

# ESUR 2018: 25th European Symposium on Urogenital Radiology



## Manual adjustment in mpMRI guided prostate biopsy significantly improves the detection rate of prostate cancer: experience in 400 patients

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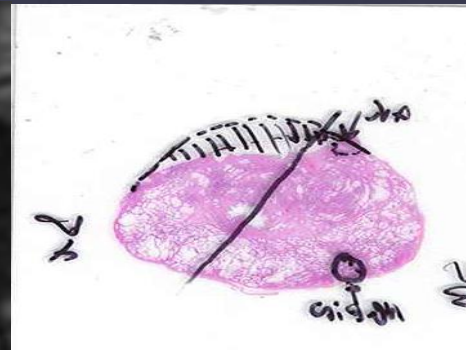
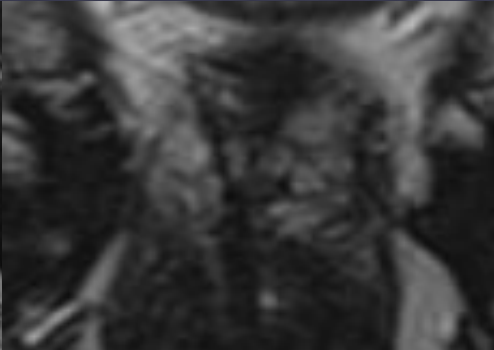
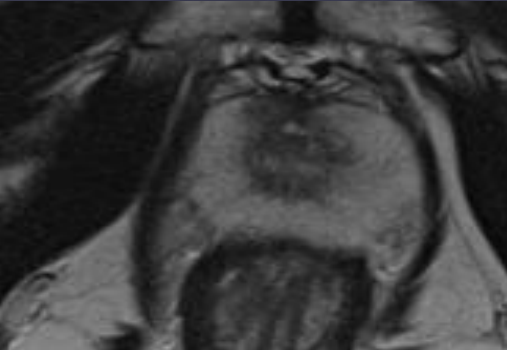
IEO

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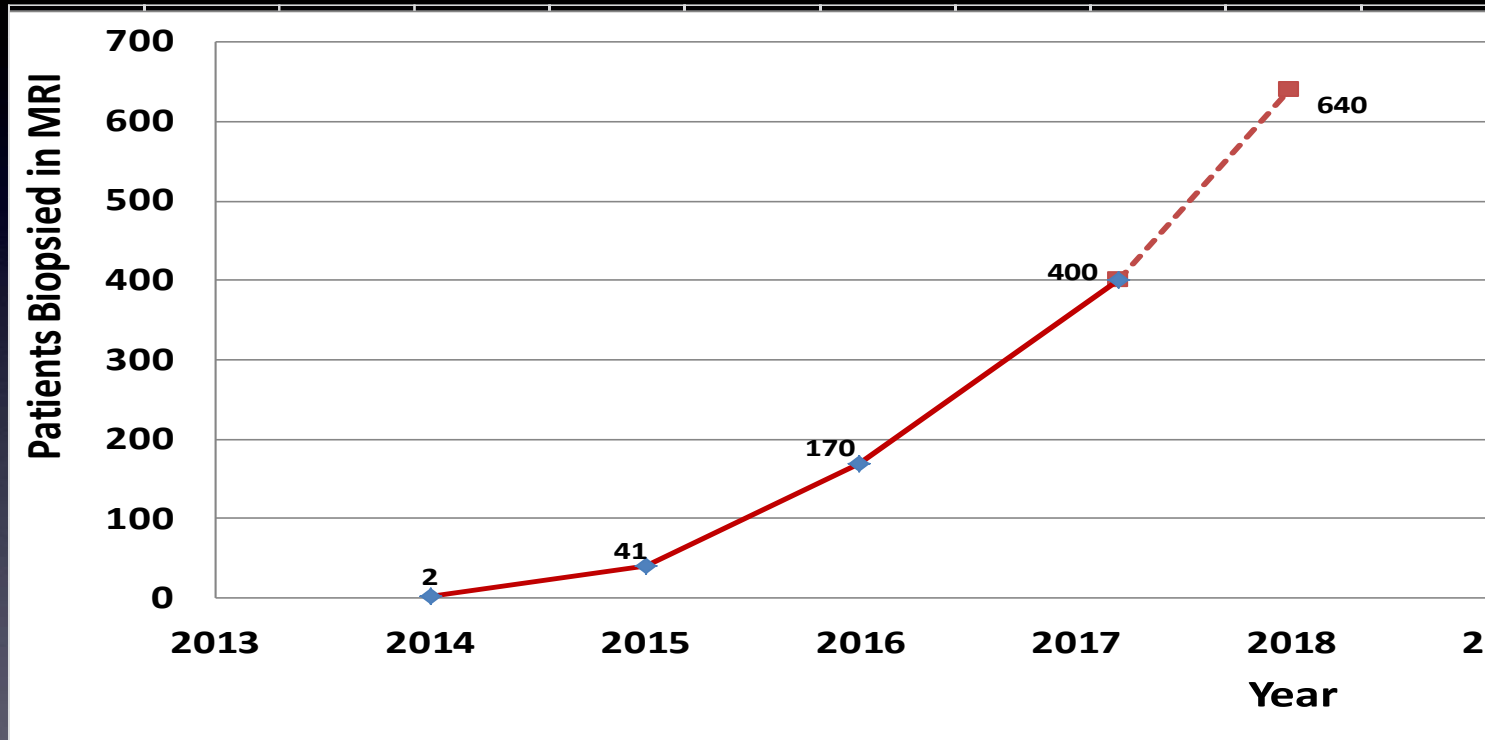
Research  
for care

