

# CUBITAL TUNNEL SYNDROME

## **The Problem**

Numbness and tingling to your hand can occur from a number of problems. A common cause of tingling and numbness to the ring and small finger is cubital tunnel syndrome. Cubital tunnel syndrome refers to compression of the ulnar nerve at the level of the elbow in the region of the cubital tunnel. Compression of the ulnar nerve will cause tingling and numbness in the sensory distribution of the ulnar nerve (small and ring finger) and motor disturbance in the small muscles in your hand supplied by the ulnar nerve and weakness of hand grip and pinch strength.

## **Anatomy**

The ulnar nerve runs behind the elbow in a bony groove of the humerus with a ligament over the top, forming the cubital tunnel. Just past the elbow, the nerve then goes through the flexor carpi ulnaris muscle into the forearm and continues into the hand giving both sensation and muscle function to the hand. Increased pressure on the ulnar nerve is produced by bent elbow positions and the nerve is further compressed when you lean on the elbow. Increased compression on the ulnar nerve will cause alteration in the sensory and motor function of the nerve. The sensory nerve fibers from the ulnar nerve go to the small and ring finger. The most important muscle function supplied by the ulnar nerve is to provide the power for pinch between your thumb and index finger and also muscle function to the other small muscles of your hand give you hand dexterity.

## **Nerve Compression**

Compression on a nerve can alter both sensation and muscle function. You have probably felt the effects of nerve compression before; when your foot falls “asleep” or when you hit your “funny bone”. The changes in the nerve produced by pressure will progress with increased force of compression and/or length of time of compression. Positions that place increased tension or pressure on the nerve will increase the compressive forces on the nerve (for example bending your elbow and leaning on it when you are on the phone). However, this progression of

changes to the nerve will occur slowly, likely months and possibly years. You may notice that your symptoms get worse over time; that you have more numbness, more often or that your pinch or grip is getting weaker.

The changes that occur in the nerve will be reflected in the symptoms that you feel in your hand. Therefore in the early stages of nerve compression when there is little change in the nerve function, your symptoms will be relatively mild and occur only occasionally. It will take more pressure on the nerve for a longer period of time before you feel any symptoms. At the beginning you may only feel tingling and/or numbness at night after you have been sleeping with your elbows bent for a long time. As the nerve compression progresses the tingling and/or numbness to your small and ring finger will occur more often with less time in irritating positions. You may also feel pain at the inside of your elbow and aching of the muscle along the inside of the forearm. When the nerve compression is severe, the numbness will be fairly constant and you may have weakness or loss of muscle bulk (atrophy) of the muscles innervated by that nerve.

The ulnar nerve at your elbow is exposed to increased pressure when the elbow is bent. The least amount of tension is placed on the ulnar nerve when the elbow is straight. Some conditions like diabetes, hypothyroidism, rheumatoid arthritis, alcoholism, anorexia and obesity can increase your risk of developing problems with nerve compression like cubital tunnel syndrome. Some people have a hereditary tendency to develop nerve compression problems.

## **Treatment – Nonoperative**

The first strategy of treatment is to understand the activities and positions that irritate your symptoms and then try to avoid these positions. By changing how you do things, you will take pressure off the ulnar nerve. Positions that place the elbow in bent postures (flexion) will increase pressure on the ulnar nerve and elbow straight positions (extension) will decrease the pressure. Most people sleep with their arms and hands in curled flexed positions and therefore usually the first step of nonoperative treatment is

to protect the ulnar nerve at night. Supposedly, wearing a splint at night that holds your elbow straight can decrease pressure on your ulnar nerve at night. We have found that the majority of patients are uncomfortable wearing the splint at night and therefore do not recommend wearing a splint to hold your elbow straight. We recommend wearing an elbow pad at night that cushions the ulnar nerve from direct pressure and most patients find this pad comfortable. You can also make an elbow pad by placing a shoulder pad in an athletic sock. When you awaken at night with tingling and/or numbness in your hand, you should straighten your elbow. Eventually you will retrain to sleep with your arms in a more extended position even when you do not have tingling or numbness in your hand. During the day, it is important to identify activities that you do that are irritating your ulnar nerve. Initially wearing the elbow pad during the day will serve as a reminder to get out of elbow bent positions and/or leaning on the elbow (like leaning on the elbow and bending the elbow when talking on the telephone, when driving and leaning on the arm rest). If you spend a lot of time on the telephone, we recommend a head set to decrease the amount of time spent in elbow flexion. Stretching exercises at the elbow/forearm/wrist may be helpful in patients with tightness of the flexor carpi ulnaris muscle.

