

Micro-Ultrasound Masterclass

Prostate Cancer Screening with Micro-Ultrasound



Presented By

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Why Screen with Micro-Ultrasound?

1

The Negative Biopsy Conundrum

A patient has an elevated PSA, undergoes biopsy, and it comes back negative — but the uncertainty remains. Could that biopsy have been avoided in the first place?

2

Real-time Risk Evaluation

Micro-ultrasound gives real-time, high-resolution visualization that can inform a patient's risk directly — used alone or alongside PSA and MRI.

3

Backed by Growing Evidence

A rapidly expanding body of clinical data now supports micro-ultrasound's role across the screening and biopsy pathway.

Klotz et al., CUAJ 2020

Study included registry data from **1,040 subjects across 11 institutions** undergoing both mpMRI and micro-ultrasound-guided biopsy.

Micro-ultrasound sensitivity was significantly higher than mpMRI for detecting **Gleason Grade 2+ cancer** and for negative predictive value (NPV).

Modality	Sensitivity	Specificity	PPV	NPV
mpMRI	90% (371/411)	22% (136/629)	43% (371/864)	77% (136/176)
Micro-ultrasound	94% (386/411)	22% (138/629)	44% (386/877)	85% (138/163)
p-value (non-inferiority)	< 0.001	< 0.001	< 0.001	< 0.001
p-value (superiority)	0.03	0.45	0.32	0.04

Non-inferiority and superiority p-values shown vs. mpMRI.

Beatrici et al., The Prostate 2025

- Applied the concept to true screening in **425 men** with a **median follow-up of 39 months**.
- **52.7% of men** were **negative** on micro-ultrasound — of whom **92.4% avoided an MRI**.
- **85.7% of men** with a **negative** micro-ultrasound **avoided biopsy** over the follow-up period, with only 2 cases of missed clinically significant prostate cancer (csPCa).

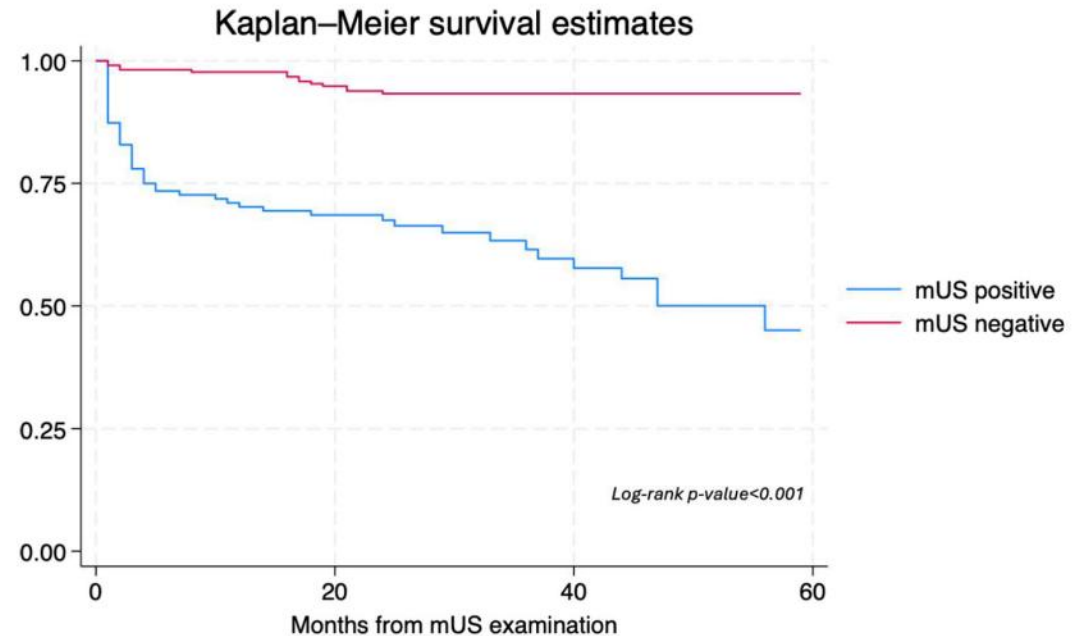
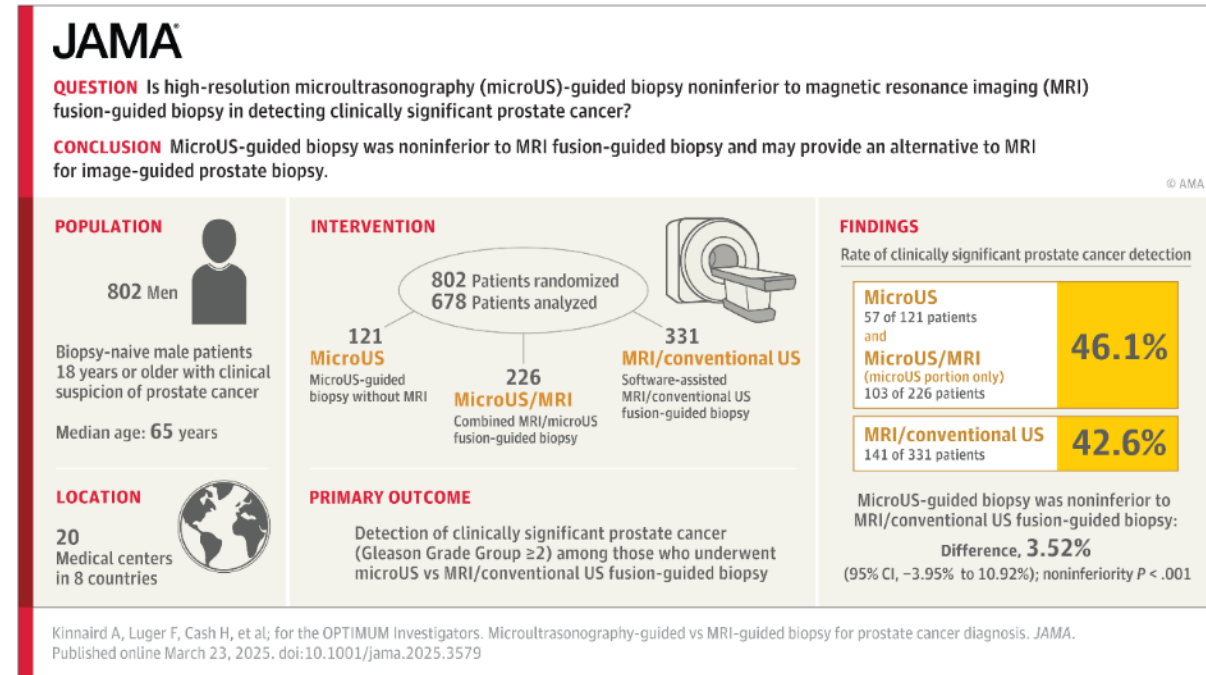