# PURPOSE

- To compare the results of software-guided sampling with those obtained after manual adjustment of needle position
- To evaluate whether manual adjustment improves the detection rate of PCa.



# Experience IEO – Milan (tot. 506 pts)



Last up-date 31° August 2018

# METHODS AND MATERIALS

- Patients :
  - 402 consecutive patients ( 11/2014 - 02/2018)
    - Suspicious PCa (+/- previous random biopsy)
    - mpMRI
      - Lesion  $\geq$  PI-RADS 3\* (v1 & v2)
  - Two radiologists
    - Senior and junior under supervision

\*study patients 23 pts PI-RADS 2

# METHODS AND MATERIALS

- Technique
  - Dyna CAD and Dyna TRIM : “In-bore” MRI-GB
  - 1.5T (Avanto, Siemens)



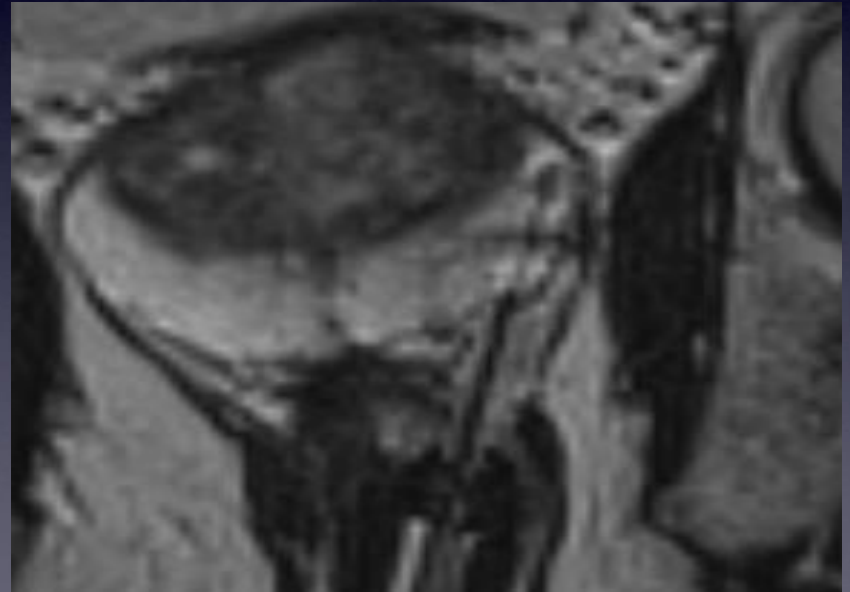
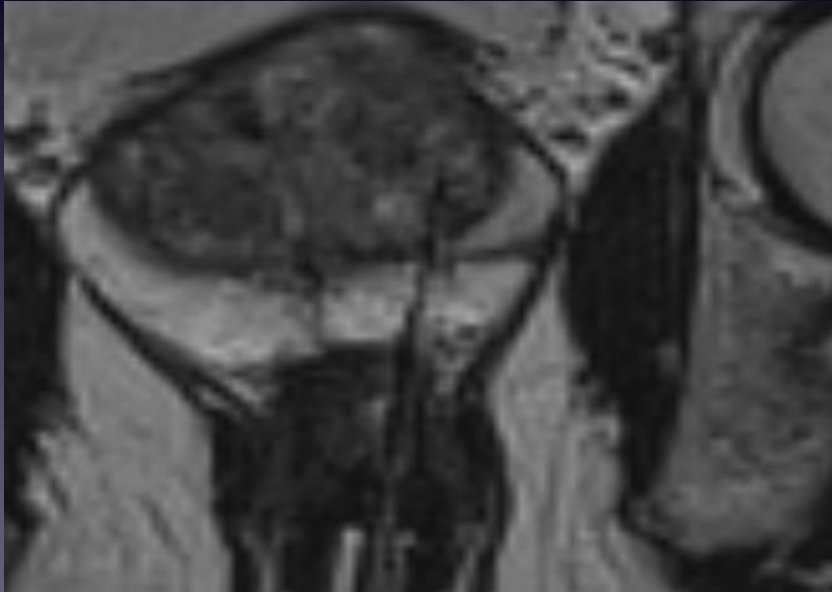
# METHODS AND MATERIALS

- SW guided
  - Dyna CAD 3.3



# METHODS AND MATERIALS

- Manual adjustment
  - Soft tuning



# METHODS AND MATERIALS

- Pathology

- Biopsy sample

- Gleason Score<sup>1</sup>
    - % core involvement
    - Maximum core extension

- Final histology → in operated patients

1. Epstein JI, et al. Am J Surg Pathol 2005;29(9):1228–1242



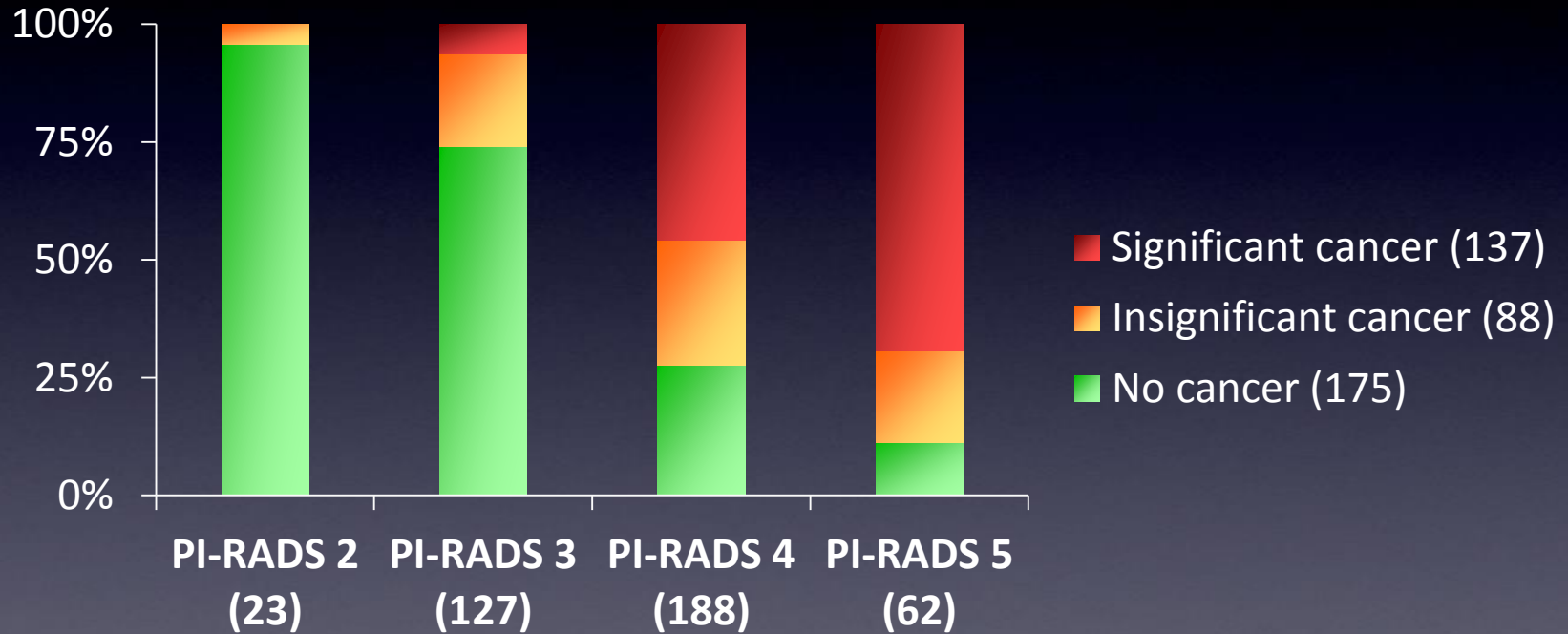
# Results (400 pts\*\*\*)

