Abstract

Value of fat-suppressed fluid-sensitive MRI sequences for the detection and characterisation of Modic I end-plate changes of the lumbar spine


European Congress of Radiology ECR, Vienna (A), March 2016 (Oral Presentation)

Purpose
To assess the value of fat-suppressed fluid-sensitive sequences for the assessment of Modic I end-plate changes on magnetic resonance imaging (MRI) of the lumbar spine.

Methods/Materials
Institutional review board-approved multi-center study with written informed consent. Sagittal T1-weighted (T1w), T2w, and fat-suppressed fluid-sensitive MRI images of 100 consecutive patients (consequently 500 vertebral segments; 52 female, mean age 74±7.4 years; 48 male, mean age 71±6.3 years) with suspected lumbar spinal canal stenosis were retrospectively evaluated. We recorded the presence (yes/no) and extension (i.e. Likert-scale of height, volume, and end-plate extension) of M1 end-plate changes in T1w/T2w sequences and compared the results to fat-suppressed fluid-sensitive sequences using the McNemar and Wilcoxon signed-rank test.

Results
Fat-suppressed fluid-sensitive sequences revealed significantly more Modic I changes compared to T1w/T2w sequences (156 vs. 93 segments, respectively; p < 0.001). The extension of Modic I changes in fat-suppressed fluid-sensitive sequences was significantly larger compared to T1w/T2w sequences (height: 2.27±0.79 vs. 2.53±0.82, volume: 2.1±0.65 vs. 2.35±0.76, end-plate: 2.19±0.81 vs. 2.46±0.76), (p < 0.05). Modic I changes which were only visible in fat-suppressed fluid-sensitive sequences but not in T1w/T2 w sequences were significantly smaller compared to Modic I changes which were visible in T1w/T2w sequences (height: 1.8±0.8 vs. 2.54±0.8, volume: 1.72±0.7 vs. 2.34±0.8, end-plate: 1.97±0.9 vs. 2.46±0.8), (p < 0.05).

Conclusion
In conclusion, fat-suppressed fluid-sensitive MRI sequences of the lumbar spine revealed significantly more Modic I end-plate changes and demonstrated a greater extent compared to standard T1w/T2w imaging. We suggest that fat-suppressed fluid-sensitive MRI sequences should be part of clinical routine protocols.