FIGURE 2 | Kaplan-Meier survival curves, illustrating the difference in cancer-free survival between the groups based on mUS results. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

Cancer-free survival (Kaplan-Meier estimates)

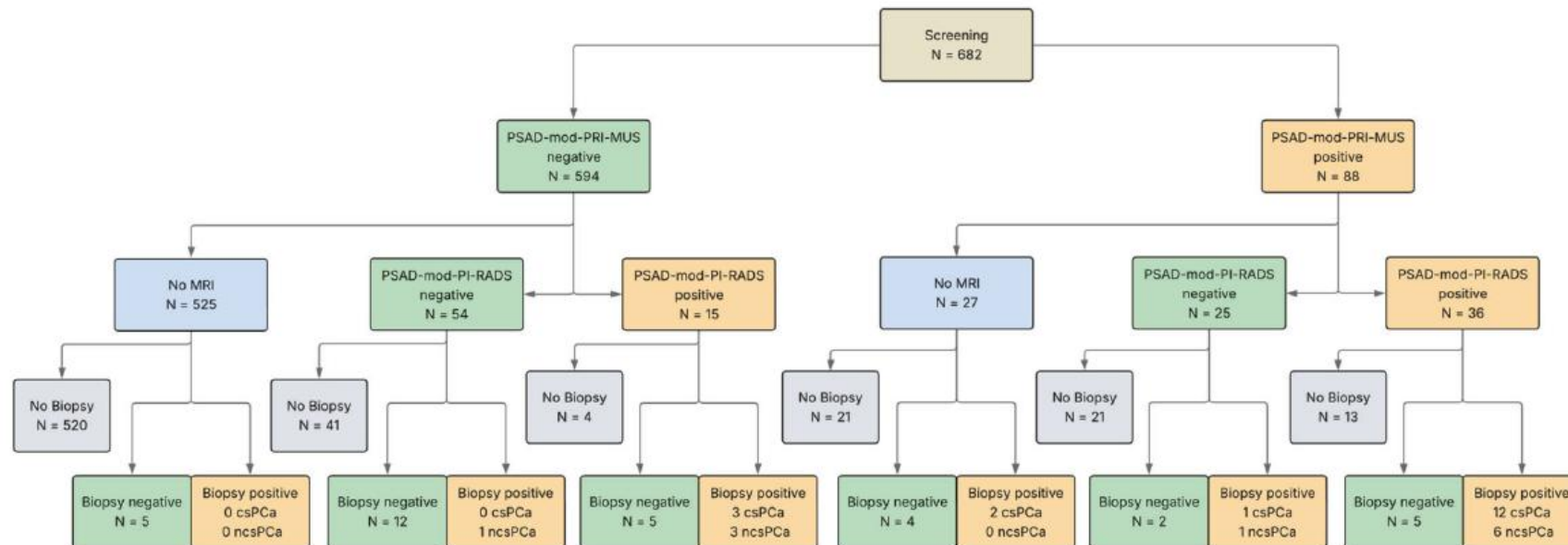
Kinnaird et al., JAMA 2025

- Multi-site, International randomized trial of micro-ultrasound vs. mpMRI-directed biopsy.
- Outcome:** Micro-ultrasound alone was **non-inferior** to MRI-fusion biopsy for csPCa detection.
- Post-hoc analysis:** with a staged approach (initial micro-ultrasound, then MRI when PRI-MUS ≤ 3), **89/226 (39%) MRIs and 54/226 (24%) biopsies** for double-negative cases **would have been avoided.**
- Only 3 cases (1.3%) of csPCa** — all Gleason Grade 2 - would have been missed.



Wendler et al., PCPD 2026

- A large-scale true screening cohort, introducing the PSAD-modified-PRI-MUS score.
- **Biopsy avoided in 45/69 (65%) patients** with a negative PSAD-modified-PRI-MUS.
- Of the 24 patients biopsied, **3 cases of csPCa were found (12.5%)**, all 3 were positive on mpMRI, which could serve as a safety net.
- Of 27 men biopsied with a positive PSAD-modified-PRI-MUS, **csPCa was found in 13 (48%)** and any cancer in 20 (74%).



CLINICAL EVIDENCE

Validated Risk Scales: Peripheral Zone & Anterior/TZ

EXACT+ IMAGING

Assigning a Risk Score (via PRI-MUS) to each Prostate Region
Ghai et al. J Urology 2016

1	2	3	4	5
PRI-MUS 1 Small regular ducts "Swiss Cheese"	PRI-MUS 2 Hyperechoic with/without ductal patches	PRI-MUS 3 Mild heterogeneity or Bright Echoes in hyperechoic tissue	PRI-MUS 4 Heterogeneous "Cauliflower, smudgy or mottled" or Bright Echoes ("Starry Sky")	PRI-MUS 5 Irregular Shadowing, or Mixed-echo lesions, or Irregular Prostate / PZ border
1 "Swiss Cheese"	2 Hyper. ductal patches	3 Mild hetero. bright echoes in hyper tissue	4 Bright Echoes	5 Irregular Shadowing
1 "Swiss Cheese"	2 Hyper. ductal patches	3 Mild hetero. bright echoes in hyper tissue	4 "Cauliflower"	5 Mixed Echo Lesion with Irregular Prostate border
1 "Swiss Cheese"	2 Hyper. ductal patches	3 Mild hetero. bright echoes in hyper tissue	4 "Smudgy/Mottled"	5 Irregular Shadowing
Systematic Biopsy		Target Suspicious Region		

EXACT+ IMAGING

PRI-MUS™ Anterior

HIGH-RISK FEATURES (NO PARTICULAR ORDER OF RISK)

Focal Anterior Lesions	Hypoechoic Finger-like Projections	Storm-cloud	Lesions Occupying the Anterior Horn and Lateral Anterior Prostate

The ExactVu Screening Procedure

- 1 Instill lidocaine in the rectum
- 2 Perform digital rectal exam (DRE)
- 3 Insert probe
- 4 Take volume measurement
- 5 Large/XLarge sweep — apex and base
- 6 Small/Medium sweep — apex and base
- 7 Review findings again after the probe is removed



