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

Lughezzani G1, Maffei D1, Lazzari M1, Colombo P2, Lista G1, Cardone P1, Hurle R1, Casale P1, Saita A1, Buffi N1, Guazzoni G1.

Departments of Urology1 and Pathology1, Istituto Clinico Humanitas IRCCS, Humanitas Clinical and Research Center, Rozzano, Italy.

REFERENCES

INTRODUCTION
mpMRI and MRI/ultrasound fusion biopsies have been increasing in popularity in patients with suspected prostate cancer (PCa). 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 PCa.

60 patients each with PI-RADS ≥3 (mpMRI) → High-resolution TRUS ExactVu micro-ultrasound system → PRI-MUS protocol to locate targets → Additional 12-core random biopsy and MRI-fusion biopsy

METHODS:
• 60 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) protocol1 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 micro-ultrasound lesion (suspicious target with mottled appearance). This core was positive on Pathology (GS 7=3+4). MRI assigned this area a PI-RADS 3 score.

PRI-MUS 5 micro-ultrasound lesion (suspicious target with smudgy appearance and irregular shadowing). This core was positive on Pathology (GS 7=4+3). MRI assigned this target a PI-RADS 5 score.

RESULTS:

60 patients with PI-RADS ≥3 (mpMRI) → 47 identified with PRI-MUS ≥3 → 13 identified with no targets

MRI identified 60 patients with targets
14 PCa
18 csPCa
56 benign
6 Unknown
17 PI-RADS 3
28 PI-RADS 4
9 PI-RADS 5

Micro-Ultrasound
Identified 47 patients with PRI-MUS ≥3
8 PCa
17 csPCa
22 benign
6 PCa
1 csPCa
6 benign

CONCLUSIONS:
• Micro-ultrasound sensitivity and NPV in detecting csPCa was 83%, while specificity was 29% (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

REFERENCES