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Article

How May Longer Console-Time Influence Outcomes after Robot Assisted Radical Prostatectomy (RARP)

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Abstract: Longer operating time in radical prostatectomy may escalate the risk of perioperative complications. Various factors like cancer extent, procedure's level of difficulty, habitus and previous surgeries may lengthen robotic assisted radical prostatectomy (RARP) and therefor compromise outcomes. Objective: this study investigates the influence of operating time on outcomes after RARP in real life settings in a monocentric single surgeon study. Methods: 500 consecutive patients who underwent RARP between April 2019 and August 2022 were included. Patients were divided in three groups. Short (n=157; 31.4%) under or equal to 120 minutes, average (n=255; 51%) between 121 and 180 minutes, long (n=88; 17,6%) above 180 minutes console-time. Demographic, baseline and perioperative data were analyzed and compared between groups. Univariate logistic regression was completed to investigate the association between console-time and outcomes and to predict factors which may prolong surgery. Results: hospital stay and catheter days were significantly longer in group 3 with medians 6 and 7 days ($p<0.001$ and <0.001, respectively). Those findings were confirmed in univariate analysis, $p=0.012$ for Catheter days and $p<0.001$ for Hospital stay. Moreover, major complications were higher in patients with longer procedures $p=0.008$. Prostate volume was the only predictor for prolonged console time ($p=0.005$). Conclusion: RARP is a safe procedure and most patients will be discharged uneventfully. Yet longer console-time is associated with longer hospital stay, catheter days and major complications. Caution has to be taken in large prostate to avoid longer procedures, which may prevent postoperative advert events.

Keywords: Prostate cancer; robot assisted radical prostatectomy (RARP); console-time.

1. Introduction

Longer operating time in radical prostatectomy is known to increase the risk of perioperative complications especially venous thromboembolism (VTE) [1,2]. It is also reported to be associated with the development of symptomatic lymphoceles [3]. In the early days of robotic introduction in prostate surgery, operating time was longer compared to open retropubic radical prostatectomy [4,5]. In learning curve, urologists need longer to complete the procedures [5,6]. Cancer extent, procedure's level of difficulty as well as prostate volume, habitus and previous abdominal surgery play a contributing role in prolonging robot assisted radical prostatectomy (RARP) [7]. This imposes the need to investigate the impact of console-time on perioperative course of RARP. Many authors wrote about possible risk factors to prolong OR-time [7–9]. However, the effect of operating time on postoperative outcomes as complications, catheter days and length of hospital stay might be understudied. This study involves a monocentric single surgeon cohort of 500 patients, 40% with locally advanced tumors, and aims to examine the effect of longer operating time on functional and oncological outcomes. It also investigates factors which may lengthen an operation.

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2. Methods

2.1. Surgical procedure and Setting:

All procedures (n=500) were completed transperitoneally with the Da Vinci X® Surgical Systems (Intuitive Surgical, Sunnyvale, CA, USA). Pelvic lymphadenectomy was performed in all patients and no intraabdominal drainage was inserted. Prior to skin incision, intravenous single-shot antibiotics were administered. The Vesicourethral anastomosis (VUA) was done in a one-layer fashion with a continuous circumferential double-armed barbed suture. In most cases the anastomosis included a one layer Rocco stitch. After completion, patients received intraoperatively anastomosis water-tightness test with 200-300 ml sterile water. All patients received a transurethral (TUC) and a suprapubic catheter (SPC). The transurethral catheter was removed on the first postoperative day (POD1). On POD3 or POD4 patients were allowed to urinate naturally. Suprapubic catheter was removed after one day when micturition was successful and adequate. In case of primary extravasation on cystography, patients were discharged with catheter and catheters were removed in an outpatient visit later.

2.2. Participants and Methods

500 consecutive patients from a prospectively collected database who underwent RARP between 04/2019 and 08/2022 by a specialized surgeon due to locally confined (pT1-2; n=297; 59,4 %) and locally advanced prostate cancer (pT3-4; n=203; 40.6 %) were included in analysis.