Clinical Pearls & the Learning Curve

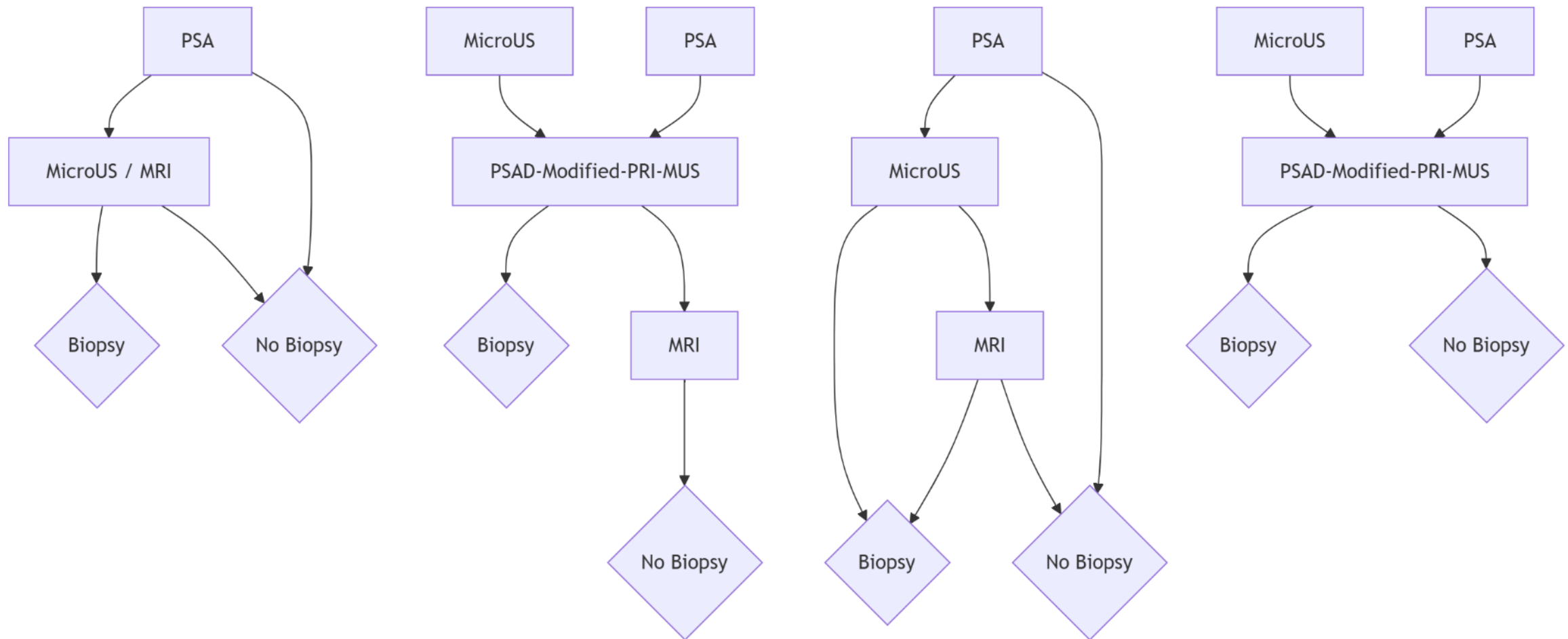
What to Scan

- ✓ Scan everyone — including LUTS patients — to learn what healthy prostates look like, too.
- ✓ Some difficult areas to master:
 - ✓ Chronic inflammation / prostatitis
 - ✓ Symmetric changes
- ✓ Requires a higher skill level than biopsy alone — review the Mastery program.

How to Build Skill

- Compare against MRI
- Compare against pathology for the cases you biopsy
- Review interesting or discordant cases as a team.
- Treat the first cases as a deliberate learning period, not a production line.

Screening Strategies



Four staged approaches combining PSA, micro-ultrasound (MicroUS), and MRI to guide the biopsy decision.

