

AbstractID: 11689 Title: Effect of Gold Marker Seed on MR Spectroscopy of the prostate

Purpose: Prostate magnetic resonance stereoscopic imaging (MRSI) is an emerging technology that may enhance targeting in radiotherapy. Gold seed fiducial markers are commonly used in prostate radiotherapy to perform daily prostate localization. If MRSI is to be used in targeting prostate cancer, the impact of gold seeds on MRSI must be understood. The purpose of this study is to characterize the local effects of gold seeds on the chemical shift spectra of MRSI.

Method and Materials: Two different phantoms are used in this study. One is filled with water and agar containing Choline. A Gold Marker seed is put in the agar. In the second phantom a cylindrical cavity is filled with liquid Choline and Citrate in water. A gold Marker seed is mounted in the middle of the fluid. Single voxel (SV) and three-dimensional MR Spectra of the chemical shift (CSI) are taken. Chemical Shift spectra are compared in the presence and absence of gold seed. Spectra close to and near the seed are studied.

Results: In general, Choline and Citrate peaks are broadened by the single voxel containing the seed. Local effects on adjacent voxels are seen, mostly by way of an altered baseline drift. This artifact dissipates with distance and is most prominent when the gold seed is aligned perpendicular to the magnetic field. A precise description of the gold seed artifact on prostate MRSI chemical shift spectra will be reported.

Conclusion: Gold seeds can cause local artifacts in prostate MRSI. Characterization of this artifact will permit more accurate interpretation of the MRSI spectra.