Tennis Elbow
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(Also known as Lateral Epicondylitis, Tennis Elbow Syndrome, Extensor Tendinopathy, Extensor Carpi Radialis Brevis Tendinopathy)

What is tennis elbow?
Tennis elbow is a common overuse injury which typically causes pain at the outer aspect of the elbow. Although it can occur at any age, it is commonly seen in patients between the ages of 40 and 50.
The group of muscles at the back of the forearm are commonly called the forearm extensors (figure 1). These muscles act to extend the wrist and fingers (i.e. bend them backwards) and have a common bony attachment at the outer aspect of the elbow called the lateral epicondyle (figure 1). The forearm extensors attach to the lateral epicondyle via the extensor tendon.
During contraction of the forearm extensors, tension is placed through the extensor tendon at its attachment to the lateral epicondyle. When this tension is excessive due to too much repetition or high force, damage to the tendon occurs. Tennis elbow is a condition whereby there is damage, with subsequent inflammation and degeneration of the extensor tendon at its bony attachment to the outer elbow. It usually occurs due to gradual wear and tear associated with overuse, however, the condition may also occur traumatically due to a specific incident. The extensor muscle that is most commonly affected in this condition is known as the extensor carpi radialis brevis.
Causes of tennis elbow
Contrary to what the name suggests, you do not have to play tennis to develop this condition. In fact, tennis elbow is more commonly seen in non-tennis players than in tennis players. Patients typically develop this condition in association with activities involving repeated wrist extension against resistance. This includes sporting activities such as tennis, squash, badminton, as well as manual work such as carpentry, painting, chopping wood, bricklaying, repetitive use of a screwdriver, sewing and knitting or working at a computer. Patients may also develop this condition from other activities involving repetitive or forceful gripping of the hand.
It is common for patients to develop this condition following a sudden increase in activities that place stress on the forearm extensors (such as involvement in a tennis tournament over consecutive days) or due to a change in these activities (such as hitting balls in the wet, hitting into a strong breeze, using a new tennis racquet or technique, or simply hitting the ball too hard). Occasionally, the condition may develop suddenly. This is usually due to a forceful movement involving a heavy lifting or gripping force through the arm. In tennis players, tennis elbow is often associated with poor backhand technique. A history of wrist, elbow, shoulder or neck injury may also increase the likelihood of developing this condition.
Signs and symptoms of tennis elbow
The symptoms associated with tennis elbow usually develop gradually over a period of time. Initially, symptoms may present as an ache following an aggravating or unaccustomed activity. This may often be felt first thing in the morning. Patients usually experience localized elbow pain 1-2cm down from the bony lump on the outer aspect of the elbow (lateral epicondyle – figure 1) that increases on firmly touching this region. Occasionally, pain may radiate into the forearm.
In less severe cases of this condition, patients may only experience a minor ache. In more severe cases, pain may be quite incapacitating and can keep the patient awake at

night. Usually pain is experienced as an ache that increases to a sharper pain with activity. Occasionally, this condition can be associated with neck or upper back pain on the same side. In longstanding cases muscle weakness and reduced grip strength may also be present.

Patients with tennis elbow often experience an increase in pain during everyday activities such as picking up a cup, turning a door knob, opening a jar, shaking hands, carrying groceries or turning the steering wheel of a car. Elbow stiffness may also be experienced and is typically worse first thing in the morning.

Diagnosis of tennis elbow

A thorough subjective and objective examination from a physiotherapist is usually sufficient to diagnose tennis elbow. Further investigations such as an MRI scan or Ultrasound may be required, in rare cases, to confirm diagnosis.

Treatment for tennis elbow

Most cases of tennis elbow settle well with appropriate physiotherapy. This requires careful assessment by the treating physiotherapist to determine which factors have contributed to the development of the condition, with subsequent correction of these factors.

The success rate of treatment in patients with this condition is largely dictated by patient compliance. One of the key components of treatment is that the patient rests sufficiently from ANY activity that increases their pain until they are symptom free. Activities placing large amounts of stress through the elbow and forearm should also be minimized. These include: racquet sports (tennis), gripping activities, opening jars, cans or doors and carrying or lifting. Resting from aggravating activities ensures the body can begin the healing process in the absence of further tissue damage. Once the patient can perform these activities pain free, a gradual return to these activities is indicated provided there is no increase in symptoms.

Ignoring symptoms or adopting a 'no pain, no gain' attitude is likely to lead to the condition becoming chronic. Immediate, appropriate treatment is essential to ensure a speedy recovery. Once the condition is chronic, healing slows significantly resulting in markedly increased recovery times.

