

CHANGES OF THE BLADDER FUNCTION FOLLOWING RADICAL PROSTATECTOMY: COMPARISONS BETWEEN ROBOT-ASSISTED LAPAROSCOPIC AND OPEN RETROPUBIC PROCEDURES FROM A MULTICENTER DATABASE

Hypothesis / aims of study

Urinary dysfunction after radical prostatectomy (RP) has been mainly focused on the changes of urethral sphincter function following surgery. However, bladder function itself may be changed after surgery because some damage to the bladder could be occurred in relation to the manipulation on the bladder and surrounding structures during the surgery. We aimed to compare the changes of bladder function following surgery between men undergoing robot-assisted laparoscopic prostatectomy (RALP) and open retropubic RP, using a multicenter database.

Study design, materials and methods

From 2011 to 2013, two hundred and thirteen men received the urodynamic testing prior to and at 6 months after RP at three hospitals. After excluding 63 men with neurogenic abnormality, adjuvant pelvic irradiation before follow-up urodynamic study, a history of surgery/radiation on the pelvis, urethral/anastomotic stricture, or urinary incontinence following surgery, 150 men were evaluated. In the follow-up urodynamic study, men were instructed to try to void without an abdominal strain during a pressure-flow study and mechanical stop test was applied to identify the presence of detrusor pressure if the detrusor pressure was not observed during voiding trial.

Results

The mean age at surgery was 68 years (interquartile range 63-71) and 82% of the surgeries were carried out by a single surgeon. Table 1 shows the results on the changes in the urodynamic bladder and sphincter functions between RALP (n = 84) and open retropubic RP (n = 66). Only free post-void residual volume was significantly different among the pre-operative urodynamic parameters between the groups. In both groups, most of the urodynamic parameters showed significant changes following operation except for a few variables. Among parameters on storage phase, percent of detrusor overactivity decreased and percent of reduced compliance ($\Delta V/\Delta p_{det} \leq 20$ mL/cmH₂O) increased significantly after surgery in both groups. In parameters on voiding phase, percent of bladder outlet obstruction (AG ≥ 40) did not change significantly in both groups. However, bladder contractility index value decreased and percent of detrusor underactivity (AG <20 and uroflow <12 ml/s; [1]) increased significantly only in those with RALP (14.3% \rightarrow 31.6%).

Interpretation of results

Based on our findings, detrusor overactivity became improved but, bladder compliance became impaired in 20-25% of patients following surgery. Further studies for the clinical interpretation on these findings may be warranted.

Concluding message

We confirmed the changes of various parameters related to the bladder function after RP. In particular, detrusor contractility deteriorated significantly only in men undergoing RALP.

Table 1. Comparison of the changes in the urodynamic bladder and sphincter functions between robot-assisted laparoscopic and open radical prostatectomy

Parameter	RALP group (n=84)			Open RP group (n=66)		
	Pre-RP	Post-RP	P-value	Pre-RP	Post-RP	P-value
Uroflowmetry						
Qmax (ml/sec)	12.5 (9.0, 17.0)	14.5 (11.0, 20.0)	0.006	10.0 (8.0, 14.5)	14.0 (9.5, 20.5)	0.001
PVR (ml)	15.0 (9.3, 40.8)	14.0 (6.0, 24.0)	0.111	24.5 (13.0, 50.0)	15.5 (7.0, 34.3)	0.021
Urethral pressure profilometry						
MUCP (cmH ₂ O)	77.0 (62.0, 97.0)	65.5 (57.3, 78.8)	0.001	71.0 (52.8, 85.8)	60.5 (50.3, 76.0)	0.006
FUL (mm)	69.0 (63.3, 76.0)	42.5 (35.0, 54.8)	<0.001	66.5 (61.0, 75.0)	42.5 (37.0, 52.0)	<0.001
Filling cystometry						
MCC (ml)	400.5 (321.8, 493.8)	390.5 (323.3, 475.8)	0.929	423.0 (336.8, 527.5)	402.0 (324.5, 513.0)	0.750
DO (%)	25 (29.8%)	12 (14.5%)	0.004	18 (27.3%)	8 (12.1%)	0.041
RC (%)	2 (2.4%)	17 (20.2%)	0.001	2 (3.0%)	17 (25.8%)	<0.001
Pressure-flow study						
PdetQmax (cmH ₂ O)	43.0 (36.3, 52.0)	30.5 (21.3, 45.0)	<0.001	48.0 (37.5, 58.0)	32.0 (24.8, 42.3)	<0.001
Pdetmax (cmH ₂ O)	51.5 (44.0, 64.8)	44.0 (37.5, 53.5)	<0.001	57.0 (43.0, 67.3)	44.0 (40.0, 51.5)	<0.001
BOO (%)	13 (15.5%)	9 (10.5%)	0.424	15 (23.1%)	6 (9.1%)	0.077
BCI value	92.5 (79.0, 111.0)	86.0 (69.0, 103.8)	0.001	98.0 (79.0, 111.5)	91.0 (74.5, 121.3)	0.641
DU (%) by Nitti et al.	12 (14.3%)	27 (31.6%)	0.011	10 (15.1%)	16 (24.2%)	0.286

RALP, robot-assisted laparoscopic prostatectomy; RP, radical prostatectomy; Qmax, maximum flow rate; PVR, post-void residual volume; MUCP, maximum urethral closing pressure; FUL, functional urethral length; MCC, maximum cystometric capacity; DO, detrusor overactivity; RC, reduced compliance; PdetQmax, detrusor pressure at maximum flow rate; Pdetmax, maximum detrusor pressure; BOO, bladder outlet obstruction; BCI, bladder contractility index; DU, detrusor underactivity.

References

1. Nitti et al., J Urol 2002;168:135-8

Disclosures

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