

Rehabilitation Approaches for Lateral Elbow Tendinopathy: A Review

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ABSTRACT

Lateral elbow tendinopathy, commonly known as tennis elbow, is a prevalent musculoskeletal condition causing pain and functional impairment at the lateral elbow. Physiotherapy is central to its conservative management. This review synthesises current evidence on rehabilitation approaches for lateral elbow tendinopathy. It examines the principal interventions, including exercise therapy with an emphasis on eccentric and progressive resistance training, manual therapy, load management and bracing, education and activity modification, and adjunctive modalities, and reviews evidence regarding their effects on pain, grip strength and function. The literature indicates that exercise therapy, particularly eccentric and progressive resistance training, is the core and most strongly supported intervention, that manual therapy and load management provide useful adjuncts, and that a combined, individualised approach is most effective, while passive modalities have a more limited role. The review emphasises an active, exercise-based and individualised approach and appropriate load management. It concludes that rehabilitation, centred on progressive exercise, is effective in lateral elbow tendinopathy, and highlights the need for further research to optimise protocols and prevent recurrence.

KEYWORDS: *Lateral Elbow Tendinopathy, Tennis Elbow, Exercise Therapy, Eccentric Exercise, Musculoskeletal Physiotherapy, Manual Therapy, Load Management, Rehabilitation*

INTRODUCTION

Despite its common name, it affects many people who do not play tennis, occurring frequently in those whose work or daily activities involve repetitive gripping and wrist movements [1], [2].

Lateral elbow tendinopathy, commonly known as tennis elbow or lateral epicondylalgia, is a prevalent musculoskeletal condition affecting the common extensor tendon at the lateral elbow, causing pain, reduced grip strength and functional impairment [1]. Although often self-limiting over time, it can be persistent and disabling, affecting work and daily activities, and it represents a common reason for seeking musculoskeletal care [1], [2]. Most cases are managed conservatively, with physiotherapy playing a central role.

This change in understanding has had a direct influence on treatment, moving the emphasis away from rest and anti-inflammatory measures toward graded loading of the tendon [2], [3]. Lateral elbow tendinopathy is now understood as a tendinopathy, involving degenerative and failed-healing changes in the tendon rather than primarily inflammation, which has important implications for management [2], [3]. This understanding has shifted treatment toward active, loading-based rehabilitation aimed at stimulating tendon adaptation and restoring function, rather than reliance on passive or anti-inflammatory approaches. Exercise therapy, particularly progressive loading, is central to this approach [3].

The balance between these interventions has shifted over time toward active, loading-based approaches, with passive treatments playing a smaller role than in the past [2], [3].

Rehabilitation for lateral elbow tendinopathy encompasses exercise therapy, with an emphasis on eccentric and progressive resistance training, manual therapy, load management and bracing, education and activity modification, and adjunctive modalities [2], [3]. These interventions address the tendon pathology, pain, strength and functional impairment and the loads applied to the tendon. They are often combined within an individualised programme, reflecting the multifactorial nature of the condition.

Although many cases improve over time regardless of treatment, the condition can be slow to

resolve and prone to recurrence, and effective rehabilitation aims to speed recovery, restore function and reduce the likelihood of relapse [1], [2]. This natural variability also complicates the interpretation of treatment effects.

Although rehabilitation is well established, the relative roles of different interventions, the optimal exercise protocols and the prevention of recurrence continue to be defined. The problem addressed in this review is the need to synthesise current evidence on rehabilitation approaches for lateral elbow tendinopathy. Accordingly, this review examines the principal interventions, evaluates the evidence regarding their effects, and considers the case for an active, exercise-based and individualised approach.

REVIEW METHODOLOGY

Particular emphasis was placed on exercise-based rehabilitation, which forms the core of contemporary management, while the supporting roles of other interventions were also considered [2], [3].

This narrative review was based on a structured search of peer-reviewed literature concerning rehabilitation of lateral elbow tendinopathy. Databases were searched using terms relating to lateral elbow tendinopathy, tennis elbow, lateral epicondylalgia, exercise therapy, eccentric exercise, manual therapy, bracing and physiotherapy. Systematic reviews, randomised controlled trials and relevant guidelines were prioritised, and findings were organised by intervention and outcome. The principal rehabilitation approaches are illustrated in Figure 1 and summarised in Table 1.

