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Cochrane in CORR®: Surgical Interventions for Treating Acute Achilles Tendon Ruptures (Review)

Raman Mundi MD, Kim Madden BSc,
Mohit Bhandari MD, PhD, FRCSC

Importance of the Topic

In recent decades, the increasing interest in competitive and recreational

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sport participation among aging adults has been accompanied by a rise in sports-related injuries [2, 5]. Rupture of the Achilles tendon is one of the most common such injuries, typically afflicting

new evidence emerges and in response to feedback, and The Cochrane Library (<http://www.thecochranelibrary.com>) should be consulted for the most recent version of the review.

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R. Mundi MD (✉)

Division of Orthopaedics, Center for Evidence-Based Orthopaedics, McMaster University, 293 Wellington St. North, Suite 110, Hamilton, ON L8L 8E7, Canada

e-mail: Raman.mundi@medportal.ca

K. Madden BSc, M. Bhandari MD, PhD, FRCSC

Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada

men in their fourth and fifth decades of life [2, 4]. It is estimated that the incidence of these injuries is 18 per 100,000 in some regions, a considerable rise from the two per 100,000 estimates in the 1980 s [2–4]. Despite the rising incidence, as well as the lengthy disability and rehabilitation associated with Achilles tendon ruptures, the ideal method of managing such injuries remains a matter of debate [5]. As per the clinical practice guidelines approved by the American Academy of Orthopaedic Surgeons, both surgical and nonsurgical treatment of acute Achilles tendon ruptures are acceptable options. However, the grade of recommendation remains weak for both treatment options, as there is a paucity of high-quality evidence and inconsistency in results to make strong recommendations either way [1]. Accordingly, a rigorous systematic review and meta-analysis of available high-quality evidence was warranted.

Upon Closer Inspection

Khan and Smith [3] performed a robust meta-analysis comparing several

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aspects in the management of acute Achilles tendon ruptures. Rerupture rates, complication rates (infections, adhesions, nerve injury) and long-term function, appropriately formed the primary outcomes in this review for which definitive conclusions were sought. However, the capacity of a systematic review to draw unequivocal conclusions hinges directly on the quality of studies that comprise it. Among the 12 randomized controlled trials included in this review, only five (42%) had adequate allocation concealment, four (33%) did not report the method of randomization, and no studies reported the use of blinded outcome assessors. Additionally, there was considerable variation amongst the trials in their postsurgical and nonsurgical rehabilitation protocols. Pooled treatment effects are difficult to interpret in such circumstances, as outcomes are influenced by both the intervention and rehabilitation. Because of the limited number of studies, pooled estimates could not be calculated across all comparisons being investigated. A compelling analysis was that of open surgical repair to nonsurgical management, in which the

pooled estimates demonstrated lower rerupture rates (5% versus 12%, risk ratio [RR], 0.41), but higher rates of infection (RR 4.89), adhesions (RR, 11.73), and nerve injury (RR, 7.44) associated with surgical repair. However, this analysis consisted of six small trials with a small number of events in each trial.

Take-Home Message

Open surgical repair for the management of acute Achilles tendon ruptures appears favorable to nonsurgical management with respect to decreasing the risk of tendon rerupture, but has a higher risk of associated wound and nerve complications. Both surgical and nonsurgical management of such patients remain valid treatment options, as neither has proven superior in all patient important outcomes. However, additional trials that had been identified by the authors at the time of this review, but were not available for inclusion, have since been published. For instance, Willits et al. [6] performed a multicenter randomized trial of 144

patients that were randomized to either open surgical repair with accelerated rehabilitation or to accelerated rehabilitation alone. This trial found no significant difference in rerupture rates between the surgical and nonsurgical treatment arms at three months followup. These findings have been further corroborated by a recent meta-analysis of ten randomized trials comparing surgical intervention to nonsurgical treatment. A stratified analysis demonstrated no significant difference in rerupture rates if a functional rehabilitation protocol with early range of motion was instituted in the nonsurgical group (adjusted relative risk [ARR], 1.7%), whereas surgery significantly reduced rerupture when compared to prolonged immobilization (ARR, 8.8%) [5]. As such, the decision to proceed with surgical versus nonsurgical treatment in the management of acute Achilles tendon ruptures remains a matter of ongoing debate. Given the available evidence, treatment decisions should largely be made based on the available rehabilitation protocol and the preferences of a well-informed patient [5].

