

A Neurological Perspective on the Use of Extension Traction for the Restoration of Cervical Lordosis

Brad McKechnie, DC, DACAN

Extension traction has been advocated for use in functional restoration of cervical lordosis in patients who have had a loss of their normal cervical curve. This procedure involves the sustained use of traction, with the cervical spine in an extended posture. From a neurological perspective, certain patients may not be candidates for this procedure, namely the patient with a congenitally small cervical spinal canal and the patient with acquired central canal stenosis, due to cervical spondylosis. The rationale for precaution with this procedure revolves around the biomechanical interaction of the vertebrae comprising the cervical spinal canal, the ligamentous support structures of the region, and the spinal cord within the spinal canal. The average sagittal canal diameter in the lower cervical region is 17 millimeters. Extension causes the sagittal diameter to decrease in the lower cervical region, while simultaneously causing the spinal cord to widen in its anterior to posterior dimension.

In the normal cervical spine, with a normal sagittal canal diameter, the sustained extension position should not be hazardous to the patient. However, in the case of a patient with sagittal canal compromise, due to congenital stenosis or acquired central canal stenosis, the extension traction procedure may be neurologically detrimental to the patient, as this position may produce spinal cord compression. The possibility of sagittal canal compromise can be ascertained through the use of neutral lateral and extension lateral cervical films that are taken at 72 inches, non-bucky. Using these views, the sagittal diameter of the central canal may be examined by measuring from the posterior/inferior corner of the vertebral body above, to the superior aspect of the lamina of the vertebra located directly below. The critical measurement in the neutral position is 13 millimeters. A patient with a cervical spinal canal diameter measuring 13 millimeters or less should not be subjected to sustained extension traction. In the patient with a congenitally small cervical canal, the use of sustained extension will cause further narrowing of the central canal, due to the combined effects of infolding of the ligamentum flavum, coupled with the simultaneous increase of the spinal cord's anterior to posterior diameter, and increase the probability of cord compression. The use of sustained extension traction in the cervical spondylosis patient, that demonstrates acquired central canal compromise, is not advocated. In the extended position, the cord will be subjected to the combined effects of infolded ligamentum flavum, coupled with posteriorly projecting osteophytes produced around the degenerating disc spaces. These structures, in conjunction with the widening of the cord in its anterior to posterior dimension upon extension, can produce spinal cord compression and the potential of spinal cord damage through repeated applications of this procedure. Thus, the doctor should carefully evaluate the sagittal canal diameter of patients being considered for extension traction.

References

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JANUARY 1991

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