	Patients	Prostate cancer	
Avg size 10.6mm (4-38mm)		All prostate cancer (%)	Significant cancer (%)*
PI-RADS 2	23	1 (4,3%)**	0 (-)
PI-RADS 3	127	33 (26%)	8 (6.3%)
PI-RADS 4	188	136 (72.3%)	86 (46%)
PI-RADS 5	62	55 (88.7%)	43 (69%)
Total***	400	225 (56%)	137 (34%)

\*\*\*2 local recurrence excluded

\*GS 3+4 or higher, \*\*2 ASAP

# Results in 400 pts\*

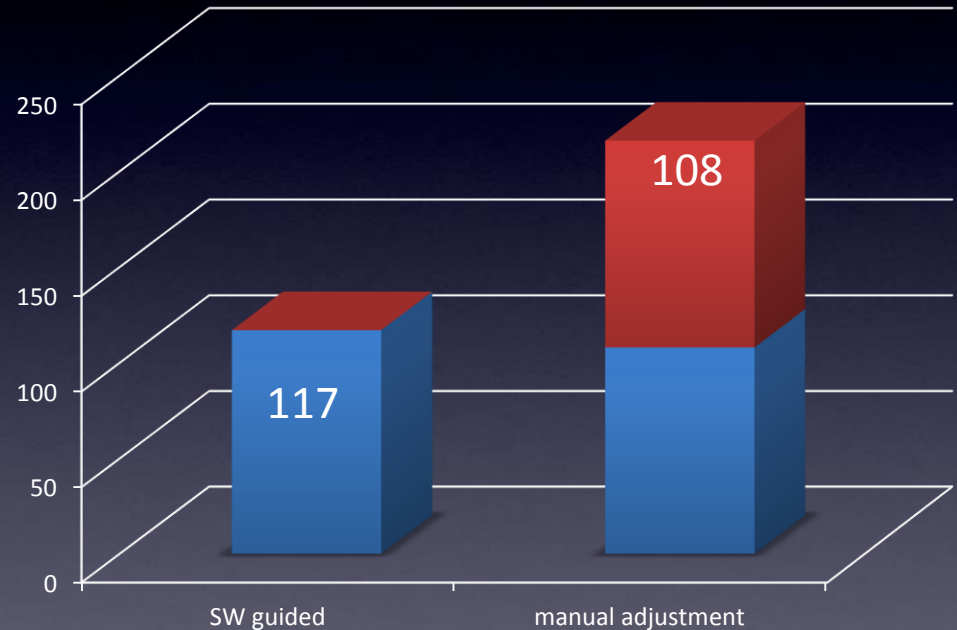


Significant cancer: GI  $\geq 3+4$

\*2 local recurrence excluded

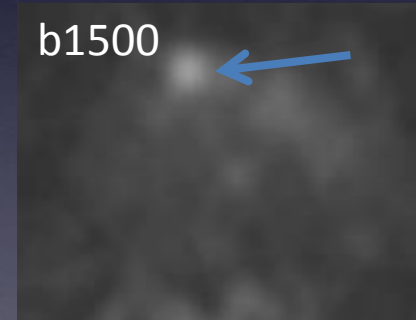
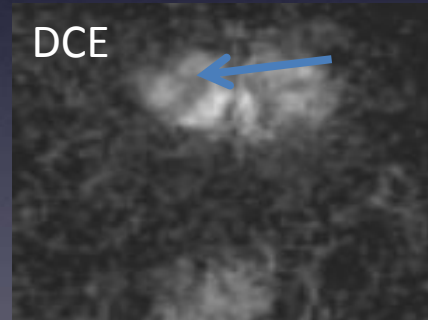
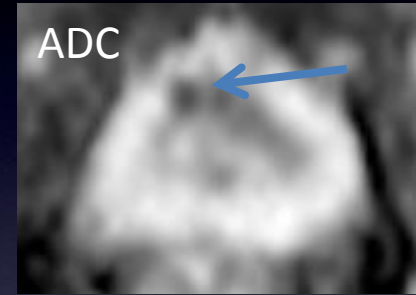
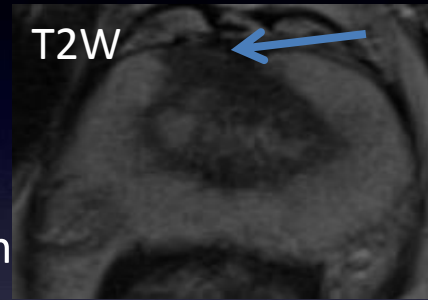
# Results

- PCa → 225/400 pts (56%)
  - Only 117 Pca in core A
  - Additional 108 Pca in cores (B, C, etc...)
    - manual adjustment increased the diagnostic rate of 92.3% ( $p < .0001$ )

