

Carpal tunnel syndrome and posture

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Nowadays, Carpal tunnel syndrome (CTS) is **one of the Western industrialized world's most common neuropathies**, being **related to specific postures** of the body and wrist in **working or doing physical exercise**.

Research has demonstrated a connection between the incidence of carpal tunnel syndrome and some **repetitive activities**, with or without effort. In fact, if repeated or **prolonged, flexing and extension movements of the wrist** (and of the fingers too) can increase the pressure on the carpal tunnel, causing the median nerve to be compressed.

Women are three times more likely than men to suffer from this syndrome. To carry out certain actions may lead to carpal tunnel syndrome. For example, 60 in 100 people carrying out specific jobs are affected. Working with vibrating tools (**pneumatic drills, screwdrivers, drills, bricklayer's tools**) can also make carpal tunnel syndrome more likely. However, also people whose work includes **precise and repetitive wrist actions are affected, such as people who work with a computer mouse**. Men and women **between the ages of 40 and 60** are equally affected. Occasionally, there are patients under the age of 20 or pregnant women.

70% of the patients are affected by bilateral carpal tunnel syndrome, involving both hands, and the dominant hand is usually affected first.

Other factors that can lead to carpal tunnel syndrome are: diabetes mellitus, rheumatoid arthritis, myxedema, and amyloidosis. Conditions such as pregnancy, the use of oral contraceptives, menopause and previous fractures at the wrist, with joint deformities, arthritis and arthrosis can also lead to this syndrome.

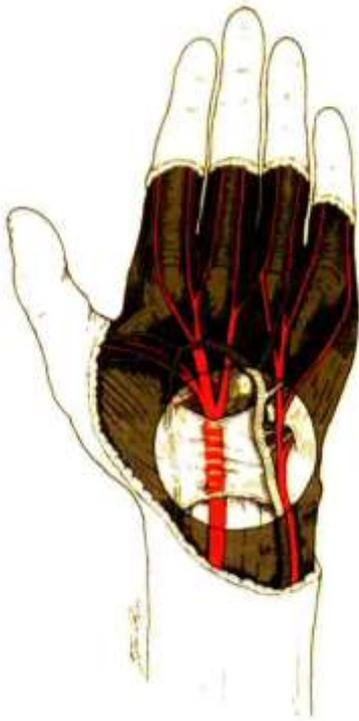


Figure 1: Median nerve in the carpal canal – ulnar nerve in Guyon's canal.

What is carpal tunnel?

Carpal tunnel is a “canal”, a passageway of carpal bones at the base of the hand, on which is set the transverse ligament of the carpus. This ligament is a fibrous band that forms the “roof” of the tunnel. This “tunnel” houses the median nerve, muscles and tendons, and the tendons of the flexor muscles of the fingers. In carpal tunnel syndrome (CTS) the **carpal tunnel shrinks, causing the median nerve to be compressed**. Try to imagine a tunnel under a mountain that begins to shrink. We can easily imagine that cars will have to slow down and eventually stop, thus blocking the traffic flow, maybe causing some accidents and other inconveniences for drivers.

How do symptoms manifest themselves?

During the first phase of the disease, the main symptoms of carpal tunnel syndrome are a **tingling sensation, numbness or swelling of the hand** (especially in the thumb, index and middle finger, sometimes involving half of the ring finger) and a **reduced strength in the hand**, especially during day and night time. The patient will have to shake his/her arm in order to recover the sensation in the hand and arm. Finally, **the pain will lead up to the forearm**, the so-called “inflammation” symptom.

If the condition gets worse, it can cause **loss of sensibility** or **loss of the hand strength** and atrophy of the thenar eminence (part of the hand at the base of the thumb, involved in all the hand movements). These are called “deficit” symptoms.

In some cases, this syndrome can be followed by tendinitis, bursitis and tennis elbow. The reason is simple: all these conditions have the same origin. They occur as a result of muscle tension, muscle shortening and alterations in the neck and arm posture. **Muscle tensions under effort** – of the wrist or other parts of the body related through muscular chains – **are the main reasons for carpal tunnel syndrome**. In fact, **muscular chains connect our entire body**, and if one chain shortens in length, the whole body is affected, even unexpected parts of it.

