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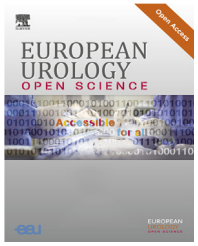

European Association of Urology

Prostate Cancer

Effect of Preoperative Multiparametric Magnetic Resonance Imaging on Oncologic and Functional Outcomes Following Radical Prostatectomy

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Abstract

Background: Advancements in imaging technology have been associated with changes to operative planning in treatment of localized prostate cancer. The impact of these changes on postoperative outcomes is understudied.
Objective: To compare oncologic and functional outcomes between men who had computed tomography (CT) and those who had multiparametric magnetic resonance imaging (mpMRI) prior to undergoing radical prostatectomy.
Design, setting, and participants: In this retrospective cohort study, we identified all men who underwent radical prostatectomy (n = 1259) for localized prostate cancer at our institution between 2009 and 2016. Of these, 917 underwent preoperative CT and 342 mpMRI.
Outcome measurements and statistical analysis: Biochemical recurrence-free survival, positive margin status, postoperative complications, and 1-yr postprostatectomy functional scores (using the 26-item Expanded Prostate Cancer Index Composite [EPIC-26] questionnaire) were compared between those who underwent preoperative CT and those who underwent mpMRI using propensity score weighted Cox proportional hazard regression, logistic regression, and linear regression models.
Results and limitations: Baseline and 1-yr follow-up EPIC-26 data were available for 449 (36%) and 685 (54%) patients, respectively. After propensity score weighting, no differences in EPIC-26 functional domains were observed between the imaging groups at 1-yr follow-up. Positive surgical margin rates (odds ratio 1.03, 95% confidence interval [CI] 0.77–1.38, p = 0.8) and biochemical recurrence-free survival (hazard ratio 1.21, 95% CI 0.84–1.74, p = 0.3) were not significantly different between groups. Early and late postoperative complications occurred in 219 and 113 cases, respectively, and were not different between imaging groups. Our study is limited by a potential selection bias from the lack of functional scores for some patients.

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Conclusions: In this single-center study of men with localized prostate cancer undergoing radical prostatectomy, preoperative mpMRI had minimal impact on functional outcomes and oncologic control compared with conventional imaging. These findings challenge the assumptions that preoperative mpMRI improves operative planning and perioperative outcomes.

Patient summary: In this study, we assessed whether the type of prostate imaging performed prior to surgery for localized prostate cancer impacted outcomes. We found that urinary and sexual function, cancer control, and postoperative complications were similar regardless of whether magnetic resonance imaging or computed tomography was utilized prior to surgery.

1. Introduction

Radical prostatectomy remains one of the most common treatment strategies for clinically localized prostate cancer in men with life expectancy >10 yr [1]. The goal of surgical management is to maximize oncologic control while retaining important quality of life functions such as sexual potency and urinary continence. Achieving these goals can be challenging, as functional and oncologic outcomes often represent competing interests in surgical planning. In men with a high risk of disease extension beyond the prostate, wider resection that sacrifices important structures responsible for sexual and urinary function, such as the neurovascular bundles and urethral length, may be warranted. Understanding disease location and aggressiveness may help better refine dissection to maximize cancer control while preserving function.

Various clinical parameters, such as prostate-specific antigen (PSA) levels, Gleason score, digital rectal examination, and percent of positive biopsy cores, have been used to predict extracapsular extension (ECE) and lymph node involvement and are useful for operative planning [2]. Additionally, conventional imaging studies, such as computed tomography (CT) and technetium-99m bone scintigraphy, are supported by guidelines in the workup of men with unfavorable disease and provide further anatomical information useful for surgical intervention [3]. While helpful for identification of advanced disease, these imaging modalities have limited ability to determine ECE, seminal vesical invasion (SVI), neurovascular bundle invasion, and lymph node involvement [4].

Multiparametric magnetic resonance imaging (mpMRI) has garnered interest for use in prostate cancer staging for over 20 yr. Recent advances in this imaging modality with the incorporation of multiple functional sequences, such as diffusion-weighted and dynamic contrast-enhanced imaging, have rekindled interest in more widespread preoperative use. Indeed, mpMRI now more accurately differentiates normal prostatic tissue from malignancy and is often performed preoperatively given the widespread adoption of fusion biopsy techniques.

