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Cervical Spine Stenosis -- Diagnostic Considerations

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Prior to the advent of advanced imaging such as CT and MRI, cervical spine stenosis (CST), was defined by bony radiographic measurements. These radiographic measurements were developed by Torg et al., and Pavlov et al.^{1,2} The height of the spinal canal from the midpoint of the posterior aspect of the vertebral body up to the spinolaminar line is divided by the height of the corresponding vertebral body. A canal body ratio of less than 0.80 was considered significant. Recently the validity of such measurements has become suspect due to studies like Herzog et al.,³ which have shown that patients and athletes who are completely asymptomatic may have abnormal canal ratios. The size of the canal varies from 15-25mm between C3-C7 averaging about 17mm. Below a critical level of 13mm, Wolf has described two stenosis conditions: absolute (less than 10mm), and relative stenosis (between 10-13mm).⁴ Patients with absolute stenosis and small canals typically present with myelopathy with or without radiculopathy: patients with relative stenosis and larger canals usually present with radiculopathy.

Cantu has proposed that only diagnostic technologies that view the cord itself, such as MRI and CT or CT/myelography be used to assess these types of patients. The size of the spinal cord varies between 5-11.5mm, thus true stenosis may be present with low to normal canal measurements and a large cord, further delineating the need for MRI-like tests.⁵ Cantu has also proposed the term "functional stenosis," which is a loss of the functional reserve of CSF around the cord. Only MRI, and CT/MYELO can visualize this reserve capacity. By using the functional spinal stenosis model, canal size and ratios are less important.

The importance of spinal stenosis for the practicing doctor of chiropractic is in the sports injury and whiplash (cervical acceleration/deceleration) populations of patients. A patient with CST with or without functional reserve is very susceptible to hyperextension/hyperflexion type injuries. A small central bulging or herniated disc can be a monumental problem in a patient with spinal stenosis which may not have been as large a problem in a patient with a large canal and functional CSF reserve. When treating these patients in the chiropractic setting one must exercise caution and constantly be on the alert for long tract signs,

extramedullary symptoms, hyperflexia, and pathologic reflexes which would necessitate a neurosurgical referral.

A useful neurophysiologic tool in assessing this type of patient is the SSEP/DSSEP. DSSEP can help identify the level or levels of neurologic compromise by sequential testing of serial dermatomes. In a study by Kraus et al., dynamic SSEP testing was utilized to test the functional capacity in patients with radiographic evidence of spinal stenosis. They found that flexion/extension stress caused changes in latency and amplitudes in cervical waveforms after stress which weren't present prior to stress.⁶

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