

MRI evaluation of foraminal changes in the cervical spine with assistance of a novel compression device

Introduction. Standard supine MRI does not acquire images in a position where most patients with intermittent arm radiculopathy have symptoms. The aim of this study was to test the feasibility of a new compression device and to evaluate image quality and foraminal properties during a Spurling test under MRI acquisition.

Methods. Ten asymptomatic individuals were included. First, the subjects were positioned in the cervical compression device and images were acquired in a relaxed supine position. Thereafter, we mimicked a Spurling test with the compression device, while repeating the image acquisition. A radiologist measured the blinded investigations evaluating cervical lordosis (C3-C7), foraminal area (oblique sagittal) and foraminal cross-distance (axial). A total of three levels (C4-C7) were measured on the right side on each individual. Measurements were compared between the compressed and relaxed state. Reliability tests for inter- and intraclass correlation were performed.

Results. The device was feasible to use. Images of adequate quality was obtained in all patients. A significant increase (mean 9.4°, $p = 0.013$) in the cervical lordosis and a decreased foraminal cross-distance (mean 32%, $p < 0.001$) was found, during the simulated Spurling test. The foraminal area did not reach a statistically significant change after compression. We had excellent intraobserver reliability and good interrater reliability.

Conclusion.

A Spurling test applied during MRI acquisition is feasible with the novel device and provided images of satisfactory quality. We detected increased in cervical lordosis and a shorter foraminal cross distance, indicating the possibility of detecting changes of the foraminal properties.