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Appendix

Surgical interventions for treating acute Achilles tendon ruptures (Review)

Khan RJK, Carey Smith RL

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Surgical interventions for treating acute Achilles tendon ruptures (Review)
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[Intervention Review]

Surgical interventions for treating acute Achilles tendon ruptures

Riaz JK Khan¹, Richard L Carey Smith¹

¹Department of Surgery and Pathology, University of Western Australia, Perth, Australia

Contact address: Riaz JK Khan, Department of Surgery and Pathology, University of Western Australia, Gate 3 Verdun Street, Nedlands, Perth, Western Australia, 6009, Australia. rjkkhan@gmail.com.

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ABSTRACT

Background

There is a lack of consensus on the best management of the acute Achilles tendon rupture. Treatment can be broadly classified into surgical (open or percutaneous) and non-surgical (cast immobilisation or functional bracing).

Objectives

To evaluate the relative effects of surgical versus non-surgical treatment, or different surgical interventions, for acute Achilles tendon ruptures in adults.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (July 2009), the Cochrane Central Register of Controlled Trials (*The Cochrane Library* 2009, Issue 3), MEDLINE (1966 to 20th July 2009), EMBASE (1966 to 2009 week 29), CINAHL (1983 to July 2007) and reference lists of articles.

Selection criteria

All randomised and quasi-randomised trials comparing surgical versus non-surgical treatment or different surgical methods for acute Achilles tendon ruptures in adults.

Data collection and analysis

Two review authors independently selected potentially eligible trials; trials were then assessed for quality using a 10-item scale. Where possible, data were pooled.

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Main results

Twelve trials involving 844 participants were included. One trial tested two comparisons.

Quality assessment revealed a poor level of methodological rigour in many studies, particularly with regard to concealment of allocation and the lack of assessor blinding.

Open surgical treatment compared with non-surgical treatment (6 trials, 536 participants) was associated with a statistically significant lower risk of rerupture (risk ratio (RR) 0.41, 95% confidence interval (CI) 0.21 to 0.77), but a higher risk of other complications including infection (RR 4.89, 95% CI 1.09 to 21.91), adhesions and disturbed skin sensibility (numbness). Functional status including sporting activity was variably and often incompletely reported, including frequent use of non standardised outcome measures, and the results were inconclusive.

Open surgical repair compared with percutaneous repair (4 trials, 174 participants) was associated with a higher risk of infection (RR 9.32, 95% CI 1.77 to 49.16). These figures should be interpreted with caution because of the small numbers involved. Similarly, no definitive conclusions could be made regarding different tendon repair techniques (3 trials, 147 participants).

Authors' conclusions

Open surgical treatment of acute Achilles tendon ruptures significantly reduces the risk of rerupture compared with non-surgical treatment, but produces significantly higher risks of other complications, including wound infection. The latter may be reduced by performing surgery percutaneously.

PLAIN LANGUAGE SUMMARY

Surgical interventions for treating acute Achilles tendon ruptures

Rupture of the Achilles tendon is common and said to be increasing. It typically occurs in males in their 30s and 40s who play sport intermittently. People present with severe pain in the tendon, at the back of the ankle. Signs include a palpable gap at the rupture site, and marked weakness of ankle plantar-flexion (movement so toes point downwards). Options for management include non-surgical interventions (plaster of Paris, bracing or splinting) or surgical repair of the tendon. Following either method of treatment, the ankle may be immobilised for up to 12 weeks (in a cast, allowing no movement at the ankle and variable weight-bearing), or mobilised early (in a brace, allowing movement at the ankle and partial to full weight-bearing).

Twelve trials including 794 participants acute Achilles tendon rupture were included. The majority of participants were male, and the average ages of the study populations were between 36 to 41 years. Many of the trials had flawed methods that undermined the reliability of their results.

Open surgical treatment compared with non-surgical treatment (6 studies, 502 participants) was associated with a lower risk of rerupture, but a higher risk of other complications such as infection, adhesions and disturbed skin sensibility (numbness and tingling). There were insufficient and inconclusive data on function and sporting activities.

Percutaneous repair (involving stab incisions through which the repair suture is passed through without direct exposure of the tendon) compared with open repair (4 studies, 174 participants) was associated with a lower risk of infection. These figures should be interpreted with caution because of the small numbers involved. Similarly, no definitive conclusions could be made regarding different tendon repair techniques (3 studies, 141 participants).

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