P002 Multi-parametric MRI performance using PI-RADS v2 in detecting clinically significant prostate cancer after negative biopsy and persisting suspicion of malignancy

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Introduction & Objectives: This is a prospective cohort study to assess the clinical performance of multiparametric magnetic resonance imaging (mpMRI) to detect clinically significant prostate cancer (csPCa).

Materials & Methods: Between April 2016 and September 2018 a total of 200 men who had their serum prostate specific antigen (PSA) levels rising after a previous negative transrectal ultrasound (TRUS)-guided biopsy, underwent 1.5T prostate mpMRI, reported using the Prostate Imaging Reporting and Data System version 2 (PI-RADS v2), followed by 20-region transperineal template prostate mapping (TTPM) biopsy as a reference standard. The primary goal was to assess the ability of mpMRI to detect clinically significant prostate cancer. Significant prostate cancer was defined by histology as Gleason score ≥4+3 and/or cancer core length ≥6 mm.

Results: Mean (SD) age was 62 years (5.9), median (IQR) PSA was 7.6 ng/ml (5.6-10.9), median (IQR) prostate volume by MRI was 62 ml (46.9-87.5). On TTPM biopsies, 31 patients (15.5%) had clinically significant prostate cancer. 158 (79%) had positive prostate mpMRI using PI-RADS v2 ≥3 with sensitivity of 87.1% (95% CI: 70.2-98.9%) and specificity of 22.5% (95% CI: 16.4-29.5%), negative predictive value (NPV) 90.5% (95% CI: 77.4-97.3%) and positive predictive value (PPV) 17.1 (95% CI: 11.6-23.9%). Overall accuracy calculated by AUROC curve was 0.548 (0.480-0.616). 132 patients (66%) had positive prostate mpMRI using PI-RADS v2 ≥4 with sensitivity of 74.2% (95% CI: 55.4-88.1%), specificity of 35.5% (95% CI: 28.3-43.2%), NPV 88.2% (95% CI: 78.1-94.8%) and PPV 17.4 (95% CI: 11.4-25.0%), AUROC 0.549 (0.462-0.635).

Conclusions: mpMRI using PI-RADS v2 shows high sensitivity in ruling out significant prostate cancer in men requiring a repeat prostate biopsy, though tends to over diagnose cancer.