

Value of targeted biopsy in detecting prostate cancer using an office-based MR-US fusion device

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Introduction: Targeted biopsy of prostate lesions identified on MRI may enhance detection of important prostate cancers (CaP). We evaluate CaP detection rates in 171 consecutive men using MR-US fusion targeted prostate biopsy.

Methods: Subjects in this IRB-approved study underwent targeted biopsy either for active surveillance (N=106) or persistently elevated PSA but negative prior conventional biopsy (N=65). Biopsies took place from 3/2010-9/2011. Before biopsy, each man had a multiparametric MRI at 3.0-Tesla that incorporated T2-weighted imaging, dynamic contrast enhancement, and diffusion-weighted imaging. No endorectal coil was used. Lesions on MRI were outlined in 3D and assigned increasing cancer suspicion levels (image grade 1 to 5) by a urologist. A commercial biopsy tracking system was used to fuse the stored MRI with real-time ultrasound (US), generating a 3D prostate model on-the-fly. Working from the 3D model, transrectal biopsy of target lesions and 12 systematic biopsies were performed under local anesthesia in the clinic. Figure 1 displays a sample workflow.

Results: 171 subjects (median age 65) underwent targeted biopsy. At biopsy, median PSA was 4.9 ng/ml and prostate volume was 48 cc. Mean time from probe insertion to last biopsy was ~20 minutes. CaP was found in 53% of men, 38% of whom had Gleason ≥ 7 . 38% of men with Gleason ≥ 7 cancers were detected only on targeted biopsies. Targeted biopsy findings correlated with level of suspicion on MRI (Figure 2). 15 of 16 men (94%) with an image grade 5 target were found to have CaP, including 7 with Gleason ≥ 7 .

Conclusion: Prostate lesions identified on MRI can be accurately targeted using MR-US fusion biopsy in a clinic setting using local anesthesia. Biopsy findings correlate with level of suspicion on MRI. Targeted prostate biopsy has the potential to aid in the selection of patients for active surveillance and focal therapy.

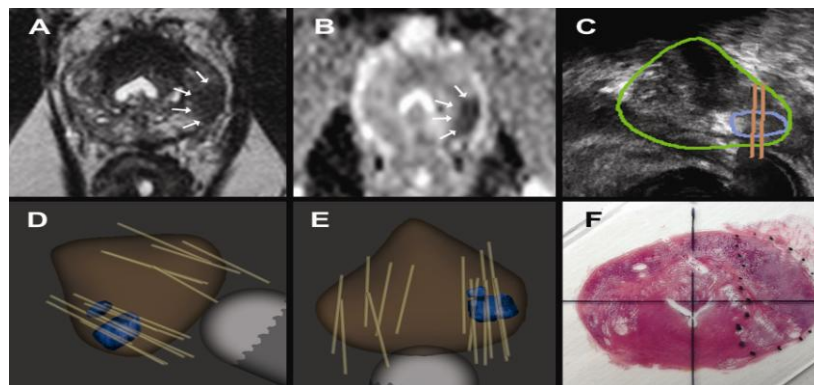
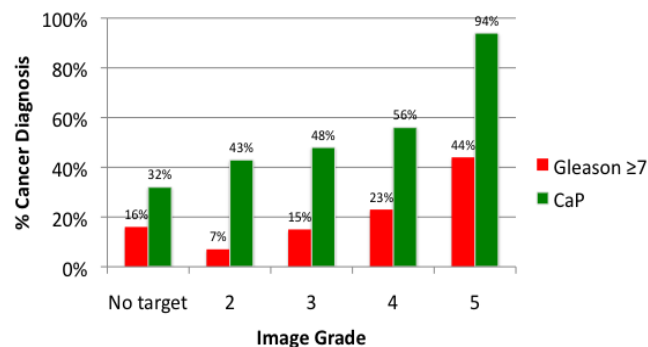


Figure 1



	No target	2	3	4	5
# Patients	19	14	61	61	16
# Any CaP	6	6	29	34	15
# Gleason ≥ 7 CaP	3	1	9	14	7

Figure 2

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