# Impact and Predictive Value of Prostate Weight on the Outcomes of Nerve Sparing Laparoscopic Radical Prostatectomy in Patients with Low Risk Prostate Cancer

Dong-Gen Jiang[1], Chu-Tian Xiao[2], Yun-Hua Mao[2], Jian-Guang Qiu[2], Jie Si-tu[2], Min-Hua Lu[2], Xin Gao[2]*

**Purpose:** To investigate the impact of prostate weight on outcomes of nerve sparing laparoscopic radical prostatectomy (LRP) and assess its predictive value on postoperative continence and potency recovery.

**Materials and Methods:** We conducted a retrospective study on the clinical data of 165 patients with low risk prostate cancer (PCa) who underwent nerve sparing LRP. All the patients included had normal preoperative urinary and sexual function. The association of prostate weight with perioperative data was assessed using Spearman correlation coefficient. Univariate and multivariate Cox regression analyses were employed to identify prognostic predictors for continence and potency recovery.

**Results:** Increased prostate weight was significantly associated with older age, higher prostate-specific antigen (PSA), lower biopsy and pathological T stage and Gleason score, longer operative time, and higher estimated blood loss ($P < .05$). The continence rates at the 3rd, 6th, and 12th month after surgery were 63.6% (105/165), 87.9% (145/165), and 95.8% (158/165); and the potency rates were 44.8% (74/165), 62.4% (103/165) and 77.6% (128/165), respectively. Furthermore, multivariate Cox analysis showed that patient age (HR = 0.52, 95% CI: 0.35-0.76) and prostate weight (HR = 0.54, 95% CI: 0.34-0.86) were independent predictors for continence recovery, while only patient age (HR = 0.66, 95% CI: 0.45-0.96) could independently predict potency recovery.

**Conclusion:** Larger prostate size was correlated with older age, higher PSA, lower tumor stage and grade, longer operative time, and more intraoperative blood loss in low risk PCa patients. Increased prostate weight may independently predict poor continence recovery after nerve sparing LRP.

**Keywords:** erectile dysfunction; prostatectomy; prostatic neoplasms; prostate size; prognosis; treatment outcome; urinary incontinence

## INTRODUCTION

Following the introduction of anatomic radical prostatectomy (RP) by Walsh PC,[1] this procedure has become a routine treatment modality for localized prostate cancer (PCa) worldwide. However, incontinence and erectile dysfunction after RP for early stage PCa can significantly affect the quality of life (QOL) of patients, especially for those with preoperative normal potency.[2] The intrafascial approach nerve sparing RP has been reported to be apply to low risk PCa patients,[3-5] which enables the dissection of the prostate with limited trauma to the surrounding fascias and the enclosed neurovascular bundle (NVB). Patients who underwent nerve sparing laparoscopic radical prostatectomy (LRP) could achieve accelerated rehabilitation of continence and potency to a high percentage, without unfavorable effect on the oncological outcomes.[5]

As the introduction of prostate-specific antigen (PSA) screening and the prevalence of active surveillance, men diagnosed with clinically organ-confined PCa have presented with larger prostate weight.[6] The application of external-beam radiation therapy and brachytherapy in PCa with large gland size is technically limited, which makes RP the treatment of choice.[7,8] Nevertheless, RP for larger prostates is associated with longer operative time, greater blood loss, and higher surgical difficulty.[9-11] There are several published data analyzing the impact of prostate size on perioperative and functional outcomes of RP,[9-14] while no consensus has been reached. To date, the effect of prostate size on outcomes of nerve sparing LRP remains unclear. The purpose of our study was to explore the association of prostate weight with perioperative data of patients with low risk PCa, and assess the predictive value of prostate weight on continence and potency recovery after nerve sparing LRP.

