

Magnetic resonance imaging guided transperineal prostate needle biopsy in patients without a rectum

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Introduction: Prostate cancer screening with PSA and DRE has been the standard of care. In cases of abnormal DRE or serum PSA, TRUS-guided biopsy is warranted for tissue diagnosis. However, those patients who do not have a rectum pose a diagnostic dilemma. We introduce a novel technique of incorporating magnetic resonance imaging (MRI) into our focal treatment platform to allow for transperineal targeted biopsy of suspicious lesions.

Methods: Two patients who had a total colectomy with the creation of a permanent ileostomy for ulcerative colitis and diverticulitis were referred for elevated PSAs. Both patients underwent initial screening with multiparametric MRI that included T2-weighted, diffusion-weighted, spectroscopy, and dynamic contrast enhanced sequences. Two radiologists independently reviewed and graded any suspicious lesions based on the number of positive sequences (low $\leq 2/4$, moderate $3/4$, or high $4/4$).

The biopsy was performed using in-gantry MRI to locate the lesion. With the patient under conscious sedation and in frog-legged position, a brachy template grid was placed firmly against the perineum. Visualase software (Visualase, Houston, TX) that is currently employed in phase I MR-guided focal laser ablation of prostate cancer allowed for the calculation of the depth of the lesion and the determination of its corresponding location on the grid. Next, a 14-gauge Abbocath titanium trocar with an encasing plastic sheath was inserted into the lesion. Once MRI confirmed correct placement, the trocar was exchanged for an 18-gauge Dynatrim MR-compatible biopsy gun (Invivo, Gainesville, FL). Multiple specimens were taken.

Results: Pathology revealed no evidence of malignancy except for chronic inflammation. No intraoperative complications were noted and blood loss was marginal. Repeat PSAs revealed a decrease in values.

Conclusions: MRI possesses superb ability in soft tissue differentiation and multiplanar capability. Its utility in combination with our focal treatment platform allows for successful and safe targeted biopsy in unique situations.