

# 17- MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING PRIOR TO SALVAGE RADIOTHERAPY FOR BIOCHEMICAL RECURRENCE AFTER RADICAL PROSTATECTOMY

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## INTRODUCTION

Radical prostatectomy in patients with clinically localized prostate cancer is an effective treatment but may fail in up to 20–40% of the cases. The possible patterns of post-prostatectomy relapse can be local recurrence in the prostatic bed, regional recurrence in the lymph nodes, metastatic disease, or a combination of these.

For salvage radiotherapy to be most effective, treatment should be considered before the PSA level is allowed to rise too high, when disease is more likely to be confined to the prostate bed.

At low PSA levels, current imaging techniques are poor at detecting disease, making it difficult to differentiate local and distant recurrences and to target the radiotherapy appropriately. Usually, site of recurrence is unknown and salvage radiotherapy target volumes of the prostatic bed are based on empirical data and differ between different guidelines. In recent years, multiparametric magnetic resonance imaging (MPMRI) has become more widely used in these settings of patients and it is the only imaging technique recommended by the European Society of Urogenital Radiology to evaluate pelvic recurrence in patients with low PSA levels.

## MATERIALS AND METHODS

We reviewed data on 30 patients with biochemical relapse after radical prostatectomy who underwent to 3 Tesla MPMRI with T2-weighted imaging, diffusion weighted imaging (DWI) and dynamic contrast-enhanced imaging (DCE), from April 2016 to October 2018 at Papa Giovanni XXIII Hospital of Bergamo. Target volume dose was 70 Gy/35 fractions, homogeneously, on prostatic bed in patients without macroscopic lesions on MPMRI while, patients with macroscopic recurrence detected by MPMRI received an integrated boost up to 72 Gy/32 fractions at the recurrent tumor volume and 64 Gy/32 fractions in the remaining prostate bed. We used Chi-Square test to identify any possible relationship between clinical, pathological and MPMRI results.

## RESULTS

Median value of PSA at the time of biochemical relapse was 0,25 ng/ml (range 0,10 - 0,67 ng/ml).

MPMRI was positive in 33,3% of patients.

