

Ulnar neuropathy

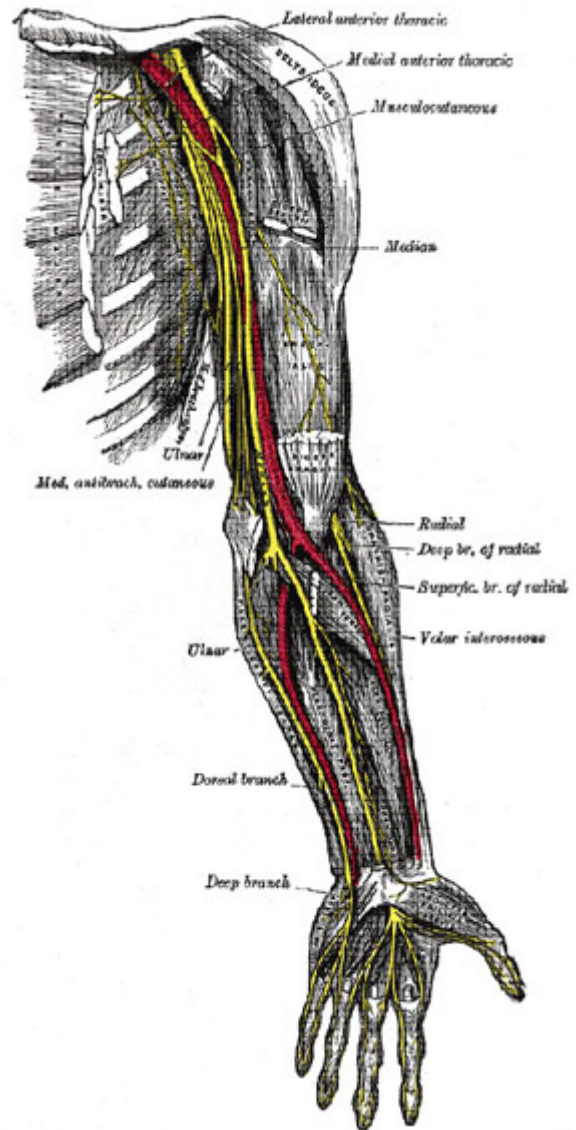
Introduction

The nerves of our body are its 'electrical wires.' As such, they are insulated with a thin fatty material called myelin. Among the many functions of nerves, there are two that are obvious: (1) they carry electrical impulses from the brain and spinal cord to make muscles contract, and (2) they carry impulses back from the skin to the brain, so we can feel. The longest nerves in the body are those that carry electrical impulses up and down from the toes to the spinal cord; on average these are more than 40 inches (100 cm) long. Those that reach the fingers are only slightly shorter. The three major nerves of the arm are the median, the ulnar, and the radial.

The second concept to understand is that the nerves, when running from the spinal cord to the ends of the toes (or fingers), follow a very complex path, between and/or under muscle fibers and tendons (which are like gristle), and often inside a fibrous tunnel. These tunnels are usually situated at the joints of the body, so that the stretching of the nerve across the joint as it bends or straightens is protected by the tunnel. The diagram below is from a very old anatomy text, yet it is a great illustration of the complex path that the nerves must follow as they course down the limbs.

Mechanisms

However, there are also places where a nerve may be very superficial (just under the skin) and the two best examples are (1) on the outside of the leg, just below the knee, where the common peroneal nerve runs from behind the knee around the head of the fibula bone, and (2) the ulnar nerve at the elbow, which can also be easily felt, especially in a thin person. It is this nerve that causes the shooting pain and tingling in the little finger when a person bumps their "funny bone." If you bend the elbow to 90 degrees and press in with your finger tips, in the groove on the inner side of the elbow, you may be able to feel the ulnar nerve like a piece of spaghetti running around the elbow joint.



It is at this site that the ulnar nerve is most likely to be bruised or stretched, usually slowly over time with repetitive strain, which results in the symptoms and signs termed "ulnar neuropathy." Sometimes the fibrous bands around the elbow joint also may thicken and squeeze the ulnar nerve-the consequence is the same as the stretching injuries.

