Dokumenttyp: journal article

Autor(en) des Beitrags:
Li, X; Yu, A; Virayavanich, W; Noworolski, SM; Link, TM; Imboden, J

Titel des Beitrags:
Quantitative characterization of bone marrow edema pattern in rheumatoid arthritis using 3 Tesla MRI.

Abstract:
To develop imaging techniques that provide quantitative characterization of bone marrow edema pattern (BME) in wrist joints of patients with rheumatoid arthritis (RA), including volume, signal intensity changes, and perfusion properties. Fourteen RA patients and three controls were scanned using 3 Tesla MR. BME was semi-automatically segmented in water images obtained from iterative decomposition of water and fat with echo asymmetry and least-squares estimation (IDEAL) sequences. BME perfusion parameters (enhancement and slope) were evaluated using three-dimensional (3D) dynamic enhanced MRI (DCE-MRI). Experimental reproducibility, inter- and intra-observer reproducibility of BME quantification were evaluated using root mean square coefficients of variation (RMS-CV) and intraclass correlation (ICC). The RMS-CV for BME volume quantification with repeated scans were 6.9%. The inter-observer ICC was 0.993 and RMS CV was 5.2%. The intra-observer ICC was 0.998 and RMS CV was 2.3%. Both maximum enhancement and slope during DCE-MRI were significantly higher in BME than in normal bone marrow (P < 0.001). No significant correlation was found between BME quantification and clinical evaluations. A highly reproducible semi-automatic method for quantifying BME lesion burden in RA was developed, which may enhance our capability of predicting disease progression and monitoring.
treatment response.