

Lateral Epicondylitis: Accurate Evaluation and Successful Resolution

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What is Lateral Epicondylitis (LE)?

LE is clinically defined by pain in the region of the lateral epicondyle of the distal humerus, which is provoked by resisted use of the extensor muscles of the wrist.

According to Robert Nirschl, MD (Journal of Bone and Joint Surgery, 1979; 61: 832-839) lateral epicondylitis is angio-plastic hyperplasia of the extensor carpi radialis brevis (ECRB) and to a minor extent the antero-medial border of the extensor digitorum communis (EDC).

According to Nirschl (ASHT Annual Meeting, Hollywood, CA 2002) LE is degenerative in nature, as opposed to being inflammatory making LE more a tendinosis rather than a tendinitis.

Epidemiological Review

- LE affects 1.3% of the general population, as compared to 0.4% suffering from a diagnosis of medial epicondylitis.
- Prevalence is highest for people aged 45-54 years, with men and women equally affected.
- According to NIOSH (National Institute for Occupational Health and Safety) Publication No. 97-141, LE is an “uncommon” disorder with overall prevalence in the general population being from 1 to 5%.

- The only well defined risk factor for LE is smoking. However, being a smoker, former smoker, obesity, repetitive movements and forceful activities, all independent from one another are felt to be risk factors for medial epicondylitis, according to The American Journal of Epidemiology Volume 164, Issue 11, pp. 1065-1074.

According to another NIOSH Publication (1997) titled: Elbow Musculoskeletal Disorders: Evidence for Work-Relatedness, there is insufficient evidence according to 20 epidemiological studies completed focusing on physical work place factors and their relationship to epicondylitis.

In other words no studies were able to link repetitive work as the dominant exposure factor for developing epicondylitis (lateral or medial).

Types of Non-surgical Interventions for LE:

- Rehabilitation therapies (OT, PT, Hand Therapy)
- Local cortisone injection
- Local injection of autologous blood
- Electrical stimulation
- Prolotherapy
- Dry needling
- Acupuncture

Research and Non-Surgical Management of LE:

If therapists were to treat patients with LE based only on evidence based practice we would not be treating this disorder.

Most of the literature reviewed concluded that well controlled, well designed studies on the effectiveness of non-surgical intervention did not exist, as most of the studies have not been based on sound research and were of low quality.

According to MacDermid, et al, in the January-March 2010 Journal of Hand Therapy research suggests that NSAID (non-steroidal anti-inflammatory drug) injection was “likely” beneficial, but exercise, mobilization, acupuncture, splinting and surgery all had “unknown” effectiveness.

Despite the fact there is a shortage of well designed studies to provide evidence-based support for non-surgical intervention, it is widely agreed upon in the literature that an adequate patient history and a good physical examination of the patient is the best way to correctly diagnose LE, and that non-surgical intervention is favored over surgical intervention.

So how do we increase our chance of effectively managing LE?

- Need to understand the underlying pathology.
- Need to understand that all patients with LE do not present with the same level of severity.
- Need to classify signs and symptoms.
- Need to choose interventions based on the individual patient's presentation and how they fall in the classification system.

Underlying Pathology of LE:

In tissue samples from the ECRB tendons suffering from chronic tendinosis there is an absence of inflammatory cells, according to Kraushaar and Nirschl (The Journal of Bone and Joint Surgery 81-A: 259-278).

Histological evidence notes tissue to be angio-fibrotic, degenerative, and avascular in nature.

Collagen is noted to be irregular, immature and disorganized compared to normal cells and upon visual inspection tissue appears dull, gray, granular, moth eaten and has a chewed bubble gum appearance....all evidence of tissue with failed tendon healing.

According to Edward Diao, MD from UCSF Dept. of Orthopedic Surgery at the American Society for Surgery of the Hand Conference in San Francisco in March 2001, pathology of LE includes often partial ECRB tendon rupture, exostosis of the lateral epicondyl, degeneration of the EDC and chronic cumulative muscle fiber regeneration secondary to the effects of ongoing mechanical stress.

Anatomy Review and Surface Anatomy

- Osteology
- Muscle attachments and Functions
- PIN (Posterior Interosseous Nerve)
- Palpate: Lateral Epi, extensor wad and common extensor attachment, ECRB, EDC, RT and 2nd dorsal wrist compartment

Palpatory Technique:

Getting a good visual and palpatory assessment is necessary for being able to target involved tissue and assisting with classification of LE. Your visual and palpatory assessment should be congruent and or supportive of each other.

