ESHNR 2011 Abstract 2:

Title:
Can histographic analysis of apparent diffusion coefficient help discriminate between benign and malignant nodes in head and neck squamous cell carcinoma?

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Objective:
To investigate histographic analysis of apparent diffusion coefficient (ADC) measurements as discriminators of benign from malignant lymph nodes in patients with head and neck (H&N) squamous cell carcinoma (SCC)

Materials and Methods:
Seventeen patients with H&N SCC staged for nodal disease using anatomical MRI, contrast enhanced CT and ultrasound ± fine needle aspiration gave informed consent for additional MR diffusion weighted imaging (DWI). Axial DWI was performed by short tau inversion recovery (STIR) echo planar imaging and trace weighted images obtained b 0, 50, 100, 300, 600 and 1000. Image analysis was conducted using Jim 5.0. Nodal disease and contralateral benign nodal tissue was contoured and all pixel ADC values within the volumetric regions recorded. Malignant and benign nodal ADC histographic features (kurtosis and skewness) were compared using a student t test. Reciever operating characteristic (ROC) analysis was used to compare the utility of histographic measures for prediction of malignant nodes.

Results:
Median ADC for malignant and benign nodes was 0.928 (range 0.46 to 1.1) and 0.948 (range 0.77 to 1.3) x10-3mm2-1 respectively, with no significant difference between the two groups (p=0.181). Median skewness of malignant (1.07, range -0.29 to 2.84) histograms was significantly higher than for benign (0.23, range -1.329 to 1.14) histograms (p=0.006). There was no significant difference in kurtosis between the two groups (p=0.22). Histographic skewness was a good predictor of abnormal nodes (area under the ROC curve = 0.798).

Conclusions:
Histographic analysis of ADC can help differentiate malignant from benign nodes for patients with SCC of the head and neck.