RADIAL CHANNEL SYNDROME

The radial channel (or tunnel) is an arbitrary designation for the space created by the lateral aspect of the olecranon process and the proximal head of the radius, posterior to the articular capsule. One or more branches of the radial (musculospiral) nerve may run through this channel on its way to innervate its end organs. If the soft tissues in the area are traumatized by an external pressure or blow, bacterial infection, or even repetitive pronation and supination of the forearm (as occurs in racquet sports or various industrial tasks) they may inflame and the consequent interstitial swelling may exert pressure on the nerve. In simple cases, the result imitates the pain pattern associated with the *Tennis Elbow Syndrome*. The pain may seem to originate from the distal tendon of the lateral triceps head above the elbow and radiate into the forearm along the extensor carpi radialis brevis, or it may be restricted to a single point of pain just distal to the elbow on the lateral dorsal aspect of the forearm. In severe cases, numbness and muscular weakness may hamper hand function if sensory and motor nerves are sufficiently affected by abnormal pressure. In the extreme, a patient may be unable to button a shirt or perform other intricate functional hand tasks.

It's not unusual for radial channel inflammation to have been misdiagnosed as a *Tennis **E**lbow Syndrome*. Typically, however, the condition fails to respond to therapy that would normally have cleared up a tennis elbow. Differentially, there may be tenderness over the radial nerve around the proximal radial head but not over the extensor carpi radialis proximal tendon or lateral epicondyle, as in tennis elbow. If the third finger and wrist extension are forced it may tighten the fascial origin of the extensor carpi radialis brevis and increase the pain, as will passive pronation of the forearm and active finger and wrist flexion. More conclusively, differential skin resistance (DSR) survey will demonstrate a zone of relatively high skin resistance over the radial channel, usually above and below the level of the tip of the olecranon process by several centimeters. The survey should first be performed with the channel closed (palm down) and then with the channel open (palm up).

Treatment

Treatment varies according to what is the real salient issue responsible for the *Radial Channel Syndrome,* adhesions and inflammation.

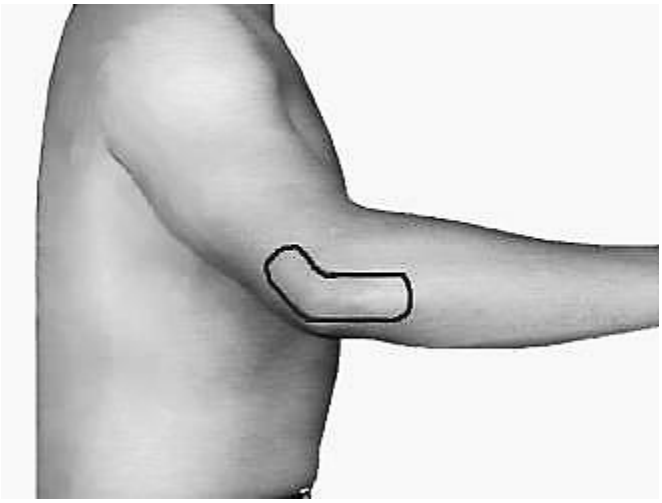
Application:

- Preset an electrical stimulator to deliver a medium frequency, with a 10-second on, 10-second off duty cycle. Place a negative electrode over the inflamed zone and a positive electrode over the wrist extensor muscle bellies. Adjust the amplitude to the point that a near tetanic contraction occurs in the wrist extensor muscles. Stimulate for 15 minutes.

- Manipulate the soft tissues in and around the radial channel to eliminate any adhesions that may be present. The channel should be manipulated alternately with the channel both opened and closed (palm up and palm down).

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.8 W/cm^2. Ultrasound the radial channel in the position in which the DSR survey indicated inflammation to be present (closed or open), utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes.

- Preset an electrical stimulator to deliver a 7 Hz, wide-pulse, galvanic current. Place a positive electrode over the radial channel, and a negative electrode over the wrist extensor muscles. Electrically stimulate for 20 minutes.



The high skin resistance pattern commonly associated with inflammation of the full Radial Channel 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 in the position in which the DSR survey indicated inflammation to be present (closed or open), 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. The channel should be manipulated alternately with the channel both opened and closed (palm up and palm down).

- 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 in the position in which the DSR survey indicated inflammation to be present (closed or open), 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, into the radial 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 in the position in which the DSR survey indicated inflammation to be present (closed or open), 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. The channel should be manipulated alternately with the channel both opened and closed (palm up and palm down).

- 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, into the radial channel, 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.

If simple inflammation is the salient issue, only one or two sessions may be required to completely relieve the syndrome. If a bone spur is present, as many as six or eight sessions may be required for complete relief.

Post Treatment Suggestions:

The patient should avoid any activity which involves fully externally rotating the involved forearm against resistance. For example, the patient should avoid caring heavy cooking equipment, like heavy trays, large ceramic bowls or cast iron skillets, with the involved wrist externally rotated to the end of range.

Trigger Points

The following trigger point formations may, singly or in combination, imitate or contribute to the pain of the *Radial Channel 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, Triceps (long head), Distal medial triceps, Anconeus, Brachialis, Supinator, Middle finger extensor, Fourth finger extensor, Flexor carpi radialis, Brachioradialis, Pronator teres, and Extensor carpi radialis longus.