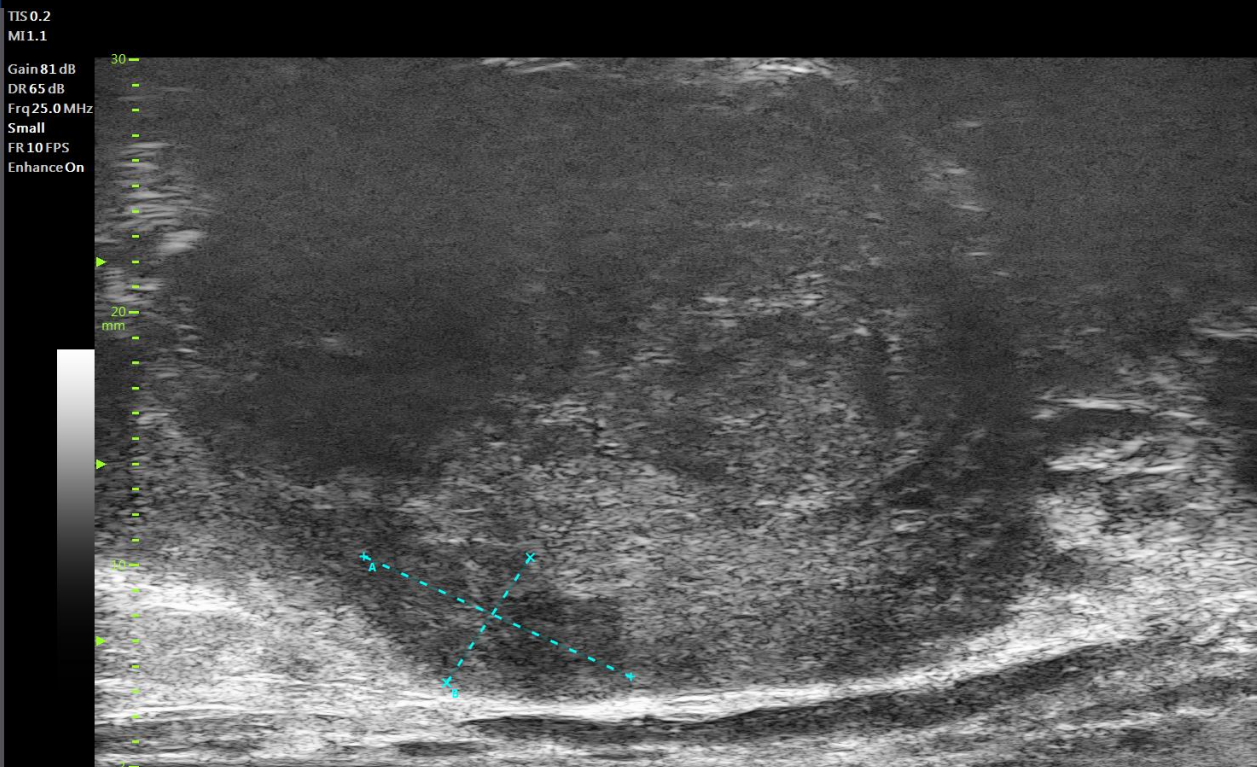
Case One

Patient Background

- Referred by Urologist with PSA of 7.1
- Sent to ProUro for initial analysis without prior MRI or diagnostic imaging
- DRE was negative
- Prostate volume 25 ml, 25 CC
- PRI-MUS 4 lesion identified at left base during examination



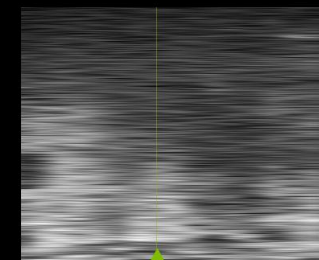
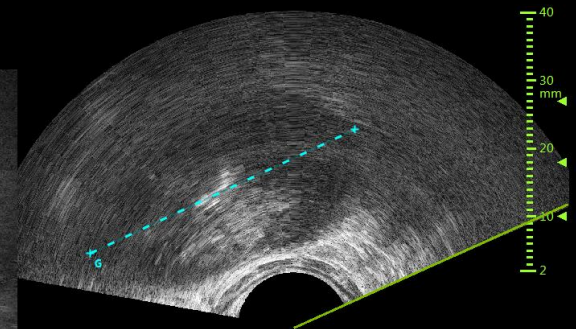
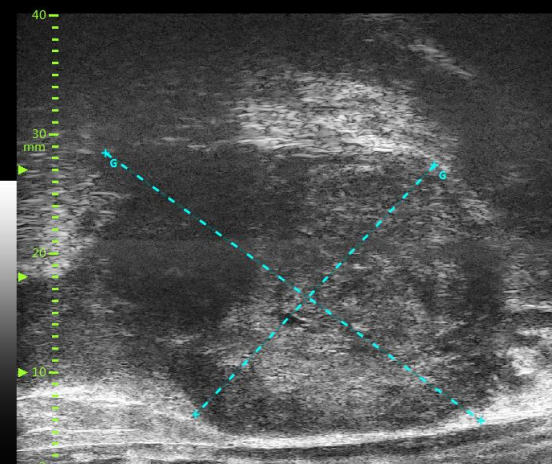
Case One