The synthesis gave particular weight to the contemporary understanding of the condition as a tendinopathy, which has reshaped the relative emphasis placed on active loading compared with passive and anti-inflammatory approaches.

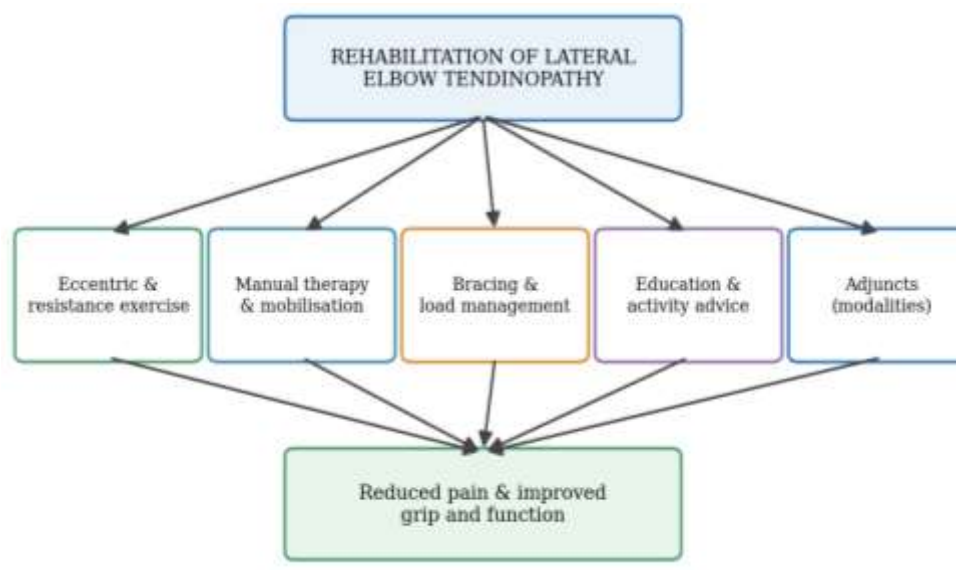


Figure 1: Principal Rehabilitation Approaches for Lateral Elbow Tendinopathy

Table 1: Rehabilitation interventions for lateral elbow tendinopathy

Intervention	Description
Exercise therapy	Eccentric and progressive resistance training
Manual therapy	Mobilisation and soft-tissue techniques
Load management / bracing	Activity modification and bracing
Education	Advice on load and activity
Adjunctive modalities	Supplementary passive treatments

INTERVENTIONS AND EVIDENCE

Exercise Therapy and Progressive Loading

The interventions are considered separately below, but they are typically combined within an individualised programme in which progressive exercise forms the foundation and the other approaches play supporting roles.

Eccentric exercise, in which the muscle-tendon unit lengthens under load, has been studied extensively in tendinopathy and is thought to impose a beneficial stimulus for tendon remodelling [2], [3].

Building the load-bearing capacity of the wrist extensor muscles and tendon is central to restoring pain-free grip and function [2], [3].

Exercise therapy, with an emphasis on eccentric and progressive resistance training, is the core and most strongly supported intervention for lateral elbow tendinopathy [2], [3]. Progressive loading is thought to stimulate tendon adaptation and remodelling, reduce pain and restore strength and function. Evidence indicates that exercise therapy improves pain, grip strength and function, and eccentric and progressive resistance protocols are widely used. Exercise forms the foundation of contemporary rehabilitation, consistent with the understanding of the condition as a tendinopathy [3].

The shift from viewing the condition as an inflammatory ‘epicondylitis’ to a degenerative tendinopathy has been one of the most important developments in its management, because it reframes the goal of treatment from suppressing inflammation to promoting tendon adaptation through graded loading [2], [3]. This conceptual change underpins the central place of progressive exercise in contemporary rehabilitation.

Manual Therapy and Load Management

Techniques such as mobilisation with movement applied at the elbow have been described as a means of reducing pain and improving grip during functional tasks, supporting participation in exercise [2], [3].

Its benefits tend to be short-lived, which is why it is best paired with an ongoing exercise programme rather than used alone [2], [3].

Manual therapy, including mobilisation and soft-tissue techniques, is used as an adjunct to exercise, and may provide short-term pain relief and improved movement that facilitate active rehabilitation [2], [3]. Load management, including activity modification and the use of bracing such as counterforce or wrist orthoses, helps reduce excessive loading of the tendon and manage symptoms during rehabilitation. These approaches support the core exercise programme by addressing pain and the loads applied to the tendon, and are individualised to the patient.

