



When Is mp-MRI Reliable in Predicting Extra-prostatic Extension in Prostate Cancer Patients Treated with Radical Prostatectomy Results from a Large, Multi-institutional Series

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Introduction

- Although multi-parametric MRI (mp-MRI) has been proposed for local staging in clinically localized prostate cancer (PCa), it is characterized by suboptimal predictive characteristics which limit its impact on clinical practice.
- However, whether such low performances apply to all men with PCa is still unknown.
- We hypothesized that the performance of mpMRI in the identification of extra-prostatic extension varies significantly according to baseline disease characteristics.

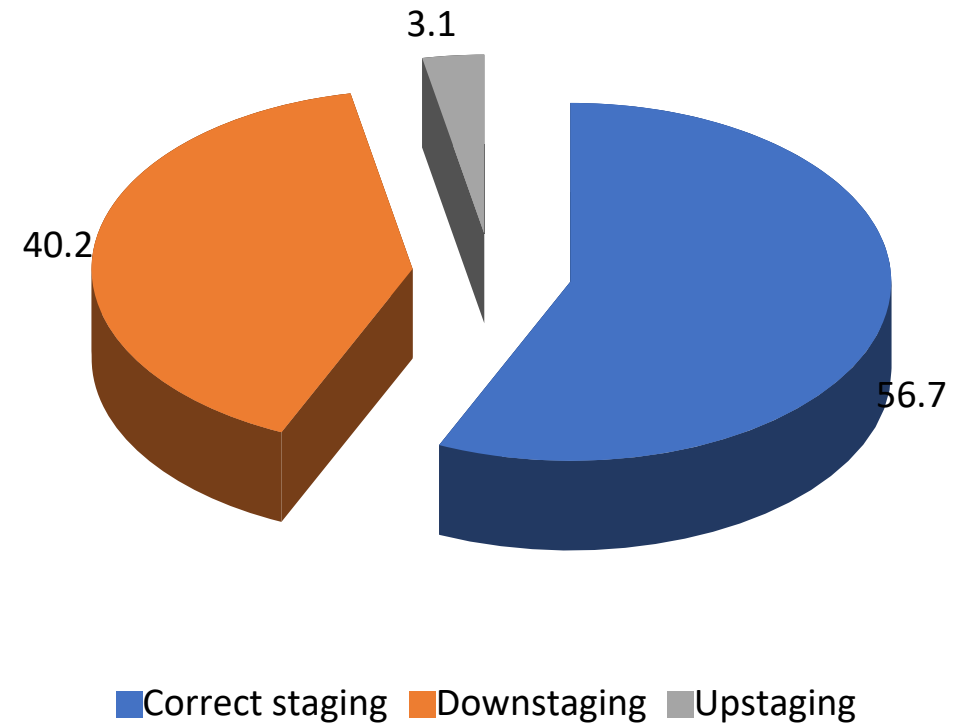
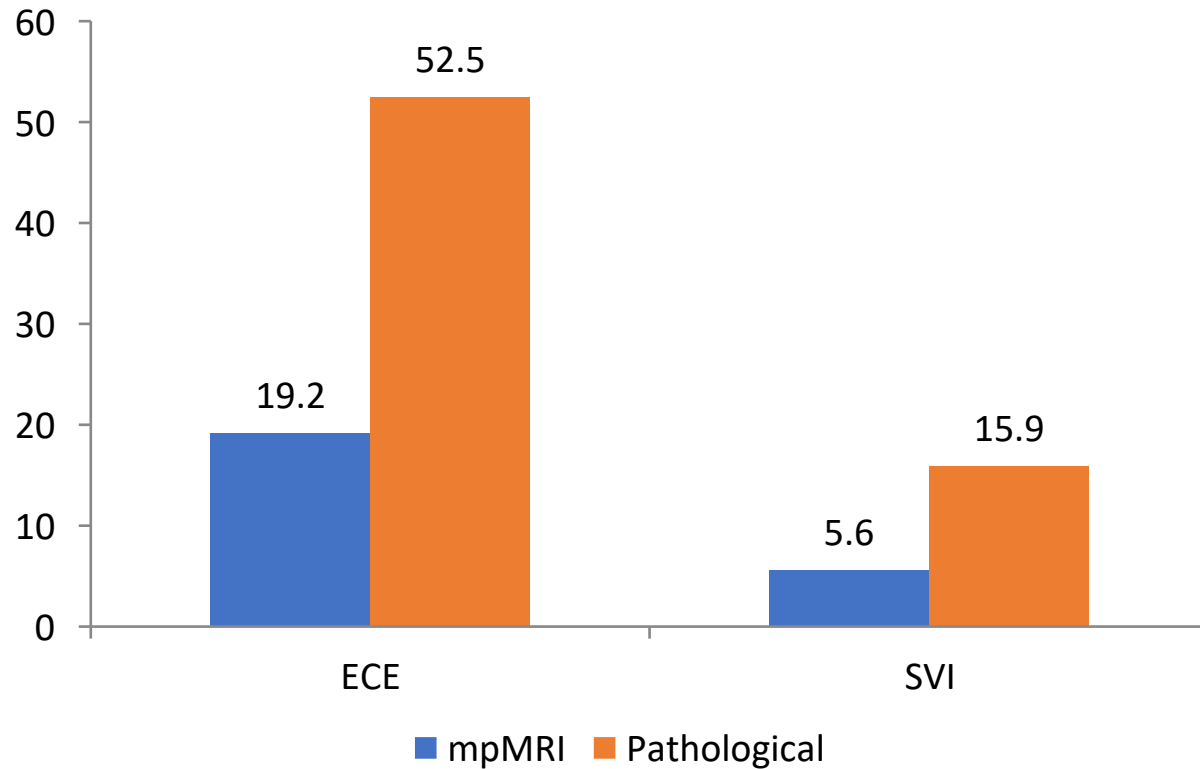
Materials and Methods