+ Vol 24.55 cc
GL 1.384 cm
L2 2.88 cm
L3 4.24 cm
PSAD 0.29

TIS 0.1
MI 1.1

Gain 81 dB
DR 65 dB
Frq 25.0 MHz
Medium
FR 93 FPS



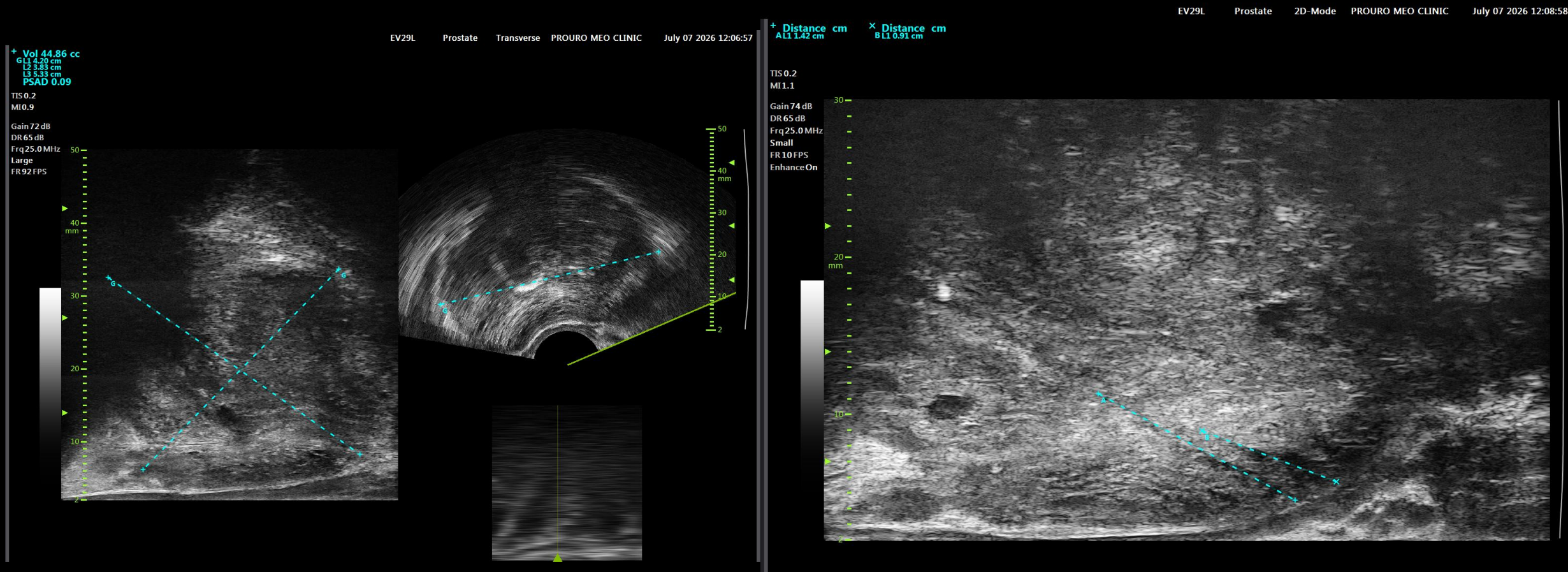
Case 2

Patient Background

- 78 year old male, PSA of 4
- Requested consultation
- Had prior biopsy 4 years ago
- Prostate volume of 45 cc
- BPH nodule changes observed
- 1 ventral lesion on the left mid-gland was observed and was uncertain, but no clear indication of cancer

