



## Upright MRI Cervical Spine: Neck Pain and Radiculopathy

Ha Nguyen MD; Saman Shabani BS, MD; Ninh Doan MD PhD; Brian D. Stemper PhD; Jamie Baisden MD; Christopher E. Wolfla MD, FAANS; Glenn Paskoff MS; Barry S. Shender PhD

[Institution]

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### Introduction

Cervical degenerative disc disease may cause axial neck pain and cervical radiculopathy. Unfortunately, many patients have pain relief in the supine position, but worsening symptoms in an upright position. Moreover, foraminal stenosis in the cervical spine can be visualized with MRI, but false-positive and negative rates tend to be high in clinical settings. Consequently, there has been a steady growth of literature regarding the utility of positional MRI to augment the diagnosis of spinal pathologies. Limited literature exists regarding upright imaging of the cervical spine.

### Methods

22 adults (17 asymptomatic patients and 5 symptomatic patients) were selected. A 0.6 T upright MRI scanned each patient in the upright position. Various parameters were obtained from the C3/4 level to C6/7 level, including those pertaining to the foramen (cross sectional area (CSA), height, width), the disc (bulge, height), the alignment (C2-C7 angle, wedge angle, segmental angulation, segmental translation), the spinal cord (AP diameter, transverse diameter, CSA, anterior spinal distance, posterior spinal distance), and the spinal canal (AP diameter, transverse diameter, CSA). Findings were compared with via independent t tests between symptomatic patients and asymptomatic patients.

### Results

Statistically significant findings were discovered for the following parameters: foraminal CSA at C6/7 ( $p = 0.00258$ ), foraminal width at C3/4 ( $p = 0.0362$ ) and C6/7 ( $0.032$ ), foraminal height at C6/7 ( $p = 0.037$ ), C2-C7 angle ( $p = 0.048$ ), vertebral body translation at C5/6 ( $p = 0.048$  and anterior spinal distance at C4/5 ( $p = 0.046$ ) and C5/6 ( $p = 0.017$ ).

### Conclusions

Upright MRI can assess differences in foraminal stenosis and sagittal alignment between asymptomatic and symptomatic volunteers, which appeared pronounced at the lower cervical levels.

### Learning Objectives

- 1) Better understanding regarding prior literature on upright MRI C spine
- 2) Consideration of the benefits of upright MRI for C spine pathologies

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