

(MP74-01) Multiparametric Prostate MRI Structured Report Informs Preoperatively of Risk for Positive Apical Surgical Margins During Radical Prostatectomy

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INTRODUCTION

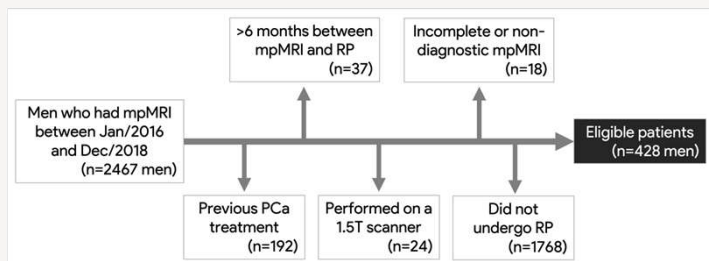
- **Positive surgical margins (PSM)** are an **undesirable surgical outcome**
- **mpMRI** extensively used for PCa detection and staging, potentially underutilized for preoperative planning
- **Apical lesions at greater risk** for PSM

OBJECTIVE

To determine and compare the incidence of PSM in men with vs without lesions flagged as at-risk for apical PSM during prospective mpMRI interpretation

MATERIALS AND METHODS

- **Design:** Single-center, retrospective review of prospectively generated data
- **Eligibility:** Treatment-naïve men with abnormal 3T mpMRI (PI-RADS v2 score ≥ 3) between Jan/2016-Dec/2018 followed by RP within 6mo from MRI
- **Reference standard:** Apical surgical margin status (negative, positive) on whole-mount histopathology
- **Analysis:** Logistic regression with propensity score-weighting to compare the rate of PSM in the two groups (flagged vs non-flagged men) adjusted for confounding variables



RESULTS

- A higher proportion of PSM was noted in flagged (56% [51/91]) compared to non-flagged apical lesions (31%, 41/133; OR: 2.318, 95% CI: 1.571-3.420)
- Other variables associated with higher PSM rate: PSA, PSA density, lesion size, apical location, PIRADS score, grade group and pT stage

Clinical, imaging and histopathological characteristics of men without (non-flagged) versus with (flagged) lesions

	Non-Flagged	Flagged	All	p-value ²
n	79% (337/428)	21% (91/428)	100% (428/428)	NA
Age ¹ , years	63.7 ± 7.3	64.3 ± 7.6	63.8 ± 7.3	0.5595
PSA ¹ , ng/mL	9.0 ± 9.6	12.3 ± 3.4	9.7 ± 17.9	0.2153
Prostate volume ¹ , cc	43.3 ± 21.1	44.5 ± 23.1	43.6 ± 21.5	0.8179
PSA density ¹ , ng/mL/cc	0.2 ± 0.3	0.3 ± 0.3	0.2 ± 0.3	0.7396
Index lesion size ^{1,3} ,mm	16 ± 9	20.1 ± 11.4	16.9 ± 9.7	0.0002
Apical location	No	NA	48%(204/428)	NA
	Yes	100%(91/91)	52%(224/428)	
PI-RADS v2 score	3	5%(16/337)	1%(1/91)	0.0102
	4	47%(158/337)	33%(30/91)	
	5	48%(163/337)	66%(60/91)	
NS approach	No	46%(154/337)	46%(42/91)	1.0000
	Yes	54%(183/337)	54%(49/91)	
Grade group	1	5%(17/337)	3%(3/91)	0.5714
	2	54%(182/337)	48%(44/91)	
	3	23%(76/337)	23%(21/91)	
	4	6%(20/337)	7%(6/91)	
	5	13%(42/337)	19%(17/91)	
pT stage	2	53%(180/337)	40%(36/91)	0.0385
	3a	33%(110/337)	39%(35/91)	
	3b	14%(47/337)	22%(20/91)	
Surgical margin status	-	69%(232/337)	44%(40/91)	<0.0001
	aPSM	31%(41/133)	53% (48/91)	
	oPSM	31%(105/337)	56%(51/91)	

¹ Mean ± standard deviation; other data shown represents number of patients

² p-values calculated using Fisher Exact Test and Wilcoxon Rank-Sum Test

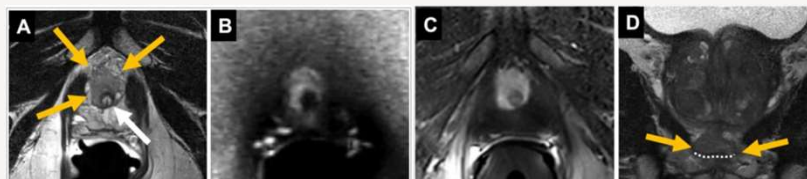
³ MRI-visible index lesion

aPSM, apical positive surgical margin

oPSM, overall positive surgical margin

NA, not applicable

Example of lesion flagged as at-risk for positive surgical margins based on its location in the apical most prostate. Pre-biopsy revealed a 10 mm PI-RADS 4 lesion (orange arrows) encircling the distal most prostatic urethra (white arrow) in the anterior and lateral apex shown by the axial T2WI (A), DWI (B) and DCE(C) images. Coronal (D) T2WI helps delineate the apical most location of the lesion and its contact with the glandular margin (dashed line). Biopsy: GG2 PCa, RP confirmed a pT2 GG2 adenocarcinoma with a positive right apical margin.



DISCUSSION AND CONCLUSION

- **Standardized language** in the structured reports for mpMRI of the prostate helps the preoperative identification of patients at risk for apical positive surgical margins
- This should facilitate appropriate patient counseling and optimize treatment decisions
- Limitations: single-center study, subjective nature of flag, lack of assessment whether surgeons used flag to modify surgical approach