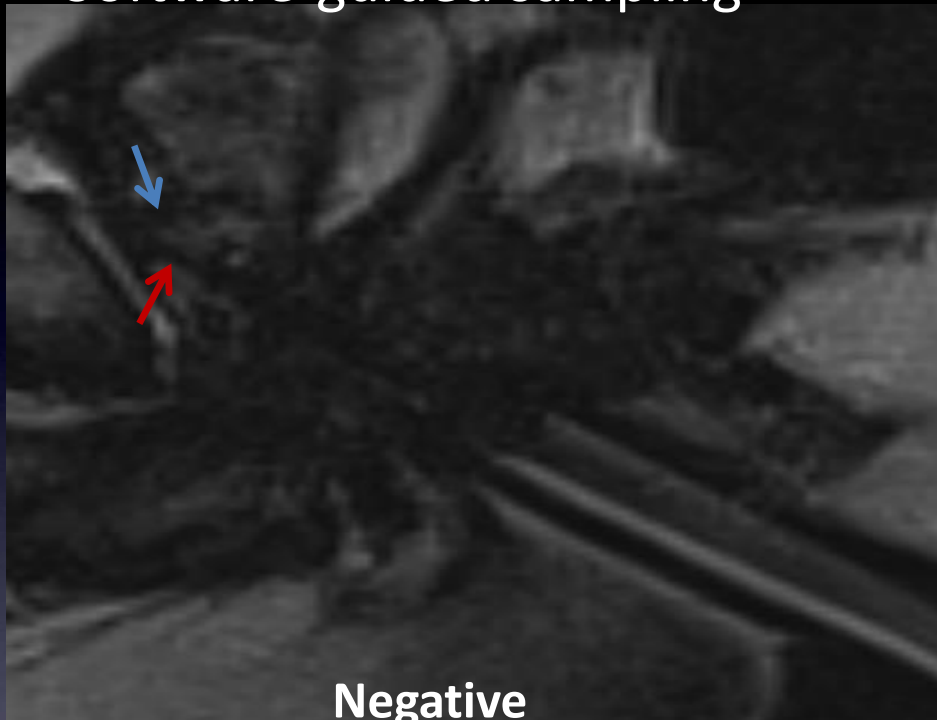


# Case: mpMRI → PI-RADS 4

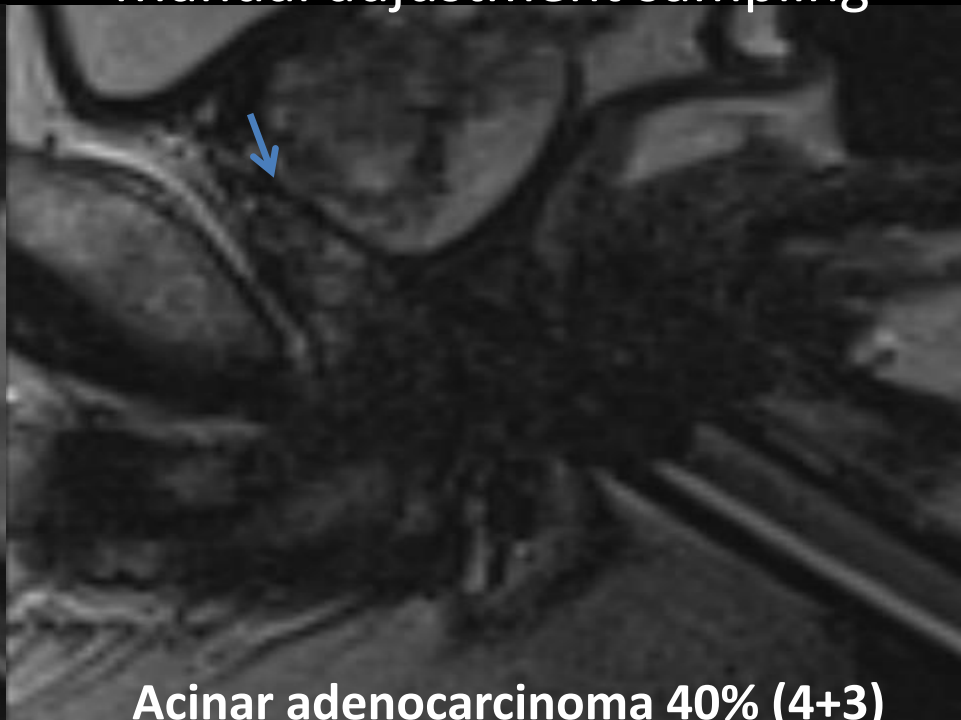
- Lesion (5mm), Rt PZ (mid level)
  - T2W = 4
    - Circumscribed hypointensity <1.5cm
  - DWI = 4
    - Focal markedly hypo- on ADC / hyperintense on DWI <1.5cm
  - DCE = pos
    - Focal early enhancement