Bracing is generally regarded as a supportive measure to manage symptoms and reduce strain on the tendon during functional activity, rather than as a treatment that resolves the underlying tendinopathy [2], [3]. Used judiciously alongside exercise and activity modification, it can help patients remain active while the tendon adapts.

Education and Activity Modification

Patients who understand why loading is beneficial are often more willing to persist with exercise despite some initial discomfort [2], [3].

Setting realistic expectations about the typically gradual course of recovery can also help maintain adherence and prevent discouragement during rehabilitation [1], [2].

Identifying and modifying the specific activities that provoke symptoms is often a key step in allowing the tendon to recover [1], [2].

Education and activity modification are important components, helping patients understand the condition and manage the loads applied to the tendon [2], [3]. Advice on appropriate activity, load management and the expected course of recovery supports adherence and self-management and helps prevent aggravation. Given the relationship between tendon loading and symptoms, particularly in occupational and sporting contexts, education on load management is central to both recovery and the prevention of recurrence.

Because the condition is closely linked to repetitive loading of the wrist extensors, often in occupational or sporting contexts, education on how to modify aggravating activities is integral to both recovery and the prevention of recurrence [1], [2]. Helping patients understand the relationship between load and symptoms enables them to participate actively in managing their condition.

Adjunctive Modalities and Combined Treatment

Their limited evidence base, relative to the strong support for exercise, argues against making them a central component of treatment [2], [3].

Adjunctive passive modalities are sometimes used, but the evidence for their effectiveness is

generally limited, and they are not a substitute for active, exercise-based rehabilitation [2], [3]. A consistent theme is that a combined, individualised approach centred on progressive exercise, with manual therapy, load management and education as adjuncts, is most effective. The reported benefits of rehabilitation across outcomes are summarised in Figure 2 and Table 2.

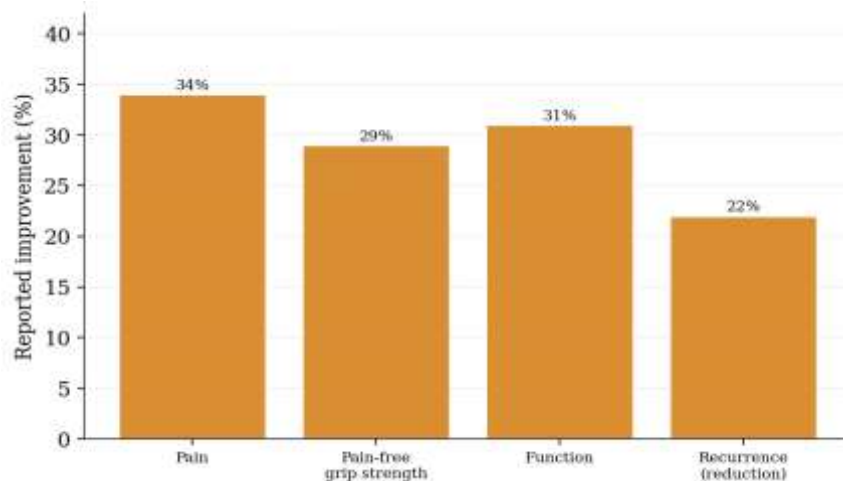


Figure 2: Reported Improvements Associated With Rehabilitation of Lateral Elbow Tendinopathy

The improvements shown across pain, grip strength and function are consistent with the effects of progressive loading on tendon capacity and on the strength of the wrist extensor muscles [2], [3].

Table 2: Summary of Evidence for Rehabilitation Interventions.

Intervention	Evidence level	Main reported benefit
Exercise therapy	Strong	Improved pain, grip and function
Manual therapy	Moderate	Short-term pain relief
Load management / bracing	Moderate	Symptom management
Adjunctive modalities	Limited	Limited additional benefit

DISCUSSION

This conclusion is consistent with the broader tendinopathy literature, in which progressive loading has emerged as the central therapeutic principle across several tendons [2], [3].

The evidence reviewed indicates that rehabilitation centred on progressive exercise is effective in lateral elbow tendinopathy, improving pain, grip strength and function, and that a combined, individualised approach is most effective [2], [3]. Exercise therapy, particularly eccentric and progressive resistance training, is the core and most strongly supported intervention, with manual therapy, load management and education providing useful adjuncts, while passive modalities have a more limited role.

