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Abstract 017

Accurate Prostate Biopsies Using Low-Field Portable Interventional MRI In an Ambulatory Surgical Center

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Introduction and Background: The Promaxo system is a portable, open, and low field Magnetic Resonance Imaging (MRI) system for transperineally (TP) guided prostate biopsy (Promaxo Inc., Oakland, California, United States). It operates at 65 mTesla so does not require additional shielding or other facility upgrades usually needed for high field MRI. To accurately guide and target lesions of the prostate tissue, low-field MRI is co-registered with the T2-weighted (T2W) high-field (3 Tesla) images of the patients.

Methods and Materials: Thirty (30) male patients of age between 48 and 78 years old (67.47.6). The patients' blood prostate-specific antigen (PSA) score were from 1.4 to 16.3 (5.54.0). Prior to the TP procedure under low-field MRI

guidance, the lesions (PI-RADS > 3) were annotated by radiologists on T2W high-field (3 Tesla) MRI. The low-field MRI protocol includes a 1 min of scout and 7 min of 3D-T2W images obtained with a surface coil were used for both high and low-field images. The T2W low-field image, that includes MR visible markers, is used to accurately register with the corresponding T2W images from 3T MRI. Targets for biopsy are assigned with the brachy grade biopsy template that is attached to the patient's perineum. Biopsy was done with patients under general anesthesia.

Results: The cancer detection rate from this limited study at an ambulatory surgical setting is 77% with a Gleason group (GG) of 1 and 2, implying 23 patients were positive among 30 patients. Especially, the PSA of four patients were below 3 but with improved targeting with Promaxo low-field MRI cancers with Gleason score 3+3 was detected enabling the patient to be under active surveillance protocol.

Conclusions: The Promaxo MRI is able to provide biopsy targets accurately, benefitting the patients by mitigating the false negative.



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