We focused on console time, which was defined as the time from the point when the robot is docked until is undocked again at the end of the procedure. Regarding the duration of the procedure patients were divided into three groups based on cut off values of 120 and 180 minutes. **Short** under or equal to 120 minutes, **average** between 121 and 180 minutes, **long** above 180 minutes. Those cut-off values were chosen as they were the repeatedly used values in the literature [10,11]. Demographic, intraoperative and postoperative data were analyzed and compared. Variables included were age, international prostate symptom score (IPSS), international index of sexual function (IIEF), initial PSA, pre- and postoperative Gleason Score, prostate volume in transrectal ultrasound (TRUS), American Association of Anesthesiology Morbidity Score (ASA), pre- and postoperative hemoglobin (Hgb), previous medical and surgical treatment of the prostate and D'Amico Risk Classification. All postoperative complications within 90 days after the procedure were graded by the Clavien-Dindo Classification [12]. Minor complications are those that were managed conservatively. Major complications are those necessitating an intervention, intensive care or resulting in organ injury. Length of hospital stay was considered as the primary endpoint of the study. Since the transurethral catheter was removed on surgery's day or the postoperative day one (POD1), length of suprapubic catheter days was considered as secondary endpoint. Univariable and multivariable logistic regression models were used to investigate the association between console-time and various perioperative outcomes. It is also used to identify predictors which could forecast longer console-time.

Statistical analysis was performed using SPSS® v27. Categorical variables were summarized as frequencies (percentage) and continuous variables as mean ± standard deviation, interquartile ranges (IQR) and median values. The Kolmogorov-Smirnov one-sample test was used to verify normal distribution (test of normality). One way ANOVA-test was performed for parametric numeric variables. Post-Hoc comparison (Bonferroni) test was done in case of significant ANOVA-test. Independent-Samples Kruskal-Wallis Test was executed for nonparametric variables. Univariable logistic regression and linear regression models were used for further association analysis.

2.3. Ethics Statement

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and approved by the ethics committee of the medical association Westfalen-Lippe and Wilhelm's university of Münster (ethical vote: 2022-585-f-S).

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3. Results

3.1. Baseline Parameters

Groups were not statistically different regarding ASA, IPSS and IIEF scores. Tumor parameters like initial PSA, Gleason score and D'Amico risk classification were also equally distributed among groups. Furthermore, the rate of nerve sparing technique was not different between groups. (Table 1).

Table 1. Analysis of demographic, baseline clinical and preoperative characteristics between groups.