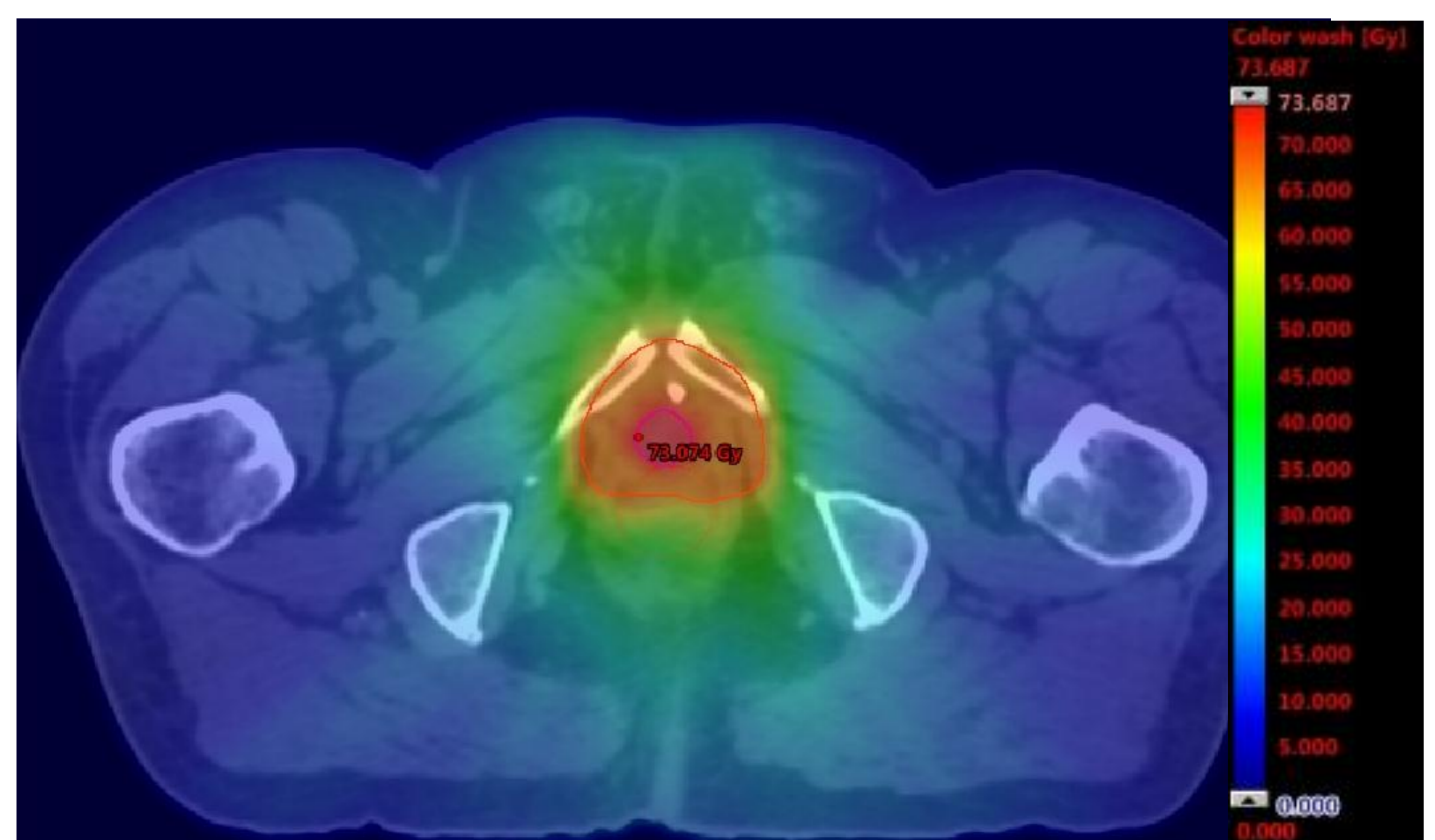
In 1 patient MPMRI showed, at the level of bladder-uretral anastomosis, a vegetative tissue thickening in the bladder lumen which was histologically confirmed to be normal prostatic tissue, so no salvage radiotherapy was performed. In another patient, was detected a dubious macroscopic recurrence in the prostate bed and a bone metastasis, subsequently not confirmed by PET choline, so salvage radiotherapy was performed as standard.

Median PSA value in positive MPMRI was 0,24 ng/ml (range 0,15 - 0,67 ng/ml) and median PSA doubling time was 7,84 months (range 1,77 - 20,76 months) while, in patients without macroscopic recurrence at MPMRI median PSA values was 0,26 ng/ml (range 0,10 - 0,54 ng/ml) and median PSA doubling time was 7,54 months (range 1,55 – 22,32 months). Median PSA velocity was 0,02 ng/ml/y for both positive and negative MPMRI patients.