While preoperative mpMRI has been shown to affect surgical decision-making, especially with regard to nerve sparing, the impact of these alterations in decision-making on oncologic and functional outcomes is poorly understood. In this retrospective cohort study, we compared the effect of preoperative CT and mpMRI on perioperative complications and postoperative oncologic and functional outcomes. We hypothesized that preoperative mpMRI use will provide better disease resolution than CT and result in improved postoperative outcomes due to more precise surgical extirpation.

2. Patients and methods

Following institutional review board approval, all patients aged 18 yr and older with clinically localized prostate cancer (cT1-3b, N0, M0, and PSA at diagnosis <50) who underwent radical prostatectomy with and without lymph node dissection as primary treatment between 2009 and 2016 at the Mayo Clinic, Rochester, Minnesota, were included for an analysis. Patients who had undergone previous pelvic radiation, received androgen deprivation therapy, and presented with metastatic disease were excluded. Patient, disease, pathology, and surgical characteristics were retrospectively obtained from the electronic medical record (EMR) by a Mayo Clinic prostatectomy registry–trained analyst and nurse.

2.1. Exposure

Receipt of preoperative imaging was defined as undergoing either CT or mpMRI within 3 mo prior to the date of surgery. All mpMRI images were obtained with 3.0 Tesla magnetic field strength using standardized prostate-specific protocols including T1-weighted, T2-weighted, diffusion-weighted, and dynamic gadolinium contrast-enhanced imaging sequences. These images were then reviewed by dedicated urologic radiologists with training in prostate mpMRI interpretation. Patients were grouped by preoperative imaging modality for an analysis. Those patients who underwent both CT and mpMRI imaging were included in the mpMRI cohort.

2.2. Outcomes

Our primary outcomes of interest were functional domain scores 1 yr after surgery. Functional outcomes are assessed routinely at our institution during postoperative follow-up using the 26-item Expanded Prostate Cancer Index Composite (EPIC-26) questionnaire, which assesses five symptom domains (urinary incontinence, urinary irritative/obstructive, sexual, bowel, and hormonal) using a 100-point scale, with higher scores representing better function.

Secondary outcomes included early (within 30 d of surgery) and late (>30 d after surgery) complications, surgical margin status, and biochemical recurrence-free survival. Perioperative complications were

obtained from the EMR and/or patient-reported outcomes via a survey. Margin status was determined by a genitourinary specialized pathologist. Biochemical recurrence was defined as a PSA value of >0.2 ng/ml following radical prostatectomy confirmed by at least one additional PSA value.

2.3. Covariates

We considered multiple potential confounders that may influence surgical, oncologic, and functional outcomes. These included age at the time of surgery, preoperative PSA, American Joint Committee on Cancer (AJCC) clinical T stage, biopsy Gleason score, and baseline preoperative functional scores.

2.4. Statistical analysis

Patient clinicopathologic characteristics were summarized using descriptive statistics. Comparisons between the CT and mpMRI groups were made using *t* tests for continuous variables and chi-square tests for categorical variables.

Propensity for mpMRI was estimated using logistic regression based on age at the time of surgery, preoperative PSA, surgical approach (robotic vs open), AJCC clinical T stage, and biopsy Gleason score. Unstabilized propensity score weights were created and subsequent analyses fitted using the weighted cohort. Balance characteristics before and after weighting were assessed using standardized differences. Weighted logistic regression using generalized estimating equations (GEEs) with robust covariance estimates was utilized to evaluate the association between mpMRI versus CT and outcomes including margin status, and early and late complications. Blood loss was compared between groups using weighted linear regression with GEEs. Additionally, weighted Kaplan-Meier estimation and weighted Cox proportional hazard regression with robust sandwich covariance estimates were used to compare biochemical recurrence-free survival between groups.

There were no missing data for variables used in the estimation of the propensity score. In the analysis of clinical outcomes (including positive margin status, complications, and blood loss), a complete case analysis was performed with respect to missing outcomes. Recurrence-free survival was analyzed with all patients (no missing outcomes), censoring at the date last known alive and recurrence free where applicable.

