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Removing the specimen with traction during robotic radical prostatectomy does not cause a positive surgical margin

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Background/aim: The aim of this study was to gauge whether removal of a specimen with traction during robot-assisted laparoscopic radical prostatectomy causes a positive surgical margin or not.

Materials and methods: One hundred and sixty-nine patients with localized prostate cancer who underwent robot-assisted laparoscopic radical prostatectomy from 2009 to 2011 were included in the study. After dividing the patients into two groups, we recorded their characteristics and pre-op/post-op evaluations.

Results: There were 111 and 58 patients in groups 1 (with traction) and 2 (without traction), respectively. We evaluated the patients' ages, follow-up time, body mass index (BMI), prostate-specific antigen (PSA) values, pre-op and post-op Gleason score values, pathological stage, positive surgical margin rates, and biochemical PSA recurrence rates. There was no statistically significant difference between the groups for age, pre-op PSA values, BMI, pre-op and post-op Gleason scores, positive surgical margin rates and biochemical recurrence rates. There was a significant difference between prostate weight, tumor volume, and clinical stage.

Conclusion: Removing the specimen with traction during robot-assisted laparoscopic radical prostatectomy does not cause a positive surgical margin. The incision should be as small as possible for cosmetic appearance.

Key words: Prostate cancer, radical prostatectomy, specimen, traction

1. Introduction

Robot-assisted laparoscopic radical prostatectomy (RALP) has become the preferred surgical technique for localized prostate cancer. One of the most important factors in its oncological success is the surgical margin status (1). Positive surgical margin (PSM) status has a possible relation to the surgeon, surgical technique, and disease burden (1,2). Our aim was to evaluate the effect of traction, likely the cause of the PSM, during specimen removal. There are many studies comparing PSMs according to techniques, pathological findings, and clinical stage, but we found none regarding the technique of specimen removal (3).

2. Materials and methods

A total of 169 patients who were treated by RALP for localized prostate cancer between 2009 and 2011 were included in this study. All the patients were evaluated and ethics committee permission was given for each. We planned this study to investigate patients with postoperative PSM but no prostate-specific antigen (PSA) recurrence. Patients were randomized into two groups, A and B, according to whether traction was used or not while removing the specimen. A traction procedure consists of removing the specimen from a small incision. Nontraction procedures remove the specimen from an incision larger than the prostate, which eases the procedure.

Student's t-test was used for follow-up, age, body mass index (BMI), PSA, prostate weight, and tumor volume. The chi-square test was used for Gleason grade, stage, surgical margin invasion (SMI), and biochemical recurrence rate (BCR). All values were calculated as mean and SD. SPSS 16 was used.

3. Results

Group A (traction group) had 111 patients, while group B (nontraction group) had 58. There was a

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statistically significant difference between the groups for prostate weight, tumor volume, and clinical stage. Age, BMI, preoperative PSA levels, biopsy Gleason score, prostatectomy Gleason score, pathological stage, SMI status, and BCR were similar for both groups. Patients' preoperative and postoperative characteristics are summarized in Tables 1 and 2. Although there were pT0 patients in both groups, there was no additional therapy, such as androgen deprivation therapy, given preoperatively.

4. Discussion

RALP is currently the main surgical technique for localized prostate cancer. In the United States, 85% of radical prostatectomies are performed robotically (4). Generally, PSM rates after different techniques for radical prostatectomy seem to be equal, but the surgical technique performed may occasionally affect these rates (5,6). Oncologic outcomes of robotic surgery are generally similar with laparoscopic and open surgery (7–10).

Table 1. Preoperative characteristics of patients. *: Statistically significant.