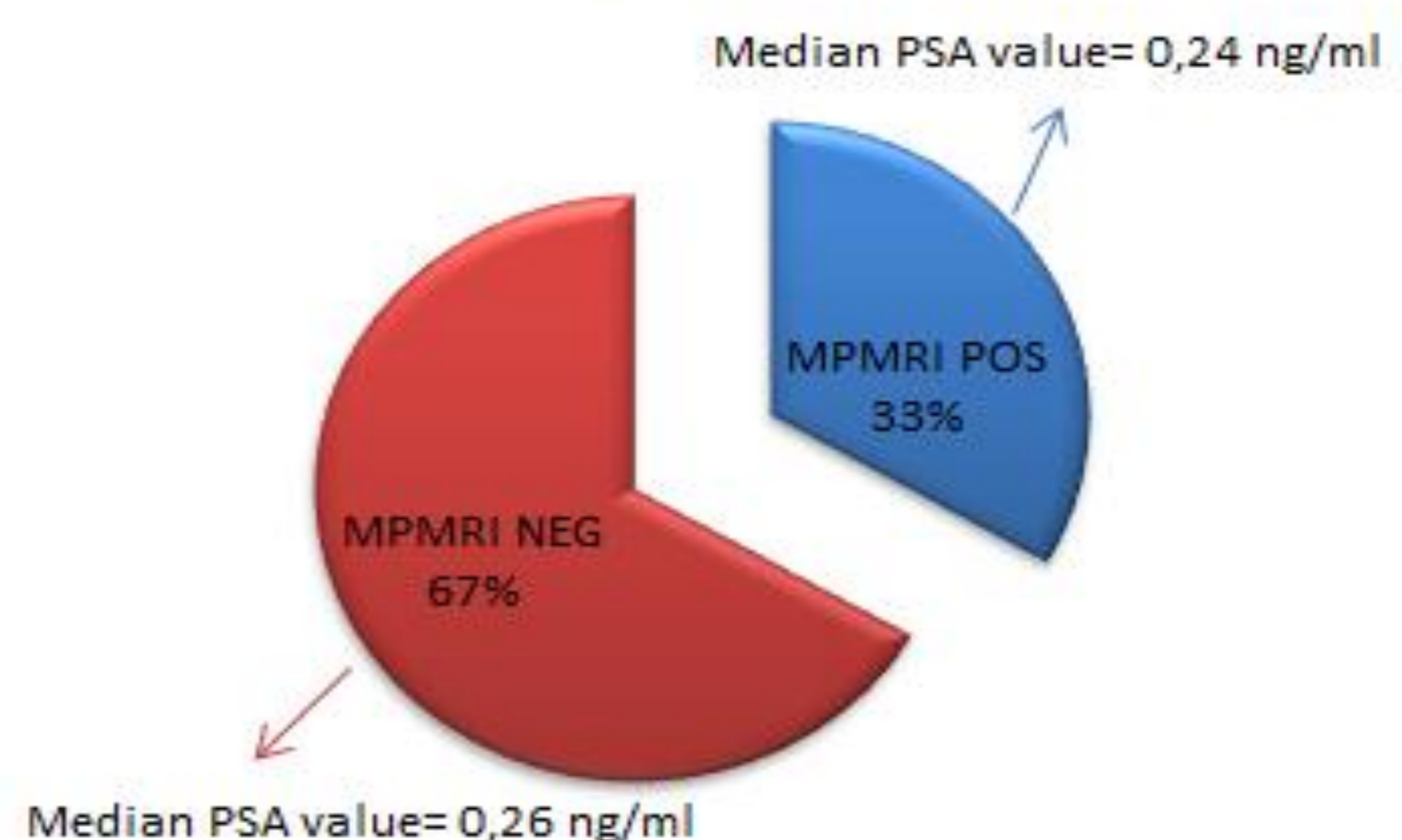
The perianastomotic site was the most common location of local recurrence documented by MPMRI.

Most of patients had pT2c or pT3, pN0 tumors and 70% of patients had Gleason score 7. 60% of patients had positive surgical margins.

We did not find statistically significant differences in clinical and pathological variables between patients with positive and negative MPMRI.



Macroscopic recurrence in prostate bed detected by MPMRI



## CONCLUSIONS

MPMRI could detect the macroscopic site of recurrence nearly in one third of cases (despite low PSA levels) and could be used to counteract target omissions and to improve the accuracy and precision of dose delivery in salvage radiotherapy after radical prostatectomy.

Our results suggest that the information obtained by MPMRI could influence diagnostic and therapeutic choice and could be integrated into the decision-making process for salvage radiotherapy planning.

Further prospective trials are necessary to investigate the utility of MPMRI in salvage radiotherapy as well as the role of dose escalation-desalation protocols.