ORTHOSURGERY
Ιατρείο Ορθοπαιδικών Παθήσεων

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Lateral Epicondylitis

Surgical Treatment and Rehabilitation

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Surgical Indications and Considerations

Anatomical Considerations: Lateral epicondylitis primarily involves the origin of the extensor carpi radialis brevis, occasionally, the anterior edges of the extensor communis and the underside of the extensor carpi radialis longus and, rarely, the origin of the extensor carpi ulnaris. The extensor carpi radialis brevis muscle lies deep to the longus muscle and superficial to the joint capsule. The annular and collateral ligaments are located beneath and just distal to the origin of the ECRB muscle.

Pathogenesis: Lateral epicondylitis, also known as tennis elbow, represents a pathologic condition of the common extensor muscles at their origin on the lateral humeral epicondyle and is characterized by pain in this area. Lateral epicondylitis is directly related to activities that increase the tension and stress of the wrist extensor and supinator group. Repetitive eccentric muscle overload is thought to be a large contributing factor to the development of this condition. It is theorized that repetitive micro trauma leads to a micro tear which repairs itself, through this process also produces fibrosis and granulation tissue. With repetitive micro trauma, the tendon experiences mucoid degeneration and leads to a failure of the tendon over time.

The wrist extensor group falls in to the category of tendons that are vulnerable to injury. The tendons have poor vascular supply, wrap around a convex surface, cross more than one joint and are subjected to repetitive stress. In tendons, collagen fibers and primary tendon bundles run parallel courses. In normal tendons, nerves and blood vessels extend through the major connective tissue septa but do not invade the fascicles. On gross examination, the tendon appears firm, taut and tan or beige. In tendonitis, the abnormal tissue can be easily identified from the normal tissue. Examination usually reveals grey, shiny and edematous immatureappearing tissue. This tissue closely resembles scar tissue. Microscopically, the normal tendon fibers are disrupted by fibroblasts and vascular granulation like tissue. This appearance has been described as an angiofibroblastic hyperplasia. Upon surgical or microscopic examination there is usually no evidence of inflammation associated with tennis elbow. The term tendonitis is rapidly changing to tendinosis, to denote the difference between acute inflammatory changes verse a degenerating pathologic process.

Epidemiology: Tendonitis of the elbow is the most prevalent elbow injury, with an incidence of 1-3% in the general population and between 30% and 50% in tennis players. The characteristic age of onset is between 35 and 50 years, with a median of 41 years. Lateral epicondylitis is most common in participants of racket sports or in the industrial worker with jobs, which require repetitive and forceful use of the wrists and elbow. It is more common in white males and usually on their dominant side.*Diagnosis:*

• Pain at the lateral elbow

• Point tenderness in the area of the ECRB tendon, slightly distal to the lateral elbow

• Pain with forceful gripping
• Pain with resisted wrist extension with elbow extended
• Pain with passive wrist flexion, pronation and ulnar deviation with the elbow extended
• X-Ray: to rule out radiocapitellar arthritis
• MRI: MR images correlate well with surgical and histological findings of neovascularization and mucoid degeneration

Differential Diagnosis:

 Neuropathic

Radial tunnel syndrome
Entrapment of posterior interosseous nerve
Entrapment of musculocutaneous nerve
Entrapment of median nerve
Ulnar entrapment syndrome

 Inflammatory

Radiocapitellar arthritis
Synovitis
Gouty arthritis
Infection

 Trauma

Radial neck fracture
Distal humerus fracture

 Referred pain

Cervical radiculopathy
Shoulder arthritis
Carpal tunnel syndrome

 Other

Medial Epicondylitis
Tumor
Bone cyst

Nonoperative Verse Operative Management: Surgical intervention is usually indicated for patients who have undergone conservative care but still have pain 6 months to a year after initial symptoms. Conservative care consists of activity modification, NSAIDs, counterforce bracing, physical therapy or cortisone injections. Surgery is usually considered for patients who have had 3 or more cortisone injections with minimal success or for patients who present with pain that alters routine daily function. Nonoperative treatment is successful in between 75 to 90% of cases.

According to the Cochrane Review, presently, there are no published controlled trials of surgery for lateral elbow pain. Without a control group, it is not possible to draw conclusions about the value of this modality of treatment.

Surgical Procedure: There are several surgical procedures for the treatment of lateral epicondylitis; including the open procedure, arthroscopic, and percutaneous release. This guideline will focus on the open procedure described by Nirschl and Pettrone, as this is still considered the gold standard procedure.

An oblique incision is made just proximal to the lateral epicondyle distally toward the radial head. The extensor aponeurosis is identified and a longitudinal incision is made to visualize the extensor group. The extensor carpi radialis longus is then retracted back to visualize the brevis tendon. The pathologic tissue usually includes the origin of the extensor carpi radialis brevis and less frequently the anterior extensor aponeurosis or extensor longus. The pathologic tissue is then excised. Often osteotome decortication of the exposed lateral epicondyle is performed to enhance blood flow and postoperative healing but recent evidence suggests no benefit to this aspect of the procedure.

Preoperative Rehabilitation:

• Patients are instructed to stay in their immobilizer for the majority of the time for 48 hours after surgery
• Supine sleeping is encouraged, with pillows to support the elbow
• Shoulder motions 3-5 times per day
• On day one, gently finger and wrist motions are allowed for 2-3 minutes 3 times per day

POSTOPERATIVE REHABILITATION

Note: The following guideline is a summary of the guidelines provided by Nirschl, Baker, and Galloway.

Phase I: Days 1-7

• Movement of the wrist and fingers for 2 minutes, 3-5x/day
• Ice and NSAIDs are utilized for pain control
• The patient is also educated on the signs of wound infection; including excessive swelling, redness, excessive heat, oozing from the incision, a dramatic increase in pain or a fever greater than 100° for more than one day
• Day 3: Showering is allowed, with bandages off, and gentle pain-free elbow, wrist and shoulder ROM is started. At this point the immobilizer is optional.

Phase I: Days 7-17

• More aggressive ROM is encouraged in and out of the shower

• Goals for day 17 are 80% of normal elbow ROM
• The arm can be used for light activity only
• Ultrasound
• High Volt Galvanic Stimulation

Phase I: Days 18-21

• Sub maximal Isometrics are started
• The patient begins antigravity wrist flexion, extension, supination and pronation without pain
• If painful the patient is instructed to utilize a counterforce brace during exercising
• Once the patient can perform 30 repetitions, without pain, they can progress to a 1-pound weight or light resistance band. All exercises are performed with the elbow bent to 90° and resting on a table or the lower extremity

Phase II: Weeks 3 – 6

Goals: Pain level less than pre-surgery level
Full ROM.

• Therapeutic exercises:

Rotator cuff, elbow and scapular stabilization training with light resistance
Aerobic conditioning on a stationary bike or treadmill
Light stretching is encouraged at this stage with emphasis on end range and passive overpressure
Progressive resistive exercises – strengthening wrist flexion, extension, supination/pronation, ulnar and radial deviation. Progress the patient from a flexed and elbow supported elbow to a fully extended and unsupported elbow
Pain free grip strengthening with putty or ball
Utilize counterforce brace during exercise if pain continues

• Gentle soft tissue mobilization/massage along and against fiber orientation
• Consider use of ice after exercise.

Phase III: Weeks 8 – 12

• Begin task specific functional activities
• Return to sport activities
• Continue counterforce bracing if needed
• Continue wrist, elbow, shoulder and scapular strengthening
• Patient is allowed to return to athletics once their grip strength is normal.