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### UTILIZATION OF MULTIPARAMETRIC MRI IN PATIENTS WITH ELEVATED PSA AND PRIOR NEGATIVE TRUS-GUIDED BIOPSIES: CORRELATION WITH IMAGING-GUIDED TARGET BIOPSIES

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**Purpose:** To assess the value of multiparametric MRI (mp-MRI) in patients with elevated PSA and prior negative TRUS-guided prostate biopsies and to determine the detection rate of prostate cancer (PCa) in these patients by confirmatory imaging-guided target biopsy.

**Materials and Methods:** 536 consecutive men with elevated PSA ( $\geq 4$ ) and prior negative systematic TRUS-guided prostate biopsies underwent mp-MRI. 194 of 536 patients had cancer-suspicious regions (CSRs) at mp-MRI classified as PI-RADS  $\geq 3$  based on PI-RADS v2 by a single experienced reader. 186 of 194 patients underwent confirmatory imaging-guided biopsies (MRI-guided or US/MR fusion-guided) of a total of 208 CSRs. Pathology results, including Gleason score (GS) from the target biopsies, as well as number of prior TRUS-guided biopsies, age, PSA, PSA density (PSAD) and prostate volume of each patient were recorded. Statistical significance of differences in clinical information between patients with positive and negative target biopsies was evaluated.

#### Results

Imaging-guided target biopsies confirmed PCa in 169 of 208 CSRs (81%) in 154 of 186 patients (83%). Among them, 143 CSRs were confirmed to be PCa GS  $\geq 7$  (GS 7, n= 102; GS 8, n=27; GS, 9 n=13 and GS 10, n=1), and the remaining 26 were PCa GS 6. In PI-RADS 5 (n=107), 4 (n=65) and 3 (n=36) lesions, the detection rates of prostate cancer were 97%, 78% and 42%, respectively. The mean number of prior TRUS-guided prostate biopsies per patient was 2.3 (range 1 to 7). There was a statistically significant difference in PSAD (0.36 vs. 0.16) between the 154 patients with tumor and the 376 patients without tumor ( $P \leq 0.001$ ).

**Conclusions:** Mp-MRI is a very useful tool for evaluating patients with elevated PSA and prior negative TRUS-guided biopsies. It helped identify undiagnosed PCa in 29% of our patients (85% of whom had PCa GS  $\geq 7$ ). PSAD may be clinically useful in predicting outcomes from mp-MRI in these patients.