## MATERIALS AND METHODS

### *Enrollment*

This study was conducted after the approval of the Ethics Committee of the Third Affiliated Hospital of Sun Yat-Sen University (No. [2015] 2-130). We retrospectively reviewed the records of PCa patients from the PCa database of our hospital, and those without completed clinical data were excluded from the research population. Between January 2002 and December 2014,

[1]Department of Urology, the Seventh Affiliated Hospital of Sun Yat-Sen University, No.628 Zhenyuan Road, Shenzhen 518107, China.
[2]Department of Urology, the Third Affiliated Hospital of Sun Yat-Sen University, No.600 Tianhe Road, Guangzhou 510630, China.
*Correspondence: Department of Urology, the Third Affiliated Hospital of Sun Yat-Sen University, No.600 Tianhe Road, Guangzhou 510630, China.
Tel: + 86 20 85252990. Fax: +86 20 85252678. E-mail: urogx@hotmail.com.
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**Table 1.** Correlation between prostate weight and preoperative characteristics of the 165 patients with low risk prostate cancer.

| Variables | Total (%) | Prostate Weight | | r | *P*-value |
|---|---|---|---|---|---|
| | | < 75 g (%) | ≥ 75 g (%) | | |
| All cases | 165 (100) | 124 (75.2) | 41 (24.8) | - | - |
| Age (year) | | | | .369 | < .001 |
| < 65 | 89 (53.9) | 80 (64.5) | 9 (22.0) | | |
| ≥ 65 | 76 (46.1) | 44 (35.5) | 32 (78.0) | | |
| BMI ( kg/m$^2$) | | | | -.116 | .137 |
| < 24 | 72 (43.6) | 50 (40.3) | 22 (53.7) | | |
| ≥ 24 | 93 (56.4) | 74 (59.7) | 19 (46.3) | | |
| Preoperative PSA (ng/mL) | | | | | |
| < 7 | 78 (47.3) | 65 (52.4) | 13 (31.7) | .179 | .021 |
| 7-10 | 87 (52.7) | 59 (47.6) | 28 (68.3) | | |
| Comorbidities | | | | .010 | .901 |
| 0 | 54 (32.7) | 41 (33.1) | 13 (31.7) | | |
| 1 | 79 (47.9) | 59 (47.6) | 20 (48.8) | | |
| ≥ 2 | 32 (19.4) | 24 (19.3) | 8 (19.5) | | |
| Clinical T stage | | | | -.166 | .034 |
| ≤ cT1c | 115 (69.7) | 81 (65.3) | 34 (82.9) | | |
| cT2a | 50 (30.3) | 43 (34.7) | 7 (17.1) | | |
| Biopsy Gleason score | | | | | |
| < 6 | 29 (17.6) | 17 (13.7) | 12 (29.3) | -.177 | .023 |
| 6 | 136 (82.4) | 107 (86.3) | 29 (70.7) | | |

**Abbreviations:** BMI, body-mass index; PSA, prostate-specific antigen.

a total of 967 men underwent LRP at our institution, 165 consecutive low risk PCa patients with preoperative normal urinary and sexual function who received nerve sparing LRP were included in the study. Low risk PCa was identified according to the D'Amico risk stratification scheme (clinical T stage ≤ cT2a, PSA < 10 ng/mL, and a Gleason score < 7).[15] The 2002 American Joint Committee on Cancer TNM staging system was applied for both clinical and pathological staging. Gleason score was evaluated according to the International Society of Urological Pathology 2005 guidelines.[16] LRP specimen was submitted in their entirety and prostate weight, which included the prostate, seminal vesicles, and vasa deferentia stumps, was measured at the time of pathological examination by the pathologist. No patient had contraindications for general anesthesia and all the procedures were performed by one experienced surgeon (Xin Gao). Written consent from patients of the study cohort was considered, while as this was a retrospective study in which most of the data were obtained more than 5 years ago and all data were analyzed anonymously, it was considered not needed.

