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Cochrane in CORR®: Surgical Versus Conservative Treatment for Acute Injuries of the Lateral Ligament Complex of the Ankle in Adults (Review)

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Importance of the Topic

More than 650,000 ankle sprains present to emergency departments in the United States for treatment every year [14]. The vast majority of these sprains are injuries to the lateral ligament

complex resulting from a forceful inversion of the ankle joint during physical activity [7]. The impact of a lateral ligament complex sprain is experienced through acute pain and swelling, several weeks of acute disability resulting in time lost from work or other activities, and in as many as

20% of patients, chronic instability of the ankle joint [1, 7].

Anatomically, lateral ligament sprains are almost always localized to the anterior talofibular ligament. The calcaneofibular ligament is also involved in 50% to 75% of sprains [2]. The third ligament of the lateral ligament complex – the posterior talofibular ligament – is rarely involved. In cases of chronic instability, anatomic reconstructive procedures (as originally described by Brostrom [4] and subsequently modified) frequently are used to correct a deficient lateral ligament complex and restore stability of the ankle joint [4].

It is plausible that primary repair of acute lateral ligament complex tears may facilitate ligament healing, shorten time

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Cochrane Reviews are regularly updated as 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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off work and/or athletic activities, and reduce the incidence of chronic instability. However, surgical intervention also has inherent disadvantages, such as wound infection, iatrogenic nerve injury, and other postsurgical complications. The primary objective of this Cochrane Review is to determine whether surgical management is superior to conservative management of acute lateral ligament complex injuries [6].

Upon Closer Inspection

The lack of a standardized patient-oriented outcome instrument provided unique challenges to this meta-analysis, and led to the need to independently evaluate 11 outcomes (four primary outcomes and seven secondary outcomes). A maximum of 12 of 20 trials reported data on a common outcome to allow for a meta-analysis. A validated, reliable, and universally accepted ankle outcome instrument would have facilitated a rigorous and informative meta-analysis of outcome data from all trials [5], but such an outcome instrument does not presently exist [3, 9].

A single trial published by Prins [10] in 1978 demonstrated several benefits of surgical management – results that differed substantially from other published trials, including several more-recent and

better-designed efforts [8, 11–13] – and greatly influenced the pooled estimate for many outcomes. The pronounced and, occasionally differing, direction of Prins' results may be attributable to the trial being only quasi-randomized, resulting in no concealment of treatment allocation or blinding. In order to test the robustness of the results, the authors of this review performed several sensitivity analyses both with and without Prins' trial data. Excluding this trial reduced the variability of results between trials, and eliminated all significant benefits in applicable primary outcomes for surgical intervention.

When interpreting the results, it is also important to explicitly recognize characteristics of patients enrolled in the included trials. Both adults with chronic ankle instability and children were deliberately excluded. The majority of patients in these trials were young active adult males suffering from ankle injuries that were painful and/or swollen enough for them to present to an acute care setting. In other words, these are patients who had relatively severe injuries, and theoretically are most likely to have benefited from surgical intervention. In general, one would expect a patient presenting to an ambulatory or primary care clinic to have an even more diminished benefit from surgical intervention. This is an important

consideration when determining the clinical relevance of the results.

Take-Home Messages

Overall, this Cochrane Review (which is current to January 2006) failed to demonstrate a benefit of surgery compared with conservative management for acute lateral ligament complex injuries. Since this review was conducted, at least two more randomized controlled trials have been published comparing conservative and surgical management for acute lateral ligament complex injuries [8, 11]. Both of these trials failed to demonstrate significant differences between surgery and conservative management in their primary outcomes, further corroborating the findings of this Cochrane review.

Because studies have failed to consistently demonstrate evidence of benefit for surgical repair, along with the additional complications inherent with an invasive surgical procedure, surgery for acute lateral ligament complex injuries is not recommended, regardless of severity. The optimal method of conservative management (rigid immobilization versus early mobilization) remains a topic of ongoing investigation. The development of a standardized outcome instrument that is validated, reliable, and universally accepted will facilitate analysis of future trials in foot and ankle surgery.

