TENNIS ELBOW (LATERAL EPICONDYLITIS) SYNDROME

T*ennis Elbow Syndrome* (lateral epicondylitis or radiohumeral bursitis) is characterized by pain over the lateral epicondyle of the humerus, which may radiate to the lateral portion of the arm and forearm. Point tenderness may be just distal to the lateral epicondyle, along the line of the extensor carpi radialis brevis muscle for several inches. Elbow pain is increased by dorsiflexion and supination of the wrist against resistance, and pronounced weakness of grip and wrist dorsiflexion may be present. The patient may complain of an inability to "shake hand", grip or lift light objects, or to unscrew jar lids, or turn doorknobs.

The cause of *tennis elbow* is a bit controversial. Some authorities claim the cause to be an inflammation of a true radiohumeral bursa located between the common extensor muscles of the wrist and the radiohumeral joint of the elbow. Others claim the cause is a partial avulsion of the common extensor tendon from its origin at the lateral epicondyle of the humerus with resultant periostitis. Still others would lay the blame for the *Tennis Elbow Syndrome* at the door of an acute inflammatory response to tendon strain and adhesions between tissue layers associated with the tendon and its synovial sheath.

The *tennis elbow* condition seems to arise from an attempt to forcibly supinate the wrist against resistance (as required in driving a screw), or from a violent extension (snap) of the elbow and wrist with the hand pronated. Patients often report unawareness of any action that may have precipitated the condition.

Differential skin resistance (DSR) survey will characteristically reveal a distinct area of relatively high skin resistance just over the lateral epicondyle and proceeding distally over the extensor carpi radialis muscle to the distal extent of the coincident palpation tenderness. If adhesions are present, they may be specifically identified and located through auscultation of the proximal tendon and muscle belly. Some cases of *tennis elbow* demonstrate attendant inflammation of the olecranon fossa (determined by differential skin resistance survey with the elbow flexed to 90°) or the distal tendon of the lateral triceps head.

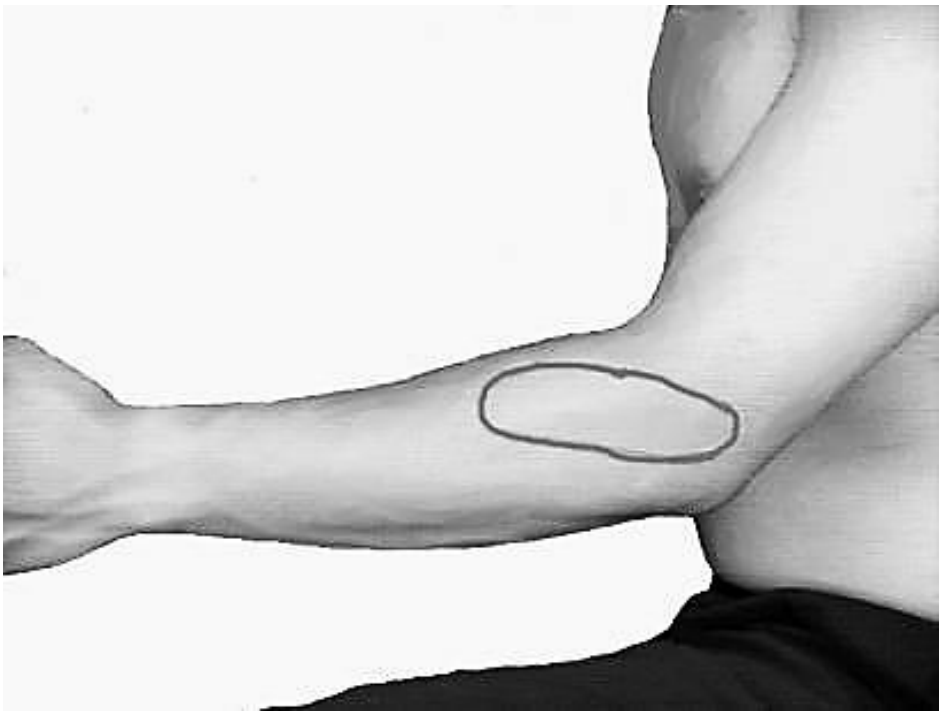
Treatment

Application:

- Place a negative electrode over the inflamed zone and a positive electrode over a more distal area on the extensor side of the forearm. Preset the electrical stimulation unit to deliver a visible contraction, at 7 Hz. Stimulate for 10 minutes. Then, set the unit to deliver a medium frequency current, with a duty cycle of 10-seconds on and 10-seconds off, sufficient to produce a near tetanic contraction of the involved muscles. Stimulate for 10 minutes. Place a firm cylindrical object in the patient's hand and instruct the patient should be instructed to "fight" the pull of the muscles when the electrical stimulator causes a contraction.

- Manipulate the tissues in and around the inflamed zone to eliminate any adhesions that might be present.

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm^2. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes.



The high skin resistance pattern most commonly associated with the Tennis Elbow Syndrome

The following treatment forms have also been effective.

Variation:

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.8 W/cm^2. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This procedure is designed to soften the adhesions that may be present.

- Manipulate the tissues in and around the inflamed zone to eliminate any adhesions that may be present.

- Twenty minutes after the first ultrasound, preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm^2. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This is performed to "cool off" the manipulated zone by effectively halting the production of prostaglandins by the stressed tissues.

- Apply mechanical vibration, delivered at 60 to 120 Hz, to the tendon of the extensor radialis brevis muscle, for two minutes. Apply the vibration at a relatively high but tolerably comfortable level for the patient. This is performed to increase capillary circulation in the involved tissues.

Variation:

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.8 W/cm^2. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This procedure is designed to soften the adhesions that may be present.

- Manipulate the tissues in and around the inflamed zone to eliminate any adhesions that may be present.

- Apply cold laser (with or without simultaneous electrical stimulation provided by the laser applicator) to the inflamed zone for approximately 6 minutes. This is performed to "cool off" the manipulated zone by effectively halting the production of prostaglandins (or facilitating enzyme destruction of **all** inflammatories being produced) by the stressed tissues.

- Apply mechanical vibration, delivered at 60 to 120 Hz, to the tendon of the extensor radialis brevis muscle, for two minutes. Apply the vibration at a relatively high but tolerably comfortable level for the patient. This is performed to increase capillary circulation in the involved tissues.

An inelastic elbow cuff (applied an inch distal to the elbow crease) may be helpful in some cases for reducing elbow pain associated with finger and elbow flexion against resistance. In other cases, the condition seems to be exacerbated by the additional pressure of a forearm cuff.

Trigger Points

The following trigger point formations may, singly or in combination, imitate or contribute to the pain of the *Tennis Elbow Syndrome*: Scalenus, Scalenus (minimus), Infraspinatus, Lateral teres major, Coracobrachialis, Middle trapezius [C], Supraspinatus (muscle), Latissimus dorsi (upper portion), Serratus posterior superior, Subclavius, Medial triceps (lateral fibers), Lateral triceps, Longhead of the triceps, Distal medial triceps, Anconeus, Brachialis, Supinator, Middle finger extensor, Fourth finger extensor, Flexor carpi radialis, Brachioradialis, Pronator teres, and Extensor carpi radialis longus.