### *Surgical Technique*

The patient positioning, trocar placement, and the major steps of the surgery have been previously described in detail.[5,17] We focus here on the pivotal surgical essentials of our technique. All the patients included received a bilateral intrafascial nerve sparing approach, the intrafascial plane is developed between the prostatic fascia and the capsule after the posterior plane is developed. The prostatic fascia is incised by sharp and athermic dissection from prostate capsule to facilitate complete mobilization and lateralization of the NVB off the prostate. To be noted, the dissection is initiated at the middle of the prostate and continued in a retrograde direction towards the base of prostate to completely detach the NVB from the prostatic pedicles. Then the prostatic pedicles are clipped by Hem-o-lok® clips and detached with athermic scissor without injuring the NVB. Subsequently, the dissection plane is continued in a descending manner towards the apex. Before vesicourethral anastomosis, an approximate 15-cm long absorbable self-retaining suture (QuillTM SRS) with one five-eighths arc needle is prepared. The bladder neck is firstly narrowed with running suture from the dorsal edge to form a "tennis racket" shape. Then the continuous suture of the anastomosis is initiated by passing the needle from the outside in on the full thickness of bladder neck and then from the inside out on the full thickness of the urethra at 4 o'clock position. Subsequently, the running suture is continued at 6, 8, 10, 12 and 2 o'clock position, respectively, to complete the vesicourethral anastomosis.

### *Postoperative Care*

The urethral catheter was removed in case no anastomotic leakage was detected using cystography. After catheter removal, patients were guided to carry out daily pelvic floor muscle training. All the patients received phosphodiesterase 5 inhibitors (PDE5-Is) (sildenafil 25mg per day) for the first eight weeks postoperatively and thereafter as subjectively needed. Besides, rehabilitation using vacuum erection device was also recommended 3 weeks after the surgery once they returned to continence.

### *Outcomes Assessment*

Urinary and sexual functions were evaluated with self-administered validated questionnaires preoperatively and at the 3rd, 6th, and 12th month after surgery, and then simultaneously during the follow-up visits or telephone interviews. All answers were collected by a special independent research staff member. Urinary function was assessed using International Continence Society questionnaire and continence was defined as no pad or a protective pad daily. Sexual function was evaluated by the use of Sexual Health Inventory for Men (SHIM) questionnaire,[18] which is a shortened five-question version of the International Index of Erectile Function. Potency was defined as SHIM score ≥ 21, with or without the use of oral PDE5-Is. Com-

**Table 2.** Association of prostate weight with perioperative and pathological outcomes of the 165 patients after LRP.

| Variables | Total (%) | Prostate Weight | | r | P-value |
|---|---|---|---|---|---|
| | | < 75 g (%) | ≥ 75 g (%) | | |
| All cases | 165 (100) | 124 (75.2) | 41 (24.8) | - | - |
| Operative time (min) | | | | .221 | .004 |
| < 200 | 80 (48.5) | 68 (54.8) | 12 (29.3) | | |
| ≥ 200 | 85 (51.5) | 56 (45.2) | 29 (70.7) | | |
| Estimated blood loss (mL) | | | | .179 | .022 |
| < 250 | 86 (52.1) | 71 (57.3) | 15 (36.6) | | |
| ≥ 250 | 79 (47.9) | 53 (42.7) | 26 (63.4) | | |
| Blood transfusion | | | | .062 | .429 |
| No | 160 (97.0) | 121 (97.6) | 39 (95.1) | | |
| Yes | 5 (3.0) | 3 (2.4) | 2 (4.9) | | |
| Hospital stay (day) | | | | .095 | .226 |
| < 12 | 82 (49.7) | 65 (52.4) | 17 (41.5) | | |
| ≥ 12 | 83 (50.3) | 59 (47.6) | 24 (58.5) | | |
| Catheterization time | | | | .060 | .441 |
| < 9 | 73 (44.2) | 57 (46.0) | 16 (39.0) | | |
| ≥ 9 | 92 (55.8) | 67 (54.0) | 25 (61.0) | | |
| Perioperative complications | | | | .122 | .119 |
| None | 134 (81.2) | 104 (83.9) | 30 (73.2) | | |
| Clavien I-II | 27 (16.4) | 18 (14.5) | 9 (22.0) | | |
| Clavien III-IV | 4 (2.4) | 2 (1.6) | 2 (4.8) | | |
| Pathological T stage | | | | -.168 | .031 |
| pT2a | 92 (55.8) | 63 (50.8) | 29 (70.7) | | |
| pT2b | 48 (29.1) | 40 (32.3) | 8 (19.5) | | |
| ≥ pT2c | 25 (15.2) | 21 (16.9) | 4 (9.8) | | |
| Pathological Gleason score | | | | -.181 | .020 |
| < 7 | 122 (73.9) | 86 (69.4) | 36 (87.8) | | |
| 7 | 34 (20.6) | 30 (24.2) | 4 (9.8) | | |
| ≥ 8 | 9 (5.5) | 8 (6.4) | 1 (2.4) | | |
| Positive surgical margin | | | | .127 | .104 |
| No | 149 (90.3) | 114 (92.0) | 35 (85.4) | | |
| Yes | 16 (9.7) | 10 (8.0) | 6 (14.6) | | |

