

Pain over the lateral aspect of the elbow that is usually aggravated by gripping, heavy lifting or simple tasks of daily living has commonly been referred to as tennis elbow (a.k.a. lateral epicondylitis). Where in reality, the number of tennis players who suffer from this condition constitutes a small percentage of total sufferers. To add further ambiguity to this affliction, evidence can be found to support or refute any hypothesis of a specific etiology or effective treatment. Thankfully, the use of manual therapy techniques is advantageous in the assessment and management of chronic tennis elbow.

### **Possible Causes of Tennis Elbow**

Lateral epicondylitis commonly occurs in people between 35-50 years old with a higher proportion being males and predominantly with the involved elbow of the dominant arm. Black people are rarely affected. Chronic sufferers usually have decreased force and endurance output in the affected extremity. It has commonly been reported that the cause of this condition results from repetitive and cumulative injury. However, there are many theories as to the etiology of the sufferer's symptoms.

Intrinsic factors contributing to tennis elbow are perhaps the most causal. They are a result of tissue that was stretched beyond its adaptive capacity causing subsequent deterioration and symptoms. Although it is commonly believed that the extensor carpi radialis brevis (ECRB) is the prime culprit, the exact location of this symptomatic tissue is controversial. Cyriax (1936) reported that the 'weakest link' in the attachment of the muscle to the bone is at the bone. This was theorized because, when compared to the rest of the muscle, the tendon has the poorest blood supply. While Nottbloom (1994), as reported by Garrett and colleagues, has indicated that the site of damage is always at the musculotendinous junction. Moreover, Kivi has suggested that the surrounding connective tissue is the prime area of injury. To further confuse this issue, it has been reported that the annular ligament, with its firm attachment to the ECRB, may actually be a cause of symptoms. Another intrinsic etiology of lateral elbow pain could be a result of radial tunnel syndrome. As the forearm is fully pronated and the wrist is flexed, the deep branch of the radial nerve (the posterior interosseus nerve) is compressed as it passes posterior to the arcade of Froshe (30% incidence) along the fibrous edge of the supinator muscle. Upon palpation, the radial head is tenderer than the lateral epicondyle. Further, isometrically resisted supination of the forearm is more painful than isometrically resisted extension of the wrist. The latter of the last two sentences signify true tennis elbow. Other possible intrinsic causes of lateral epicondylitis include bursitis, periostitis, capsulitis of the HR joint, pinching of the synovial fold, inflammation of the radial collateral ligament, degeneration of the HR joint (see above), fibrosis of the annular ligament and ectopic calcification of the lateral epicondyle.

The cervical spine is the major extrinsic source of elbow pain with cervical radiculopathy and facet dysfunction being the two primary etiologies. When a nerve is elongated beyond its adaptive potential, nerve root ischemia can result. This elongation is primarily caused by poor posture. Spontaneous firing of selected large myelinated fibers with resultant hyperesthesia in the segmentally related dermatome and hypertonicity in the segmentally related muscle ensues. If the nerve root ischemia progresses to cause damage to the nerve's capillary endothelium, segmental demyelination of selective nerve endings and decreased nerve conduction velocities will follow. Finally, if progression ends with denervation of the nerve, minor trauma can cause micro and macro tears in the weakened collagen of the fascia surrounding the muscles and bones of the forearm.

A final extrinsic factor contributing to tennis elbow pain could be a result of psychogenic factors secondary to anxiety or depression.

### **Manual Therapy Management of Chronic Tennis Elbow**

If the assessment accurately diagnosed tennis elbow, all passive movements were pain-free. As such, passive movements have no place in treatment. Conservative treatment routinely includes rest, Physiotherapy (particularly friction massage, active-release techniques, cold application, TENS, interferential and ultrasonic therapy), analgesic and anti-inflammatory medication, bracing, and injections of a steroid and local anesthetic mixture. However, a small percentage of cases (approximately 10%) do not resolve with these interventions.

Many advocate the use of Mill's manipulation to treat chronic sufferers. Wadsworth advises that the patient be supine and fully relaxed under general anesthesia. A mixture of steroid and local anesthetic is injected into the proximal tendon of the ECRB at the lateral epicondyle. The patient's hand is then grasped with one hand while the other is used to steady the arm above the elbow. The elbow is brought into full flexion and pronation, and the wrist is fully flexed. The elbow is then forcefully extended, typically causing an audible 'pop' at full extension. Wadsworth (1987) believes this sound stems from a breakdown of adhesions that have formed at the common extensor origin. If this procedure is unsuccessful, it can be repeated. In addition to manipulation, he also advises that steroid and local anesthetic injections continue to be used on the chronic tennis elbow. It should be noted that in the extremely unresponsive patient surgery is considered as a last resort. However, since Wadsworth's regime has a high success rate it results in considerable savings of hospital expenditure and loss of work and leisure activities when compared with surgical procedures.