

Manual Muscle Testing for Cervical Radiculopathy (Pt. 1)

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Cervical radiculopathy is pain in the distribution of a specific cervical nerve root due to compressive pathology from disc herniation, spur formation or hypermobility states.¹⁻³ Radiculopathy may eventually lead to surgery.

Differential Diagnosis

A proper differential diagnosis is important because when neck pain without radiculopathy is treated surgically, there is no improvement over that of the natural history of a non-operative group.⁴ The criteria for the establishment of a diagnosis of cervical radiculopathy due to compressive pathology in the cervical spinal canal are generally a positive contrast study and/or CT scan, a root distribution neurologic deficit, and radicular arm pain.

Differential diagnosis of radiculopathy requires consideration of numerous factors. Peripheral nerve entrapment distal to the radix, e.g., thoracic outlet syndrome, median nerve conditions at the elbow, forearm and carpal tunnel, and ulnar and radial nerve peripheral entrapment. Finally, peripheral vascular disease and chest and shoulder pathology should be ruled out,⁵ such as rotator-cuff tears, impingement syndrome, bursitis, arthritis of the shoulder, and bicipital tendon involvement. A Pancoast tumor may mimic a C8 radiculopathy.⁶

Evaluation (Signs and Symptoms)

The typical clinical examination for radiculopathy is to evaluate sensation, motor function and deep tendon reflexes. Sensory symptoms, such as paresthesia, hyperesthesia and hyperalgesia, are much more common than motor symptoms or reflex changes in radiculopathy.

Following trauma, the symptoms can develop immediately or within several hours; the maximum delay is a few days. Characteristic pain is severe aching or that of a shooting quality. The pain is expected to follow a dermatome; however, it may be widely distributed because each spinal nerve supplies pain fibers to bones, joints, muscles and blood vessels, as well as to the dermatome. Involvement of the 5th, 6th and 7th nerve roots may even radiate pain anteriorly over the chest wall and posteriorly into the back.

Even in the absence of radiating symptoms in a dermatomal distribution, nerve root compression may still be present.⁷ The presence of upper trapezius or interscapular pain may be the extent of the symptoms reported by the patient.

Radiculopathy must be differentiated from referred pain from stimulation of sensory nerve endings in the soft tissues. This referred pain is not distributed to a clearly defined dermatome. In the discogenic syndrome, there are motor, sensory or deep tendon reflex abnormalities. The pain complaint may be in the neck, about the shoulder, and in the area of the scapula. This pain

develops as a result of stimulation to the sinuvertebral nerve fibers in the annulus fibrosis, and in the anterior and posterior longitudinal ligaments. Referred pain does not have the sharp, shooting quality of radicular pain; it is more vague and diffuse. Acute radiculopathy pain can be modified by head and neck positions. There is controversy about how positions might aggravate or relieve the pain.

Awalt, et al.,⁸ found by radiographic measurement that the intervertebral foramen from C2 through C7 increased in size in the head-forward position as compared to neutral. This conflicts with Kendall and McCreary's⁹ observation of narrowing of C4-5 and C5-6 levels in the head-forward posture. Various head and neck positions may change pain, as well as findings of deep tendon reflex and manual muscle testing.

A number of researchers indicate that about two-thirds of cervical radiculopathy cases resolve with conservative care.¹⁰ With such a rate of natural recovery, conservative care is the recommended treatment initially.¹¹

Rodine and Vernon conducted a systematic review of the published research on the manipulative treatment of cervical radiculopathy, showing it to be a viable option for patients suffering from the condition.¹

Manual Muscle Testing

Dynamic examination of spinal function produces different information than that of static evaluation. The applied kinesiology method of vertebral challenge appears to be a more dynamic technique for determining the vertebral complex's effect on the nervous system. The AK manual muscle test permits a specific sensorimotor challenge to a specific muscle or joint in the neck to be immediately followed by another specific test to a distant joint or muscle in the upper body, thereby making evident to both the physician and the patient the dynamic interactions going on between two distant, but interacting structures.

There are two types of challenge that reveal this disturbance: 1) axial compression to the cervical spine; and 2) specific vertebral challenge.

Axial compression is applied by the patient pressing on the vertex of his head in a caudal direction. Any possibly involved muscle can be tested for weakening. Conversely, cervical traction strengthens associated weak muscles.¹⁹

Goodheart uses the wrist extensors, if strong in the clear, as general indicator muscles for challenging this cervical problem. Often the wrist extensors will be strong when the patient is non-weight-bearing and weak when standing or sitting because of the head's weight on the cervical spine.

Editor's Note: Part 2 of this digital exclusive appears in the November 2018 issue and includes complete references to the citations in both parts.

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