**Abbreviations:** LRP, laparoscopic radical prostatectomy.

plications occurring during the surgical procedure or within 3 months after surgery were documented and classified according to the modified Clavien grading system.[19] Positive surgical margin (PSM) was defined as the presence of tumor tissue on the inked surface of the specimen.

### *Statistical Analysis*

The data were analyzed using IBM Statistical Package for the Social Science (SPSS Inc, Chicago, Illinois, USA) version 20.0. Continuous parametric variables were presented as the median value and interquartile range. The association between prostate weight and perioperative data of the patients were evaluated by Spearman correlation coefficient. Univariate and multivariate analysis using Cox proportional-hazards regression model were performed to identify independent prognostic predictors for continence and potency recovery during the follow-up. All tests of significance were two sided, and $P < .05$ indicated statistical significance.

## RESULTS

Association between Prostate Weight and Preoperative Characteristics

The median patient age was 65 (61-68) years, Body Mass Index (BMI) was 24 (22-27) kg/m$^2$, preoperative PSA was 6.9 (5.3-8.6) ng/mL, and prostate weight was 48 (27-74) g. As showed in **Table 1**, after assessing by Spearman correlation coefficient, prostate weight was found to be significantly associated with patient age (r = .369, $P < .001$), preoperative PSA level (r = .179, $P$ = .021), clinical T stage (r = -.166, $P$ = .034) and biopsy Gleason score (r = -.177, $P$ = .023). Patients with large prostate weight were likely to have older age, higher PSA level, and earlier tumor stage. However, no remarkable correlation was observed between prostate weight and BMI, as well as preoperative comorbidities ($P > .05$).

Correlation of Prostate Weight with Perioperative and Pathological Outcomes

The perioperative patient data and pathological outcomes are demonstrated in **Table 2**. The median operative time was 207 (185-236) mins, estimated blood loss was 245 (150-400) mL, hospital stay was 12 [11-14] days and catheterization time was 9 [8-11] days. The bilateral nerve sparing procedures were conducted in all cases. Despite the described strict inclusion criteria, tumors with pathological T stage > pT2b were demonstrated in 25 (15.2%) patients. Similarly, tumors with pathological Gleason score > 7 were found in 9 (5.5%), while the incidence of PSM was only 9.7% (16/165). In the Spearman correlation coefficient analysis, larger prostate weight was remarkably correlated with longer operative time (r = .221, $P$ = .004), more estimated blood loss (r = .179, $P$ = .022), lower pathological T stage (r = -.168, $P$ = .031) and Gleason score (r = -.181, $P$ = .020). Whereas no significant association was found between prostate weight and blood transfusion, hospital stay, catheterization time, perioperative complications, and PSM ($P > .05$).

