

# CUBITAL TUNNEL SYNDROME

The ulnar nerve, along with the radial and median nerves, is one of the three major nerves of the arm. It supplies sensation to most of the hand muscles, as well as to much of the forearm. If there is pressure on the ulnar nerve as it passes through the cubital tunnel, a bony passageway along the inside of the elbow, there will be sensory and motor changes in the hand.

Entrapment of the ulnar nerve is also known as cubital tunnel syndrome. If you “hit your funny bone” and have a tingling sensation in the small and ring fingers, you have hit the ulnar nerve as it is pulled into the bony groove of the cubital tunnel. With cubital tunnel syndrome there is pressure on the ulnar nerve each time the elbow is bent, reducing the supply of blood to the nerve. This causes damage to the nerve over time.

There are three long bones in the arm: the humerus, or upper arm, and the ulna and radius, the two bones of the lower arm. The bone on the little finger side of the forearm is the ulna, and the bone on the thumb side of the forearm is the radius. The elbow joint is a hinge joint formed by the end of the humerus and the end of the ulna, the larger bone. The ulna is smaller at the wrist, and widens quite a bit towards the elbow. Multiple ligaments attach these bones together at the elbow, allowing the joint to bend like a hinge.

The end of the radius forms a separate joint with the humerus, at a point on the humerus called the capitulum. It is a different kind of joint, however, allowing the rotating motion that lets you twist your hand, like you're turning a doorknob.

The end of the humerus has several bony prominences which are important parts of the cubital tunnel. On the inside edge of the elbow is a point called the medial epicondyle. You can feel this “bump” if you bend your elbow. Between this point and the tip of the elbow, called the olecranon, lies a narrow passageway. This is the cubital tunnel. The ulnar nerve travels from the upper arm, through this passageway, behind the elbow, to the lower arm, ending in the ring and little fingers. This has been called the “funny bone”. A thin layer of tissue covers the tunnel, protecting it somewhat from damage.

This tunnel can become compressed, however, because of an injury or irritation and swelling, causing pressure on the ulnar nerve. This compression and the resulting symptoms are known as cubital tunnel syndrome.

## **Causes of Cubital Tunnel Syndrome**

If you have changes in sensation to the muscles in the hand (except for the muscle used to control the thumb), this may be the result of sensory and/or motor (muscle) nerve compression. Sometimes it is difficult to pinpoint the exact cause of the problem. Specific causes may include:

- An injury in the region of the elbow, such as a fracture, dislocation, direct blow, or severe twisting of the elbow.
- Sudden forceful flexion and extension of the elbow as may occur while holding the steering wheel during a rear end vehicular collision.
- Pressure on the nerve while performing jobs requiring significant elbow flexion throughout the day, such as typing, computer data entry, or assembly line work.

Nerve compression is more common in people with arthritis, alcoholism, diabetes, and/or thyroid problems.

## **Symptoms of Cubital Tunnel Syndrome**

You will feel numbness and tingling in the ring and little fingers and along the back and side of the hand. These sensations are more acute when your elbow is bent, as in the following situations:

- Holding a telephone.

- Resting the head on the hand.
- Crossing your arms over the chest.
- Curling your arm under your body at night.
- Holding your hand on top of a steering wheel.
- Using the computer for long periods of time.

You may also experience a general weakening of the motor function of the hand, causing you to drop things or have difficulty opening jars. You may have a hard time coordinating your fingers while typing or playing the guitar, piano, or violin. The problem usually worsens with activities or occupations that are practiced over an extended period of time.

Some patients with ulnar nerve entrapment have pain along the inside border of the shoulder blade on the same side as the nerve irritation, though this is not a common symptom.

### **Treatment of Cubital Tunnel Syndrome**

Your doctor will examine your arm and ask about your medical history, including any injuries to the arm and elbow. He or she will look for indications of the wasting of muscle tissue in the hand, such as a hollowed out appearance of the web space between the thumb and the index finger and between the metacarpal bones. Dry, pale skin over the little finger and half of the ring finger is also suggestive of chronic nerve irritation.

Nonoperative treatment of this condition involves making changes in your routine to allow the elbow to straighten and rest as much as possible. Regular daily activities need to be adjusted. Use pillows to change your sleeping position or use an elbow splint to prevent your elbow from bending at night. Try using a headset or cradle attachment while talking on the phone. Arrange your chair and desk so that when writing or working at a computer keyboard, the elbow is flexed no more than 30 degrees and the wrist is in a neutral position. Pay attention to your daily activities and discuss with your doctor the practicality of using a splint to keep the elbow straight or at 30 degrees flexion. A towel wrapped around the elbow or sports elbow protector (such as those worn in hockey) can be used during the day to limit flexion and protect the elbow from getting bumped. It is important to carefully manage contributing medical conditions such as diabetes and arthritis. Your doctor may recommend surgery if your symptoms are continuous and disruptive. One common operation for this condition is called an anterior submuscular transposition of the ulnar nerve. This involves making a surgical incision behind the elbow. The ulnar nerve is identified in the cubital tunnel and the bands causing pressure on it are released. The flexor-pronator muscles, those that start from the elbow and cross down the forearm, are lifted from the bone. The ulnar nerve is removed from the cubital tunnel and placed below this muscle layer, providing it with an increased blood supply and protecting it from further injury. The surgeon uses an operating microscope (magnifying glasses) to show detail and limit the chances of injury to surrounding tissue. Patients who have constant numbness, severe weakness, or muscle wasting may have scar tissue inside the nerve. In these cases, micro-surgical release of scar tissue in the nerve is performed, again with the aid of magnifying glasses or an operating microscope. The outer wrapping of the nerve is opened and the scar tissue within the nerve is freed.

Recovery from surgery typically occurs in two phases. First there is the immediate release of pressure on the nerve, with a marked improvement in blood flow. By the time sutures are removed, you will often notice some positive change in the sensation of numbness and tingling of the fingers. Nerves that have been scarred or degenerated take longer to heal.

Nerve fibers regenerate from the elbow, the site of the injury, through the forearm and hand to the fingertips. This is a long process and cannot be hastened. Gripping strength in the muscles of the forearm takes about 4 to 5 months to show improvement. Neural regeneration in the hand and fingers tends to take 1 to 1 ½ years. The process is slower in older individuals and in those who have experienced severe neuromuscular damage.

Your doctor will make recommendations for post-operative rehabilitation, including medication, massage, and therapeutic exercise. There may be some sensory loss due to the injury of small nerves, but these areas frequently diminish in size over time. Nerve regrowth may be associated with the same sensation of pain that is experienced when your leg and foot "come back to life" after falling asleep. Post-surgical pain lasting longer than six weeks requires further evaluation.

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