

## Is it Tennis Elbow or Radial Tunnel?

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A patient enters your office with lateral elbow pain. He has a job requiring repetitive movements of his right arm. He reports having had the same pain three months ago and was treated with cortisone. He felt relief for a few weeks, but the pain returned, a dull pain at the lateral elbow on wrist extension, pronation and supination.

Palpation reveals tenderness near the lateral epicondyle; resisted testing of the wrist extensors and passive flexion of the wrist reduplicate the pain. You may have treated him with spinal adjustments, friction massage, active release, ultrasound etc., but the pain persisted. Sometimes he stated that he was improving, but he seemed to reach a plateau. The reason for lack of progress might be due to what is called radial tunnel syndrome (RTS).

At the level of the radiocapitellar joint, the radial nerve divides into the posterior interosseous and superficial radial nerves. The posterior interosseous nerve (PIN) goes through the radial tunnel, which is about two inches long, extending proximally from the capitulum of the humerus (which is its posterior wall), between the brachioradialis and brachialis through the supinator muscle to its distal end.

There are five known places in the radial tunnel where the PIN could become compressed. Depending on the amount of compression, the PIN (which is a motor nerve) can be affected such as to result in partial or complete paralysis of the wrist, finger and thumb extensors. This is rather rare and more often due to overuse, especially excessive pronation and supination or vigorous contraction of the forearm extensor muscles. Compression in this tunnel results in symptoms similar to lateral epicondylitis.

Spinner and Spinner<sup>1</sup> believe that in 10% of patients with lateral epicondylitis, there is a coexistent radial tunnel syndrome due to radiocapitellar bursitis. They feel that with recurrent inflammation, the arcade of Frohse contracts and encroaches on the posterior interosseous nerve. The arcade of Frohse is a fibrous arch at the proximal edge of the supinator, which is one of the locations in the radial tunnel where compression occurs. Since the arcade of Frohse is not seen in a full-term fetus, it probably is developmental and dependent on use.<sup>2</sup>

The following signs and functional tests should make you think that a radial tunnel syndrome is causing the lateral elbow pain.

The patients' location of pain is more localized in the mobile wad of forearm extensors distal to the lateral epicondyle, about four finger breadths. Localized pain may also be at the distal end of the supinator near the proximal third of the forearm. There may be pain on the lateral epicondyle, but pain will usually be more acute distally. Since the supinator is involved with the radial tunnel, there should be pain elicited with resistive supination with the arm and forearm in extension. There will be even

more pain if the supination test is done with the wrist flexed.

Another test known as the middle finger sign is performed. With the forearm and fingers extended, the middle finger is resisted in extension. This test is positive because there is compression of the PIN by the fascial portion of the extensor carpi radialis brevis (ECRB). The only problem with this test is that the ECRB is the main muscle involved in lateral epicondylitis. Lister<sup>3</sup> states that if this test is more painful than passively flexing the fingers and wrist of an extended elbow, then the radial tunnel is involved.

Night pain is more common in RTS than lateral epicondylitis. The pain in RTS is usually a dull ache compared to the sharp, knife-like pain of lateral epicondylitis. Motor weakness and neurological signs are not commonly found in either of the above. If there is weakness of the wrist, finger and hand extensors, then the PIN is suffering with greater compression and the condition is more serious. The condition is then called posterior interosseous syndrome.

Treatment for RTS might require a period of elbow splinting with the forearm in the neutral rotation. Active release and friction massage should be used. It is recommended to wait three to six months before considering surgery.<sup>2</sup>

### *References*

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