Patients with tennis elbow usually benefit from following the R.I.C.E. Regime. The R.I.C.E regime is beneficial in the initial phase of injury (first 72 hours) or when inflammatory signs are present (i.e. morning pain or pain with rest). This involves resting from aggravating activities, regular icing, the use of a compression bandage and keeping the arm elevated. Anti-inflammatory medication may also significantly hasten the healing process by reducing the pain and swelling associated with inflammation.

Patients with this condition should perform pain-free flexibility and strengthening exercises as part of their rehabilitation to ensure an optimal outcome. The treating physiotherapist can advise which exercises are most appropriate for the patient and when they should be commenced. An eccentric strengthening program is often required to restore full strength and function to the elbow (especially when the condition is chronic).

A graduated return to activity or sport as guided by the treating physiotherapist is required in the final stages of treatment for this condition. Often the use of a tennis elbow brace or support can assist during this phase of rehabilitation.

Prognosis of tennis elbow

With appropriate management, most minor cases of tennis elbow that have not been present for long can usually recover within a few weeks. In more severe and chronic cases recovery can be a lengthy process and may take up to 6 months in those who

have had their condition for a long period of time. Early physiotherapy intervention is therefore vital to hasten recovery.

Contributing factors to the development of tennis elbow

There are several factors which can predispose patients to developing this condition. These need to be assessed and corrected with direction from a physiotherapist. Some of these factors include:

- excessive or inappropriate activity
- poor sporting technique or equipment
- muscle weakness
- muscle tightness
- joint tightness
- inadequate warm-up
- inadequate rehabilitation following a previous elbow injury
- a history of neck or upper back injury
- a history of injury to the nerves that supply the elbow

In tennis players, racquet size, grip size, string tension, court surface or ball weight may all contribute to the development of tennis elbow.

Physiotherapy for tennis elbow

Physiotherapy treatment for this condition is vital to hasten the healing process, ensure an optimal outcome and reduce the likelihood of injury recurrence. Treatment may comprise:

- soft tissue massage
- electrotherapy
- taping
- bracing
- joint mobilization
- dry needling
- ice or heat treatment
- progressive exercises to improve flexibility and strength
- training and activity modification advice
- technique correction
- education
- anti-inflammatory advice
- devising and monitoring an appropriate return to sport or activity plan

Other intervention for tennis elbow

Despite appropriate physiotherapy management, some patients with this condition do not improve. When this occurs the treating physiotherapist or doctor can advise on the best course of management. This may include X-rays, ultrasound or MRI investigations, pharmaceutical intervention, corticosteroid injection, autologous blood injection or referral to appropriate medical authorities who can advise on any intervention that may be appropriate to improve the condition. In very rare chronic cases of tennis elbow, surgical intervention may be considered.

Exercises for tennis elbow

The following exercises are commonly prescribed to patients with this condition. You should discuss the suitability of these exercises with your physiotherapist prior to beginning them. Generally, they should be performed 3 times daily and only provided they do not cause or increase symptoms.

Tennis Elbow Stretch

Begin this exercise by keeping your elbow straight (figure 2). Slowly bend your wrist down using your other hand until you feel a mild to moderate stretch pain-free. Hold for 15 seconds and repeat 4 times.

Figure 2 – Tennis Elbow Stretch (right arm)

Tennis Ball Squeeze

Begin this exercise holding a tennis ball (figure 3). Squeeze the tennis ball as hard as possible and comfortable without pain. Hold for 5 seconds and repeat 10 times.

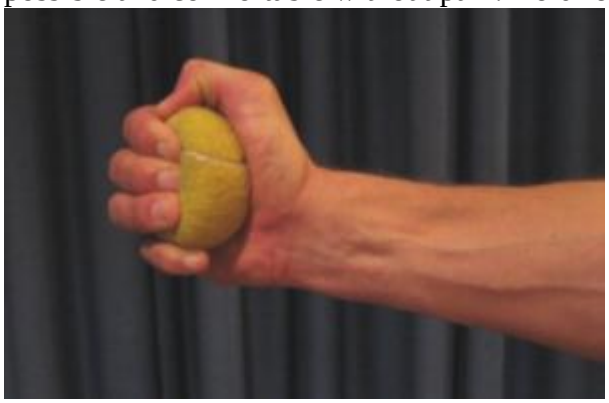

Figure 3 – Tennis Ball Squeeze (right hand)