Why is Carpal Tunnel Syndrome the Flagship of Repetitive Strain Injury?

Greg Hart
Kinesiologist
President, Human Effort

Since the wave interest in Repetitive Strain Injury (RSI) broke on the shore of our consciousness some time in the 1980's, Carpal Tunnel Syndrome (CTS) has been its flagship. But what is it really? Perhaps more importantly what isn't it? Well, starting with the facts, CTS is quite simply a range of symptoms including pain, loss of sensation, tingling, burning etc. arising from irritation of the median nerve as it passes through a small passage in the wrist (about the size of a dime). It shares this passage with several hand flexor (turn your hand into a fist) tendons. When pressure comes to bear on the median nerve some of the above symptoms may manifest themselves predominantly in the thumb and the first two fingers of the hand, as this is the area the nerve affects.

Right away we have to ask, how could this happen? And right away we discover CTS is a secondary ailment arising from some original insult to other tissue. In the acute sense, this can happen when the posture of the wrist is altered to place the hand in either significant extension or flexion, but it is definitely worse in extension. The reason these postures are poor is that they reduce the already crowded space available for the free movement of the median nerve. Chronically, it can occur in roughly the same way, but more due to the fact that the flexor tendons become inflamed (tendinitis, the primary injury) and begin to 'choke off' the median nerve. This isn't the context to go into a detailed description of the actual anatomy and mechanics of Carpal Tunnel Syndrome.

So what usually happens? It is still common for the first attempt at treatment to involve some form of immobilization, either at night or at work or both. Research is now clearly demonstrating that this approach can actually exacerbate the condition through reduced circulation and the weakening of tissue and the propensity for individuals to develop nasty compensating habits that bring on more damage to related structures, that is assuming the related structures are not already involved . . . more on that later. Nerve Conduction Velocity (NCV) studies have become very popular as a form of presurgical diagnosis. NCV is a procedure involving the passage of electrical current along sections of nerve tissue to determine if there are significant delays in the speed of the signal. It can be very diagnostic, but it has also demonstrated high levels of 'false positive' results and makes a number of assumptions about the dynamics of normal nerve function.

This brings us to surgery, which is very common. We should be clear that the surgical procedure 'releases' the carpal ligament. This increases the available space in the carpal tunnel by effectively raising the roof of the tunnel. It relieves CTS, but it does not

resolve the underlying fundamental problem, like tendinitis or something that isn't even local . . . more on that later.

What if the fundamental problem is not even specific to the wrist? Since the symptoms of CTS are largely neurological in nature it can lead to a confusing scenario since this nerve tissue is continuous in nature. Any dysfunctional involvement of this tissue at any point in its length can potentially generate a number of difficulties at any point along its length. This includes the 'double crush' injury that is characterized by a primary impact on nerve structures in the central area (close to the shoulder or spine) and a secondary nerve 'swelling' as a result in one of the wrist tunnels.

There is also a variant of this that is categorized as T4 Syndrome referring to the thoracic spine in general, but usually to the T4 vertebrae and its related structures. It typically involves the rotation of the vertebral body and an elevation of the associated rib, which places enormous tension against all the nerve structures in the region. This syndrome can mimic CTS very closely as well as generate extremely 'bizarre' referrals of pain, sensation, swelling and skin colour and temperature changes. This is a postural dysfunction and can only be corrected through a mechanical correction (through manual manipulation) of the involved structures followed by postural improvements.

Another problem attributed to CTS, is a set of conditions referred to as Thoracic Outlet Syndrome (TOS) which involves the brachial plexus, which lies near the upper rib cage near the armpit. This is a critical junction of nerve tissue before it continues out into the arm and hand. It is a very restricted anatomical space and any postural changes through the shoulder and neck that cause this space to become more restricted can lead to serious difficulty that can generate symptoms very much like CTS.

There are a number of other conditions related to weak upper back posture combined with tightness through the front of the shoulder that can generate symptoms into the hands. Considering the prevalence of such postural changes in Western society, is it any wonder that these RSI conditions exist. It just happens that CTS is not as common as it appears. If you were to poll a number of physiotherapists and ask then how common the actual CTS is, they would say less than 20% of the time it is diagnosed.