	Total (n: 169)	Traction group (n: 111, 65.7%)	Nontraction Group (n: 58, 34.3%)	P-value
Follow-up, months, mean ± SD	33.85 ± 8.45	38.62 ± 6.30	24.72 ± 2.26	< 0.001*
Age, years, mean ± SD	61.11 ± 6.65	61.22 ± 6.81	60.91 ± 6.40	0.822
BMI, mean ± SD	26.90 ± 2.97	27.07 ± 2.99	26.50 ± 2.92	0.522
Preoperative PSA, mean ± SD	8.5 ± 5.73	8.88 ± 6.25	7.76 ± 4.56	0.084
Prostate weight, g, mean ± SD	53.20 ± 19.13	50.22 ± 17.39	58.91 ± 21.10	0.037*
Tumor volume, mL, mean ± SD	7.85 ± 1.62	8.80 ± 1.90	6.05 ± 8.54	0.029*
Biopsy Gleason score, n (%)				0.336
≤ 6	121 (71.6)	84 (49.7) (75.7)	37 (21.9) (63.8)	
3+4	26 (15.4)	15 (8.9) (13.5)	11 (6.5) (19)	
4+3	9 (5.3)	4 (2.3) (3.6)	5 (3) (8.6)	
>7	13 (7.7)	8 (4.7) (7.2)	5 (3) (8.6)	
Clinical stage, n (%)				< 0.001*
cT1	78 (46.2)	78 (46.2) (70.3)	-	
cT2	91 (53.8)	33 (19.5) (29.7)	58 (34.3) (100)	

Table 2. Postoperative findings of patients.

	Total (n: 169)	Traction group (n: 111, 65.7%)	Nontraction group (n: 58, 34.3%)	P-value
Prostatectomy Gleason score, n (%)				0.462
pT0	9 (5.3)	6 (3.6) (5.4)	3 (1.7) (5.2)	
≤ 6	92 (54.4)	66 (39.2) (59.5)	26 (15.4) (44.8)	
3+4	40 (23.7)	23 (13.6) (20.7)	17 (10.1) (29.3)	
4+3	16 (9.5)	9 (5.3) (8.1)	7 (4.2) (12.1)	
>7	12 (7.1)	7 (4.1) (6.3)	5 (3) (8.6)	
Pathological stage, n (%)				0.064
pT0	8 (4.7)	5 (3) (4.5)	3 (1.7) (5.1)	
pT2	123 (72.8)	75 (44.4) (67.6)	48 (28.4) (82.8)	
pT3a	38 (22.5)	31 (18.4) (27.9)	7 (4.1) (12.1)	
SMI				0.746
Negative	142 (84)	94 (55.6) (84.7)	48 (28.4) (82.8)	
Positive	27 (16)	17 (10.1) (15.3)	10 (5.9) (17.2)	
BCR	11 (6.5)	8 (4.7) (7.2)	3 (1.8) (5.2)	0.611

However, some results suggest that the rates are different for different techniques (11–13). It is well known that the PSM may be related to the disease burden, surgeon, and technique. Robotic surgery has some advantages versus laparoscopic surgery, and these are related to both the patient and the surgeon. To determine if traction may cause a PSM, we randomized the patients into two groups as traction and nontraction. We hypothesized that traction may cause damage to the prostate capsule and show a pseudopositive surgical margin. In our study, PSM rates were similar in both groups. Higher tumor volume and stage can affect PSM rates (2). Although the traction group had higher tumor volume rates and lower clinical stage, the PSM rates were similar. In addition, prostatectomy Gleason scores were similar for both groups. Higher preoperative PSA levels (>10 ng/mL) may have an effect on PSM formation, but our groups had no difference in PSA levels (14). We included operations performed by the same person because PSM rates can differ among surgeons. Some authors have described a "capsular incision index" to show the damage to the capsule that may cause pseudopositive surgical margins (2). We think that, because the traction made by the fourth arm of the robot may cause a pseudopositive surgical margin, the pathologist must reveal a possible positive margin via colored ink; they must also see the capsule of the prostate. If they do not, this may not be a positive margin. This is very important because it can affect extra therapy options. To avoid unnecessary treatment, both the surgeon and the pathologist must be very careful, as mistakes may not only increase morbidity, but also cost.

In conclusion, surgical margin status after radical prostatectomy is an important topic. Surgical technique is vital for prevention of PSMs, but pathological findings are equally important for determining additional treatment. Removing the specimen with traction during RALP does not cause PSM. The incision should be as small as possible for cosmetic appearance.

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