Pain, Function, and Safety Following Dextrose Prolotherapy for Chronic Lateral Epicondylitis: A Systematic Review of Randomized Trials

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INTRODUCTION

Lateral epicondylitis is a common, frequently persistent tendinopathy that can impair upper-extremity function and grip. Dextrose prolotherapy is used as a regenerative injection strategy, however, reported protocols and comparative efficacy vary. This systematic review evaluated the efficacy and safety of prolotherapy for adult lateral epicondylitis, with an emphasis on pain, function, strength, durability of benefit, and adverse events across randomized clinical trials.

MATERIALS & METHODS

A PRISMA-guided systematic review was conducted to evaluate the efficacy and safety of prolotherapy for the treatment of lateral epicondylitis. A comprehensive literature search of PubMed and Google Scholar was performed using combinations of the terms “lateral epicondylitis,” “tennis elbow,” “prolotherapy,” “dextrose prolotherapy,” and “hypertonic dextrose injection”. Original clinical studies evaluating prolotherapy in adult patients with lateral epicondylitis were considered for inclusion. Review articles, case reports, conference abstracts, animal studies, non-English publications, and studies lacking clinical outcome data were excluded. Two reviewers independently screened titles and abstracts, followed by full-text assessment of potentially eligible studies. Data extracted included study design, sample size, patient demographics, prolotherapy protocol (injectate concentration, injection frequency, and treatment duration), comparator, follow-up duration, pain and functional outcomes, and reported adverse events. The search identified 41 records, of which 11 studies met the inclusion criteria.

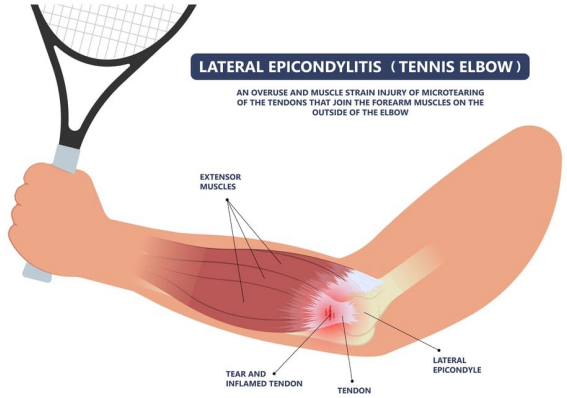


Figure 1. Mechanism of pain in lateral epicondylitis.

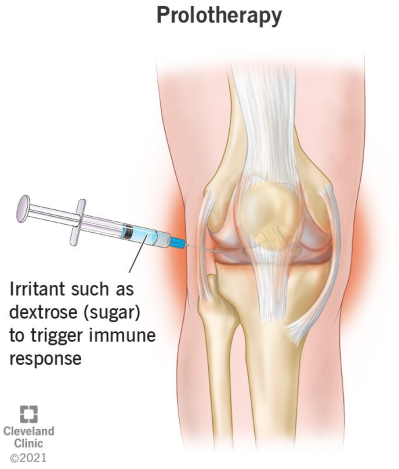


Figure 2. Mechanism of pain relief using prolotherapy.

RESULTS

11 Randomized trials involving 760 enrolled participants met the inclusion criteria. Sample sizes ranged from 24 to 231, and follow-up ranged from 8 weeks to 24 months. Protocols varied from one to four injection sessions using 5%-30% dextrose; two trials incorporated sodium morrhuate. Comparators included saline, corticosteroid, wait-and-see, extracorporeal shock-wave therapy (ESWT), physiotherapy, hyaluronic acid, autologous blood, splinting, and platelet-rich plasma (PRP). Seven trials reported at least one statistically significant between-group outcome favoring prolotherapy. Compared with saline or watchful waiting, prolotherapy significantly improved pain, Patient-Rated Tennis Elbow Evaluation scores, grip strength, or extension strength, with reported p-values ranging from <0.001 to 0.041.

Prolotherapy was superior to corticosteroid at 3 months for pain and QuickDASH scores (p=0.03 and p=0.01) and was superior to hyaluronic acid for pain and function at 12 weeks (p=0.03-0.04). One 24-month trial favored prolotherapy over physiotherapy and ESWT on selected long-term outcomes but not short term outcomes, although PRP produced the greatest overall improvement. No treatment-related adverse events were reported other than injection-associated pain was reported in one trial.

CONCLUSION

Prolotherapy appears safe and may improve pain and function in chronic lateral epicondylitis, with the clearest benefits observed in comparison to saline or observation. However, superiority over established treatments was inconsistent and varied by comparator and follow-up duration. Heterogeneity in dextrose concentration, co-injectates, injection frequency, and outcome measures limits identification of an optimal protocol. More extensive standardized head-to-head trials are needed to clarify comparative effectiveness and durability.

REFERENCES

Bankole A. Prolotherapy in the treatment of “tennis elbow” or lateral epicondylalgia. Prolotherapy Now. Accessed September 18, 2026. https://prolotherapynow.com/prolotherapy-in-the-treatment-of-tennis-elbow-or-lateral-epicondylalgia/

Cleveland Clinic. Prolotherapy. Updated May 19, 2026. Accessed September 18, 2026. https://my.clevelandclinic.org/health/treatments/22426-prolotherapy