	Total (500)	**Short n=157; 31.4%**	**Middle n=255; 51%**	**Long n=88; 17,6%**	***p-Value***
Age (year)					
Mean ± SD	66.8 ± 7.1	67 ± 6.7	67 ± 6.5	65.7 ± 9	0.260
Median	68	68	68	67	
ASA-score					
1	96 (19,2)	36 (22,9)	40 (15,7)	20 (22,7)	
2	314 (62,8)	90 (57,3)	175 (68,6)	49 (55,7)	0.777
3	82 (16,4)	28 (17,8)	36 (14,1)	18 (20,5)	
Missing	8 (1,6)	3 (1,9)	4 (1,6)	1 (1,1)	
Preoperative HGB (g/dl)					
Mean ± SD	14.7 ± 1.3	14.6 ± 1.1	14.7 ± 1.5	14.9 ± 1	0.613
median	14.8	14.8	14.8	11	
IPSS					
Mean ±SD	11.4 ± 8.3	11 ± 8.3	11.3 ± 8.1	12.9 ± 9	0.383
median	8.3	10	10	11	
IIEF					
Mean ± SD	15.2 ± 8.7	14.6 ± 8.5	15.6 ±8.8	15.8 ±7.8	0.261
median	17	17	16	16	
Initial PSA (ng/ml)					
Mean ± SD	14.8 ± 24.5	16.2 ±27.8	13.8 ±20.6	16.5 ± 26.2	0.941
median	8	7.5	8	9.3	
BMI	28.4 ± 4.3	27.7 ± 4.5	28.8 ±4.4	28.7 ±4.4	0.261
	28	27	28	28	
Prostate-Volume (ml)					
Mean ± SD	49 ± 28	47 ± 23	49 ± 27	53 ± 38	0.236
median	43	44	44	44	
Pre-treatment					
Medical (NHT)	55 (11)	16 ()	28 (11)	11 (12,5)	0.881
Surgical (TUR-P)	34 (6,8)	14 (8,9)	16 (6,3)	4 (4,5)	0.379
D'Amico Risk Classification					
Low risk	117 (23,4)	30 (19,1)	64 (25,1)	23 (26,1)	0.627
Intermediate risk	229 (45,8)	78 (49,7)	112 (43,9)	39 (44,3)	
High risk	154 (30,8)	49 (31,2)	79 (31)	26 (29,5)	
Preoperative Gleason score					
5	1 (0,2)	1 (0,6)	0		
6	140 (28)	35 (22,3)	77 (30,2)	28 (12,5)	0.200
3+4	176 (35,2)	63 (40,1)	80 (31,4)	33 (37,5)	
4+3	59 (11,8)	20 (12,7)	33 (12,9)	6 (6,8)	

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8	82 (16,4)	27 (17,2)	44 (17,3)	11 (12,5)	
9	36 (7,2)	10 (6,4)	16 (6,3)	10 (11,4)	
10	5 (1,0)	1 (0,6)	4 (1,6)	0	
Unclassified	1 (0,2)	0	1 (0,4)	0	
Nerve Sparing					
Yes	374 (69,4)	99 (63,1)	184 (72,2)	64 (72,7)	
Partial	19 (3,8)	12 (7,6)	3 (1,2)	4 (4,5)	0.548
No	134 (26,8)	46 (29,3)	68 (26,7)	20 (22,7)	

Categorical data are presented as numbers %, SD: Standard Deviation, ASA: American association of anesthesiology comorbidity score, Hgb: Hemoglobin, IPSS: International prostate symptom score, IIEF: International index of erectile function, iPSA: initial prostate specific antigen, , BMI: Body mass index, NHT: neoadjuvant hormonal therapy, TUR-P: transurethral resection of the prostate.

3.2. Intraoperative data

The median docking-time was 115, 150 and 215 minutes in Groups 1, 2 and 3 respectively. The hospital stay was longest in group 3, median 7 days ($p<0.001$). Whereas the median hospital stays were equal in group 1 and 2 (5 days). Moreover, catheter days were significantly different between groups ($p<0.001$) with medians 4, 5 and 7 days in groups 1,2 and 3 respectively. Stage T3 was highest in group 2 (39,2 %), while stage T4 was highest in group 3 (8%). Group 3 patients had the biggest pre-postoperative hemoglobin-difference (3 g/dl), groups 1 and 2 patients had comparable pre-postoperative hemoglobin-difference (median 2,5 g/dl). In total n=368; 73.6% patients managed to go home without a suprapubic catheter while the catheter had to be removed in a later outpatient visit after discharge in n=132; 26,4% patients. In details only 53,4% of men in group 3 compared to 82,2% and 75,3% in group 1 and 2 respectively left the urological department without catheters. All other intraoperative parameters were comparable among groups. Details in Table 2.

Table 2. Intra- and postoperative data and pathological findings for all groups Group.

