Overall, the possibility of sparing the bowel at the cost of extra dose to the bladder and vice versa was demonstrated. The estimated change in primary tumor control for high versus low dose regimens was less than 1% for early stage tumors and approximately 5% for late stage tumors.

Conclusion: There is room in the optimization space for incorporation of patient outcome and toxicity preferences. This opens for SDM for anal cancer patients. The study is to be expanded, with results for a total of 22 patients to be presented at ESTRO 2016.

Poster Viewing : 10: Physics: Functional Imaging II

PV-0473
Diagnostic and predictive values of quantitative analysis on T2-w and ADC map MRI in prostate cancer
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Purpose or Objective: To explore the ability of quantitative prostate T2-weighted (T2-w) and apparent diffusion coefficient maps (ADC) MRI using Haralick texture features: i) to differentiate prostate cancer (PC) from healthy tissues; ii) to be correlated with Gleason score; iii) to predict biochemical recurrence after external beam radiotherapy (RT) for prostate cancer.

Material and Methods: Tumor and prostate zones were segmented on co-registered T2-w and ADC on two pre-treatment 3.0T MRI from 83 patients with a median age 67 years (range 50-82 years) and a median pre-treatment PSA of 9.8 ng/ml (range 3.4-48.0 ng/ml). 9 (11%) tumors were localized in the transitional zone (TZ) and 74 (89%) in the peripheral zone (PZ). Tumors were clinically staged as follows: 13% of T1, 46% of T2 and 41% of T3. Gleason scores were as follows: 6 (27%), 7 (51%), 8 (20%) and 9 (2%). They were 2% of low-risk, 33% of intermediate-risk and 65% of high-risk tumors according to D'Amico risk group classification. Almost all patients received standard treatment consisting in IMRT (100%) with IGRT (94%) associated with hormonal therapy in 53% of the patients. After a median follow-up of 47 months (range 19-65 months), 11 patients had biochemical recurrence. A total of 114 grey-leveled features (first order, gradient-based and second order Haralick texture characteristics) and 4 geometrical features (maximal tumor diameter, maximal tumor perimeter, maximal tumor area and tumor volume) were extracted on normalized T2-w and ADC and were analyzed. Statistical analyses were performed using Wilcoxon signed-rank test, Spearman’s correlation coefficient, Harrell’s C-index, Kaplan-Meier curves and univariate Cox regression analysis.

Results: i) 56 out of 57 T2-w and 46 out of 57 ADC grey-leveled features were significantly different between tumor and prostate tissues in the PZ and 25 out of 57 T2-w and 37 out of 57 ADC features in the TZ (p<0.05). ii) 5 T2-w features and 4 ADC features were significantly correlated with Gleason score, all were Haralick texture features. iii) T2-w features that significantly predicted (p<0.05) biochemical recurrence were: maximal tumor diameter/perimeter/area/volume, Kirsch gradient operator, normalized mean and standard deviation of signal intensity and 3 Haralick texture features (Difference Variance, Contrast, Inverse Difference Moment). Information Measure of Correlation, Sum Average, Sum Variance and Sum of Squares). Only normalized mean value on ADC was significantly predictive of biochemical recurrence.

Conclusion: Quantitative analysis using Haralick texture characteristics on T2-w MRI are good features: i) to differentiate prostate cancer from healthy tissues, ii) for Gleason score assessment and iii) to predict biochemical recurrence after RT. Geometrical characteristics extracted from T2-w are also good predictors of biochemical recurrence after RT.

PV-0474
Comparison of DCE MRI and FMISO-PET kinetic parameters in head and neck cancer patients
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Purpose or Objective: Tumour hypoxia is associated with poor response to radiotherapy. Comprehensive hypoxia assessment through [18F]-fluoromisonidazole (FMISO) PET imaging requires quantitative techniques, such as dynamic acquisition. However, dynamic FMISO PET protocols might be simplified by using DCE-MRI imaging in addition to static FMISO-PET. The aim of this work was to compare FMISO and DCE-MRI kinetic parameters by means of correlation analysis.

Material and Methods: This study was done on N=6 head and neck cancer patients, who were imaged dynamically with FMISO-PET and DCE-MRI on the same day. Images were registered and analyzed for kinetics on a voxel basis. FMISO-