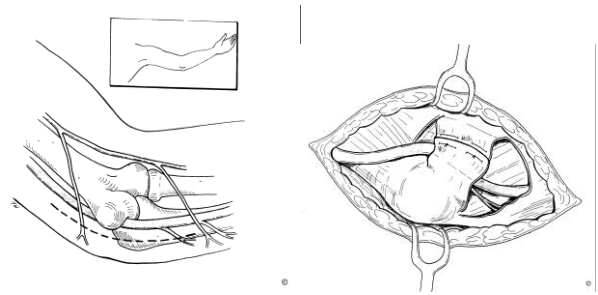
If nonoperative treatment is going to be successful in relieving symptoms, you will notice a decrease in your symptoms within 4 to 8 weeks. However, it may take many months to completely relieve your symptoms. If you do not notice any relief or if you have muscle wasting, then it is unlikely that nonoperative treatment is going to be successful and surgical management will be recommended.

### **Treatment – Operative**

There are many surgeries that have been describe for the treatment of cubital tunnel syndrome to take pressure off the ulnar nerve. If surgery is not performed the pressure on the ulnar nerve will continue, causing more numbness to your ring and small finger. Eventually, the small muscles of your hand will become weak, particularly in your pinch strength. These more severe changes will take many months and probably years to develop. Therefore there is no

urgency to have surgery for cubital tunnel syndrome unless you have severe ulnar neuropathy especially with muscle wasting.

The anterior transmuscular transposition of the ulnar nerve is the operation that we recommend. This operation to decompress the ulnar nerve involves releasing all tight soft tissue bands that are pressing on the nerve, moving the nerve to a position in front of the elbow within the flexor pronator mass and performing a flexor pronator muscle tendon lengthening procedure. This operation is usually done as an outpatient (or one night in hospital) with an anesthetic to your arm. There will be an incision behind your elbow. For your comfort, a long acting anesthetic is placed at the incision site that may cause increased numbness for up to a day after surgery. A drain is placed in the incision to help to remove any blood from collecting at the operative site. After the incision is closed, a bulky dressing is placed on your arm to keep your elbow bent and wrist in a neutral position for 2-3 days.



As with any surgery there are risks and complications that can occur with cubital tunnel surgery. There will be a scar behind your elbow that may extend into your upper arm or your forearm. Occasionally some patients will develop scar sensitivity or stiffness to the hand/arm. If this occurs, you will be referred to therapy for instruction in desensitization exercises and other exercises to try to decrease the pain, sensitivity and swelling. Even though you will have a drain placed at the incision, you may have excessive bleeding that may result in a hematoma (collection of blood underneath the skin). In most cases, this will reabsorb without any treatment, but sometimes it may be necessary to aspirate or to evacuate the hematoma. There is a risk of infection. There is also the risk of injury to the ulnar nerve or one of the surrounding nerves.

## **Postoperative Management**

Your hand, wrist and elbow will be placed in a bulky dressing that goes from your hand to above your elbow, leaving your thumb and fingers free to move. Bending and straightening your fingers will help to keep the soft tissues gliding smoothly, to decrease the swelling and to keep your joints from becoming stiff. At your first postoperative visit, 2 to 3 days following surgery, the bulky dressing will be removed and you will be instructed in range of motion exercises for your hand, wrist, elbow and shoulder. You may now shower and wash with soap and water (however, do not soak your arm in water until the incision is healed). A light dressing will be placed over the steri-strips and you will be given a sling to wear at night. During the day, we encourage you to regain your active range of motion and to use your hand for light activities, avoiding activities that require strength of your operated hand. The stitches will be cut about 2 weeks after surgery. After the incision is healed, gentle massage of the region with cream will help to soften this area. Until you have regained full range of motion of your elbow, you will be more comfortable and get

a better night's sleep, if you continue to wear the sling at night (about 2-4 weeks).

In the majority of cases, you can do the range of motion and strengthening exercises on your own. You should have full range of movement by 3 weeks after surgery. Patients, who are returning to work that requires a lot of strength or who are progressing slowly with their movement, may be sent for therapy. This will help to regain your range of motion and strength more quickly. It is anticipated that the majority of patients will regain full function of their hand within a couple of months, although the incision may remain tender for many months while the scar tissue at the incision matures.

Return of sensation to the hand will vary in the time it takes to come back. Some or all of the tingling will likely be relieved fairly soon after the surgery. If however, you have had symptoms for a very long time and had severe numbness to your fingers and weakness to your muscles, these improvements will take a much longer period of time, at least 1 year. The nerve will regenerate at the rate of 1 inch per month. As the feeling comes back, you may notice more pins and needles, burning or crawling feelings to your hand and this is normal sensory nerve regeneration.

Written by:

Susan E. Mackinnon, MD & Christine B. Novak, PT, MS  
Washington University School of Medicine, St. Louis, Missouri  
March, 2001