Functional outcomes at 1 yr following surgery were compared using linear regression estimated using GEEs with robust variance estimates following propensity score weighting and adjusting for baseline functional outcome. Missing data were common for functional assessments at baseline and 1 yr; we employed multiple imputation with 25 iterations using fully conditional specification assuming that missing data were missing at random possibly related to other observed baseline and follow-up data. Analyses were run on each imputation, and results were combined to reflect uncertainty due to missing data. A complete case analysis is reported as a sensitivity analysis in the subgroup with complete case data.

A two-sided p value of <0.05 was considered statistically significant. All analyses were performed using version 9.4 of the SAS software package (SAS Institute Inc., Cary, NC, USA).

3. Results

3.1. Patient characteristics

Of the 1259 patients who underwent radical prostatectomy for localized prostate cancer, 917 underwent preoperative CT and 342 mpMRI. Following propensity score weighting, baseline characteristics were well balanced (Table 1).

Surgical and pathologic characteristics are summarized in Table 2. Overall, approximately one-quarter (n = 322) of patients had pathologic stage ≥T3 disease. The majority (n = 1174, 93%) underwent pelvic lymph node dissection at the time of prostatectomy. Positive margins were found in 23.6% (n = 297) of cases. Of note, there were no differences in the type of nerve sparing performed between groups (p = 0.5). In the weighted sample, absolute standardized differences were <0.10 for baseline characteristics used in the propensity score estimation.

3.2. Functional outcomes

EPIC-26 functional outcomes at baseline and 1 yr after surgery were available for 449 (n = 228 in the CT group and n = 221 in the mpMRI group) and 685 (n = 458 in the CT group and n = 227 in the mpMRI group) patients, respectively. Both baseline and 1-yr follow-up surveys were completed by 332 patients (individual item responses included in Supplementary Tables 1 and 2). After adjusting for baseline function, there were no differences in functional outcomes at 1 yr between the mpMRI and CT groups using multiple imputation (Table 3). Results were similar in a sensitivity analysis among the 332 patients with complete data (Supplementary Table 3).

3.3. Oncologic outcomes

The median follow-up for the CT and mpMRI groups were 5.2 and 1.6 yr, respectively. Biochemical recurrence-free survival was not significantly different between groups following propensity score weighting (hazard ratio 1.21, 95% confidence interval [CI] 0.84–1.74, p = 0.3; Fig. 1). Positive surgical margins were present in 23.5% of patients in the CT group and 24.0% in the mpMRI group (total n = 1259, odds ratio 1.17, 95% CI 0.85–1.61, p = 0.3).

3.4. Perioperative complications

Early and late complication data were available for 906 and 868 patients in the CT group and 334 and 318 in the mpMRI group, respectively. A total of 153 early complications and 87 late complications were observed in the CT group, whereas 66 early complications and 26 late complications were observed in the mpMRI group. The most common early complications were urine leak (CT: 5.9%; mpMRI: 4.5%), urinary retention requiring recatheterization (CT: 4.2%; mpMRI: 3.3%), urinary tract infection (CT: 2.8%; mpMRI: 2.7%), and wound infection (CT: 2.4%; mpMRI: 2.7%). The most common late complications included hernia (CT: 4.3%; mpMRI: 2.2%), lymphocele (CT: 2.5%; mpMRI: 2.8%), and bladder neck contracture (CT: 1.8%; mpMRI: 1.6%). After propensity score weighting, there was no difference in early or late complications between groups (Table 4). Additionally, intraoperative estimated blood loss was not significantly different by preoperative imaging type (total n = 1242, estimate: –37.05, 95% CI –77.91 to 3.80, p = 0.08).

