

**Khan RJ, Carey Smith RL. Surgical interventions for treating acute Achilles tendon ruptures. Cochrane Database Syst Rev. 2010 Issue 9 Art #:CD003674. doi: 10.1002/14651858.CD003674.pub4**

Design: meta-analysis of controlled clinical trials

Study question: In adults with acute Achilles tendon ruptures, what are the relative outcomes of surgical versus nonsurgical treatment, and what are the outcomes for different surgical interventions?

PICOS:

- Patient population: adults with acute ruptures of the Achilles tendon
  - o Patients with delayed presentation more than 3 weeks after injury, and patients with re-ruptures, were excluded
- Interventions: surgical repair which may be augmented, using open or percutaneous methods
- Comparison: nonsurgical treatment, generally involving cast immobilization or functional bracing
- Outcomes: primary outcomes were re-rupture rate, complications, and function
  - o Complications included infection, adhesions, and disturbed sensation
  - o Long term function included sporting activity or measured outcomes such as the American Orthopedic Foot and Ankle Score
- Study types: both randomized and quasi-randomized trials were eligible

Study selection:

- Databases included MEDLINE, EMBASE, CINAHL, and the Cochrane Central Register of Controlled Trials; the WHO International Clinical Trials Registry; date of search was July 2009
- Two authors independently selected studies for inclusion and assessed them for methodological quality based on the method of randomization, inclusion and exclusion criteria, baseline balance of treatment groups, level of experience of surgeons, similarity of co-interventions, clarity of definition of outcome measures, blinding of outcome assessors, intention-to-treat analysis, followup of at least 12 months with active followup at set periods (rather than followup only if indicated), and retention of at least 95% of participants

Results:

- 32 potentially eligible trials were found, and 12 studies with 844 patients were included in the analysis
- Most injuries occurred during sports participation

- The trials tested three comparisons: surgery vs nonsurgical treatment, open vs percutaneous surgery, and different methods of surgical repair
- 6 studies, with 536 patients, compared open surgery with nonsurgical treatment
  - o Re-rupture occurred less frequently in surgically treated (12/240) than in nonsurgically treated patients (30/249) with a pooled risk ratio of 0.41 (95% confidence interval from 0.21 to 0.77)
  - o Complications other than re-rupture were more frequent in the surgical treatment groups
    - Seven surgical patients had infections (six of them deep infections), with no infections in the nonsurgical groups
  - o Long-term function in terms of return to pre-injury level of sports activity, did not differ significantly between the surgical and nonsurgical treatment groups
    - Time to return to work data were conflicting and were not pooled, and no conclusions were drawn
- 4 studies, involving 180 patients, compared open versus percutaneous repair
  - o Only three re-ruptures occurred, 2 in the open group and 1 in the percutaneous group
  - o Infection only occurred in the open surgery group (12/66 vs 0/66), one of which required plastic reconstruction surgery
  - o Long term function in terms of return to sports activity did not differ between open and percutaneous surgery groups
  - o Average operating time was shorter for percutaneous repair (24 minutes) than in open repair (47 minutes)
- No differences were found between differing repair techniques such as 2-strand versus 6-strand repair

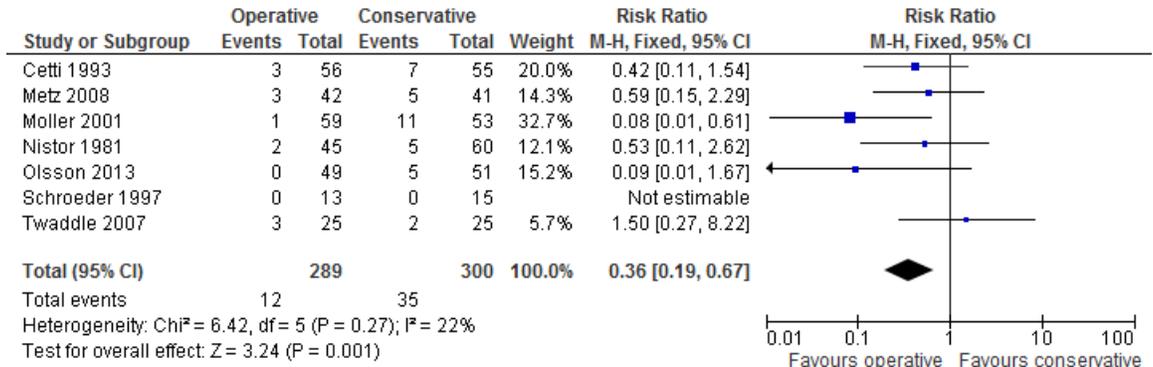
#### Authors' conclusions:

- Open surgical repair of Achilles tendon rupture reduces the risk of re-rupture but increases the risk of other complications, including infection
  - o The risk of infection may be reduced if the repair is done percutaneously
- There is no information regarding differing repair techniques; no technique has been shown superior to any other technique

#### Comments:

- Keating 2011 was one of the trials awaiting evaluation and has since been published, as has Willits 2010, and both of these studies are incorporated into a more recent meta-analysis of operative vs nonoperative treatment of Achilles tendon ruptures
- All nonoperative treatments are combined into a single pooled analysis, even though there may be differences between different types of nonoperative treatment

- Some nonoperative treatments immobilize the injured ankle for several weeks, and others allow for earlier range of motion; these differences are likely to affect re-rupture rates in nonoperatively treated patients
- Aside from a general statement that operative repair reduces re-rupture rates but increases other complications of treatment, there is sparse information to be gleaned from this meta-analysis
- If the results of a newer study (Olsson 2013) are added to the forest plot, the pooled effect continues to favor surgery with respect to the risk of rerupture



Assessment: Adequate meta-analysis for good evidence that operative repair lowers the re-rupture rate compared to nonoperative immobilization, but increases the rate of other complications including deep tissue infection

References:

Keating JF, Will EM. Operative versus non-operative treatment of acute rupture of tendo Achillis: a prospective randomised evaluation of functional outcome. *JBJS Br.* 2011;93(8):1071-8.

Willits K, Amendola A, et al. Operative versus nonoperative treatment of acute Achilles tendon ruptures: a multicenter randomized trial using accelerated functional rehabilitation. *JBJS Am.* 2010;92(17):2767-75.