



The diagnostic efficacy of biparametric non-contrast MRI in patients with total prostate-specific antigen level of 4-10 ng/mL: A Multi-center study

Chengyue Jin, Xiao Jin, Can Cui, Linyun Zhai, Wei Yu, Tao Xu*

1. Department of Urology, Peking University People's Hospital, Beijing, China . 2. Department of Urology, Peking University First Hospital

3. Department of Diagnostic Radiology, Peking University Third Hospital, Beijing, China. 4. Department of Immunobiology, Yale University School of Medicine, New Haven, USA.

Introduction

- Multiparametric MRI scan (mpMRI) of the prostate is the imaging study of choice for patients suspected to have prostate cancer (PCa).
- Dynamic contrast-enhanced (DCE) sequence only has an effect on distinguishing PI-RADS 3 and 4 lesions in the peripheral zone.
- Compared to mpMRI, biparametric MRI (bpMRI) excludes DCE sequence, which eliminates the possibility of cerebral deposition of gadolinium-based contrast agents.
- Recent studies proposed that non-contrast bpMRI is a useful diagnostic tool for PCa, also a more economical and safer tool than the current contrast mpMRI.

Objectives

- To test if the non-contrast bpMRI a useful diagnostic tool for patients with total serum prostate-specific antigen (tPSA) level of 4-10 ng/mL. .

Materials & methods

- Retrospective study of biopsy naïve patients.

Inclusion criteria:

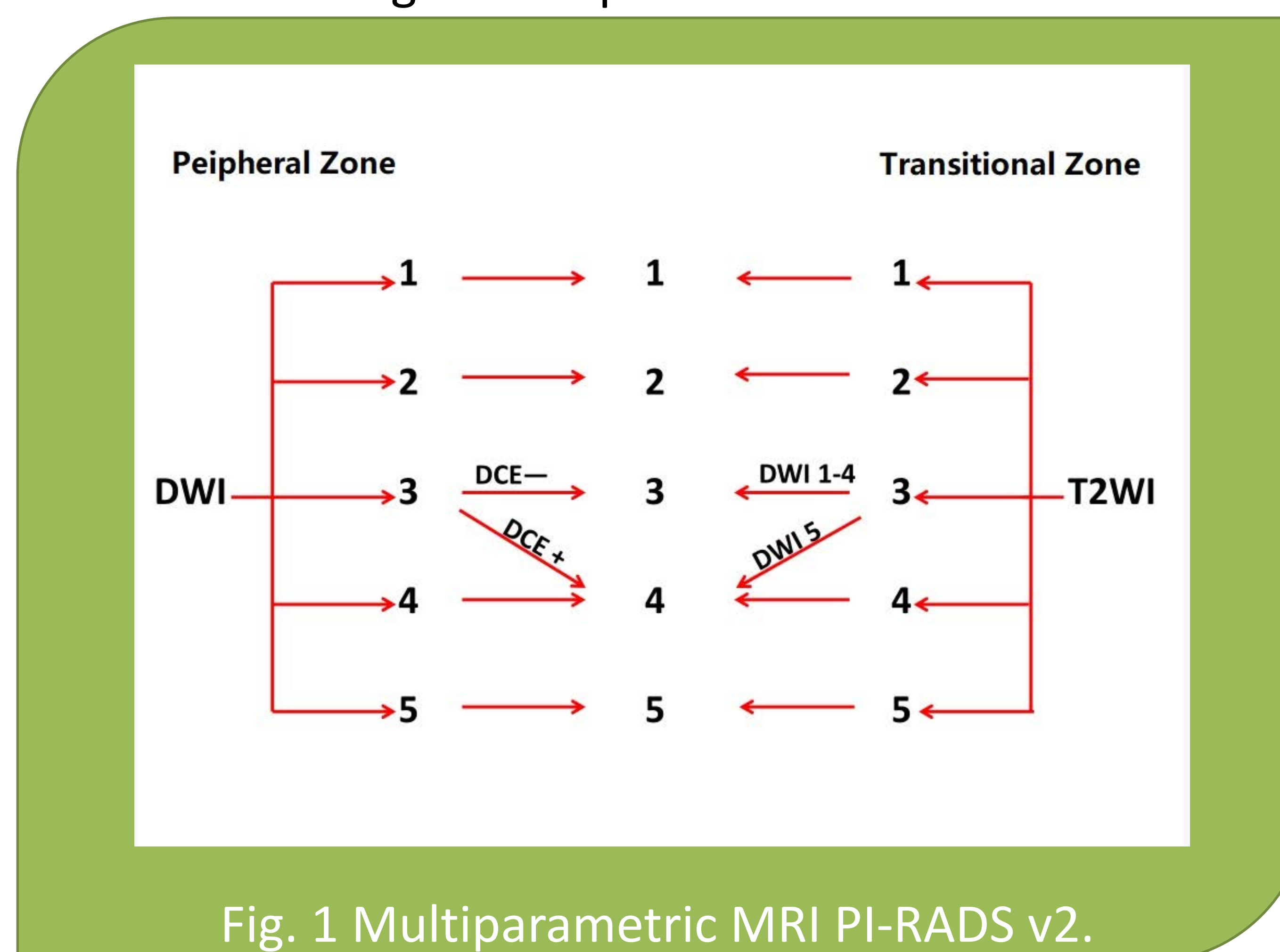
- 1) Underwent TRUS guided cognitive-fusion prostate biopsy at one of our three institutions;
- 2) pre-biopsy prostate MRI was performed within 3 months before the biopsy at one of our two urological cancer centers;
- 3) prebiopsy tPSA was 4-10ng/mL.

Exclusion criteria:

- Previous treatment for prostate cancer (neoadjuvant chemotherapy and/ or androgen deprivation therapy).

MRI sequence:

- MpMRI including T2-weighted imaging, diffusion-weighted imaging and DCE imaging was obtained and scored based upon PI-RADS v2.
- BpMRI PI-RADS score was performed using the same scale excluding DCE sequence.



Results

	Number (%)
Cancer-free	273(63.9%)
Prostate Cancer	154(36.1%)
Clinically Significant PCa	95(22.2%)
Total	427

- Univariate logistic analysis, bpMRI significantly predicts the presence of PCa (Wilcoxon Rank Order test, $p < 0.001$; AUC=0.808) and csPCa (Wilcoxon Rank Order test, $p < 0.001$; AUC=0.822).
- The negative predictive value for bpMRI (PI-RADS 1 or 2) is 96.65% for the prediction of csPCa and for PCa 88.27%.
- The negative predictive value of PI-RADS 3 performed similarly in bpMRI (85%) and mpMRI (87.33%) for csPCa.

Conclusion

- For patients with elevated tPSA of 4-10 ng/mL, bpMRI can identify 96.65% of csPCa and 88.27% of PCa.
- In bpMRI PI-RADS 3 patients, bpMRI had a similar diagnostic efficacy with mpMRI.
- Without the possible adverse effects of contrast agents, bpMRI is a safer and economic alternative for the aforementioned patient group.
- Moreover, in patients with low risk of csPCa, bpMRI without biopsy can be a possible option to avoid unnecessary invasive procedures.

Contact Information:
Chengyue Jin M.D.
charlesjin.pku@gmail.com