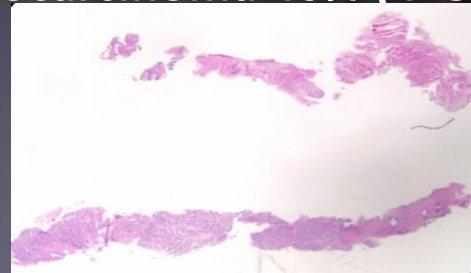
## Software-guided sampling



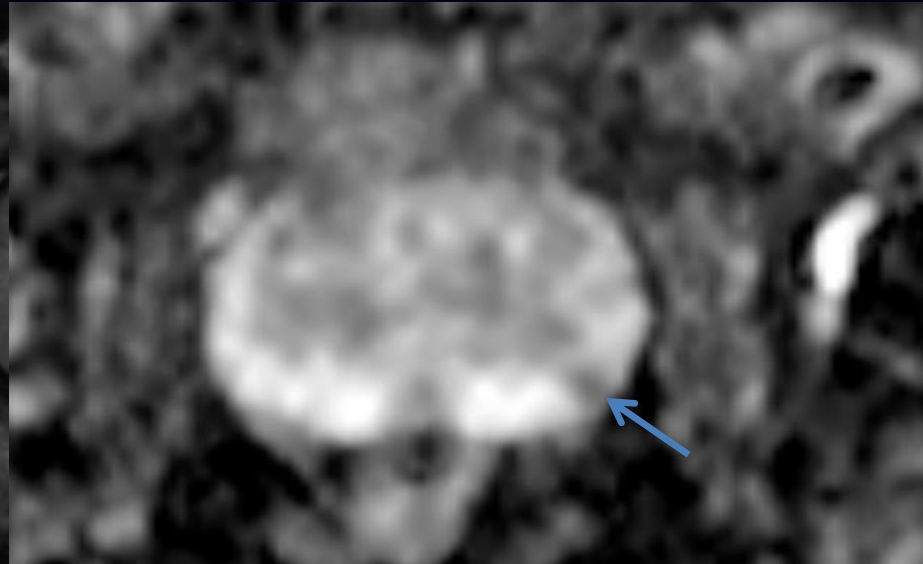
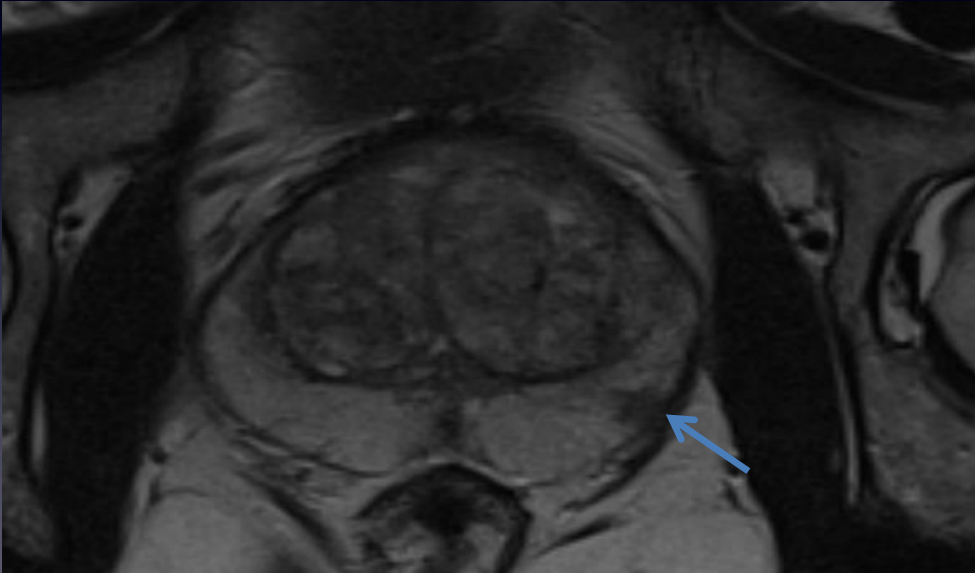
## Manual adjustment sampling



