Prostate Biopsy using Micro-Ultrasound and Fusion **Biopsy of the Prostate - True Precision?**

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BACKGROUND:

CHARITÉ

The PRECISION study was able to show that sole targeted fusion biopsy is superior to systematic biopsy. However, the combination of an MRI / US fusion biopsy with a systematic biopsy results in a maximized detection rate of significant carcinomas. The use of a micro-ultrasound system with improved resolution allows the evaluation of additional tumor-related foci, offering the option of further optimizing fusion biopsy.

METHODS:

- **178** consecutive men presenting for prostate biopsy between February and December 2018
- Biopsy using **ExactVu**^m 29MHz Micro-ultrasound system (*Figure 1*)
 - Micro-ultrasound targets



EXAG

IMAGING

- 10-core systematic samples
- MRI targets (sampled separately)
- Analysis for added value of each biopsy strategy.

Age (years)		70 [64-74]
PSA (ng/mL)		7.8 [5.7-11.9]
Volume (cc)		35.5 [27-50]
pre-biopsy mpMRI		159 (89%)
Max pi-RADS	"normal" / 1	3
	2	4
	3	15
	4	74
	5	63
Prev. Biopsies		99 (46% negative)



Figure 1: Exact Imaging's ExactVu[™] 29 MHz Micro-Ultrasound System

Table 1: Demographics

RESULTS:

Prostate cancer found in **126**/178 (71%) patients

- **88**/178 (49%) **GG > 1**
- 42/178 (24%) GG > 3
- Of the 159 cases with MRI results:
 - MRI targets upgraded the Grade Group in 34 cases (21%) including 11 cases not found with micro-ultrasound (7%)
 - Micro-ultrasound targets upgraded the Grade Group in 46 cases (29%) including 26 not found on MRI (16%)

Only in 5 cases (3%), systematic biopsy alone revealed evidence of significant prostate cancer





Figure 3: Case of a 64 y.o. man on Active Surveillance for GG 1 cancer presenting for follow-up biopsy with PSA 11.4 ng/mL. Pre-biopsy MRI showed a PI-RADS 4 lesion in the Right Transition Zone. This lesion was clearly visible on micro-ultrasound (A, blue arrows). Also visible on micro-ultrasound was an ipsilateral extension of the lesion into the Right Base and Mid Peripheral Zone (**B**, red arrows). Both areas revealed GG 3 on biopsy, all other systematic samples were benign.





Benign all PCa isPCa csPCa

Figure 4: Patient-level biopsy results. Prostate cancer was detected in **71%** of patients, with **49%** of patients harbouring **significant** (**GG** > 1) disease.

CONCLUSIONS:

- Micro-ultrasound leads to an improvement in diagnostic accuracy as a supplement to an MR fusion biopsy
- Future studies will examine whether an entirely targeted approach MRI+Micro-US is feasible and effective.

REFERENCES

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