In order to understand this syndrome, try to imagine an iron chain, with a lot of rings (muscles), which measures 67 inches long (5.7 feet). We connect the chain to the head of a person who's 5.7 feet high, fixing the first ring on the skull bones, and the last on the feet.

Now, imagine that in some traumas (falling, whiplash, repetitive stress, violent sport, etc.) a chain ring in a specific part of the body “shortens for defense” and remains shorter than the others.

Muscles interact with one another like rings in a chain, so they are all affected by this event. **If a ring or a muscle gets shortened, the first part affected is the one nearby, but then the entire skeleton is compressed** and, sooner or later, **all the articulations will be affected.**

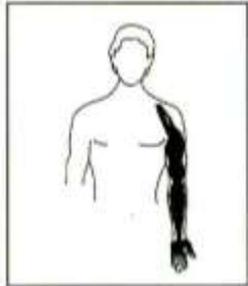


Figure 2

This is why the **muscular chain** involving arm and neck, called “**shoulder girdle**” (see fig.2) **is responsible for a lot of medical conditions**, among which the concurrent diseases of carpal tunnel syndrome. As we have seen, they all have the same origin.

What we have said so far can also explain why **a previous trauma to the foot**, or anywhere else, **can lead to conditions in other parts of the body, over time.**

This is also why we should never immediately treat the aching part.

First of all, we should observe the entire body, in order to discover the origin of the trauma, the original cause, and once we’ve treated that, the unwanted effect (the disease) will disappear.

How is carpal tunnel syndrome diagnosed?

Early diagnosis through ultrasound scanning is an important way to diagnose and correctly prevent the condition.

When the patient reports tingling (paresthesia) or pain, often radiating from the forearm, usually in the morning or overnight, carpal tunnel syndrome is the most likely diagnosis.

However, it is important to perform the objective neurological examination, in order to test strength, osteotendinous reflexes and perception (with clinical tests). We should also perform the EMG/ENG exam (electromyography/electroneurography), in order to evaluate the seriousness of the syndrome, and to leave out any nerve damage (such as cervical pressure). Apart from evaluating the seriousness of the syndrome, the EMG/ENG exam can help to differentiate a carpal tunnel syndrome from diseases such as cervical radiculopathy, brachial plexopathy and polyneuropathy that can easily cause symptoms similar to those of CTS’s.

If the diagnostic process is complete, carpal tunnel syndrome is not hard to diagnose. In Italy, carpal tunnel syndrome is classified into six stages of seriousness. The first stage is negative (only clinical symptoms, with negative results in the EMN/ENG exam), even though a lot of patients feel a discomfort. The sixth stage is severe atrophy of the thenar eminence (the pulp at the base of the thumb). In this phase, the muscle at the base of the thumb shrinks, because it is involved in every aspect of the hand movements.

Evolution of the syndrome

Clinical experience has shown that symptoms get worse during cold weather and settle in the hot season, even though the disease remains at the same level of seriousness. Although in some cases the condition remains stable over time, if not treated properly, **carpal tunnel syndrome tends to get worse over the years.**

Common treatment

In medical literature, we find two kinds of treatments: **conservative** and **surgical**.

According to the American Academy of Neurology, the conservative treatment should only be recommended if there is no strength or sensitivity deficit, and if the EMG/ENG exam is clear. However, in this case the patient should be kept under control, in order to prevent irreversible damages (such as the ultimate loss of strength in the hand).

Conservative treatment

Sometimes, changing your work habits can relieve symptoms. Common treatments: ultrasound, iontophoresis and laser can relieve symptoms, but they do not treat the syndrome's cause. NSAIDs (nonsteroidal anti-inflammatory drugs) are not very effective, while steroidal drugs have a time-limited efficacy. Some injections can ease symptoms, but usually cause two major "collateral effects": a demonstrated fibrous damage of the nerve and the risk that the patient postpones the surgery, causing permanent damage. A splint wrist is an effective treatment, but it is not easy to stand. Moreover, patients wear it at night, and therefore the splint doesn't treat the syndrome's cause. Policarpal is a new wrist support that limits the flexion-extension of the wrist without blocking it, thus allowing the normal hand movement (even the opposition of the thumb). You can easily wear it night and day, thus treating the cause of the disease.