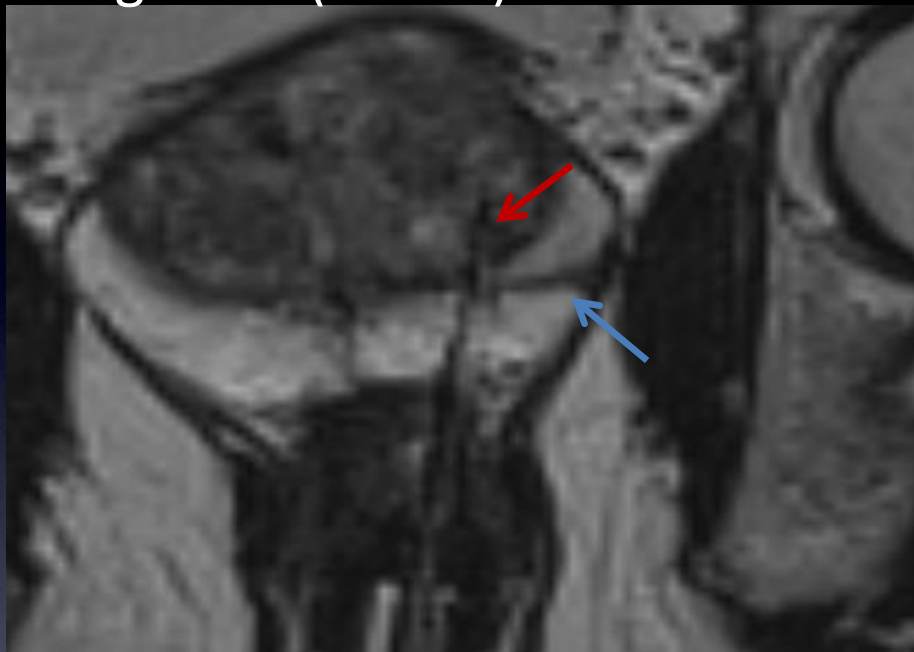
5mm maximum  
linear extension



mpMRI → PI-RADS 4 left PZ



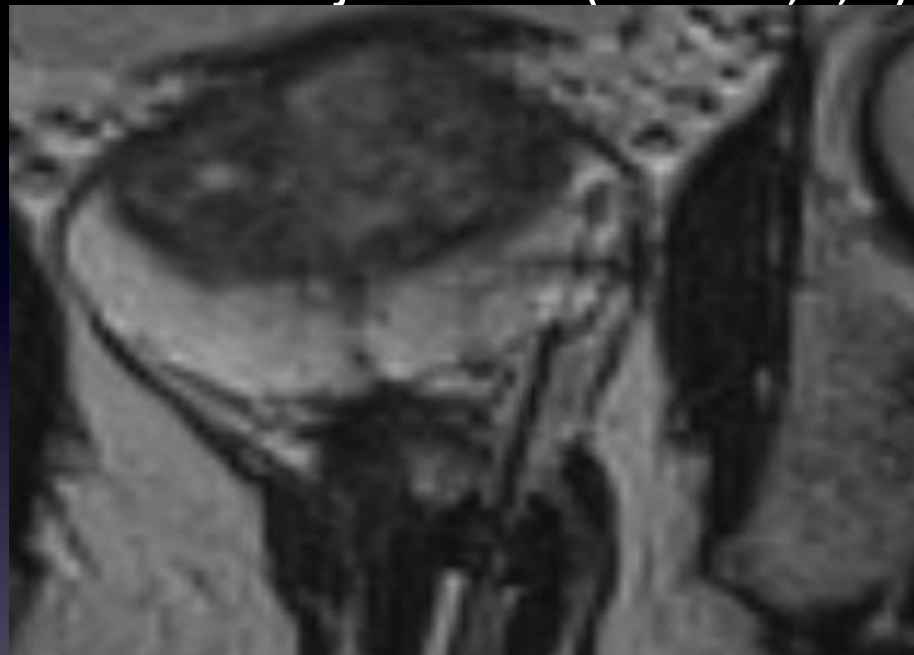
## SW guided (core A)



Normal parenchyma, no evidence of cancer

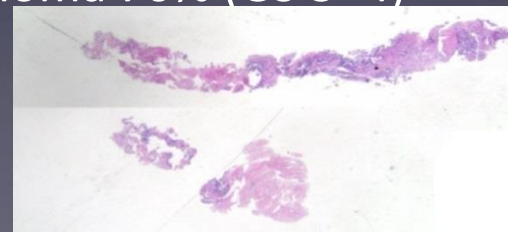
Experience needed for fine tuning

## Manual adjustment (cores B,C,D)



Adenocarcinoma 70% (GS 3+4)

6 mm = max  
linear extension



# Limitations

- Heterogeneous population
  - Naive, previous negative biopsy, AS, different sizes
  - Selection criteria changed over time
    - Depending on local practises (now MR-TRUS available)
    - Now more strict (<10mm, difficult sites, previous -ve biopsy and mpMRI positive)
- Single centre experience
  - Related to operator experience



# CONCLUSION

- Manual adjustment of needle trajectory was *mandatory* to improve the detection rate of PCa with MRI-GB
  - From 117 to 225 pts diagnosed with PCa after manual adjustment
    - 92.3% of improvement in our cohort (108/225 pts )

# THANK YOU

Acknowledgements

Prostate MRI Team (IEO)

G. Petralia, MD, P. Pricolo, MD, P. Summers, PhD