Distinguishing between the various potential sites of median-nerve entrapment can be challenging.

In some cases, symptoms are identical. Nerve-conduction tests can help identify the issue, but are not infallible.

Figure 4: Measurement of grip strength.

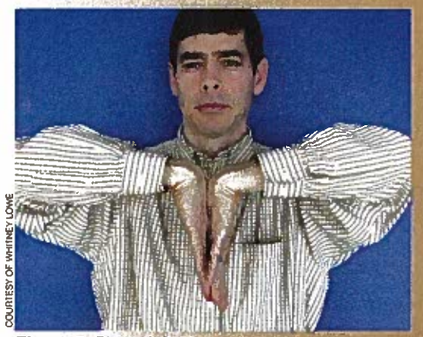

Figure 5: Phalen's test.

Figure 6: Final and fully stretched position for median-nerve mobilization technique.

• Finally, the nerve can be compressed between the flexor tendons and the flexor retinaculum, from either tissue swelling in the tendons, which is most common, or limited natural space or other obstruction in the carpal tunnel.

It is not uncommon for there to be simultaneous compression at multiple sites along the nerve's path. This is why treating the entire length of the nerve's route is an effective approach.

Evaluation

Median-nerve compression pathologies produce characteristic signs and symptoms that are different from those of radial and ulnar nerve disorders; however, distinguishing between the various potential sites of median-nerve entrapment can be challenging.

In the evaluation, remember your client may have multiple sites of median-nerve compression simultaneously.

The key to recognizing median-nerve involvement is through the patterns of sensory and motor disruption that are produced. When it is only the median nerve being compressed, symptoms primarily occur in the hand and sometimes the forearm. The median nerve has a higher percentage of sensory fibers than motor, so sensory symptoms usually appear first.

Sensory indicators of median-nerve pathology are neurological sensations, such as paresthesia, numbness or shooting-and-burning pain within the median-nerve distribution in the hand. (See Figure 3.)

The median nerve innervates the major flexor muscles of the forearm and hand. Impairment of motor signals from median-nerve compression can produce weakness in grip strength. (See Figure 4.)

Atrophy of muscles innervated by the median nerve at the base of the thumb is also likely. If an individual has more advanced motor symptoms in addition to sensory symptoms, it is indicative of a more severe nerve-compression problem.[2]

To narrow down the location of median-nerve compression, note where symptoms are felt. Nerve-compression symptoms are most commonly felt distal to the site of compression; therefore, carpal tunnel syndrome characteristically produces neurological sensations in the hand but not throughout the upper extremity, although reports of forearm discomfort are reported.

Conversely, symptoms of thoracic outlet syndrome often occur throughout the upper extremity because other nerves—ulnar, usually; sometimes radial—are being compressed in addition to the median nerve.

However, if only the median nerve is involved, it is possible for carpal tunnel syndrome-like symptoms to occur only in the hand. Symptoms felt in the forearm could be indicative of median-nerve entrapment under the bicipital aponeurosis or in the pronator teres. Still, it is possible for symptoms to only occur in the hand.

Other aspects of the assessment, such as history, are important for locating potential sites of compression. Injuries or accidents, occupational activities and other information all contribute to an overall picture.

Other systemic pathologies, such as diabetes or multiple sclerosis, can also produce similar signs and symptoms. Neurological symptoms alone are not enough to determine median-nerve involvement.

Distinguishing between locations of median-nerve entrapment is usually done through special orthopedic tests; however, the tests' accuracy is still debated, so do not rely on this evaluation step alone. The Adson maneuver, arm-elevation test, military brace test, Wright's abduction test, pronator teres test, Phalen's test and upper-limb neurodynamic tests can all be used to clarify the problem. It is best not to rely on just one or two tests. Performing multiple tests and combining the findings will paint a more accurate picture of the compression location.

One of the most common tests for carpal tunnel syndrome is the Phalen's test. In this procedure, the client holds her wrists in flexion with the back of the hands pressed against each other. If symptoms are reproduced within about 30 to 60 seconds, carpal tunnel syndrome is likely. (See Figure 5.)

Holding the hands in this position compresses the contents of the carpal tunnel and increases pressure on the median nerve, which would exaggerate symptoms if a compression pathology exists.

Treatment approaches

The most important goal is to reduce compression on the affected nerve. Because there are potentially multiple sites of entrapment, working the entire arm and upper chest region has clinical advantages. This is one of the unique benefits of massage; clinicians generally work more holistically on the body as opposed to isolated treatment. Treatment should address hypertonic muscles throughout the length of the nerve's pathway, with a focus on those muscles surrounding the impingement site(s).