

Level-Specific Morphometric Changes in the Cervical Spine: An Mri-Based Morphometric Study

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Abstract:

Background: Degenerative disorders of the cervical spine are a major cause of neck pain, radiculopathy, and myelopathy. MRI is the preferred imaging modality for evaluating cervical spine anatomy and morphometric variations. This study evaluated level-specific morphometric changes of the cervical spine using MRI.

Methods: A retrospective observational study was performed on 50 cervical spine MRI scans (31 males and 19 females; mean age 46.2 ± 12.4 years). Vertebral body, vertebral canal, spinal cord dimensions, and intervertebral disc height were measured from the craniovertebral junction to C6–C7.

Results: Vertebral body dimensions progressively increased toward the lower cervical spine, with the maximum AP (16.42 mm) and transverse (24.24 mm) diameters at C6–C7. The vertebral canal was narrowest at C4–C5. The spinal cord showed the greatest transverse diameter at C5–C6 and the smallest AP diameter at C6–C7. Intervertebral disc height progressively decreased toward the lower cervical levels, indicating increasing degenerative and biomechanical changes.

Conclusion: MRI demonstrates significant level-specific morphometric variations throughout the cervical spine. These findings provide valuable reference data for early diagnosis of cervical canal stenosis, radiological interpretation, surgical planning, and improved clinical decision-making.

Keywords:

Cervical spine, MRI, Morphometry, Vertebral body, Vertebral canal, Spinal cord, Intervertebral disc, Cervical canal stenosis.