Comparison Between the Diagnostic Accuracy of Micro-Ultrasound Versus Multiparametric MRI in the Detection of Prostate Cancer: Preliminary Results from a Single-Institutional Ongoing Prospective Trial

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INTRODUCTION
mpMRI and MRI/ultrasound fusion biopsies have been increasing in popularity in patients with suspected prostate cancer (PCas). These methods are however limited by cost ineffectiveness and indeterminate results.

High-resolution micro-ultrasound is a new, promising alternative as it operates at 29 MHz, resulting in higher resolution down to 70 microns, allowing for real time targeting and potentially improved diagnostic capabilities.

OBJECTIVE
Compare the diagnostic accuracy of micro-ultrasound vs mpMRI within a prospective cohort of patients with suspected PCas.

METHODS:
• 24 consecutive patients with at least one mpMRI target ROI (PI-RADS™ ≥3) were enrolled (Figure 2).
• Targeted TRUS-guided biopsy was performed using ExactVu™ micro-ultrasound system (ExactVu™, Exact Imaging, Figure 1), by a urologist blinded to mpMRI results.
• PRI-MUS™ (prostate risk identification using micro-ultrasound) protocol was used to locate targets (PRI-MUS ≥3) (Figure 3, 4).
• All patients also received a standard 12-core random biopsy and targeted biopsy to MRI ROIs.

PRI-MUS 4
PRI-MUS 5

MRI identified 24 patients with targets
11 PI-RADS 3
8 PI-RADS 4
5 PI-RADS 5

Micro-Ultrasound

Identified 17 patients with PRI-MUS ≥3
14 PCa
6 csPCa

Identified 7 patients with no targets
10 benign

Additional 12-core random biopsy and MRI-fusion biopsy

PRI-MUS protocol to locate targets

PRI-MUS 4 micro-ultrasound lesion (suspicious target with smudgy appearance and irregular shadowing). This core was positive on Pathology (GS 7=4+3).

PRI-MUS 5 micro-ultrasound lesion (suspicious target with mottled appearance). This core was positive on Pathology (GS 7=3+4).

MRI assigned this area a PRI-RADS 3 score.

MRI assigned this target a PRI-RADS 5 score.

CONCLUSIONS:
• Micro-ultrasound sensitivity and NPV in detecting csPCa was 100% while specificity was 38.8% (possibility attributed to learning curve).
• Micro-ultrasound appears to be a valuable tool to identify the presence of csPCa in patients with suspected PCa determined by mpMRI.