- Overall, 845 patients who underwent MRI-targeted biopsy and radical prostatectomy (RP) between 2015 and 2019 at six referral European centers were identified.
- All patients had a positive MRI-targeted biopsy and received concomitant systematic biopsy. All patients had available details on biopsy grade group as well mp-MRI data such as suspicious extra-capsular extension (ECE) and seminal vesicle invasion (SVI), PIRADS score and the maximum diameter of the index lesion.
- The rate of misclassified local stage by mp-MRI defined as a discordance between clinical stage determined at imaging and pathological stage, was assessed. Preoperative imaging was reviewed by high-volume dedicated uro-radiologists and surgical specimens were reviewed by dedicated uro-pathologists.
- Logistic regression analyses assessed predictors of misclassified local stage by mp-MRI in the overall cohort. We then assessed the performance characteristics of mp-MRI in predicting ECE according to baseline characteristics.

Results: descriptive characteristics of the patients

Variables	Overall (n=845)
Age	65 (60; 69)
PSA at diagnosis (ng/ml)	7.7 (5.6-11.2)
mpMRI PIRADS	
3	119 (14)
4	439 (52)
5	287 (34)
mpMRI IL max diameter (mm)	12 (9-16)
Extraprostatic invasion at MPRI	
ECE	162 (19.2)
SVI	47 (5.6)
Grade Group at target biopsy	
1	115 (13.6)
2	380 (45)
3	206 (24.4)
4	95 (11.2)
5	49 (5.8)
Grade Group at systematic biopsy	
0	129 (15.8)
1	171 (20.9)
2	302 (36.9)
3	122 (14.9)
4	53 (6.5)
5	42 (5.1)
pT stage	
pT2	401 (47.5)
pT3a	310 (36.7)
pT3b	133 (15.7)
pT4	1 (0.1)

Results: mpMRI and pathologic stage



Sensitivity	Specificity
31%	94%

Multivariable analyses predicting misclassified local stage

	OR (95% CI)	P-value
MpMRI PIRADS		
3 ref	1	0,1
4	0,7	0,1
5	0,58	0,03
csPca at systematic biopsy	1,43	0,02
Grade Group at target biopsy		
1 ref	1	0,005
2	1,155	0,544
3	1,603	0,072
4	2,099	0,015
5	2,897	0,005
PSA at diagnosis	1,01	0,306
Maximum diameter of the index lesion at mpMRI	1,006	0,66

Performance characteristics

	Sensitivity	Specificity
Overall	31%	94%
PIRADS 5 and a negative concomitant systematic biopsy	52%	91%
Remaining cohort	21%	97%

Conclusions

- mpMRI is characterized by suboptimal predictive accuracy in the identification of pathological ECE and/or SVI.
- Although the sensitivity of imaging in the assessment of extra-prostatic extension improved in men high PIRADS and negative concomitant systematic biopsy, it reached only 50%.
- Therefore, mp-MRI remains an inaccurate tool for staging even in men with more aggressive features.