Use of multiparametric MRI of prostate in active surveillance cohort of patients with localized prostate cancer in large urology group setting

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Introduction and Objectives: Multiparametric magnetic resonance imaging (mpMRI) has become common in our practice since being introduced in October of 2012. In total, for the purpose of diagnosis and targeted treatment, mpMRI has been performed on over 80 patients. The advanced imaging and collection of data, compared to ultrasound or basic MRI, can lead to the earlier detection of clinically significant tumors of various sizes. The aim of this study was to determine the feasibility of using mpMRI to monitor/reclassify patients with low grade Prostate Cancer (PCa) undergoing Active Surveillance in a large urology practice.

Materials and Methods: This is a retrospective study reviewing the records of 19 total patients following active surveillance (AS) protocol. All patients have been diagnosed with biopsy proven prostate cancer (PCa) and have undergone at least one mpMRI as a means of surveillance. The median total PSA of the group at time of diagnosis was 5.75 ng/ml and the mean age of the group was 64.5 years old. Between the 19 patients, 26 mpMRI tests were conducted, consisting of T2-weighted, diffusion weighted (DWI), and dynamic contrast enhanced (DCE) MRI. Targeted ‘cognitive’ TRUS-MRI guided biopsy was used to locate progression of the PCa and help to determine whether a patient should stay on AS versus choosing more aggressive, definitive treatment. Confirmatory biopsy was also used to determine overall sensitivity and specificity of the mpMRI conducted for suspicious regions of interest (ROI).

Results: The sensitivity and specificity for the group was 67% and 100% respectively. The positive predictive value for the group was 100% while the negative predictive value was 69%. mpMRI was able to detect all clinically significant cancers. It did not detect only some small size lesions (≤5mm) of Gleason score 6 that did not have a relevant clinical value. In four of the 19 cases (21%), patients fit the criteria for reclassification (Gleason ≥7, ≥ 3 new positive cores) out of the AS group. Three of these four patients exhibited clear progression of PCa on mpMRI and elected for more aggressive treatment (Prostatectomy and Radiation therapy). The progression of cancer in the fourth patient was not seen on mpMRI but only after biopsy. This patient elected to stay in AS because of his advanced age.

Conclusion: Despite the limitation of small sample size, mpMRI can be used as an effective diagnostic tool in the AS cohort of a community practice. It can facilitate early detection and progression of suspicious lesion(s) towards clinically significant PCa, thus triggering the start of more aggressive treatment. Further data collection along with a standardized procedure in the setting of a multicenter trial will allow more robust conclusions in the future.