Presenter is in disagreement with Jane Fedorczyk, MS, PT, CHT, ATC, in her article appearing in the April-June 2006 Journal of Hand Therapy. Fedorczyk states:

“Therapists would not likely be able to determine the presence of these histopathological changes without imaging studies...”

Palpatory Examination:

What are you looking and feeling for?

- Quality of the attachment of the common extensor at the lateral epicondyl...in particular the antero-medial edge where ECRB and EDC insert.
- Any contrast between the density of the feel and appearance of the attachment, in comparison to the uninvolved side.

- Smoothness of muscle tissue, as compared to roughness or “creptitation” type feel upon deeper palpation.
- Change in contour and shape of the muscle belly and attachment.
- Smooth vs. grainy muscle texture in the muscle belly.

Clinical Evaluation:

What are you going to rule out?

- Extensor strain
- Radial head synovitis
- C6-C7 cervical radiculopathy
- Radial head and neck #'s
- Radial Tunnel or PIN entrapment

Common symptoms reported during the initial assessment interview:

- Lateral elbow pain that may or may not radiate distally into the forearm or proximally.
- Pain with gripping and picking up objects, especially with forearm pronated.
- Pain is primarily with use.
- There may be changes in activity levels and routine secondary to pain.

Therapist should already have an idea about the diagnosis before the physical examination begins, and all you are doing is confirming your hypothesis during the actual exam.

Provocative Testing may include:

- Manual muscle testing of the ECRB and the EDC.
- Long finger extension test.
- Putting wrist and digital extensors on stretch.
- Power gripping the Jamar dynamometer with the elbow flexed at 90 degrees and then again with the elbow in full extension and arm elevated to 90 degrees at the shoulder.

LE: CHT Classification System

Type I – Acute LE

Characteristics:

- Onset of pain within the last 6 weeks to 3 months.
- Pt typically reports a distinct painful event.
- Inflammation is often noted at the common extensor attachment.
- Pain behaviors with putting the extensor wad on stretch.

- Pt has limited use of the involved extremity.
- AROM of the elbow, forearm, wrist and hand are pain provoking.
- Pt is hesitant to have the examiner touch them during the physical exam.
- Pain behaviors with mmt of the ECRB and EDC.
- Profound loss of grip strength in both elbow flexed and extended positions with Jamar.

Type II – Mild Chronic

Characteristics:

- Persistent LE pain for longer than 3 months.
- Pain is primarily with use.
- No significant change in activity levels.
- Undisrupted sleep.
- Grade 5/5 ECRB and at least a 4/5 EDC with no significant pain behaviors with mmt.

- Reports discomfort with palpation of the LE and has mild pain behaviors with deep palpation.
- Negative long finger extension test.
- Pain reports with power gripping Jamar with the elbow in an extended position.
- Grip with elbow extended is approaching the value of grip with the elbow flexed using the Jamar.

- Mild degenerative changes are noted visually and upon palpation of the LE.
- May have pain reports when putting extensor wad on stretch.

Type III – Moderate Chronic

Characteristics:

- Persistent LE pain for longer than 3 months.
- Pain primarily with use, but may linger after specific tasks.
- Changes reported in routine activities especially sporting activities.
- Sleep is not typically disrupted, but may awaken with some pain at LE.

- Grade 4/5 or 5/5 ECRB and at least a 4-/5 EDC with or without pain behaviors.
- Pain behaviors with deep palpation at the LE.
- May have a (+) long finger extension test.
- May have pain behaviors with putting the extensor wad on stretch.
- Pain with gripping Jamar with elbow extended.

- Grip with elbow extended is between 25 to 40% less than with elbow in the flexed position.
- There is definite visual and palpable changes to the LE.

Type IV – Severe Chronic – Responsive

Characteristics:

- Persistent LE pain for longer than 3 months.
- Pain with use and at rest, although pain may not be persistent throughout the day.
- Pt reports difficulty performing basic ADL's such as picking up coffee mug, or moving bed covers.

- Disrupted sleep and painful awakening common complaint.
- Grade 4-/5 to 5/5 ECRB and 4-/5 or less EDC with pain behaviors with mmt.
- (+) long finger extension test typical.
- Significant degenerative changes noted at the LE both visual and palpable.
- Putting wrist extensors on stretch is not necessarily painful.