This understanding also helps explain why approaches aimed primarily at suppressing inflammation, including some injection therapies, may offer only short-term relief and can be outperformed by active rehabilitation over the longer term [2], [3].

Loading programmes are typically progressed gradually according to the patient's symptoms, increasing the demand on the tendon as tolerance improves [2], [3].

The central role of progressive exercise reflects the contemporary understanding of the condition as a tendinopathy [2], [3]. Because the underlying pathology involves degenerative and failed-healing changes rather than primarily inflammation, active loading that stimulates tendon adaptation is more appropriate than passive or anti-inflammatory treatment. This conceptual shift has placed progressive exercise at the centre of rehabilitation and reframed the roles of other interventions as supportive rather than primary, which is an important message for practice.

Recognising these supporting roles helps clinicians avoid over-reliance on any single adjunct and keeps the focus on the exercise programme that drives recovery [2], [3].

The complementary roles of the adjunctive interventions are clinically important [2], [3]. Manual therapy may provide short-term pain relief that facilitates exercise, while load management and bracing help control symptoms and tendon loading during rehabilitation, and

education supports adherence and the management of load in daily and occupational activity. Integrating these adjuncts with a core exercise programme, individualised to the patient, addresses the multiple factors involved in the condition. The clinical significance lies in the demonstration that an active, exercise-based and individualised approach offers effective management, while excessive reliance on passive modalities is not supported.

A particular difficulty in interpreting the evidence is that the condition often improves spontaneously over time, so that distinguishing the specific effect of an intervention from natural recovery requires well-designed controlled studies [1], [2]. This natural history complicates conclusions about both efficacy and the prevention of recurrence.

The variety of loading protocols studied, differing in type, intensity and progression, makes it difficult to identify a single optimal regimen from the current evidence [2], [3].

Several challenges and limitations apply. The evidence, while supportive of exercise, includes heterogeneity in exercise protocols, adjunctive interventions and outcomes, and the optimal exercise protocol, including type, dosage and progression, is not fully defined. Recurrence is common, and the long-term prevention of recurrence is less well characterised. These considerations indicate the need for further research to optimise protocols and prevent recurrence, while an active, exercise-based approach remains well supported.

The reframing of management around active loading, with passive treatments relegated to a supporting or limited role, represents a meaningful change in practice that aligns treatment with the underlying tendon pathology [2], [3].

LIMITATIONS

The frequent spontaneous improvement of the condition further complicates the attribution of benefit to any specific intervention [1], [2].

This review has several limitations. As a narrative review rather than a systematic review with meta-analysis, it is subject to selection bias and does not provide pooled quantitative estimates. The evidence on rehabilitation of lateral elbow tendinopathy includes heterogeneity in exercise protocols, adjunctive interventions, patient populations and outcome measures, complicating

comparison. The optimal exercise protocol is not fully defined, and data on the long-term prevention of recurrence are limited. The review emphasises widely studied interventions, particularly exercise, and the self-limiting course of the condition in some patients complicates the interpretation of treatment effects.

FUTURE SCOPE

Comparative trials of different loading protocols, and studies clarifying how to dose and progress exercise, would be particularly valuable for refining practice [2], [3].

Future research should establish the optimal exercise protocols for lateral elbow tendinopathy, including the type, dosage and progression of loading, and clarify the additional value of adjunctive interventions. High-quality trials with longer-term follow-up are needed to assess the durability of benefits and, importantly, the prevention of recurrence, which is common. Research into load management and activity modification, particularly in occupational and sporting contexts, would inform both recovery and prevention. Investigation of which patients respond best to particular approaches, and of the integration of exercise with education and load management within individualised programmes, would further optimise musculoskeletal physiotherapy for lateral elbow tendinopathy.

CONCLUSION

This positions exercise as the foundation of treatment, with other interventions arranged around it to support engagement and symptom control [2], [3].

Rehabilitation centred on progressive exercise is effective in lateral elbow tendinopathy, improving pain, grip strength and function, and a combined, individualised approach is most effective. Exercise therapy, particularly eccentric and progressive resistance training, is the core and most strongly supported intervention, consistent with the understanding of the condition as a tendinopathy, while manual therapy, load management and education provide useful adjuncts and passive modalities have a more limited role. An active, exercise-based and individualised approach with appropriate load management is recommended. Further research is needed to optimise exercise protocols and to improve the prevention of recurrence in lateral elbow tendinopathy.

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