

Magnetic Resonance Imaging-Ultrasound Fusion Targeted Prostate Biopsy in a Consecutive Cohort of Men with No Previous Biopsy: Reduction of Over Detection through Improved Risk Stratification

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Abstract

Purpose: MRF-TB (magnetic resonance imaging-ultrasound fusion targeted prostate biopsy) may improve the detection of prostate cancer in men presenting for prostate biopsy. We report clinical outcomes of 12-core systematic biopsy and MRF-TB in men who presented for primary biopsy and further describe pathological characteristics of cancers detected by systematic biopsy and not by MRF-TB.

Materials and methods: Clinical outcomes of 452 consecutive men who underwent prebiopsy multiparametric magnetic resonance imaging followed by MRF-TB and systematic biopsy at our institution between June 2012 and June 2015 were captured in an institutional review board approved database. Clinical characteristics, biopsy results and magnetic resonance imaging suspicion scores were queried from the database.

Results: Prostate cancer was detected in 207 of 382 men (54.2%) with a mean±SD age of 64±8.5 years and mean±SEM prostate specific antigen 6.8±0.3 ng/ml who met study inclusion criteria. The cancer detection rate of systematic biopsy and MRF-TB was 49.2% and 43.5%, respectively (p=0.006). MRF-TB detected more Gleason score 7 or greater cancers than systematic biopsy (117 of 132 or 88.6% vs 102 of 132 or 77.3%, p=0.037). Of 41 cancers detected by systematic biopsy but not by MRF-TB 34 (82.9%) demonstrated Gleason 6 disease, and 26 (63.4%) and 34 (82.9%) were clinically

insignificant by Epstein criteria and a UCSF CAPRA (University of California-San Francisco-Cancer of the Prostate Risk Assessment) score of 2 or less, respectively.

Conclusions: In men presenting for primary prostate biopsy MRF-TB detects more high grade cancers than systematic biopsy. Most cancers detected by systematic biopsy and not by MRF-TB are at clinically low risk. Prebiopsy magnetic resonance imaging followed by MRF-TB decreases the detection of low risk cancers while significantly improving the detection and risk stratification of high grade disease.

Keywords: biopsy; diagnostic imaging; magnetic resonance imaging; prostatic neoplasms; ultrasonography.

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