Anterior Localization of Prostate Cancer Suspicious Lesions in 1,161 Patients Undergoing Magnetic Resonance Imaging/Ultrasound Fusion Guided Targeted Biopsies

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Abstract

Purpose: Based on findings in transrectal ultrasound guided biopsy series standard sampling of the prostate targets the posterior/peripheral zone. However, a substantial proportion of lesions that are prostate cancer suspicious and PI-RADS™ (Prostate Imaging Reporting and Data System) 3 or greater on magnetic resonance imaging is located in the anterior segment of the prostate, requiring deeper placement and targeting of the biopsy needle.

Materials and methods: Overall 1,161 patients underwent magnetic resonance imaging/ultrasound fusion guided targeted biopsy. Prostate cancer suspicious lesions on magnetic resonance imaging were dichotomized into anterior vs posterior prostate segments. Patients were stratified by the number of prior negative systematic biopsy sessions. Descriptive statistics included the frequency and proportion of multiparametric magnetic resonance imaging findings and corresponding histological results.

Results: Targeted biopsy was performed in 513 patients (44%) who were systematic biopsy naïve, 396 (34%) with 1 prior negative systematic biopsy and 252 (22%) with 2 or more prior negative systematic biopsies. When patients were stratified by the number of prior systematic biopsy sessions, the proportion with exclusively anterior, PI-RADS 3 or greater lesions on magnetic resonance imaging increased from 3.5% to 9.1% (p = 0.006). Unfavorable 3 + 4 and 4 + 3 or greater primary Gleason patterns were identified in exclusively anterior vs posterior lesions in 31% vs 21% of the 448 patients, of whom 64 had exclusively anterior and 384 had posterior PI-RADS 3 or greater lesions,

respectively, on magnetic resonance imaging. Multivariable logistic regression analyses confirmed these findings.

Conclusions: After multiple previous negative systematic biopsy sessions the proportion of anterior lesions on magnetic resonance imaging increased. Such lesions harbored a greater amount of unfavorable prostate cancer. Therefore, image guidance for precise targeting should be considered, especially after initially negative transrectal ultrasound guided systematic biopsy.