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Robot-assisted laparoscopic radical prostatectomy (RARP) performed via transperitoneal and extraperitoneal approaches: perioperative and early oncologic outcomes from a single surgeon experience

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Introduction & Objectives

To compare the perioperative and early oncologic outcomes after transperitoneal (Tp-RARP) and extraperitoneal (Ep-RARP) robot-assisted laparoscopic radical prostatectomy for localized prostate cancer.

Materials & Methods

We retrospectively collected the clinical data of 612 localized prostate cancer cases done by a single surgeon, in which 302 patients were treated by Tp-RARP, and 310 underwent Ep-RARP. Tp-RARP were mostly done from 2014 to 2017, and Ep-RARP from 2017 to late 2019.

Table 1. Demographic, clinical, morphological and perioperative data of patients based on Tp & Ep Approach

	Tp-RARP, n=302	Ep-RARP, n=310	P-Value
Age, years, mean (SD)	68.3 (6.1)	69.0 (6.0)	0.155*
BMI, kg/m^2, mean (SD)	24.7 (3.5)	24.5 (3.4)	0.560*
Abdominal surgical history	72/302	60/310	0.177†
Prostate volume, cm^3, mean (SD)	38.9 (20.6)	41.7 (23.4)	0.142*
Preoperative PSA, ng/ml, median (quartile)	12.7 (8.0-26.7)	12.9 (7.9-28.0)	0.110*
Pathologic Grade Groups, %			0.240‡
1	31 (10.3)	26 (8.4)	
2	73 (24.2)	62 (20.5)	
3	67 (22.2)	77 (24.8)	
4	40 (13.2)	45 (14.5)	
5	38 (12.6)	57 (18.4)	
Neo-adjuvant therapy	53 (17.6)	27 (8.7)	
pT stage, %			0.109‡
T2a	34 (11.2)	34 (11.0)	
T2b	6 (2.0)	10 (3.2)	
T2c	177 (58.6)	158 (51.0)	
T3,T4	78 (25.8)	62 (20.0)	
pN stage, %			0.566†
N0	220 (72.8)	210 (67.7)	
N1	32 (10.6)	26 (8.4)	
Nx	43 (14.2)	28 (9.0)	
EAU risk groups, %			0.622‡
Low-risk	8 (2.6)	12 (3.9)	
Intermediate-risk	21 (7.0)	22 (7.1)	
High-risk	178 (58.9)	156 (50.3)	
Locally advanced	88 (29.1)	74 (23.9)	
Surgical margin, %			0.576†
Negative	222	204	
Positive	73	60	
T2a	0 (0)	2 (5.9)	
T2b	0 (0)	0 (0)	
T2c	43 (24.3)	34 (21.5)	
T3, T4	30 (38.4)	26 (41.9)	
Surgery time, mins, mean (SD)	146.7 (40.8)	122.6 (41.0)	***<0.001****
Estimated blood loss, ml, mean (SD)	140.0 (99.4)	139.7 (83.4)	0.977*
Indwelling catheter, days, mean (SD)	7.4 (2.7)	7.5 (3.0)	0.687*
Hospital stay after surgery, days, mean (SD)	7.6 (3.7)	6.6 (3.5)	***0.002****
Bowel function recovery time, h, mean (SD)	25.1 (10.5)	9.7 (2.4)	***<0.001*****
Grade III-IV complications	4/302	3/310	
Urinary continence rates (6 month, ≤1 pad/d)	121/190	116/164	

*T-test, **Mann-Whitney U test, †χ^2 test or Fisher's exact test, ‡Cochran-Mantel-Haenszel χ^2 test, P-*value* <0.05 was regarded as statistically significant;

Results

There was no significant difference for age, body mass index (BMI), preoperative prostate-specific antigen, pathological stage and Gleason score, tumor volume, positive surgical margin , lymph node status, blood loss, bladder catheterization time and complication rates between these two different approaches. Ep-RARP had shorter operative time (122.6 mins for Ep-RARP and 146.7 for Tp-RARP, P<0.001) and faster patient oral diet intake (9.7 vs and 25.1 hours, respectively, P<0.001). The average hospitalization time were 6.6 and 7.6 days after Ep-RARP and Tp-RARP (P=0.002). For patients with prior abdominal surgical history and for those with BMI≥30, the Ep-RARP approach also has advantages in taking less blood loss.

Fig 1

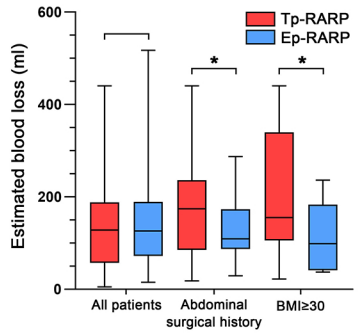

Figure1 Estimated blood loss based on different patient groups * P<0.05

Fig 2

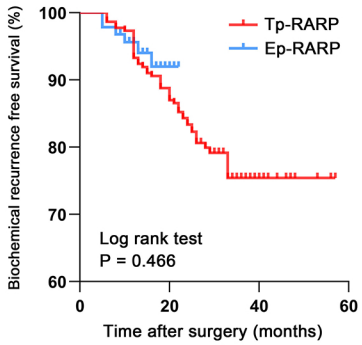

Figure2 Biochemical recurrence free survival between Tp-RARP & Ep-RARP groups

Conclusions

Ep-RARP is a well-developed technique which has the advantages of shorter operation time and less bowel disturbance rate compared with traditional Tp-RARP, especially in patients with prior abdominal surgical history or obesity. However, further multi-centered randomized controlled trials are need for evaluating its safety and efficacy.