4. Discussion

In this single-center cohort study, we failed to identify any association between preoperative mpMRI use and biochem-

Table 1 – Comparative demographic and clinical characteristics between men with localized prostate cancer undergoing radical prostatectomy who underwent either preoperative CT or mpMRI with standardized mean differences before and after propensity score weighting

	CT (*N* = 917)	mpMRI (*N* = 342)	Total (*N* = 1259)	Standardized mean difference (before)	Standardized mean difference (after)
Age at surgery, mean (SD)	61.8 (6.9)	62.6 (7.1)	62.0 (7.0)	0.1238	0.0002
Year of surgery, *n* (%)					
2009	230 (25.1)	5 (1.5)	235 (18.7)	−0.7426	−0.6486
2010	180 (19.6)	5 (1.5)	185 (14.7)	−0.6192	−0.5633
2011	195 (21.3)	7 (2.0)	202 (16.0)	−0.6277	−0.6388
2012	140 (15.3)	9 (2.6)	149 (11.8)	−0.4539	−0.5181
2013	80 (8.7)	24 (7.0)	104 (8.3)	−0.0634	−0.0994
2014	33 (3.6)	85 (24.9)	118 (9.4)	0.6388	0.6254
2015	34 (3.7)	101 (29.5)	135 (10.7)	0.7396	0.7204
2016	25 (2.7)	106 (31.0)	131 (10.4)	0.8153	0.80183
Surgery type, *n* (%)					
Open	273 (29.8)	40 (11.7)	313 (24.9)		
Laparoscopic/robotic	644 (70.2)	302 (88.3)	946 (75.1)	−0.4574	0.0032
Clinical T stage, *n* (%)					
T1–2	899 (98.0)	336 (98.5)	1235 (98.2)		
T3a	13 (1.4)	4 (1.2)	17 (1.4)	−0.0216	−0.01157
T3b	5 (0.5)	1 (0.3)	6 (0.5)	−0.039	0.01985
Biopsy Gleason score, *n* (%)					
3 + 3	319 (34.8)	117 (34.3)	436 (34.7)		
3 + 4	277 (30.2)	120 (35.2)	397 (31.6)	0.1057	−0.06934
4 + 3	148 (16.2)	49 (14.4)	197 (15.7)	−0.0497	0.08691
8–10	172 (18.8)	55 (16.1)	227 (18.1)	−0.0698	0.01213
Preop PSA (ng/ml), median (IQR)	5.8 (4.5, 8.7)	6.5 (4.5, 9.6)	6.0 (4.5, 9.0)	0.0942	0.02426
AUA risk group, *n* (%)				0.8916	
Low	256 (27.9)	88 (25.8)	344 (27.4)		
Intermediate	454 (49.6)	182 (53.4)	636 (50.6)		
High	206 (22.5)	71 (20.8)	277 (22.0)		
Baseline EPIC-26 scores, median (IQR)				–	–
Urinary irritative	93.8 (87.5, 100.0)	96.9 (87.5, 100.0)	93.8 (87.5, 100.0)		
Urinary incontinence	79.3 (58.5, 93.8)	79.3 (58.5, 100.0)	79.3 (58.5, 100.0)		
Bowel	100.0 (91.7, 100.0)	100.0 (95.8, 100.0)	100.0 (95.8, 100.0)		
Sexual	27.8 (9.7, 65.3)	27.8 (9.7, 69.5)	27.8 (9.7, 66.7)		
Hormonal	95.0 (85.0, 100.0)	95.0 (85.0, 100.0)	95.0 (85.0, 100.0)		

AUA = American Urological Association; CT = computed tomography; EPIC-26 = 26-item Expanded Prostate Cancer Index Composite; IQR = interquartile range; mpMRI = multiparametric magnetic resonance imaging; PSA = prostate-specific antigen; SD = standard deviation.

ical recurrence-free survival, negative surgical margin status, or improved 1-yr postoperative urinary, bowel, or sexual function when compared with conventional CT imaging. These null findings challenge previous reports suggesting improvement in surgical precision and therefore perioperative outcomes with preoperative mpMRI use, and offer guidance for further investigations.

