

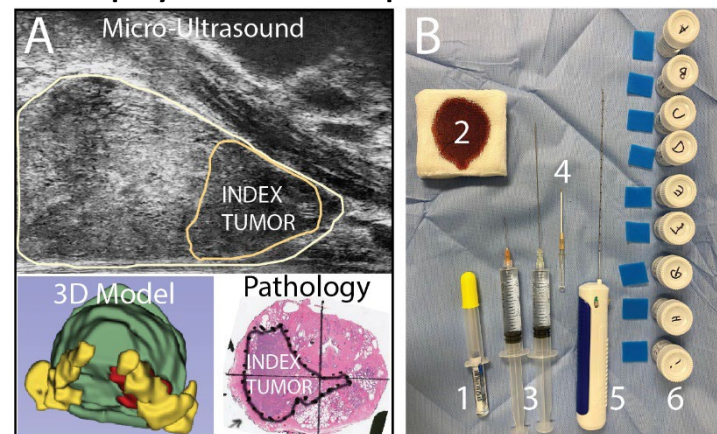
INTRODUCTION

- Conventional ultrasound (US, 5-9 MHz) guided transrectal biopsy cannot differentiate prostate cancer from benign tissue, and thus employs a blind systematic approach. The transrectal approach is associated with an increased risk of infection.
- Micro-ultrasound (Micro-US, 29 MHz) is a novel imaging technology with improved resolution compared to conventional ultrasound and may enable differentiation of cancer from benign tissue. Transperineal biopsy reduces sepsis risk, but is traditionally performed under anesthesia.
- We describe a novel approach for office based Micro-US guided transperineal prostate biopsy.

METHODS

- We performed a retrospective review of patients undergoing Micro-US guided transperineal biopsy at UF. IRB202200022.
- The prostate was scanned with Micro-US and regions of interest (ROI) were graded (PRI-MUS, Figure 3) and biopsied. Additional imaging-negative systematic biopsy was then performed.

Figure 1: A) Sagittal Micro-US image with prostate model + tumor (red), and final pathology. B) Biopsy instruments: 1- rectal lidocaine, 2- Betadine, 3- soft tissue/prostate lidocaine, 4- 14 Gauge Angiocath for 2 site puncture, 5- biopsy gun, 6- pathology containers.



METHODS (continued)



Figure 2: Clinic based transperineal Micro-US biopsy setup.

- Clinically significant prostate cancer was considered > Grade Group 1.
- Cancer incidence was calculated as # positive ROI/# total ROI, with systematic cores treated as image negative ROI's.

RESULTS

- N=21 patients were enrolled between 9/2021 – 1/2022.
- All patients underwent biopsy with local anesthesia without antibiotics, there were no Grade ≥ 2 adverse events.
- Cancer incidence was as follows – PRI-MUS 5: 66% (N=15), PRI-MUS 4: 57% (N=14), PRI-MUS 3: 0% (N=4), Systematic: 21% (N=75)

RESULTS (continued)

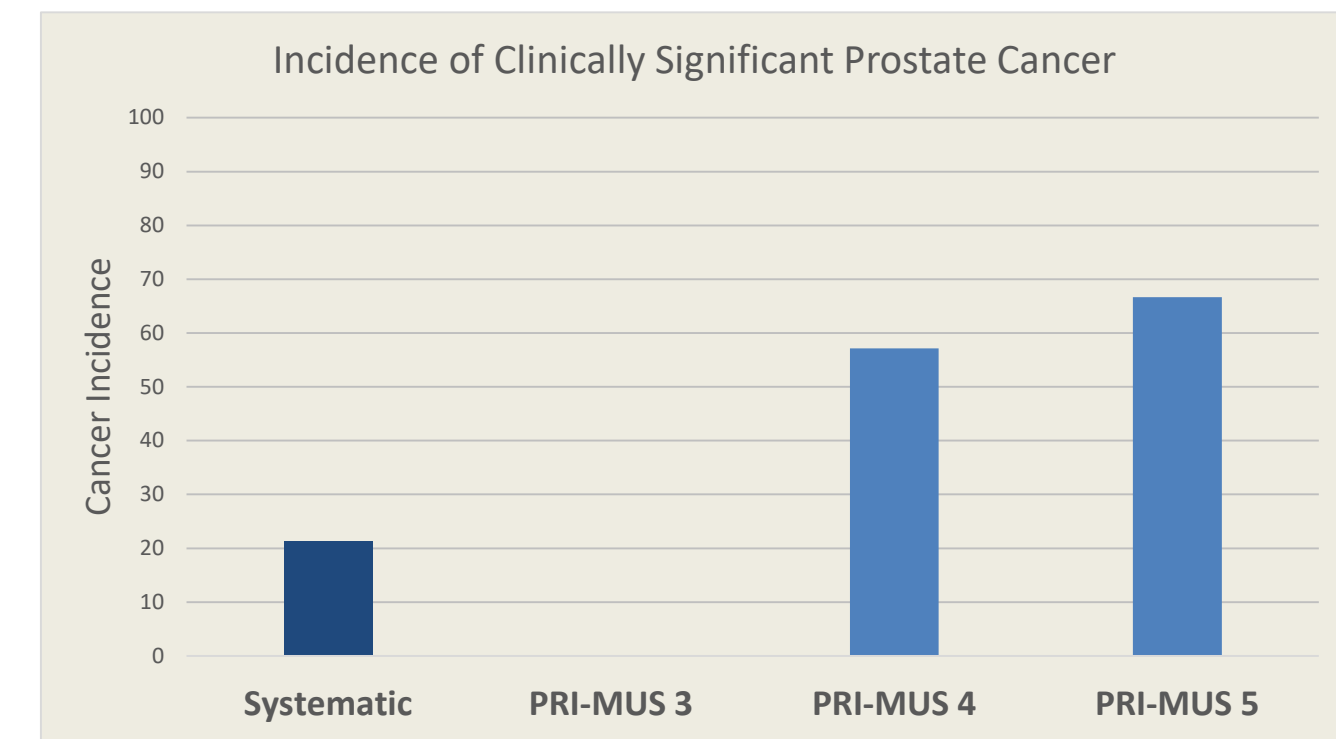


Figure 3: Bar chart with cancer incidence by Micro-US ROI of the target or systematic biopsy. Note that cancer incidence increases with PRI-MUS score. PRI-MUS = Prostate Risk Identification using Micro-Ultrasound, PRI-MUS 1&2 = normal, PRI-MUS 3 = inconclusive, PRI-MUS 4&5 = likely disease. GG=Grade Group (clinically significant cancer = $\geq GG2$).

CONCLUSIONS

- Micro-US guided transperineal biopsy under local anesthesia is technically feasible.
- PRI-MUS ROI's are associated with an increased risk of $\geq GG2$ prostate cancer.
- Systematic biopsy detect around 20% of Micro-US invisible csPCa.
- Further study is needed along with comparison to other imaging technologies such as MRI.