	Total (500)	**Short 157; 31.4%**	**Middle 255; 51%**	**Long 88; 17,6%**	***p-Value***
OR-Time Mean ± SD	151 ± 45	109 ±13	150 ± 17	228 ±38	
IQR	120-180	100-120	135-160	200-240	<0.001
median	140	115	150	215	
Prostate weight (g)					
Mean ± SD	61± 25.6	60 ± 21.9	62.9 ± 25.7	61.2 ± 30	0.546
median	55	57	57	54	
Pathological stage					
0	1 (0,2)	0	1 (0,4)	0	
pT1	1 (0,2)	0	0	1 (1,1)	0.027
pT2	295 (59)	91 (58)	147 (57,7)	57 (64,7)	
pT3	183 (36,6)	60 (38,2)	100 (39,2)	23 (26,2)	
pT4	20 (4,0)	6 (3,8)	7 (2,7)	7 (8)	
Postoperative Gleason score					
6	28 (5,6)	11 (7)	12 (4,7)	5 (5,7)	
3+4	282 (56,4)	86 (54,8)	152 (59,6)	44 (59)	
4+3	89 (17,8)	23 (14,6)	46 (18)	20 (22,7)	
8	26 (5,2)	11 (7)	10 (3,9)	5 (5,7)	0.217
9	29 (5,8)	10 (6,4)	11 (4,3)	8 (9,1)	
10	1 (0,2)	1 (0,6)	0	0	
Unclassified*	45 (9,0)	15 (9,6)	24 (9,4)	6 (6,8)	
Positive surgical margins	36 (7,2)	12 (7,6)	17 (6,6)	7 (8)	0.892
Number of Lymph nodes					

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Mean ± SD median	19.6± 7.4 18	19.2 ± 7.2 18	19.7 ± 7.3 18.5	20.9 ± 8.1 19	0.325
Positive Lymph nodes	87 (17,4)	26 (16,6)	48 (18,8)	13 (14,8)	0.651
Hgb-Difference (g/dl) Mean ± SD median	2.5 ± 4.8 2.6	2.5 ± 1.2 2.5	2.6 ± 1.38 2.5	3.18 ± 1.3 3	0.001
Transfusion	7 (1,2)	2 (1,3)	2 (0,8)	3 (3,3)	0.892
hospitalization (days) Mean ± SD median	5.6 ± 1.5 5	5.2 ± 1.1 5	5.5 ± 1.1 5	6.4 ± 2.7 6	<0.001
Catheter days Mean ± SD median	6.9 ± 4.7 5	6.2 ± 3.7 4	6.8 ±4.6 5	9.1 ± 6.1 7	<0.001
Suprabubic Catheter removed before discharge	368 (73.6%)	129 (82,2%)	192 (75,3%)	47 (53,4%)	<0.001

Categorical data are presented as numbers %, SD: Standard Deviation, IQR: interquartile range, Hgb: Hemoglobin.

3.3. Complications and Readmissions

In total (n=21/500; 4,2%) men required an intervention post RARP due to adverse events. Patients who underwent longer RARPs experienced more major complications (p=0.008), especially in group 3 (10,2%). Post hoc analysis showed significant difference only when compared to group 3. Major complications happened similarly between groups 1 and 2 (2,5 vs. 3,1%), while a trend can be suggested for more minor complications in longer operations group, statistical analysis showed no difference (p=0.272). 4 patients in our cohort suffered from thromboembolic accidents. All of them were in patients operated longer than 2 hours. 5,8% of patients where readmitted within 90 days after RARP with similar distribution between groups (p=0.338). All anastomoses related complications like acute urinary retention (AUR), urinary tract infection (UTI), vesicourethral anastomosis leakage (VUAL) and upper urinary tract obstruction (UUTO) happened infrequently and were equally distributed among groups. Urinary tract infections may not be directly anastomoses related, but they were found more often in patients with concurrent vesicourethral anastomosis leakage or micturition's disorders, so that we included them as anastomosis related. Upper urinary tract obstructions (UUTO) were found in patients were the ureter ostium was too close to the anastomosis or an obstruction was observed due to swelling in the anastomosis. Major complications required interventions can be categorized in Grad IIIa which were carried out in local anesthesia, mostly symptomatic lymphocele (n=10; 2%). 5 men had to be re-operated due to two wound hernia, two for Ileus and one for bleeding. Postoperative work up revealed upper urinary tract obstruction in 3 cases, in which DJ catheter was inserted in general anesthesia and removed 4-6 weeks later. Details in Table 3.