Predictive Value of Prostate Weight on Continence and Potency Recovery

The median follow-up was 44 months with a range of 13-113 months. During the follow-up period, the conti-

**Table 3.** Univariate and multivariate analysis of prognostic factors for continence.

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | HR (95%CI) | *P*-value | HR (95%CI) | *P*-value |
| Age (< 65 vs. ≥ 65 years) | 0.48 (0.34-0.66) | < .001 | 0.52 (0.35-0.76) | .001 |
| BMI (< 24 vs. ≥ 24 kg/m$^2$) | 1.31 (0.96-1.80) | .087 | 0.73 (0.52-1.02) | .063 |
| Preoperative PSA (< 7 vs. 7-10 ng/ml) | 0.70 (0.51-0.96) | .026 | 0.83 (0.58-1.19) | .310 |
| Prostate weight (< 75 vs. ≥ 75 g) | 0.50 (0.34-0.72) | < .001 | 0.54 (0.34-0.86) | .009 |
| Clinical T stage (≤ cT1c vs. cT2a) | 0.70 (0.50-0.99) | .041 | 0.70 (0.49-1.01) | .053 |
| Biopsy Gleason score (< 6 vs. 6) | 0.84 (0.56-1.26) | .387 | 0.68 (0.44-1.07) | .095 |
| Operative time (< 200 vs. ≥ 200 mins) | 0.98 (0.72-1.34) | .900 | 1.20 (0.85-1.69) | .295 |
| Estimated blood loss (< 250 vs. ≥ 250 ml) | 0.83 (0.61-1.23) | .224 | 0.84 (0.60-1.17) | .290 |
| Perioperative complications | | .105 | | .181 |
| None | 1 (reference) | | 1 (reference) | |
| Clavien I-II | 0.70 (0.46-1.08) | .109 | 0.73 (0.46-1.18) | .201 |
| Clavien III-IV | 0.46 (0.17-1.25) | .129 | 0.44 (0.15-1.30) | .135 |
| Pathological T stage | | .270 | | .487 |
| pT2a | 1 (reference) | | 1 (reference) | |
| pT2b | 1.19 (0.83-1.69) | .342 | 1.20 (0.81-1.75) | .364 |
| ≥ pT2c | 0.79 (0.50-1.24) | .304 | 0.88 (0.51-1.51) | .639 |
| Pathological Gleason score | | .494 | | .322 |
| < 7 | 1 (reference) | | 1 (reference) | |
| 7 | 1.00 (0.68-1.47) | .993 | 1.13 (0.74-1.73) | .572 |
| ≥ 8 | 0.66 (0.34-1.31) | .238 | 0.61 (0.28-1.31) | .202 |
| Positive surgical margin (No vs. Yes) | 0.53 (0.30-0.94) | .029 | 0.62 (0.34-1.15) | .128 |

**Abbreviations:** BMI, body-mass index; PSA, prostate-specific antigen; HR, hazard ratio; CI, confidence interval.

nence rates at the 3rd, 6th, and 12th month after surgery were 63.6% (105/165), 87.9% (145/165), and 95.8% (158/165); and the potency rates were 44.8% (74/165), 62.4% (103/165) and 77.6% (128/165), respectively. For univariate and multivariate Cox proportional hazards analysis, the first subgroup of each variable has been set as the reference (comparative level). As demonstrated in **Tables 3 and 4**, both univariate and multivariate Cox analysis indicated that patient age (HR = 0.52, 95% CI: 0.35-0.76, *P* = .001) and prostate weight (HR = 0.54, 95% CI: 0.34-0.86, *P* = .009) were independent predictors for continence recovery, while only patient age (HR = 0.66, 95% CI: 0.45-0.96, *P* = .029) could independently predict potency recovery. Since prostate weight was strongly correlated with patient age in the Spearman correlation coefficient analysis, data were further evaluated by stratified models, aiming to confirm predictive value of prostate weight independent of patient age. We also performed Cox regression analysis according to subgroups of patient age (data not shown). The *P* value for prostate weight in continence recovery prediction in the stratified model was .011, which confirmed that prostate weight was an independent predictor for continence recovery.

