

Eccentric training for Treatment of Lateral Humeral Epicondylalgia

By Dr. Ian MacIntyre

Pain on the lateral epicondyle of the humerus is a common clinical problem that mainly affects the middle aged population. Despite numerous investigations the specific pathomechanics of the disorder remain unclear.

Some differential diagnosis for lateral humeral pain include: PIN syndrome, RTS syndrome, Radio-ulnar joint dysfunction, Radio-humeral joint dysfunction.

Some studies successfully treated epicondylalgia with nerve decompression, suggesting a neurogenic component to the disorder, while most have observed a localized tendinopathy usually of extensor carpi radialis brevis.

Cyriax, 1936, stated that LE is self-limiting disorder and a spontaneous recovery should be seen with in 8 – 12 months. Several reports however, have stated this is not the case and demonstrated that some patients develop continuing problems which requires some form of active treatment.

Most text books advocate conservative treatment as the primary choice and several different methods have been described. The most frequent being stretching, bandage, local steroid injection and acupuncture, which have all shown some success. However, conservative treatment is still controversial.

Non-operative treatment with eccentric exercise has been shown as effective for Achilles tendinosis (Alfredsson 1998) and Patellar tendinosis (Curwin and Stanish 1984) and since these tendinopathies show similar clinical behaviour and histopathologic appearance, a treatment regime of eccentric exercises for lateral humeral epicondylalgia may be appropriate as a conservative treatment.

Non-operative Treatment Regime Including Eccentric Training for Lateral Humeral Epicondylalgia

Svernlov B, Adolfsson L. Scandinavian Journal of Medicine and Science in Sports 2001.

The aim of the study was to evaluate the clinical results of eccentric training regime with conventional PNF stretching and also after 3.4 years in two groups with different duration of symptoms.

PILOT STUDY:

30 patients in 2 groups

Group 1: 15 patients in a Stretching group (group S)

8.4 months symptom duration
12 had symptoms in the dominant arm
4 had previous surgery
Group 2: 15 patients in an eccentric (Group E)
10.7 months duration
13 in dominant arm
9 had previous steroid injection

Stretching Regime:

- 1) Contract extensors of the forearm for 10 sec
- 2) Relax for 2 sec
- 3) Stretch for 15-20 sec
- 4) Repeat 3-5 times/day for 2 times/day

Eccentric Training Regime:

- 1) Warm up of extensors and flexors with unloaded wrist movement for 2-3 min
- 2) Static stretch 15-30 sec for 3-5 times
- 3) Eccentric exercises of the extensors 10 sec with the elbow at 90 degrees of flexion for 3 sets of 5 reps with a dumb bell. The uninjured hand returns the weight to the starting position.
- 4) Static stretch
- 5) 1 per day

Diagnostic Criteria:

-All patients complained of pain on the lateral aspect of the elbow
-pain directly on the lateral humeral epicondyle on palpation
-pain during resisted wrist extension with elbow extended and the forearm pronated
-positive middle finger test

Exclusion Criteria:

RA, Fibromyalgia, Previous surgery, Provocative joint pain, Neck complaint, Radial nerve entrapment signs, injections in the last 3 months.

The exercises were intended to be pain free and no patients reported increased pain during the eccentric training.

The program used was a modification of Curwin and Stanish (1984) work but these patients did fewer repetitions with no increase in speed of the eccentric maneuver.

Both programs were carried out at home for 12 weeks. All patients used an elbow brace (counterforce brace) during activity and a wrist support at night. They also kept a diary of all their training sessions. The patients were all seen by a physiotherapist at the start, 3 months, 6 months and 12 months.

All patients were encouraged to use the affected arm as much as pain allowed.

During all visits by the physio, the patients made a subjective measurement of symptoms using 5 VAS scales. 1) pain at rest 2) pain on palpation 3) pain during resisted extension 4) middle finger test 5) pain during strength training.

They also rated their symptoms using question alternatives; 1) completely recovered 2) Improved 3) unchanged 4) worse

Objective evaluation was completed using a grip strength test.

RESULTS:

PILOT STUDY

3 in group S and 2 in group E experienced increased pain and were regarded as failures.

At 3 and 6 month follow up, the self rated treatment outcome showed no difference between the two groups. After 12 months all patients rated themselves as improved or completely recovered.

E = 12 complete S = 7 complete

S group = showed statistically significant improvement in all VAS reports except for pain during gripe strength testing.

E group = Statistically significant improvement was seen in all VAS groups except for pain at rest.

Grip strength increased significantly in all groups after 3 months but at 6 months the increase was significantly higher in the E groups

Gender, duration of symptoms, previous injection and hand dominance did not affect the outcome.

CLINICAL STUDY:

129 patients (72 women/57 men) avg age 46 yo with a mean duration of symptoms of 19.4 months

Groups were divided based on their duration of symptoms

- 1) less than 12 months
- 2) more than 12 months

All patients underwent the eccentric training criteria explained above.

Using the five VAS scales explained above, all patients subjectively assessed their symptoms at the start of the treatment and after 3 months.

Grip strength was measured at the same time for an objective score.

At 41 months (3.4 years) treatment outcome was evaluated using a 4 point scoring system (Verhaar) and a 4 grade self reported outcome questionnaire.
RESULTS:

At the end of the treatment period and at 3 months, a statistically significant improvement was seen in all VAS recordings and also increased grip strength was evaluated.

After 41 months:

8 patients went on to seek additional treatment.

-54 % were completely recovered

-43 % as improved

-2 % unchanged

-2 % worse

Verhaar

-38 % excellent

-28 % good

-25 % fair

-9 % poor

Group 1 (<12 months)

72 % had excellent or good results

Group 2 (>12 months)

70% had excellent or good results

No overall difference was found between outcomes of men and women, however subjects with previous steroid injections showed inferior results.

When looking at the results shown by Verhaar's score of 38% excellent and 54% completely recovered, the difference is mainly due to the criteria of tenderness on palpation at the lateral epicondyle, while they were otherwise symptom free. This tenderness however, did not interfere with their ADL's.

Even though there was no control group in this study, they divided the clinical material into 2 groups based on differences in duration of symptoms and found similar results in both groups, indicating a true positive effect of treatment.

Previous studies have found tendinosis to be more common in men than women, but this study found no gender-related differences in the outcome either in the pilot study or clinical study.

Both groups wore counterforce braces and night splints, which makes this study applicable to the whole treatment regime not just one exercise, however both groups showed better results therefore it was probably the training that produced the superior results.

The observed positive changes have been attributed to increased tensile strength in the muscle or decreased muscular strain during joint movement due to muscular lengthening effect of eccentric training.

In the present study they observed increased grip strength after the treatment program. The same findings have been found in all studies on eccentric training for tendon disorders, so it is probably due to reduced pain or training effect of hypertrophied muscle.

Alfredsson suggests that the eccentric training might aid in correcting a neuromuscular disturbance caused by the initial injury resulting in an increased muscle strength.

References:

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