Table 3. 90-day complications and Readmissions:.

Complications in detail			**Total (n=500)**	**Short 157; 31.4**	**Middle 255; 51**	**Long 88; 17,6**	***p-value***
		Minor	74 (14,8)	25 (15,9)	32 (12,5)	17 (19,3)	0.272
Minor	CDI 51 (10,2)	VTE	4 (0,8)	0	2 (0,8)	2 (2,3)	0.160
		Elevated blood analysis Parameters	6 (1,2)	4 (2,4)	1 (0,4)	1 (1,1)	
		AUR	28 (5,6)	11 (7)	11(4,3)	6 (6,8)	
		Diverse	13 (2,6)	6 (3,6)	6 (2,4)	1 (1,1)	
	CD II 23 (4,6)	Secondary VUAL*	11 (2,2)	2 (1,3)	7 (2,7)	2 (2,3)	
		UTI	11 (2,2)	2 (1,3)	4 (1,6)	5 (5,7)	

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		Hematoma requiring Transfusion	1 (0,2)	0	1 (0,4)	0	
		Major	21 (4,2)	4 (2,5)	8 (3,1)	9 (10,2)	0.008
Major	CD III a 12 (2,4)	Myocardial infarction	1 (0,2)	0	1 (0,4)	0	
		Hiatus Hernia	1 (0,2)	0	0	1 (1,1)	
		Symptomatic Lymphocele	10 (2.0)	4 (2,5)	4 (1,6)	2 (2,3)	
	CD III b 8 (1,6)	Revision	5 (1.0)	0	3 (1,2)	2 (2,3)	
		UUTO	3 (0,6)	0	0	3 (3,3)	
	CD VI 1 (0,2)	Rhabdomyolysis	1 (0,2)	0	0	1 (1,1)	
		Readmissions*	28 (5,6)	6 (3,8)	15 (5,9)	7 (8)	0.338

*some patients came to emergency with mixed AUR+VUAL+UTIs, we listed the most serious complaint. Categorical data are presented as numbers %, VTE: Venous thromboembolism, AUR: acute urinary retention, VUAL: Vesicourethral anastomosis leakage, UTI: Urinary tract infection, UUTO: Upper urinary tract obstruction.

An univariate regression analysis confirmed our findings that a longer console-time prolonged catheter and hospital days (p= 0.012 and <0.001, respectively). However, no correlation was found between console-time and readmissions, complications or positive surgical margins. Furthermore console-Time couldn't independently predict thromboembolic complications. Details are given in Table 4. Further analysis to predict which parameter can predict longer console-Times showed that only Prostate volume could independently predict longer console-Time (p=0.005). Neither D'Amico classification, Gleason score, BMI, initial PSA, neoadjuvant hormonal therapy nor pervious surgical treatment of the prostate showed a correlation with console-time.

Table 4. Univariate linear regression analysis to determine the relation between operating time and other outcomes.

	Readmission	**Minor**	**Major complications**	**Catheter days**	**Hospital stay**	**lymphoceles**	**Positive surgical margins**	**Urinoma**	**Pulmonary Embolism**	**Transfusion**
consol e-Time	0.417	0.527	0.569	0.012	<0.001	0.373	0.664	0.234	0.190	0.073

Table 5. Univariate linear regression analysis of predictors for prolonged operating time:.

	D'Amico classification	**Prostate Volume**	**BMI**	**PSA**	**Gleason score**	**Previous medical treatment (NHT)**	**Previous Prostate surgery**
console-Time	0.643	0.005	0.904	0.484	0.274	0.998	0.114

BMI: body mass index, PSA: prostate specific antigen; NHT: neoadjuvant hormonal Therapy.