- Pain behaviors with deep palpation of the LE.
- Profound pain behaviors with gripping Jamar with elbow extended position, and may also have some more mild pain behaviors with gripping with elbow flexed.
- Loss of grip strength is >50% with the elbow extended compared to elbow flexed.

Type V – Severe Chronic Non-responsive

Characteristics:

- Persistent LE pain for longer than 3 months.
- Often pt. reports a traumatic event occurred at onset of pain, and pain gradually worsened.
- Pain with use of the arm and at rest.
- Pt reports difficulty with performing many aspects of daily living primarily due to pain and secondarily due to weakness.

- Disrupted sleep common and pain upon awakening, especially extended the elbow.
- Grade 4-/5 ECRB at best, and grade 3+/5 EDC at best with significant pain behaviors with mmt.
- (+) long finger extension test.
- Significant degenerative change noted at LE both visually and palpable.

- Pain with putting extensor wad on stretch is not necessarily painful.
- Pain behaviors with deep palpation of the LE.
- Profound pain behaviors with gripping Jamar elbow extended and pain with gripping with elbow flexed.
- Loss of grip most profound with elbow extended and is >50% loss of strength.

Goals of Non-surgical Management:

- To improve circulation to the extensor attachment and extensor wad.
- To increase tissue healing and regeneration of ECRB and EDC.
- To improve strength and muscle endurance of the ECRB and EDC.

Interventions Based on Classification Type

Type I – In general intervention is more modality driven, with more activity modification and restrictions to avoid exacerbation.

Splinting: Wrist cock-up with wrist in 45 degrees of wrist extension to reduce stretch of ECRB and EDC attachment at the LE.

Modalities:

- 1 HVPC or H-Wave to increase circulation
- 2 US @ 20% with dex
- 3 Ionto of dex

Exercise:

- 1 Gentle A and PROM of the elbow, forearm, wrist and hand.

2 Gentle manual therapy techniques targeting primarily the extensor wad.

There needs to be control of pain and swelling previous to any stretching and strengthening.

Interventions for Type II:

Although treatment will continue to be modality driven, there will be more time spent with manual therapy targeting the LE, and treatment is more active with stretching and strengthening.

Exercise:

- 1 Theraband program: reversed curls, wrist extensions from neutral and wrist extensions from fully flexed wrist.
- 2 EDC strengthening with rubber band with elbow extended at side neutral, at 90 degrees of arm elevation forearm neutral and then with palm down position.
- 3 Progress to free weights: deltoids, military, forearm rotations, biceps and triceps, scap stabilizers.

- 4 Wrist extensor stretch general and ECRB and EDC isolated.
- 5 Manual therapy to extensor wad and scrapping technique at LE using a smooth, but rigid assist.

Modalities:

- 1 HVPC @ 20 pps x 20 mins.
- 2 US @ 100%.
- 3 Ionto for direct current to increase circulation.

Splinting: Rare use of counter force braces, or tensogrip sleeve.

Interventions for Type III

May not jump into strengthening as quickly as Type II as more focus will be on manual therapy in the initial stages of treatment.

Exercises:

- 1 Manual therapy mobilization of the extensor wad and scrapping technique to LE.
- 2 Stretch of ECRB and EDC if extensor wad is tight.

Modalities:

Same as for Type II

Splinting: Compression sleeve frequently helps, rare use of counter force brace or wrist cock up.

Strengthening program is same as for Type II once pt has less pain behaviors and there is noted (+) change with palpation of the LE.

Interventions for Type IV

Strengthening and stretching will commence once pain is less, so modalities and targeting LE with manual therapy will be dominant treatment choices.

Exercise:

Manual therapy to extensor wad and scrapping.

Modalities:

Same as for Type II and III.

Splinting: Pt may need a cock up splint for night time use.

Strengthening: Progress pt more slowly, but once pain is more controlled keep going with the strengthening.

Interventions for Type V

These pt's are treated in a similar manner to the Type IV classification, however these patients often require a cock-up splint for daytime and night time use.

They are typically not responsive to exercise, manual therapy, modalities within the first 4 to 6 visits and most likely will be referred back to the orthopedic specialist because non-surgical treatment will more than likely fail.

Benchmarks:

- Patients have less pain behaviors and make less negative comments about scrapping...in fact they are now doing it to themselves at home.
- Less pain behaviors with EDC strengthening.
- Grip with elbow extended and elbow flexed are approaching equal with less pain behaviors.