Joint Biomedical Engineering Seminar Series
MU ▪ MCW ▪ UWM

Friday, September 23, 2016
Noon-1pm
HRC Auditorium
Medical College of Wisconsin

L. Tugan Muftuler, PhD
Associate Professor of Neurosurgery
Medical College of Wisconsin

Abstract

Non-Cartesian MRI Method for Fast Dynamic Contrast Enhanced MRI of the Spine

Although intervertebral disc degeneration is a part of natural aging process, there are factors that influence the rate and nature of degeneration. One of the proposed mechanisms is disruption of nutrient delivery through the disc endplates, which could lead to disc degeneration1. We are currently exploring a novel approach to study such endplate changes in vivo using Dynamic Contrast Enhanced MRI (DCE-MRI). Although our initial results demonstrated profound changes in the endplates of degenerating discs, accurate quantification of such changes was hindered by low temporal resolution. Despite using the fastest protocol available from the manufacturer, the temporal resolution was sacrificed (30s) to image the thin endplates with high spatial resolution. With higher temporal resolutions, it would be feasible to quantify changes in the vascular and extravascular space using pharmacokinetic models. This could help us study the pathological changes in endplates noninvasively and explore associations between endplate changes and low back pain. Another problem with the existing protocol was motion artifacts because it is based on 3D SPGR, which is sensitive to motion. Here, we implemented a novel acquisition technique to obtain DCE-MRI data at high spatial and temporal resolution, which is also more tolerant to motion.

++++++++++++++++++++++

Medical College of Wisconsin is located at 1101 N. 87th St., Milwaukee, WI 53226.
Parking is available across the street in visitor parking. Refreshments will be served.