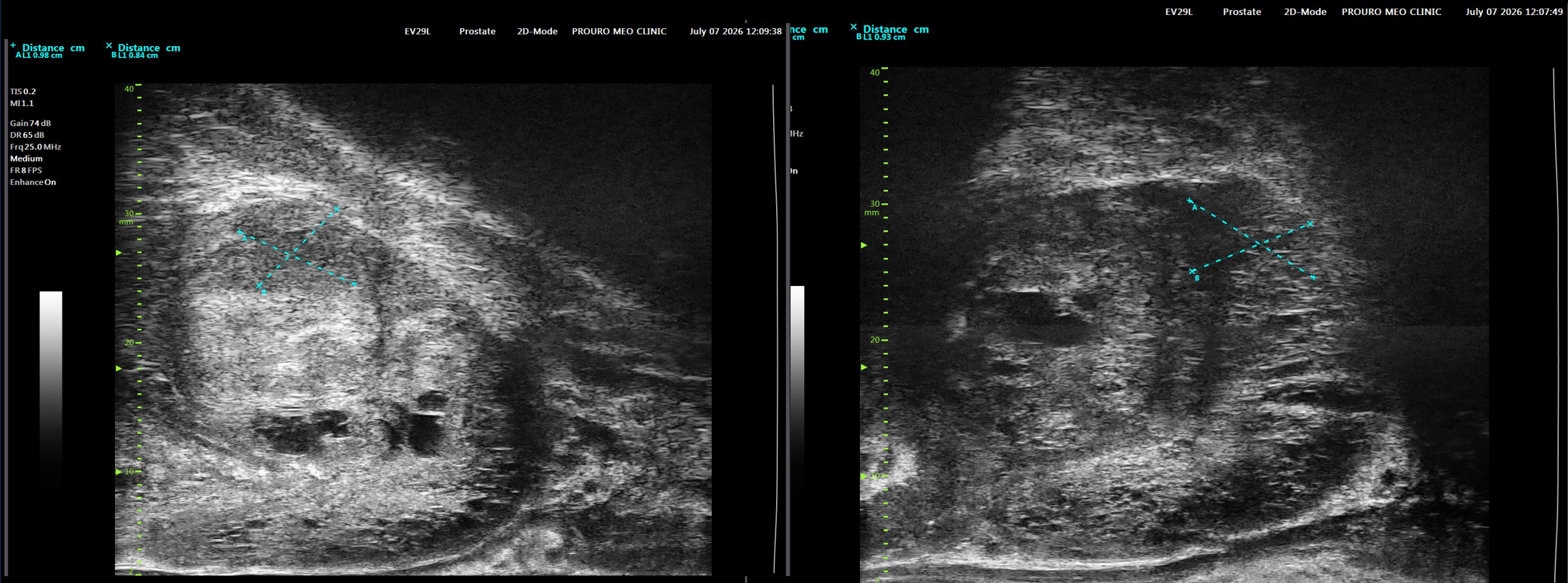


Case Two



Screening Cases

Case Two



Case 3

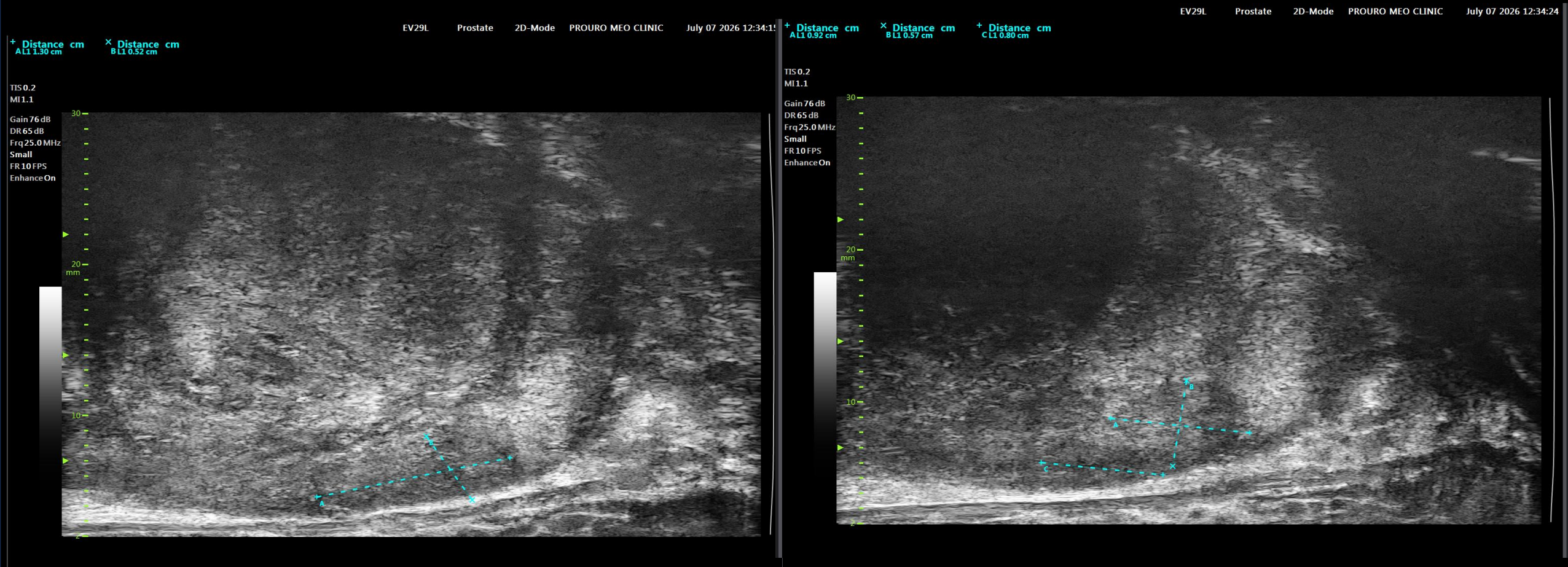
Patient Background

- 56 year old male, PSA of 4.8
- Referred by urologist for micro-ultrasound scan
- DRE detected palpable nodule on right side
- Small BPH nodule identified
- PRI-MUS 4 lateral left apex to left lateral observed
- PRI-MUS 3 lesion on right apex observed
- No change in peripheral zone



