. adhesion of skin to the Achilles tendon) categories.

How were decisions on the relevance of primary studies made?
All retrieved articles were reviewed independently by at least three reviewers based on predetermined eligibility criteria. Disagreements were discussed and settled, if necessary, by a majority vote.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
Eligible studies were reviewed independently and data were extracted by using standardised coding forms. Inconsistencies in data extraction were settled by discussion and majority vote.

Methods of synthesis
How were the studies combined?
Chi-squared analysis was used to compare the overall rates of rerupture, return to sports and complications. For the continuous variable of time to return to work, each study was weighted according to the number of subjects and the differences were analysed using an unpaired t-test.

How were differences between studies investigated?
The authors do not state how differences between the studies were investigated.

Results of the review
Two RCTs (216 patients) and 17 case series (12 of operative treatment, 5 of non-operative treatment) with no patient selection prior to treatment (774 patients). Cohort studies with matching for major variables were eligible for inclusion, but none were found.

Operatively treated group.
Strength: In 9 of the 12 case series in which strength was evaluated, at least 80% of the patients achieved greater than 80% contralateral leg strength.

Time to return to work (5 studies): 10.1 weeks (weighted average).
Return to sport (11 studies): 400/545 (73.4%).
Rerupture (13 studies): 21/742 (2.8%).
Major complications (12 studies): 21/701 (3.0%).
Moderate complications (12 studies): 76/701 (10.8%).
Minor complications (11 studies): 99/571 (17.3%).

Non-operatively treated group.
Strength: The results were similar to those in the operatively-treated group, in the 4 out of 5 case series studies in which strength was evaluated.

Time to return to work (3 studies): 10.0 weeks (weighted average).
Return to sports (6 studies): 148/200 (69.5%).
Rerupture (7 studies): 29/248 (11.7%).
Major complications (7 studies): 7/248 (2.8%).
Moderate complications (7 studies): 1/248 (0.4%).
Minor complications (7 studies): 2/248 (0.8%).

Significant differences between operatively(O) and non-operatively(NO) treated groups were seen in rates of rerupture (NO>O, p<0.001), moderate complications (O>NO, p<0.001) and minor complications (O>NO, p<0.001).

Authors' conclusions
It is difficult to recommend one treatment regimen over the other for all patients. There is no good evidence that a difference in strength, return to work or return to sports exists between patients treated with either method. Although operative treatment provides a reduced rerupture rate over non-operative treatment, the rate of moderate and mild complications in operative treatment is 20 times greater.
CRD commentary
This is a clearly-written review. The search strategy and keywords are given and procedures for study selection and data extraction are stated. However, there is no assessment of validity and no assessment of heterogeneity between the studies. The results of the two retrieved RCTs are not pooled separately from the case series studies, and there is no quality weighting, which means that undue weight may be given to the results of the case series studies in the analysis. The conclusions should therefore be treated with caution.

Bibliographic details

PubMedID
9262889

Indexing Status
Subject indexing assigned by NLM

MeSH
Achilles Tendon /injuries /surgery; Adult; Aged; Aged, 80 and over; Female; Humans; Immobilization; Male; Middle Aged; Recurrence; Rupture /complications /surgery /therapy; Treatment Outcome

AccessionNumber
11997000999

Date bibliographic record published
30/09/1998

Date abstract record published
30/09/1998

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.