Preoperative mpMRI is increasingly utilized to help guide surgical planning given its potential to obtain higher cancer imaging resolution. Accurate identification of ECE, SVI, neurovascular abutment, and apical involvement of tumors may help guide surgical dissection and avoid positive surgical margins. Unfortunately, the degree to which mpMRI can accurately assess these features is limited. A meta-analysis of patients undergoing radical prostatectomy for localized prostate cancer revealed high specificity but low sensitivity of mpMRI to detect ECE and SVI [5]. Still, mpMRI has the potential to better identify tumor location, which may influence the surgical approach. For instance, in a study of 203 patients undergoing robotic Retzius sparing radical prostatectomy, positive surgical margins were present in 42% of cases with anteriorly located tumors [6]. Additionally, considering biopsy and clinical parameters in addition to mpMRI findings may improve the imaging diagnostic accuracy, as has been shown with the development of mpMRI-based nomograms [7]; however, whether this benefit translates to better operative planning or improved surgical outcomes is unknown [8].

Intuitively, the promise of mpMRI to better localize prostate cancer and identify areas of disease extension should more often lead surgeons toward more aggressive resection (given the likelihood that such disease features are missed on conventional imaging). Studies appear to support this assumption, with 21% of cases resulting in a change of surgical planning to include more extensive resection based on mpMRI [9]. Paradoxically, despite these adjustments, mpMRI has not resulted in improving positive surgical margin status [10,11]. Our study similarly found no improvement in positive surgical margin status with mpMRI use and further affirmed the lack of oncologic benefit, as biochemical recurrence-free survival was not statistically significantly different between those who underwent CT and those who underwent mpMRI.

Studies evaluating the impact of mpMRI on postoperative functional outcomes, such as erectile function and urinary incontinence, are more varied. Changes in surgical plan following a review of preoperative mpMRI have been reported in 26–50% of cases [9,12–17]. These data support

Table 2 – Comparative surgical and pathological characteristics between men with localized prostate cancer undergoing radical prostatectomy who underwent either preoperative CT or mpMRI with standardized mean differences before and after propensity score weighting

	CT (*N* = 917)	mpMRI (*N* = 342)	Total (*N* = 1259)	Standardized mean difference (before)	Standardized mean difference (after)
Pathology T stage, *n* (%)					
T2	676 (73.9)	258 (75.7)	934 (74.4)		
T3a	135 (14.8)	54 (15.8)	189 (15.0)	0.0301	−0.04567
T3b	102 (11.1)	29 (8.5)	131 (10.4)	−0.0889	0.09452
T4	2 (0.2)	0 (0.0)	2 (0.2)	−0.0662	—
Pathology Gleason score, *n* (%)					
3 + 3	220 (24.0)	56 (16.4)	276 (22.0)		
3 + 4	396 (43.3)	174 (51.0)	570 (45.4)	0.1557	−0.17323
4 + 3	168 (18.4)	59 (17.3)	227 (18.1)	−0.0277	0.04668
8–10	131 (14.3)	52 (15.2)	183 (14.6)	0.0263	−0.02807
Pathology lymph node status, *n* (%)					
Negative	827 (94.4)	282 (94.6)	1109 (94.5)		
Positive	49 (5.6)	16 (5.4)	65 (5.5)	−0.0099	0.01867
Positive surgical margin, *n* (%)	215 (23.4)	82 (24.0)	297 (23.6)	0.0125	−0.05811
Estimated tumor volume (cc), median (IQR)	1.3 (0.4, 3.4)	1.2 (0.4, 3.0)	1.3 (0.4, 3.3)	−0.0800	−0.13899
Nerve-sparing procedure, *n* (%)					
Not performed	108 (11.8)	49 (14.3)	157 (12.5)		
Full nerve sparing	695 (75.8)	256 (74.9)	951 (75.5)	−0.0237	0.08160
Partial nerve sparing	113 (12.3)	37 (10.8)	150 (11.9)	−0.0474	−0.03654
Unknown	1 (0.1)	0 (0.0)	1 (0.1)		
Prostatic capsular involvement, *n* (%)					
None	702 (76.6)	270 (78.9)	972 (77.3)		
Focal capsule invasion	7 (0.8)	6 (1.8)	13 (1.0)	0.0888	−0.08746
Outside the capsule	206 (22.5)	66 (19.3)	272 (21.6)	−0.0791	0.07083
Unknown	1 (0.1)	0 (0.0)	1 (0.1)		
Estimated blood loss (cc), median (IQR)	250.0 (150.0, 450.0)	200.0 (150.0, 300.0)	250.0 (150.0, 400.0)	−0.3147	−0.07720
Adjuvant treatments, *n* (%)					
Hormonal	53 (5.8)	9 (2.6)	62 (4.9)	−0.1573	0.16837
Radiotherapy	30 (3.3)	9 (2.6)	39 (3.1)	−0.0378	0.05541
Salvage treatments, *n* (%)					
Hormonal	130 (14.2)	29 (8.5)	159 (12.6)	−0.1805	0.17953
Radiotherapy	144 (15.7)	28 (8.2)	172 (13.7)	−0.2333	0.23250

