



Peripheral Nerve Entrapment

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Evidence suggests that the causes of peripheral nerve entrapment are ischemia and compression. Direct mechanical compression of the nerve has been shown to cause loss of function and damage to the nerve both macro and microscopically. Severe compression may crush nerve fibers and lead to a dying back of the axons leading to a loss of function in the area served by the nerve that may take months to resolve. Left unchecked, permanent nerve injury may occur.

Lack of sufficient blood flow to the compressed nerve also plays a role in entrapment syndromes. This occurs in stages. In Stage 1, nerve compression leads to increased pressure within the nerve, slowing capillary circulation. The nerve fibers become hyperexcitable resulting in pain and paresthesias. The pain and paresthesias are aggravated by venous stasis. Relief is obtained by shaking the hand or arm thereby promoting venous return. In Stage 2, the blood vessels are damaged to the point of their becoming leaky. This results in a swollen, edematous nerve that can be seen grossly at surgery. In Stage 3, the swelling stimulates an influx of fibroblasts which leads to eventual scarring and destruction of the nerve fibers.

I. Carpal Tunnel Syndrome

Entrapment of the median nerve at the wrist causes carpal tunnel syndrome (CTS). The tunnel through which the median nerve passes is formed by the 8 carpal bones at the floor and sides of the tunnel and the transverse carpal ligament as its roof. The tunnel becomes narrowed and is frequently, although not always, associated with repetitive motion of the wrist. Systemic causes of CTS include

amyloidosis, multiple myeloma, rheumatoid arthritis, acromegaly, and hypothyroidism. These result in thickening of connective tissue including the transverse carpal ligament that will then lead to median nerve compression.

Classic signs of CTS include pain and numbness in the first three digits of the hand and half of the ring finger. It may be worse at night. Tinel's sign (tapping over the wrist produces pain or electric shock-like symptoms) and Phalen's test (holding the wrist in a flexed position reproduces CTS symptoms) are present in advanced cases of CTS. EMG and nerve conduction studies may be diagnostic but can be normal in 25% of cases.

Treatment

Splinting the wrist in a neutral position may be helpful. In our experience, if no improvement occurs after about 2 weeks, further splinting is not likely to be effective. Local injections of Xylocaine or steroid usually offer only temporary relief. The use of NSAIDs can be helpful in mild to moderate cases of CTS.

Surgical treatment is indicated in patients with motor weakness of the hand, or persistent hand or arm pain and numbness, despite conservative therapy. Surgery is performed on an out-patient basis and takes about 15-30 minutes to perform. A local anesthetic with a little IV sedation seems to work best. This allows the surgery to proceed efficiently and pain free without the need for a general anesthetic. The procedure can be an open carpal tunnel release in which there is 1 small incision over the wrist and lower palm or endoscopic where 2 small incisions are made. In each, the transverse carpal ligament is

opened in order to relieve the pressure on the median nerve. A simple dressing over the incision which allows use of the fingers is applied. Frequently, both hands are symptomatic and require surgery. It is easier on the patient if only one hand is operated on at a time. It is not uncommon for a patient to notice more symptoms in the un-operated hand once one carpal tunnel has been released in the other. Surgical success rates are on the order of greater than 90%, and most patients return to regular activities without restrictions.

II. Ulnar nerve compression

Ulnar nerve compression occurs most frequently at the elbow and sometimes at the wrist. It causes pain and/or numbness in the little finger and medial half of the ring finger. There may be weakness in the intrinsic muscles of the hand and the patient may complain of dropping objects easily. Tinel's sign at the elbow may be present. EMG and NCV studies aid the diagnosis but may be normal as in CTS. Nonsurgical treatment is limited. Where trauma is the cause, elimination of the repetitive trauma represents the best nonsurgical treatment. Like carpal tunnel release, surgery is performed on an outpatient basis under local anesthetic. Transposition of the nerve is a common surgical treatment. The ulnar nerve is moved from its point of compression at the elbow to a more superficial spot under the skin. Patients tend to present much later than those with CTS, which may slow their recovery. Nonetheless, dramatic improvement of symptoms may be noted after surgery.

Procedures Performed by James W. Melisi, MD, FACS, PLIC

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Peripheral Neuropathy:

- Surgery for Carpal Tunnel Syndrome and ulnar neuropathy

Hospital Affiliations

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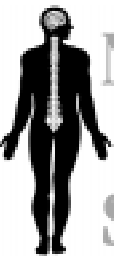
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Dr. Melisi accepts most insurance plans. To find out if he accepts yours, please call his billing office at (703) 476-0567.

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Neurological & Spinal Surgery

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James W. Melisi, MD, FACS, PLIC takes pleasure in

ANNOUNCING

the expansion of
Neurological & Spinal Surgery

In order to better serve our patients and referring physicians, we're moving both of our offices to newer and larger facilities. Effective November 5, 2001, our new main office will be located at:

The Yorktown 50 Building
8316 Arlington Boulevard, Suite 640
Fairfax, VA 22031-5216
Telephone: (703) 208-0820
Facsimile: (703) 208-0841

In addition, we are moving our Reston office to the Reston Hospital campus. Effective November 7, 2001, our Reston office will be located at:

1800 Town Center Drive, Suite 418
Reston, VA 20190-3240
Telephone: (703) 224-0006
Facsimile: (703) 478-6346

We believe the locations of our new offices* we enable us to better meet the needs of our referring physicians, and to continue to deliver quality neurosurgical and spinal surgery services to all of our patients.

For office and clinic hours, surgical scheduling, and after hour emergency medical needs, please call us and we will fax that information to you.

Also, we will be having an "Open House" party in the near future. Please check the mail for your invitation, which will be sent out in the next few weeks. We look forward to seeing you then!

*Please note that effective November 2, 2001, our Arlington office will close permanently. All patients who have appointments scheduled at the Arlington office after that date will be seen at our new main office in Fairfax.