## DISCUSSION

Widespread PSA screening, combined with the technical improvement of prostate biopsy, has resulted in increased diagnosis of PCa and detection of lower grade and earlier stage disease. The morbidity and mortality of PCa in China, although not as high as those in the

**Table 4.** Univariate and multivariate analysis of prognostic factors for potency.

| Variables | Univariate | | Multivariate | |
|---|---|---|---|---|
| | HR (95%CI) | P-value | HR (95%CI) | P-value |
| Age (< 65 vs. ≥ 65 years) | 0.63 (0.46-0.87) | .005 | 0.66 (0.45-0.96) | .029 |
| BMI (< 24 vs. ≥ 24 kg/m$^2$) | 0.84 (0.61-1.15) | .271 | 0.90 (0.64-1.27) | .560 |
| Preoperative PSA (< 7 vs. 7-10 ng/ml) | 0.85 (0.62-1.16) | .290 | 1.11 (0.79-1.56) | .539 |
| Prostate weight (< 75 vs. ≥ 75 g) | 0.89 (0.62-1.28) | .528 | 0.93 (0.58-1.50) | .763 |
| Clinical T stage (≤ cT1c vs. cT2a) | 0.73 (0.52-1.03) | .072 | 0.79 (0.55-1.15) | .224 |
| Biopsy Gleason score (< 6 vs. 6) | 0.97 (0.64-1.46) | .881 | 1.04 (0.67-1.62) | .854 |
| Operative time (< 200 vs. ≥ 200 mins) | 0.72 (0.53-0.99) | .004 | 0.73 (0.52-1.03) | .077 |
| Estimated blood loss (< 250 vs. ≥ 250 ml) | 1.19 (0.87-1.63) | .280 | 1.22 (0.87-1.72) | .251 |
| Perioperative complications | | .243 | | .100 |
| None | 1 (reference) | | 1 (reference) | |
| Clavien I-II | 1.13 (0.74-1.71) | .574 | 1.02 (0.65-1.60) | .923 |
| Clavien III-IV | 0.40 (0.13-1.27) | .121 | 0.27 (0.08-0.90) | .034 |
| Pathological T stage | | .362 | | 918 |
| pT2a | 1 (reference) | | 1 (reference) | |
| pT2b | 0.96 (0.68-1.37) | .840 | 0.94 (0.64-1.37) | .741 |
| ≥ pT2c | 0.72 (0.45-1.14) | .158 | 0.92 (0.56-1.51) | .738 |
| Pathological Gleason score | | .045 | | .085 |
| < 7 | 1 (reference) | | 1 (reference) | |
| 7 | 1.06 (0.73-1.56) | .756 | 0.92 (0.61-1.41) | .707 |
| ≥ 8 | 0.39 (0.18-0.83) | .015 | 0.39 (0.17-0.90) | .026 |
| Positive surgical margin (No vs. Yes) | 1.31 (0.75-2.27) | .343 | 1.31 (0.72-2.39) | .380 |

**Abbreviations:** BMI, body-mass index; PSA, prostate-specific antigen; HR, hazard ratio; CI, confidence interval.

western countries, were increasing markedly during the past decade.[20] RP has been established as the most durable treatment option for patients with clinically localized PCa, especially for those with good life expectancy. Following the first performance of LRP by Gao et al. in China,[21] this procedure has become a routine treatment modality for localized PCa in large medical centers of the country. Actually, the development of minimally invasive surgical techniques has resulted in greater focus on achieving optimal functional outcomes and QOL in patients after RP. Hence, the effect of various patient characteristics on outcomes of the surgery, especially for younger patients with preoperative potency, needs to be assessed comprehensively to provide valuable guidance for surgeons and patients.

