

AbstractID: 13281 Title: Magnetic Resonance Spectroscopy of the Prostate: One Institutional Experience

Purpose: Tumor volume is an important predictor of patient outcome following radiotherapy for prostate cancer. Previously, we have shown that the percentage of adenocarcinoma in the pretreatment biopsy specimen predicts for biochemical failure and local persistence of disease following radiotherapy. The purpose of this study is to determine the correlation of magnetic resonance spectroscopic imaging (MRSI) to the percentages of adenocarcinoma in pretreatment biopsy and the predictive ability of the former.

Method and Materials: Twenty two patients underwent transrectal ultrasound guided biopsy of the prostate and MRSI. For each patient, the percentage of adenocarcinoma (PAC) was calculated using a weighted average of the core length involvement in the specimen from each of six regions, namely, the right and left half of base, middle, and the apex regions of the prostate. MRSI was performed with a GE 1.5T MRI scanner (typical voxel size is 0.33 cc, TR=1000 ms, TE=130 ms). MRSI data was acquired using the PROSE protocol. Volume-averaged ratio of choline and creatine to citrate (CC/Ci) was taken over the six regions of the prostate.

Results: Unprocessed data show a correlation of 0.31 between CC/Ci and PAC. The sensitivity and specificity of CC/Ci is found to be 70% and 69%. A cutoff value of CC/Ci=1.0 or higher may predict radiotherapy failure. Areas of the prostate with CC/Ci values higher than the cutoff can be boosted to a higher dose or can be used as guidance for performing targeted biopsy.

Conclusion: There is a correlation between the various PAC, predictors of treatment failure, and the CC/Ci. CC/Ci may be able to predict radiotherapy failure or identify areas of the prostate for dose escalation.