Surgical treatment

The surgery takes about ten minutes and involves cutting the transverse carpal ligament (the "roof" of the carpal tunnel), sometimes associated to nerve damage. It can be performed through a traditional or an endoscopic technique, in local or brachial anesthesia. A 20 day period of convalescence is usually necessary, even less in the case of endoscopic technique. There are no criteria for choosing one treatment or the other, because there is no substantial difference between the results of the two techniques. Usually, it is the surgeon who chooses the most appropriate treatment, based on his/her experience and the carpus morphology. Patients can address an orthopedic surgeon, a neurosurgeon or a surgeon specialized in hand surgery.

We should specify that even though eliminating the unwanted effect, this surgery does not trace or remove the cause of the disease.

A new conservative treatment: Posture rebalancing technique

We refer to a **preventive, conservative and often decisive technique for carpal tunnel syndrome treatment**. If the condition is not irreversible, it is often possible to gain a **full recovery of manual dexterity** and the **complete disappearance of symptoms**.

First of all, we should say that our body changes, adapts and modifies itself depending on its own experience and the interactions with the outside world.

Our posture, the way we stand, move, act, breath, etc. goes through daily changes and adjustments, getting worse as time goes by. This happens because **injuries, incidents, bad posture while studying or working**, too much or too little physical exercise, bad mood, stress, pain, etc. **slowly increase muscular tensions**, and if our muscles become more tense (that is to say, shorter), muscular chains shorten in length and our articulations get compressed. Therefore, our **posture changes** and **muscles and articulations begin to deteriorate**, leading to various conditions, such as carpal tunnel syndrome.

Furthermore, when our body suffers from muscular-articular pain or discomfort, it tends to adopt a **protective system** to avoid suffering, called **“analgesic compensation”** or **“adaptive posture”**. Our body prefers to twist, bend, stoop, etc. to avoid suffering, like we do when we have a splinter under our foot and we walk without resting the sole on the ground, thus forcing the knee and burdening the other foot, etc. This is the reason why, over the years, we modify our posture, bending or stiffening.

Except from a direct trauma or blow - as we already explained - the origin of the disease is usually far from the aching part, because muscular chains “move” the problem. Carpal tunnel syndrome is no exception. Very often, the problem begins in the neck and runs through our body down to the hand. Other times, it goes further, and we can discover one or more rings of the chain previous to the neck pain, such as a dental malocclusion, a back trauma, pelvis trauma, leg trauma, foot trauma, etc. Any alteration could eventually affect our neck, our shoulder, our elbow or our hand.

Posturology is the discipline studying the reason why we have lost our correct posture, our dexterity and well-being. It tries to understand “when and how” a factor occurred to change our posture, in order to “go on with our lives” without suffering, or at least, with less suffering. In general, our pains and problems are the result of various factors, emotional factors too, that changed our posture. Think about the way we walk when we have something troubling in our mind, or the way we walk with pride when we feel confident and happy.

Our therapy, which has been taught for years in physiotherapy and posturology courses, studies the original cause of the disease, in order to rebalance posture. In this way, our body can regain its well-being.

1. Here is shown a fundamental posture to stretch all muscular chains. In this case, the arms are the one stretched the most. In the picture you can see that the neck too needs to be pulled, thus involving the longitudinal posterior chain of the body, along with the arm muscular chain.

2. In this picture the importance of the neck treatment is even clearer, because it can affect the arm and its conditions: carpal tunnel, tennis elbow, bursitis, synovitis, twitching fingers. Neck conditions too are relieved by this posture: neck pain, radicular pain, protrusion, slipped disc, etc. Seen the "complete treatment" of this therapy, every part of the body is involved, breathing included..

3. This is a more specific phase: the arm will feel all the tensions experienced over the years. As can be seen, this global muscular stretching technique involves the entire body, from the fingers to the toes.

4. Another exercise for stretching the transverse chain and treating the origin of the disease closer. Postures have to be kept for some time, while breathing in a specific way, helped by the therapist, until tensions settle down and joints recover their freedom and functionality.

5. This is an exercise focusing on the thenar and ipothenar eminence, the base of the thumb and the base of the little finger. These two parts contribute to the tunnel's shrinkage, because every prehensile activity necessarily involves them. Over the years, they tend to naturally shorten in length. That is why we aim to eliminate the tensions, muscular retractions, pathologies, the passage of time, in order to improve the quality of life.

For more information on the Raggi Method®- Pancafit® please address to Posturalmed S.A.

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