4. Discussion

The core finding of our study is that longer console time may result in longer hospital stay and longer catheter days. The difference is clearer when console-time exceeds three hours. Console-time also correlated with increased risk of postoperative major complications. Yet it did not influence minor complications or readmissions. In our study patients whose surgeries lasted more than three

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hours stayed one day longer in our urological department (p<0.001) and the urinary diversion through suprapubic catheter (SPC) was also two days longer (median 7 days) compared to patients operated in less than three hours (p<0.001). Furthermore we found that patients operated in less than two hours kept their catheter one day shorter when compared to those operated more than two hours (median 4 vs. 5 days). On the contrary, Potretzke et al. found that patients who stayed longer in the hospital underwent shorter procedures [13]. In general, the length of hospital stay in our cohort is longer compared to studies carried out outside Europe [9,13–16]. Nevertheless shorter console-Time promises a significant cut in stays and its related costs.

In total (n=21/500; 4,2%) men in our cohort required an intervention which is in range with other reports [17], half of these men belong to group 3 (n=9/88; 10,2%). While Uchida et al. found no changes in the incidence of serious complications [8], major complications in our cohort were observed more often in men who underwent longer RARPs. This is in line with finding of others [10]. On the other hand, Post hoc analysis showed significant differences only when compared to group 3. Major complications occurred similarly frequent between groups 1 and 2 (2,5 vs. 3,1%). Although this might be a coincidental finding, it suggests a threshold of three hours as a surrogate for increased major complications. Nonetheless and in agreement with Uchida et al. the univariate regression analysis didn't show a linear correlation between console-Time and major complications [8].

A total of 28 (5,6%) men were readmitted within 90 days after discharge. This is in range with other studies [10,18]. Despite a trend for more readmissions in group 3 (8%), statistically there was no difference (p=0.338). While Xia et al. found longer operating times to increase the risk for readmissions, we found no correlation between console-Time and readmissions (p=0.417). To the best of our knowledge this is the first study with this number of patients to primarily investigate predictors for prolonged console-Time and to explore the impact of console-time on postoperative outcomes and complication after RARP in a cohort of one surgeon without any exclusion criteria with almost 40% of its patients possessing locally advanced carcinomas.

Due to reimbursement regulations of the national health system, in general patients in our country tend to stay in hospital at least until catheter removal after RARP. In our cohort the overall median Catheter and hospital Days were 5 days both. Such catheter days are in the lower range of others [5]. Furthermore, we found that only 53,4% of men in group 3 were discharged without urinary catheter which is significantly lower than men in both other groups (82,2% and 75,3% in group 1 and 2 respectively). Those men had to return to an outpatient visit to get their catheter removed. This suggests a clinically relevant influence of console-time on the overall short term convalescence after RARP. Furthermore, in our cohort the rate of overall positive surgical margins (PSM) is relatively low (7,2%). Interestingly, it was equally distributed between groups. On the contrary, Salciccia et al. reported a relation between OR time and positive surgical margins. [11]. They found elevated PSM in men with OR-time less than 120 minutes by overall OR-time of 172 minutes. We couldn't find such a relation between console-Time and PSM in univariate linear regression analysis .

In line with others, our univariate analysis confirmed our findings that longer console-time resulted in longer hospital stay [11] and catheter days. Several other studies investigated factors which may lengthen RARP [9,19], however not all of them found hospital stay to be affected through it [20]. Yet Alenizi et al. found elevated BMI and prostate volume to prolong specific steps of the procedure [7]. In contrast, we found BMI to have no influence on console-time [8,19]. On the other hand, increased prostate volume was the only parameter to predict longer console-Time in our analysis (p=0.005). This comes in agreement with authors who reported similar findings in men with large prostates [19,20]. Wenzel et al. found a prostate size larger than 40 cc to prolong OR-Time yet only in retropubic radical prostatectomy RPE und not in their RARP cohort [19]. Our findings were also confirmed in Retzius-sparing robot-assisted radical prostatectomy (rsRARP) cohorts [21].