CT = computed tomography; IQR = interquartile range; mpMRI = multiparametric magnetic resonance imaging.

Table 3 – Comparative changes in the average EPIC-26 functional domain scores at baseline and 1 yr postoperatively between patients who underwent preoperative mpMRI or CT after propensity weighting and adjusting for baseline scores (for the 1-yr follow-up analysis) using multiple imputation

mpMRI vs CT	Urinary irritative				Urinary incontinence				Bowel				Sexual			
	Rate of change	95% CI		*p* value	Rate of change	95% CI		*p* value	Rate of change	95% CI		*p* value	Rate of change	95% CI		*p* value
1 yr	0.00	−2.84	2.83	1	−0.11	−5.24	5.03	1	0.13	−1.94	2.20	0.9	2.88	−3.88	9.63	0.4
Baseline	0.24	0.16	0.32	<0.001	0.69	0.46	0.92	<0.001	0.47	0.38	0.57	<0.001	0.59	0.47	0.70	<0.001

CI = confidence interval; CT = computed tomography; EPIC-26 = 26-item Expanded Prostate Cancer Index Composite; mpMRI = multiparametric magnetic resonance imaging.

surgeons' preference to completely or partially spare structures responsible for sexual and urinary function when greater confidence of disease location is obtained through mpMRI. Panebianco et al [14] evaluated preoperative mpMRI-directed management of the neurovascular bundle and identified appropriate surgical planning in 95.9% and 87.5% of those undergoing bilateral and unilateral nerve-sparing procedures, respectively. Additionally, the degree of nerve sparing as evaluated by postoperative mpMRI correlated with sexual function outcomes at 6 and 12 mo after surgery. While all these men were sexually active prior to surgery, no adjustment was made for preoperative sexual function based on validated instruments, and so interpretation of the findings is limited. In contrast, after controlling for clinicopathologic characteristics and baseline function in our study, we were unable to identify a benefit in sexual function preservation from mpMRI-directed surgery.

Preservation of the neurovascular bundle has also been linking to improved urinary continence following prostatectomy [18]. However, existing analyses of surgical planning changes secondary to mpMRI primarily focus on sexual function only. As such, the utility of preoperative mpMRI of urethral/periurethral tissue to result in improved postoperative urinary incontinence represents an important knowledge gap. Interestingly, mpMRI use did not appear to affect postoperative urinary function in our analysis.

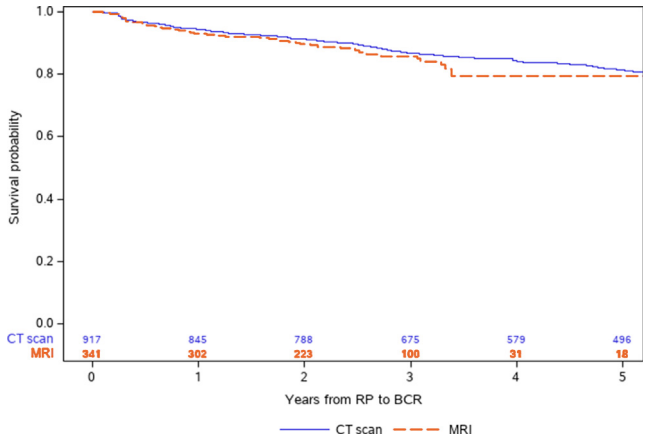

Fig. 1 – Kaplan-Meier estimation and Cox proportional hazard model of biochemical recurrence-free survival comparisons between men who underwent CT and those who underwent mpMRI prior to radical prostatectomy for localized prostate cancer. BCR = biochemical recurrence; CT = computed tomography; mpMRI = multiparametric magnetic resonance imaging; MRI = magnetic resonance imaging; RP = radical prostatectomy.

