

CARPAL TUNNEL DECOMPRESSION

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The Carpal tunnel in the wrist may be the site of compression of the median nerve causing numbness and even muscular weakness in the hand.

WHAT AND WHERE IS THE CARPAL TUNNEL?

Beneath the base of the palm is a tunnel through which all the tendons that bend the fingers pass from the forearm into the hand, together with one major nerve, called the median nerve.

WHAT DOES THE MEDIAN NERVE DO?

The median nerve is a mixed nerve, meaning that it carries fibres conveying sensation and motor fibres which supply muscle, causing movement. The areas served for sensation are the thumb, index, middle and ring fingers on the palmar side; the main muscles supplied are those at the base of the thumb that rotate or "oppose" the thumb in front of the rest of the hand.

WHAT IS CARPAL TUNNEL SYNDROME?

The carpal tunnel has a fixed cross-sectional area, and normally the structures within it fit snugly. Any increase in size of the contents, or reduction in size of the tunnel, leads to a rise in pressure, and the nerve is the structure most sensitive to this change. Mild compression of the nerve causes reduction in sensation in the thumb, index, middle and ring fingers, which is usually intermittent, and recovery of feeling is experienced as pins and needles. Pain is often also a feature, and is felt in the same part of the hand, often radiating up the forearm or even to the shoulder or neck. These symptoms are frequently experienced at night, and waking in the small hours with painful pins and needles is a common presenting symptom. If the compression becomes more severe, numbness may persist, weakness and wasting of the muscles in the pad of the thumb become noticeable, with reduced ability to oppose the thumb to the fingertips. Loss of pinch together with sensation cause severe functional limitation.

WHAT CAUSES CARPAL TUNNEL SYNDROME?

The most common cause of the condition is a rise in the amount of fluid retained in the body related to hormonal changes. This occurs in early middle-aged women, but it can occur at any age in either sex, though it is rare in children. Fluid retention during pregnancy may precipitate temporary carpal tunnel compression. It can also occur in disorders of fluid balance like thyroid deficiency (myxoedema). It develops in conditions associated with thickening of synovial membranes around tendons, such as rheumatoid arthritis, and sometimes a ganglion or benign growth of fat takes up space in the carpal tunnel, raising the pressure. Anything that distorts the shape of the carpal tunnel can precipitate median nerve compression, such as a fracture of the wrist.

DO OTHER PROBLEMS RESEMBLE CARPAL TUNNEL SYNDROME?

In many cases symptoms resembling carpal tunnel syndrome form part of so-called work-related upper limb disorders, otherwise known as overuse syndrome, or RSI, but great care is needed to establish the true cause of symptoms accurately. Inappropriate surgical decompression can only make matters worse, and may account for poorer results of the operation when a higher proportion of patients with work related disorders have been included.

HOW IS A DIAGNOSIS OF CARPAL TUNNEL SYNDROME REACHED?

The diagnosis can often be made on the basis of the patient's symptoms and signs. However, similar symptoms can result from nerve compression higher up the limb, including the neck, and when there is doubt, nerve conduction studies will be carried out. These measure the speed of impulse conduction in the nerve, and the

response of the muscles supplied to stimulation.

WHAT TREATMENTS ARE AVAILABLE FOR CARPAL TUNNEL SYNDROME?

If the condition is mild, symptomatic treatment may be helpful, including the use of a wrist splint at night. Steroid injection can be helpful, especially if there is a self-limiting cause such as pregnancy, but must be expertly done to avoid nerve damage, and in many cases is eventually followed by recurrence. More severe compression, especially when there is permanent loss of feeling or wasting and weakness of muscles, should be treated by an operation to decompress the nerve.

HOW IS THE OPERATION PERFORMED?

This is done through a one and a half inch incision on the heel of the hand, usually under local anaesthetic, which is briefly painful as is any injection. The ligament over the nerve is divided, making more room for the contents of the tunnel. A keyhole method is possible, and safely carried out by experienced surgeons, but introduces an element of risk of nerve damage, which should be entirely avoidable by open operation. The benefit of endoscopic release is a slightly shorter recovery period, but the quality of recovery is the same.

HOW QUICKLY CAN I RESUME NORMAL ACTIVITIES?

Following carpal tunnel release, the hand and wrist are bandaged for a week or two but some function can be quite quickly resumed, avoiding heavy tasks which may induce pain.

WHAT RECOVERY CAN I EXPECT?

Relief from night waking is usually experienced once the initial operating discomfort has settled. Full recovery takes one or two months since the scar is often tender at first and strength gradually returns. Function should eventually be normal provided complete release has been carried out. Rarely patients have ongoing symptoms, either due to the diagnosis being wrong, or to an adverse reaction to the surgery such as algodystrophy, where there is sweating, stiffness and sensitivity to cold. Recurrent carpal tunnel syndrome is also rare, but does occur.