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Appendix

Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults (Review)

Kerkhoffs GMMJ, Handoll HHG, de Bie R, Rowe BH, Struijs PAA



This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2010, Issue 2

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Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults (Review)
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[Intervention Review]

Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults

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ABSTRACT

Background

Ankle sprains are one of the most commonly treated musculoskeletal injuries. The three main treatment modalities for acute lateral ankle ligament injuries are immobilisation with plaster cast or splint, 'functional treatment' comprising early mobilisation and use of an external support (e.g. ankle brace), and surgical repair or reconstruction.

Objectives

We aimed to compare surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (January 2006), the Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2005, Issue 4), MEDLINE (1966 to December 2005), EMBASE, CINAHL and reference lists of articles, and contacted researchers in the field. This review is considered updated to January 2006.

Selection criteria

Randomised or quasi-randomised controlled trials comparing surgical with conservative interventions for treating ankle sprains in adults.

Data collection and analysis

At least two authors independently assessed methodological quality and extracted data. Where appropriate, results of comparable studies were pooled. We performed sensitivity analyses to explore the robustness of the findings.

Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults (Review)
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Main results

Twenty trials were included. These involved a total of 2562 mostly young active adult males. All trials had methodological weaknesses. Specifically, concealment of allocation was confirmed in only one trial. Data for pooling individual outcomes were only available for a maximum of 12 trials and under 60% of participants.

The findings of statistically significant differences in favour of the surgical treatment group for the four primary outcomes (non-return to pre-injury level of sports; ankle sprain recurrence; long-term pain; subjective or functional instability) when using the fixed-effect model were not robust when using the random-effects model, nor on the removal of one low quality (quasi-randomised) trial that had more extreme results. A corresponding drop in the I^2 statistics showed the remaining trials to be more homogeneous.

The functional implications of the statistically significantly higher incidence of objective instability in conservatively treated trial participants are uncertain. There was some limited evidence for longer recovery times, and higher incidences of ankle stiffness, impaired ankle mobility and complications in the surgical treatment group.

Authors' conclusions

There is insufficient evidence available from randomised controlled trials to determine the relative effectiveness of surgical and conservative treatment for acute injuries of the lateral ligament complex of the ankle. High quality randomised controlled trials of primary surgical repair versus the best available conservative treatment for well-defined injuries are required.

PLAIN LANGUAGE SUMMARY

Surgery versus conservative treatment for acute ankle sprains in adults

Ankle sprain is one of the commonest musculoskeletal injuries in active people. It generally involves damage to the lateral or outer ligaments, which connect bones together on the outside of the ankle joint. Treatment is usually either immobilisation of the leg in a plaster cast, or 'functional treatment' where the ankle is kept in use while protected by an external support. After treatment, however, some people still have a weak and sometimes painful ankle. This review aimed to find out if primary surgical repair of the torn ligament(s) gives a better result than either of these two non-surgical or conservative treatments.

Twenty trials were included. These involved a total of 2562 mostly young active adult males. All trials had methodological flaws that could have affected their results. Data for pooling individual outcomes were only available for a maximum of 12 trials. Additionally, there was one low quality and potentially biased trial with very positive results in favour of surgery. When this trial was excluded, the findings of better results for surgery in terms of return to sports, re-injury, persistent pain and ankle instability as judged by the patient were no longer statistically significant. Thus, the trend to a better result from surgery remains unproven. Ankle stability, as judged by the clinician using standard tests, was better after surgery than with conservative treatment. Conversely, there was some limited evidence for longer recovery times, and higher incidences of ankle stiffness, impaired ankle mobility and complications in the surgical treatment group.

We concluded that there was not enough evidence from randomised controlled trials to say whether surgery gives a better result than conservative treatment for acute ankle sprain in adults.

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