

Diagnosis

Tennis elbow is the best-known and also the most painful elbow injury in tennis players. An estimated 50% of all tennis players will suffer from tennis elbow in the course of their career. Players aged over 35 are particularly at risk. Tennis elbow is an overuse injury of the extensor muscles of the wrist, in which pain and tenderness are felt at the attachment of these muscles at the outer side of the elbow (*figure 1*). The pain may radiate into the arm, wrist and fingers. The injury usually develops gradually, as a result of multiple micro ruptures and scar tissue at the muscle attachment. The injury may also occur suddenly, for instance as a result of miss-hitting the ball, so that a larger tear develops. Lifting, gripping, twisting the wrist, shaking hands, washing dishes or opening a door may all be very painful. During tennis, hitting backhands usually provokes the pain.

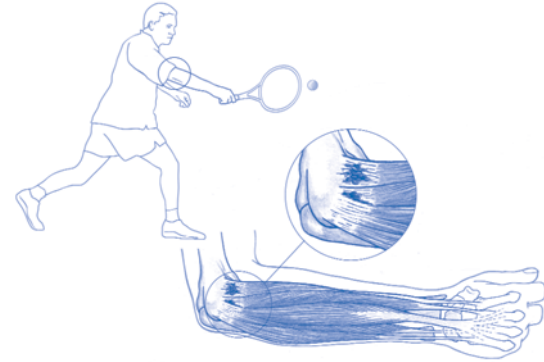


Figure 1. Tennis elbow

First Aid

Tennis elbow is a common complaint, but as yet, there is no consensus on the optimal treatment strategy. There are various therapies, all based on rest, cooling with ice and stretching techniques. In some cases, rest will mean complete withdrawal from play. In others, the complaints can be controlled by training modification and discontinuation of match play. Physiotherapy (friction massage, ultrasound, and a standardised exercise programme aimed at the mobility of the elbow and wrist, stretching exercises and strengthening of the muscles of the forearm, upper arm and hand) and manual therapy often have good effects, if necessary in combination with a brace. A corticosteroid injection may have a positive effect in the short term, but the long-term results are less positive than those of physiotherapy or rest. One negative side effect of corticosteroids is that they weaken the tendon tissue. A more conservative approach is therefore taken with this therapy today than in the past, especially with competitive tennis players. Surgery is generally advised if the complaints persist, despite long-term intense therapy for more than a year.

How to Ensure the Best Recovery

Stage 1. Improvement of Normal Function

In this phase, attention focuses on improving flexibility and strengthening the forearm muscles.

- Daily stretching of the forearm extensor muscles. Extend the arm forward from the shoulders with the palm down and the elbow straight. The fingers point to the floor. Grasp the wrist and fingers with the other hand and bend the wrist down, until tension is felt at the outside of the forearm (*figure 2*).
- Increase grip strength. This is a general exercise, which can be performed by squeezing a stress ball or low-pressure tennis ball.
- Strengthening the forearm flexor muscles. Sit on a chair and lean forward. Rest the forearm with the elbow slightly bent on the knees. Turn the hand so the palm is facing up. Holding a weight, curl the hand towards the ceiling. Return to the starting position and repeat 10-15 times. Gradually build up to three series of 10 to 20 repetitions (*figure 3*).
- Strengthening the forearm extensor muscles. Turn the palm of the hand towards the floor and rest the forearm with the elbow slightly bent on the knees. Holding a weight, curl the hand towards the ceiling and return to the starting position. Gradually build up to three series of 10 to 20 repetitions (*figure 4*).
- To maintain general fitness, running (20-30 minutes) or cycling (30-60 minutes) three times per week is recommended. Swimming is also acceptable, but should be restricted to kick-board work to limit stress on the arm/wrist.

Stage 2. Return to Play

In this phase, attention focuses on building up the specific tennis load. The increase of the load could take place as follows:

- Mini-tennis (within the service-lines), both forehands and backhands.
- Baseline tennis, hitting only forehands and (double-handed) backhands. It is preferable to start on a slow court (clay), because on fast courts there is less time available to perform the strokes well.
- Baseline tennis, hitting flat or double-handed backhands only and gradually introducing slice backhands (no topspin!).
- Volleys.
- Baseline tennis with all types of backhands.
- Smash and service.
- Practice match.
- Match play.

During Stage 2, it is important to pay close attention to timing and technique. The sense of timing ensures that renewed mastery and improvement of the techniques occurs with minimal use of strength. This is important, because it allows the player to keep the wrist straight and to hit the stroke fluently.

A few tips for the gradual build-up of the tennis-specific load, especially the backhand:

- Try to hit the ball in front of the body, so it is easier to fully use the shoulder and trunk and to stabilise the wrist.
- When the ball impacts the racket, the wrist should be straight. The forearm extensor muscles are better able to handle the shock when the wrist is straight than when it is flexed.
- Try to use the forearm for control instead of strength. The application of strength should come mainly from the shoulder and trunk muscles, which are much stronger than the forearm muscles.
- Try to use the other arm for balance when hitting a one-handed backhand. The function of the balance arm is to ensure a smooth stroke (supporting the racket in the starting position, enabling a change of grip, improving the shoulder turn etc).
- If the player cannot develop sufficient strength or co-ordination during the one-handed backhand stroke, hitting a double-handed backhand may be considered. The advantages and disadvantages of double-handed backhands should be discussed with the coach.
- In addition to the backhand, the service and overhead may also provoke pain in the elbow. Try to build up these strokes gradually too.



Figure 2. Stretching of the forearm extensor muscles



Figure 3. Strengthening the forearm flexor muscles



Figure 4. Strengthening the forearm extensor muscles

Preventing Re-injury

It is not always possible to prevent tennis elbow. However, risk can be reduced by measures such as a gradual build-up of the training programme, warm-up and stretching exercises, suitable equipment (see below) and the correct technique (hit the ball in front of the body with a straight, firm wrist).

Tips for Choosing Correct Equipment:

- The racket. To prevent tennis elbow, it is best to choose a flexible racket with a large sweet spot, such as a mid-size or oversize racket. Even though a stiff racket gives the player more power and control, a flexible racket is gentler on the arm with off-centre hits, because the flexion will absorb some of the shock and spread it over a longer period.
- Strings. Relatively low string tension is better for the arm, because it increases the dwell time of the ball on the strings. The longer contact time means that the shock of the ball impact is spread over a longer period of time. Thinner strings are more elastic and have better shock-absorbing capacities, and are therefore better for the arm than thicker strings.
- The ball. Choose new, pressurised tennis balls. Avoid, old, wet, and pressure-less tennis balls.
- The grip. A grip that is too small or too large may cause problems. In both cases, the player may have to grip the racket too tightly to prevent it from twisting, and high grip force may increase the risk of elbow injury. An easy way to determine the correct grip is by measuring the distance from the long crease in the palm (the second one down from the fingers) to the tip of the ring finger.