

Nerve Compression and Tension

By Whitney Lowe, LMT

The nervous system is a fascinating communication network. When functioning properly, it can coordinate a tremendous amount of essential information moving throughout the body.

When it is impaired, it can cause us excruciating pain or even complete limitations to movement. Because we work so closely with the soft tissues of the body, it is valuable for the massage therapist to understand more about various nervous system pathologies.

The nervous system is a complex network for the transmission of information going in two different directions. We have sensory (afferent) signals moving from the periphery of the body back to the central nervous system and motor (efferent) signals moving from the central nervous system to the periphery. Both types of signals are transmitted along the same nerve tissue. Therefore, if there is an impairment of nerve function, it is likely to affect both sensory and motor signals.

During the course of normal daily function, the structures of the nervous system are exposed to a variety of different forces. The two forces that cause problems most frequently in the nervous system are compression and tension. When something causes a problem with the proper function of nerve tissue, it is called a neuropathy. Therefore, when speaking of nerve compression and tension injuries, we call them compression or tension neuropathies.

Compression neuropathies are the most common type of nerve injuries. There may be various causes of compression neuropathy. Compression by other structures in a small space (such as an anatomical tunnel) is a common cause. Examples would include compression of the median nerve in the carpal tunnel, the posterior tibial nerve in the tarsal tunnel, or a spinal nerve root as it travels through an intervertebral foramen. Often there is some reason that the tunnel or space through which the nerve travels has narrowed, and the adjacent structures will compress the nerve. This location, where nerve tissue is immediately

adjacent to other tissues that often impinge on it, is referred to as the "mechanical interface."¹

Sometimes a compression injury will be caused by an outside mechanical force. For example, the radial nerve is often injured in the axillary region from improperly fitted crutches. Prolonged pressure underneath the axilla from the crutches will compress the radial nerve. Long-distance cyclists often experience a similar problem, termed "handlebar palsy." Handlebar palsy is a compression of the ulnar nerve in the wrist that occurs from long periods of direct pressure on the nerve, when the weight of the upper body is resting on the handlebars.

Tension neuropathies, while not as common as compression neuropathies, are increasingly viewed as important clinical problems. It has been demonstrated that for the body to move properly, the nervous system must have significant mobility. This is especially true in the extremities, in which the nerves must bend around joints and allow for increases in length as the joints bend at sharp angles. If such mobility is compromised, increased tension on the nervous tissue can cause pathological changes.²

Symptoms of compression or tension neuropathies are very similar. In fact, you can't tell the difference in a compression or tension neuropathy simply by the symptoms. In many instances compression and tension neuropathies will exist together. For example, if there is excess compression on the brachial plexus, proper mobility of the nerves of that plexus will be impaired. Therefore these nerves may be subjected to tension neuropathies farther down the arm, because the compression of the brachial plexus has limited the neural mobility.

The most common symptoms of compression and tension neuropathies include pain (often described as sharp, stabbing or electrical in nature); paresthesia (the sensation of pins and needles); numbness; or muscle weakness. These various symptoms will usually be identified with a thorough client interview and detailed physical examination procedures. In future installments of this column, we will look at a number of special tests for evaluating specific nervous system pathologies.

One of the most fascinating aspects of compression and tension neuropathies is something called the double (or multiple) crush phenomenon. This was originally described because a large number of patients with carpal tunnel syndrome also appeared to have brachial plexus neuropathies. The investigators wondered if it was possible that one site of nerve compression might make another site more sensitive and susceptible to compression pathologies. To understand how this occurs, it is helpful to investigate nerve anatomy more closely.

The nerves are not only responsible for transmitting afferent and efferent signals along their length; they are also responsible for moving their own nutrient proteins, which are essential for optimal function. The movement of these nutrient proteins is accomplished through a special type of cytoplasm within the nerve cell called axoplasm (referring to cytoplasm of the axon). The axoplasm moves freely along the entire length of the nerve. If there is a blockage to the flow of the axoplasm (called axoplasmic flow), the nerve tissue distal to that site of compression is nutritionally deprived and more susceptible to injury.

Because of the increased understanding of neural anatomy, the presence of double and multiple crush syndromes has gotten a great deal more attention. Many clinical practitioners are now finding explanations for groups of signs and symptoms that previously didn't make much sense, but are much more easily explained with the idea of the double crush. The massage practitioner whose client may have compression or tension neuropathies is strongly encouraged to study nervous system structure and function more thoroughly. Since many of these neuropathies occur because of soft tissue restriction, there is a great deal that we can often do to help alleviate these problems.

References

1. Butler, D. *Mobilisation of the Nervous System*. London: Churchill Livingstone, 1999.
 2. Turl, S. E., and George, K. P. Adverse neural tension -- a factor in repetitive hamstring strain. *J Orthop Sport Phys Therapy*. 27:16-21, 1998.
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