Although LRP is generally safe in patients with large prostates, removal of larger gland is commonly believed to be more technically challenging.[9-11] The current study analyzed the impact of prostate weight on outcomes of nerve sparing LRP for treatment of low risk PCa, and assessed the predictive value of prostate weight for postoperative continence and potency recovery. To our knowledge, no standard definition of a large prostate has ever been demonstrated, while the prostates of > 75 g versus those < 75 g were reported to be significantly different in surgical margin status, estimated blood loss and PSA failure-free survival rate.[12,13] Thus we divided the patients into two groups, according to the prostate weight of < 75 g or ≥ 75 g, for the data analyzing in our research. Most series have reported that patients with larger prostates experienced longer operative time, higher intraoperative blood loss, and lower pathological stage than those with smaller prostates, while there is no consistence with regard to the influence of prostate weight on PSM and transfusion rate.[9-13] In our study series, the PSM rate was 9.7% (16/165), and 84.8% (140/165) of the cases had a pathological T stage of ≤ pT2b, which were both more improved than those presented in the above series. The main reason might be that all cases included in the present research were low risk localized PCa. In addition, our data showed that older patients tend to have lager prostate weight. Actually, it is common that PCa patients have a comorbidity of benign prostatic hyperplasia, which occurred in 50% of men 60 years or older and 80% of men 80 years or older,[22] this may explain why older patients were likely to have larger prostate weight in our study. Similarly, we found that increased prostate weight was significantly associated higher PSA level, lower biopsy and pathological T stage and Gleason score in the low risk PCa cohort. This result is not surprising, the increased PSA production from enlarged adenoma tissue may lead to earlier detection and biopsy in the natural history of PCa, making the diagnosis of comparatively lower risk tumor. Furthermore, it is easy to understand that increased prostate weight was associated with longer operative time and higher intraoperative blood loss. As the poor visualization caused by a large prostate size makes it more challenging to expose and dissect surrounding tissues of the gland, which might lead to either direct or indirect injuries to blood vessels. The central goal of RP is complete extirpation of the primary tumor, while patients' QOL could be negatively influenced by the presence of urinary incontinence and erectile dysfunction. Therefore, more effective prognostic predictors for continence and potency recovery after RP are required to provide professional consultation for patients before surgery. In the multivariate Cox regression analysis, we identified larger prostate weight as an independent predictor for poor continence recovery, which is in line with our previous research[23] conducted in high risk PCa patients. Moreover, we found that smaller patient age could predict better continence and potency recovery. This finding is in accordance with the results of the study conducted in 3,477 patients by Kundu SD et al.[24] Urinary incontinence and erectile dysfunction after LRP are multifactorial including neurogenic and vasculogenic injuries due to traction, direct transaction, thermal injury or incorporation into haemostatic sutures with clips.[25, 26] The postoperative continence and potency recovery may therefore be compromised, especially in patients with large prostate as the technical challenge during the procedures. In the present study, the continence rates at the 3rd, 6th, and 12th month after surgery were 63.6%, 87.9%, and 95.8%; and the potency rates were 44.8%, 62.4% and 77.6%, respectively. Our results compared favorably with the majority of recently published series of patients treated with nerve sparing RP,[3-5] as we have conducted a precise anatomical intrafascial nerve sparing approach during the surgeries. The prostatic fascia, lateral pelvic fascia, and anterior layer of Denonvillier's fascia fuse with each other posterolateral to the prostate, and form a potential triangular space containing NVB.[27, 28] The intrafascial plane is the plane between the prostate capsule and the prostatic fascia, which could preserve almost all NVB fibers even if they distribute in a more dispersed shape.[3-5] Besides, we have performed a retrograde dissection approach in our nerve sparing LRP, as it could identify and release NVB from the prostate before ligation of the prostatic pedicles to avoid traction and potential injuries to NVB by any subsequent manipulation of the prostate.

The major strengths of the present study include the use of validated questionnaires to assess functional outcomes. Furthermore, all LRPs of the series were performed by one single surgeon, maintaining consistency of all surgical techniques. Simultaneously, there are certain limitations in our study. First, the weak point of the present study is inherent in its retrospective nature. In addition, the relatively small number of patients included is also the shortcoming. However, it's enough to guarantee statistical significance.

## CONCLUSIONS

In summary, our data suggested that increased prostate weight was significantly associated with older patient age, higher preoperative PSA level, lower tumor stage and grade, longer operative time, and higher intraoperative blood loss in patients with low risk PCa. Larger prostate weight might be an independent prognostic predictor for poor continence recovery after nerve sparing LRP, and it could be beneficial for patient counseling on the functional outcomes after surgery.

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## CONFLICTS OF INTEREST

None declared.

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