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Fighting Prostate Cancer with our Eyes Open: Impact of MRI staging on Risk Assessment and Radiation Therapy

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Abstract

Purpose:

The risk of tumor progression and recurrence is an important consideration when treating prostate cancer. Risk assessment includes clinical staging through physical examination and transrectal ultrasound, CT and/or bone scan imaging. Increasingly, multiparametric magnetic resonance imaging (mpMRI) is being used to identify the presence, size and location of dominant intraprostatic lesions (DIL) for novel treatment approaches, such as MR-dose painted brachytherapy. This study was done to determine how frequently risk assessment was changed after mpMRI and to summarize the dosimetric data of DIL coverage for MR-dose painted brachytherapy.

Materials and Methods:

This study was conducted as a retrospective chart audit. Staging information, dosimetric data and demographics were collected from the electronic patient record for prostate cancer patients who had mpMRI staging prior to radiotherapy. Pre- and post-mpMRI risk assessment and dosimetric data were analysed using descriptive statistics. Univariate analyses of demographic and staging information were done to identify factors associated with changes in risk assessment.

Results:

In total, 100 patients underwent mpMRI staging. Before mpMRI, 12 patients were assessed with low risk, 47 with intermediate and 41 with high risk disease. After mpMRI, risk assessment changed for 11 patients; 4 low risk patients changed to intermediate risk and 1 low and 6 intermediate risk patients changed to high risk. On average, reclassified patients had a larger prostate volume (Mean=48.4cc, StDev=10.6 vs Mean=37.1cc, StDev=12.1; p=0.004). Most patients (90/100) had a DIL identified as PiRADs 4 or 5 with an average volume of 5.4 cc. The mean boost D90% and V150% to the DIL were 131 and 69 respectively.

Conclusions:

Risk assessment changed after mpMRI in a small but significant proportion of the patients reviewed in this study. mpMRI is an important tool for the identification of intraprostatic lesions and the accurate staging of prostate cancer patients prior to HDR brachytherapy.

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