Our null findings raise several important questions requiring further study. First, the incongruency of surgical planning and measurable outcomes suggests inadequacy of current definitions of appropriateness for nerve-sparing procedures. Second, the added value of surgical alterations needs to be assessed in the context of a patient's baseline functional status, which is rarely done in the current literature. Finally, better understanding of which imaging features are most likely to threaten oncologic control may result in improved outcomes, albeit at the potential expense of sexual and urinary function. It should be noted that despite similar clinical staging between groups in our study, the decision to perform nerve sparing was similar. This may suggest that tumor location (ie, near the neurovascular bundle) influences surgeon decision-making more preferentially than clinical T stage.

Our study is limited by its retrospective design with regard to the potential for unmeasured confounders, use of intraoperative frozen section pathology review, variations in mpMRI reporting throughout the study period, and selection bias. A selection bias may have resulted from the lack of baseline and follow-up functional scores for some patients. However, results remained the same with multiple imputation and in a sensitivity analysis assessing functional outcomes in a more complete group of men without adjusting for baseline function. Furthermore, to maximize available data, a follow-up period of 1 yr was chosen. However, this may underestimate functional outcomes as further improvement has been observed beyond 1 yr following surgical management. Our study did not focus on the influence of mpMRI on operative planning, and so it is possible that we were unable to reject the null hypotheses due to a lack of imaging characteristic differences between groups. Furthermore, we assumed that when available (including those patients who underwent both CT and mpMRI), surgeons reviewed mpMRI findings prior to surgery, which may not have always been the case. Similarly, variations in surgeon proficiency, as have previously been described [19], and experience were not assessed and may have impacted outcomes. Additionally, we present findings from a single quaternary care center, and as such, our results may not be generalizable to all healthcare settings. Nevertheless, to our knowledge, we are the first to describe the effect of preoperative mpMRI on postoperative EPIC-26 functional domains in localized prostate cancer patients undergoing surgical management. Our findings support the evaluation of functional outcomes using validated instruments in future studies assessing the impact of mpMRI on radical prostatectomy outcomes.

5. Conclusions

In this single-center propensity score–weighted analysis of patients undergoing radical prostatectomy for localized prostate cancer, positive surgical margin status, biochemical recurrence-free survival, and 1-yr postoperative EPIC-26 functional domain scores were similar regardless of whether CT or mpMRI preoperative imaging was used to guide surgical planning. Our findings highlight the need for further study directed at characterizing reliable mpMRI features to guide surgical planning and optimize perioperative outcomes.

Author contributions: Daniel D. Joyce had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Joyce, Soligo, Morlacco, Karnes.
Acquisition of data: Soligo, Morlacco, Rangel Latuche.
Analysis and interpretation of data: Joyce, Rangel Latuche.
Drafting of the manuscript: Joyce.

Table 4 – Early and late complication comparisons between men with localized prostate cancer undergoing radical prostatectomy with CT or mpMRI preoperative imaging following propensity score weighting

	Odds ratio	95% CI		*p* value
Total early complications (*n* = 1240)	1.32	0.93	1.88	0.1
Urine leak (*n* = 1240)	0.57	0.31	1.03	0.1
Wound infection (*n* = 1237)	1.34	0.58	3.11	0.5
Urinary tract infection (*n* = 1238)	1.18	0.52	2.72	0.7
Urinary retention requiring catheterization (*n* = 1239)	0.79	0.37	1.67	0.5
Total late complications (*n* = 1188)	0.98	0.59	1.63	1
Hernia (*n* = 1188)	0.53	0.21	1.33	0.2
Bladder neck contracture (*n* = 1188)	0.76	0.27	2.09	0.6
Lymphocele (*n* = 1188)	1.42	0.60	3.36	0.4

CI = confidence interval; CT = computed tomography; mpMRI = multiparametric magnetic resonance imaging.

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Appendix A. Supplementary data

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