In our study n=4/500 (0.8%) men suffered from VTE of which two had concordant asymptomatic pulmonary embolism. All four incidents happened in groups 2 and 3. This is in range with reports of VTE incidence between 0.5% and 1,8% [1,2]. Other minor complications especially VUA related ones like AUR, UTIs or secondary VUAL didn't happen more often in groups 2 or 3. Nevertheless no

conclusions can be drawn due to small sample size of complications, which present a limitation of our study.

The strength of our investigation is the large number of patients included and the detailed analysis of their perioperative parameters and outcomes. Yet, limitations must be taken into account. The main limitation of our study is its retrospective nature. Furthermore, we could not include long-term outcome measures to the lack of follow-up data, which is partly explained by the national health care system in which follow up is not conducted by tertiary referral centers. We reported outcomes, complications and readmissions within 90 days after RARP through passive follow up, in which we wrote every referring urologist and general physician to report functional, oncological and other postoperative outcomes of our shared patient.

The duration of postoperative urinary diversion depends on intraoperative course, surgeon´s technique, experience and preferences. Also, it is affected by patients´ cancer characteristic and medical history. All of mentioned reasons imposes a selection bias in our study which had to be enlightened. In our cohort, men were drained via suprapubic catheter. So, in case of micturition disorders or difficulties, it was easier for patients and treating medical personal to re-open the catheter and cancel the micturition trial. This may have resulted in longer catheter days in contrast to patients drained via transurethral catheter in the literature [22]. Various factors may prolong the duration of the procedure, such as tumor extent, habitus and previous surgeries as well as surgeons experience [7]. Despite the fact that no significant differences were found in baseline parameters between groups, this didn't exclude another selection bias. The relevance of our study and therefore its evidence base must be narrowed since it was solely based on a high volume urological department and an expert surgeon. We found that almost half the men (46,7%) operated longer than three hours left the hospital with suprapubic catheter. This may also be due to other reasons, such as advanced tumors and higher rate of serious complications in this group. This imposes another limitation of our study.

5. Conclusions

Longer console-time is associated with longer hospital stay, catheter days and major complications. Patients with shorter operations have better chance to leave the hospital without catheters. Elevated prostate volume may forecast longer procedures. Yet even in longer operation most patients (more than 96%) can expect an uneventful intra and postoperative course. In complicated cases, attention must be taken to avoid postoperative adverse events due to prolonged procedures.

Author Contributions: Conceptualization: MF, FW. Data curation: MF. Formal analysis: MF, ME. Methodology: MF. Project administration: MF, ME, FW. Visualization: MF. Writing – original draft: MF. Writing – review & editing: MF, FW.

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Ethics approval/Ethics Statement: The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and approved by the ethics committee of the medical association Westfalen-Lippe and Wilhelm's university of Münster (protocol number 2022-585-f-S).

Informed Consent Statement: Not applicable.

Abbreviations

ADT:	Androgen deprivation Therapy
ASA:	American association of anesthesiology comorbidity score
AUR:	Acute urinary retention
BMI:	Body mass index

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CD:	Clavien-Dindo classification of postoperative complication
HBG:	Hemoglobin
IIEF:	International index of erectile function
IPSS:	International prostate symptom score
NHT:	neoadjuvant hormonal therapy
NSTEMI:	Non ST Segment Elevation Myocardial Infarction
POD:	Post-operative day
PSA:	Prostate-specific antigen
PSM:	positive surgical margins
TUR-P:	Transurethral resection of the prostate
RARP:	Robot-assisted radical prostatectomy
RPE:	Retropubic radical prostatectomy
SPC:	Suprapubic catheter
TUC:	Transurethral catheter
OR-time:	Operating time
LOS:	Length of hospital stay
UTI:	Urinary tract infection
VTE:	Venous thromboembolism
UUTO:	Upper urinary tract obstruction
VUA:	Vesicourethral anastomosis
VUAL:	Vesicourethral anastomosis leakage

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