

MR Neurography as a Useful Test in Evaluating People With CRPS/RSD

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MR Neurography is a new modification of magnetic resonance imaging (MRI) that obtains unique images of peripheral nerves within their surrounding soft tissues. This important advance in the assessment of injuries in which peripheral nerves to the limbs may be involved can be beneficial to individuals suspected of having CRPS/RSD. My experience with this technique has been through the recent availability of the Neurography Institute protocol at Norristown, Pennsylvania. I have reviewed the images on over 50 individuals, and have been impressed with both the images and the reports I received.

In the past, the phrase “soft tissue injury” described problems affecting connective tissues other than major tendons and ligaments— muscles and nerves that were not expected to resolve over a period of four to six weeks after injury. These injuries were not visible on routine imaging studies such as X-rays, CT scans or MRIs.

With MRI, it became possible to see some soft tissue injuries, such as disc herniations, ligament tears, tendon ruptures, and even swelling within muscles because of unique signal characteristics of the tissues at the location of the nerve root as it left the spinal canal. However,

once a nerve was on its course within the tissues of a limb, where partial injury could give rise to CRPS Type I (RSD) or type II (causalgia), it was no longer as visible, because of the similar signal characteristics of the nerve to its surrounding tissues in the limb.

MR Neurography was first used in November of 1992. The first patient images using MR Neurography identified the pattern of fibers within the nerve that previously could only be observed by direct examination. This image helped prove that the structure studied was truly a nerve. The image was published in the *Lancet* in 1993 and received a great deal of attention.

Physicians most frequently order MR Neurography studies for pain in the arms, hands, legs and feet. This pain often is caused by problems at the level of the spine, such as herniated disc or a bony spur, which leads to “pinched nerve” type problems. When there is persistent, severe pain down the arm or leg, a physician will commonly order a CT scan or MRI of the spine. If the spine imaging studies show no abnormalities, attention will be shifted to other places, such as the nerves outside the spine.

MR Neurography, unfortunately, is not yet widely available for several reasons. First, this technique is quite demanding on the MRI machine, and only units with a very powerful magnet can provide the needed images. Second, most radiologists are not trained or experienced at reading images of nerves. This is a critical factor that influences

the interpretation of the information that is obtained.

MR Neurography examinations use equipment and software which is FDA approved. Numerous insurers, including many HMOs, indemnity carriers, workers’ compensation boards, Medicare, and other entities have reviewed the use of these studies and have not denied any approvals if the performance of the imaging study itself is indicated. The CPT codes currently used for these studies are routine soft tissue MRI codes.

MR Neurography can be used in the diagnostic evaluation of any condition thought to be due to nerve compression or impingement, trauma involving peripheral nerves, repetitive strain injuries, and congenital or obstetrical abnormalities. In addition to peripheral nerve conditions such as carpal tunnel syndrome, ulnar nerve compression, thoracic outlet syndrome (including brachial plexus traction injuries), and nerve tumors, these studies are used to evaluate spine problems, such as a suspected radiculopathy, when routine studies fail to demonstrate the cause of the pathology. MR Neurography may also be useful in documenting an area of entrapment of a peripheral nerve causing partial injury to it, and resulting in either RSD or causalgia.

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