Early outcomes of combination MRI-targeted and saturation trans-perineal biopsy in restaging low-risk prostate cancer for active surveillance

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Introduction and Objectives: In low-risk prostate cancer, we evaluate a strategy of combination staging-biopsy (CSB) of robotic transperineal saturation biopsy (rTPB) and MRI-targeted biopsy (MRI-TB) in classifying risk status.

Methods: This IRB-approved, prospective study included men with low-risk prostate cancer (PSA of ≤ 10 ng/ml, Gleason score ≤ 6, clinically ≤T2a) diagnosed on conventional transrectal ultrasound-guided (TRUS) biopsy. Patients first underwent multiparametric-MRI of the prostate ≥ 6 weeks after initial TRUS biopsy. A single dedicated radiologist then marked and assigned a PIRADS score to each suspicious lesion on a 24-sector template grid of the prostate. Biopsies were performed via transperineal route under general anaesthesia with iSR'obot™ Mona Lisa, a robotic platform with maximal coverage of prostate using real-time 3D-ultrasound technology. Systematic rTPB was first performed by a surgeon blinded to the MRI findings. Next, the MRI positive sector was targeted with 6 biopsy cores by a second surgeon. Our primary outcome was upgrading of Gleason score at CSB compared to initial TRUS biopsy. The secondary outcome was proportion of upgrading at MRI-TB compared to rTPB.

Results: The 19 Singaporean men included have a mean age of 65.4 years. The mean PSA at diagnosis was 6.8 ± 2.0 ng/ml and the mean prostate volume was 33.3 ± 12.6 (range 14-60) cc. At rTPB, a mean of 26.9 ± 8.2 cores were taken per patient, with a mean biopsy intensity of 0.85 ± 0.16 cores/ml of prostate. A total of 59 sectors were positive on MRI, of which 17 were PIRADS 5, 24 were PIRADS 4 and 18 were PIRADS 3. On MRI-TB, 14 lesions were Gleason ≥7 and all were PIRADS 5. Overall, CSB up-classified 5 patients (26.3%): 2 by MRI-TB alone, 2 by both MRI-TB and rTPB, and 1 by rTPB alone.

Conclusions: CSB upgrades 26.3% of our patients presumed to be low-risk by initial TRUS biopsy. MR-TB detects 80% of these patients. In patient with PIRADS 5 score, MRI-TB detects all Gleason ≥7 cancers.