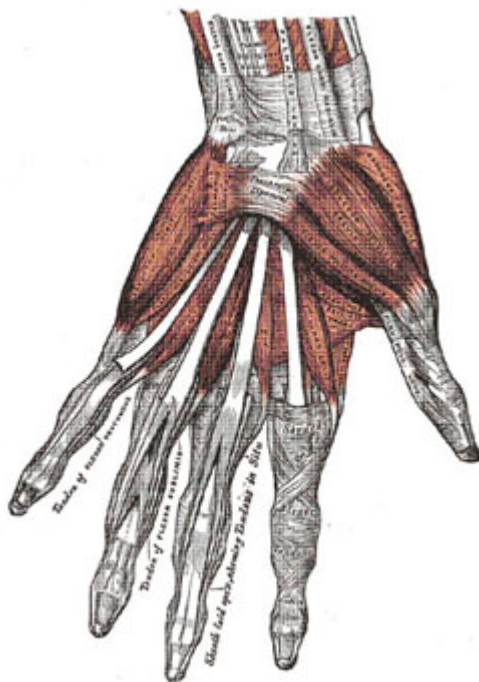
There are factors that may predispose or exacerbate the stretching and bruising of the ulnar nerve at the elbow, such as a previous elbow fracture or continuously resting the bent elbow on a desk. Diabetes may also make the nerve less resistant to damage and trauma, and inhibit healing and recovery.

Symptoms

The first symptom of ulnar neuropathy is usually an insidious tingling and loss of feeling in the little finger and the inner side of the hand as far as the wrist. This strange tingling slowly spreads, often over weeks or months, and involves the side of the ring finger next to the little finger, but strangely not the side next to the middle finger. This is because

the feeling on the skin of the ring finger is supplied by two nerves: the ulnar on the inner side and the median nerve on the outer side. Indeed, the fact that the tingling, numb feeling "splits" the ring finger is almost solely diagnostic of an ulnar nerve irritation at the elbow. The area involved is colored blue in this diagram.

Much later, perhaps over months, the muscles supplied by the ulnar nerve begin to waste and become weak. The first, somewhat irritating weakness is of the little finger, which seems to develop a mind of its own and tends to spread apart, away from the ring finger. This often results in the little finger getting caught outside when one attempts to put the hand in a pocket. About this time one may detect wasting of specific muscles. This is best appreciated on the back of the hand, where the plump muscle between the thumb and index finger sinks in. In addition, "gutters" appear between the tendons on the back of the hand. Finally, if the problem is allowed to go untreated, the fingers develop a "claw-like" deformity, with the little, ring, and to a lesser extent, the other fingers becoming increasingly bent over (flexed) toward the palm.



Diagnosis

The diagnosis is usually straightforward, especially if the numbness and tingling "splits" the ring finger as explained above. Rarely the problem may arise in the neck from osteoarthritis, causing irritation of a nerve root as it leaves the cervical spinal cord. The most important part of the diagnosis is to accurately localize the location at which the ulnar nerve is being stretched or squeezed. In most people this is in the elbow region. Your doctor will use MRI and/or ultrasound scans of the elbow region as well as electrical studies of the ulnar nerve (nerve conduction studies and electromyography). Using these techniques an experienced neurologist may be able to pinpoint the site of the trouble. A surgeon may need to

operate to release the nerve.

Management

Many doctors will recommend surgery, but the outcome of "surgical release" is not as predictable or successful as the surgical outcome for another more common entrapment neuropathy-carpal tunnel syndrome.

Timing of surgery is somewhat of a dilemma in ulnar entrapment neuropathy. On one hand, a mild case of stretching may improve with conservative measures that reduce the strain; supportive Velcro-padded splints serve to reduce the bending of the elbow and provide a degree of protection against pressure knocks. However, the longer one leaves the problem without operating, the more severe it may become and hence the less chance there is of a successful surgical release.

Many patients have a concept of "tennis elbow" - characterized by pain and discomfort around the elbow, not always with symptoms and signs of ulnar nerve involvement. Injecting steroids in and around the elbow joint may provide a degree of symptomatic relief of pain, but it has not been shown to reverse any bruising or stretching of the ulnar nerve in the long term.

The final decision about surgical intervention for an ulnar nerve problem at the elbow will usually be made after your surgeon has considered (1) the likely cause (including where exactly the pressure or stretch is localized), (2) the duration, and (3) the severity. The final decision, of course, will be a mutual one between you and your doctor after considering all of these factors.

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