



American
Urological
Association

Education & Research, Inc.

AUA VIRTUAL EXPERIENCE



PD48-12 Prostate mapping for cancer diagnosis: The Madrid Protocol. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

Moisés Elias Rodríguez Socarrás*, Juan Gomez Rivas, Vanesa Cuadros, Javier Reinoso Elbers, Luis Llanes, Ivan Michel Mercado, Julio Fernandez del Alamo, Pablo Juarez del Dago, Fernando Gomez Sancha
ICUA - Madrid, Spain



American
Urological
Association

Education & Research, Inc.

AUA VIRTUAL EXPERIENCE

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

INTRODUCTION AND OBJECTIVE:

- mpMRI - targeted biopsy is increasingly used as a useful tool to improve accuracy of PCa detection. **Micro-Ultrasound (Micro-US)** is as a new high-resolution imaging system that allows to perform real-time targeted biopsies.
- The aim is to assess **transperineal** prostate biopsy accuracy for PCa detection combining **Micro-US** and mpMRI fusion biopsy during the same procedure.



PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining micro-Ultrasound and mpMRI fusion biopsy.

METHODS:

- ✓ n= 200 patients
- ✓ Transperineal prostate biopsies
- ✓ Micro-US targeted + mpMRI fusion targeted and systematic biopsies in the same procedure.
- ✓ February 2018 - September 2019.

iCUA

INSTITUTO DE CIRUGÍA
UROLÓGICA AVANZADA

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

METHODS:

Parameters assessed:

- ✓ Age, PSA, prostate volume, MRI lesions,
- ✓ PCa, csPCa (ISUP > 1), Gleason Group Grade (GG)
- ✓ Complications according to Clavien Dindo
- ✓ McNemar test and a Logistic Regression Model

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining micro-Ultrasound and mpMRI fusion biopsy.

METHODS:

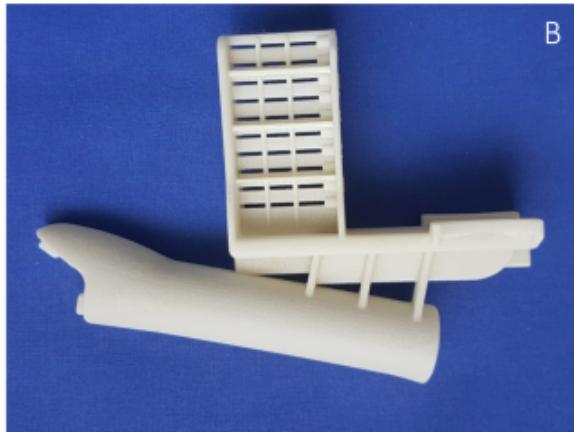
- ✓ TP guide attached to the 29MHz high-resolution Micro-US transducer
- ✓ Transperineal guide
- ✓ Stepper



PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining micro-Ultrasound and mpMRI fusion biopsy.

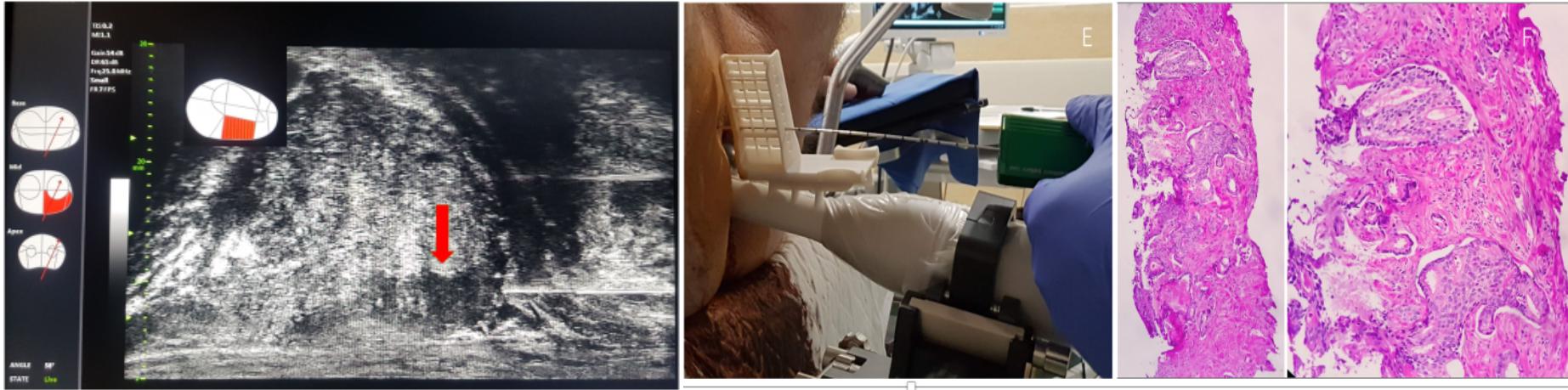
METHODS:

- ✓ TP guide attached to the 29MHz High resolution Micro-US transducer
- ✓ Transperineal prostate biopsy



A = High resolution 29 MHz micro-US transducer, transperineal guide, stepper and console **B** = Transperineal guide; **C** = rotational movements & degrees in transperineal approach

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining micro-Ultrasound and mpMRI fusion biopsy.



D - E = Suspicious area according to PRIMUS scale, identified and biopsied in real time, using micro-US and navigation system; **F** = csPCa finding in cores obtained with the transperineal micro-US guided biopsy.