Screening Cases

Case Three



Case 4

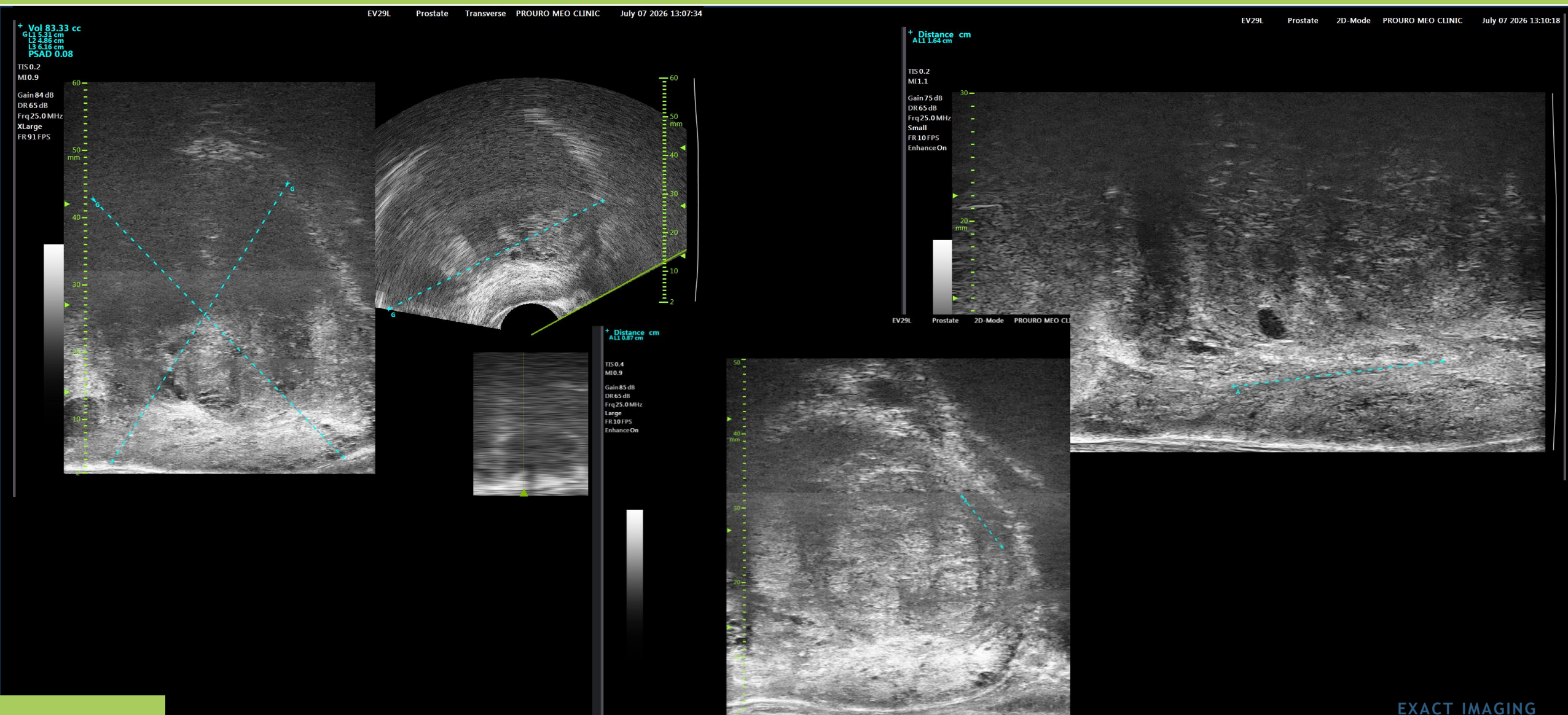
Patient Background

- 69 year old, patient of ProUro
- PSA of 5.6 rose to 6.5 necessitating the micro-ultrasound scan
- Prostate volume of 85 cc
- Known large BPH
- Slight changes to ejaculatory duct observed
- No areas of cancer observed



Screening Cases

Case Four



Key Takeaways

1. Micro-ultrasound gives patients a **direct, real-time read on risk**, reducing unnecessary MRIs and biopsies without missing clinically significant disease.
2. The **evidence base** spans registries, randomized trials, and true screening cohorts, and it **continues to grow**.
3. Skill builds through **Mastery level training with micro-ultrasound**, structured comparison with MRI and pathology, and by reviewing difficult cases as a team.
4. Staged strategies **combining PSA, micro-ultrasound, and MRI** offer a practical, **flexible screening pathway for any practice**.

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Thank You

Q&A