Dokumenttyp: journal article

Autor(en) des Beitrags: Carballido-Gamio, J; Joseph, GB; Lynch, JA; Link, TM; Majumdar, S

Titel des Beitrags: Longitudinal analysis of MRI T(2) knee cartilage laminar organization in a subset of patients from the osteoarthritis initiative: A texture approach.

Abstract: Cartilage magnetic resonance imaging T(2) relaxation time is sensitive to hydration, collagen content, and tissue anisotropy, and a potential imaging-based biomarker for knee osteoarthritis. This longitudinal pilot study presents an improved cartilage flattening technique that facilitates texture analysis using gray-level co-occurrence matrices parallel and perpendicular to the cartilage layers, and the application of this technique to the knee cartilage of 13 subjects of the osteoarthritis initiative at baseline, 1-year follow-up, and 2-year follow-up. Cartilage flattening showed minimum distortion (~ 0.5 ms) of mean T(2) values between nonflattened and flattened T(2) maps. Gray-level co-occurrence matrices texture analysis of flattened T(2) maps detected a cartilage laminar organization at baseline, 1-year follow-up, and 2-year follow-up by yielding significant (P< 0.05) differences between texture parameters perpendicular and parallel to the cartilage layers. Tendencies showed higher contrast, dissimilarity, angular second moment, and energy perpendicular to the cartilage layers; and higher homogeneity, entropy, variance, and correlation parallel to them. Significant (P< 0.05) longitudinal texture changes were also detected reflecting subtle signs of a laminar disruption. Tendencies showed decreasing contrast, dissimilarity, and entropy; and increasing homogeneity,
energy, and correlation. Results of this study warrant further investigation to complete the assessment of the usefulness of the presented methodology in the study of knee osteoarthritis. Magn Reson Med, 2010. © 2010 Wiley-Liss, Inc.