Introduction & Objectives

Active Surveillance monitoring of prostate cancer provides unique clinical challenges in that most patients have low-grade disease which is not well visualized by any common imaging technique.

This study compares high resolution (29 MHz) micro-ultrasound imaging with mpMRI and conventional ultrasound for visualizing prostate cancer in an active surveillance program.

Methods:

• 9 patients on active surveillance were imaged with mpMRI prior to biopsy (Figure 1)

• After target identification with conventional and micro-ultrasound (ExactVu™, Exact Imaging), the mpMRI report was un-blinded and cognitive fusion (using micro-ultrasound) was used to locate targets identified by all modalities. The PRI-MUS™ (prostate risk identification using micro-ultrasound) protocol1 was used to assess micro-ultrasound images, while PI-RADS™ v2 was used for mpMRI.

• Using micro-ultrasound, biopsy samples were taken from targets in each modality, in addition to 12 systematic samples.

Results:

• mpMRI and micro-ultrasound both demonstrated superior sensitivity (p=0.02) to Gleason 7+ cancer compared to conventional ultrasound (Table 1).

• Micro-ultrasound detected 89% of clinically significant cancers, compared to 56% for mpMRI.

Conclusions:

• Micro-ultrasound may be more sensitive to clinically significant prostate cancer than mpMRI, as it visualized nearly all significant mpMRI targets.

• Unlike mpMRI, micro-ultrasound is performed in the urologist office, in real-time during the biopsy procedure, and is more time- and cost-effective.

• Although the sample size is small, the results are promising in illustrating the potential utility of micro-ultrasound as a viable modality for active surveillance.