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

RESULTS:

Table 1 Demographics n = 200 patients

TP prostate Biopsies: Micro-US (Exact-VU) + MRI Fusion Biopsy (FB)

Age, (years) mean [IQR]	62.8 [58.5 - 68.5]
PSA ng/ml mean [IQR]	6.4 [4.7 - 9.1]
US Prostate vol (cc), mean [IQR]	48.0 [32.5 - 67.0]
MRI Prostate vol mean [IQR]	58.1 [36.6 - 81.5]
Positive DRE, n (%)	31 (16.1%)
Previous biopsy, n%	66 (33.5%)
Other test: Select Mdx, PCA3, 4k score (n%)	19 (9.5%)
MRI Yes	192 (96.5%)
MRI Lesions, n; mode (range)	258; 1 [0 - 4]
ASA score, mode	2
Anticoagulant therapy	22 (11.1%)
Prev. prostate surgery n, %	13 (6.5%)



PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

RESULTS:

- ✓ PCa= 57.5 % (115) , csPCa 39.5% (79)
- ✓ Micro-US and MRI targeted taken together detected significantly more PCa and csPCa than systematic biopsies alone ($p<0.001$).

Table 2 Results. n = 200 patients TP prostate Biopsies: Micro-US (Exact-VU) + MRI Fusion Biopsy (FB)

	Micro-US * Targeted	FB * Targeted	Systematic	Mapping (micro-US + FB)	p- value
PCa n,(%)	61 / 200 (30.5 %)	63 (31 %)	76 (38%)	115/200 (57.5)**	* $p=0.24$
csPCa n, (%)	52 / 200 (26%)	55 (27%)	56 (28%)	79 /200 (39.5)**	** $p<0.001$

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

RESULTS:

- ✓ Non-significant statistical difference when comparing mpMRI biopsies vs targeted micro-US biopsies for PCa or csPCa diagnosis ($p=0.24$).

Table 2 Results. n = 200 patients TP prostate Biopsies: Micro-US (Exact-VU) + MRI Fusion Biopsy (FB)

	Micro-US * Targeted	FB * Targeted	Systematic	Mapping (micro-US + FB)	p- value
PCa n,(%)	61 / 200 (30.5 %)	63 (31 %)	76 (38%)	115/200 (57.5%)**	* $p=0.24$
csPCa n, (%)	52 / 200 (26%)	55 (27%)	56 (28%)	79 /200 (39.5%)**	** $p<0.001$

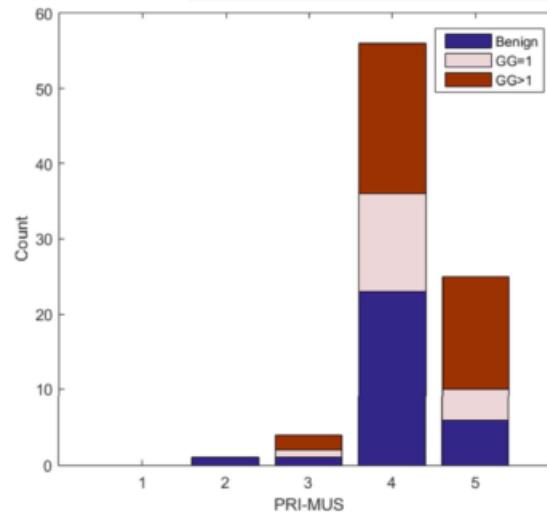
PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

RESULTS:

- ✓ Interestingly **Micro-US found 12/113 (11%) PCa that were missed by all other modalities** and 11 (92%) were csPCa.
- ✓ No fever or clinical infection was observed in any patient, 18 (9%) patients presented minor complications (Clavien Dindo I).

PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining micro-Ultrasound and mpMRI fusion biopsy.

- ✓ Both PI-RADS and PRI-MUS are strong predictors of csPCa



Factor	OR	p-value	VIF
Log10(PSA)	3.264 [13.559 - 0.786]	0.1	1.05
Age/10	1.699 [2.630 - 1.097]	0.02	1.11
DRE	1.453 [3.577 - 0.590]	0.42	1.04
Previous biopsy	0.518 [1.077 - 0.249]	0.08	1.03
PI-RADS 3	0.686 [1.935 - 0.243]	0.48	1.62
PI-RADS 4	0.595 [1.403 - 0.252]	0.24	1.89
PI-RADS 5	6.771 [22.288 - 2.057]	0	1.73
PRI-MUS 3	2.681 [11.439 - 0.628]	0.18	1.28
PRI-MUS 4	1.602 [3.890 - 0.659]	0.3	1.69
PRI-MUS 5	2.397 [6.910 - 0.831]	0.11	1.62

AUC for model with leave-one-out validation = 0.7

Logistic Regression Model (AUC for model with leave-one-out validation = 0.7). Specifically, for PSA >4, PIRADS>3 there is an improvement in detection rate between PRI-MUS 4 and PRI-MUS 5 (36% GG>1 to 60% GG>1).



PD48-12 Prostate mapping for cancer diagnosis: *The Madrid Protocol*. Transperineal prostate biopsies combining **micro-Ultrasound** and mpMRI fusion biopsy.

CONCLUSIONS:

- ✓ This is the first study using a **transperineal approach** for prostate biopsies combining both **Micro-ultrasound** and mpMRI fusion biopsy.

- ✓ Results show high accuracy for PCa and csPCA diagnosis, without infectious complications due to biopsy. The proposed method should be validated in larger randomized clinical trials.