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CHANGES OF URODYNAMIC FINDINGS AND LOWER URINARY TRACT SYMPTOMS AFTER RADICAL PROSTATECTOMY: IMPACT OF DETRUSOR CONTRACTILITY

Hypothesis / aims of study

Lower urinary tract symptoms (LUTS) including urinary incontinence and quality of life (QOL) have been considered more important recently, because radical prostatectomy (RP) has been established as a safe and effective treatment for localized prostate cancer. In the present study, we attempted to elucidate changes of urodynamic parameters and LUTS in men followed for 1 year after RP compared to the preoperative situation, particularly focus on preoperative detrusor contractility.

Study design, materials and methods

Forty-three patients, who undertook RP (laparoscopic: 27, retropubic: 16) and pressure flow study (PFS) at pre-RP and 12 months (M) after RP, were enrolled in the present study. No patients complained urinary incontinence preoperatively. Urodynamics including uroflowmetry (UFM) and PFS and questionnaire regarding LUTS were conducted at pre-RP and at 12M after RP. Detrusor underactivity (DU) was defined as <10 in preoperative maximum Watts factor value.

Study 1: Urodynamic parameters and LUTS were compared between at pre-RP and 12M after RP.

Study 2: Difference regarding urodynamic parameters and LUTS was investigated between patients with DU and normal detrusor function (ND) in both pre-RP and 12M after RP.

Results

(Study 1: Table 1) UFM at 12M after RP showed that maximum flow rate (Qmax) was significantly increased (p=0.0029) and postvoid residual urine volume (PVR) was significantly decreased (p=0.0042) compared to pre-RP. PFS revealed that Qmax was significantly increased (p=0.0039) and detrusor pressure at Qmax (PdetQmax) (p<0.0001) and PVR (p=0.0089) were significantly decreased at 12M after RP compared to pre-RP. Bladder outlet obstruction (BOO), which was assessed with A-G nomogram and bladder outlet obstruction index, was released after RP. Meanwhile, RP did not affect bladder capacity, bladder compliance, or detrusor contractility. Although detrusor overactivity (DO) was seen in 5 patients (12%) preoperatively, DO disappeared in 3 (7%) and de novo DO appeared in 4 (9%) after RP. Continence rates (frequency: ≤2, amount: ≤2, impact: ≤3) on International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) were gradually increased during follow-ups, which was 71% in frequency, 100% in amount and 85% in impact at 12M after RP. While LUTS in International Prostate Symptom Score (IPSS) at 12M after RP, including IPSS subscores, was not different from preoperative scores, QOL index was significantly better at 12M after RP than at pre-PR (p=0.0204).

(Study 2: Table 2) DU was identified in 21 (49%). Preoperative PFS revealed that Qmax (p=0.0056) and Pdet Qmax (p=0.0033) were significantly lower and PVR (p=0.0242) was significantly higher in DU compared ND. Degree of BOO was not different between DU and ND. Preoperative LUTS in IPSS and QOL index revealed that subscore regarding weak urinary stream (p=0.0414) and QOL index (p=0.0251) were significantly higher in DU than ND. At 12M after RP, PdetQmax or PVR was not different between DU and ND, although Qmax remained higher in ND than DU. IPSS, QOL index, or continence rate in ICIQ-SF was not different between DU and ND at 12M after RP. Incidence of DO, bladder capacity, or bladder compliance was not different between DU and ND at both pre-RP and 12M after RP.

Interpretation of results

(Study 1) RP released bladder outlet obstruction without the effect of detrusor contractility, which improved urodynamic parameters. However, improvement of urodynamic parameters did not affect LUTS, but correlated QOL score. Urinary continence in ICIQ-SF was gradually improved to be satisfactory in more than 80% of patients at 12M after RP.

(Study 2) Although detrusor contractility affected urodynamic parameters and LUTS preoperatively, there was little effect of detrusor contractility in urodynamic parameters and LUTS after RP.

Concluding message

RP improves urodynamic parameters, which do not significantly affect LUTS in the present study. Urinary continence is gradually improved to be satisfactory within 1 year after RP. Although a half of patients would have impaired detrusor contractility, which affects urodynamic parameters and LUTS preoperatively, there is little effect of detrusor contractility on postoperative urodynamic parameters and LUTS.

Table 1

	Pre-RP	12M	p-value
(UFM)			
Qmax	17.5±6.9	23.5±10.7	0.0029
RU	55±90	14±21	0.0042
(PFS)			
PdetQmax	49.2±20.3	30.7±16.7	<0.0001
Qmax	12.6±6.5	16.9±8.0	0.0039
PVR	60±86	23±66	0.0089
(IPSS)			
Total	8.6±7.0	7.9±4.7	N.S.
QOL	3.4±1.5	2.5±1.6	0.0204

Table 2

	DU	ND	p-value
Pre-RP			
(PFS)			
Pdet Qmax	41.1±13.2	56.9±23.5	0.0033
Qmax	9.5±3.6	15.6±7.4	0.0056
PVR	94±106	28±45	0.0242
(IPSS)			
Total	10.4±8.3	7.1±5.5	N.S.
Stream	2.0±1.8	0.9±1.1	0.0414
QOL	3.9±1.5	2.9±1.4	0.0251
12M			
(PFS)			
Pdet Qmax	26.9±12.9	34.5±19.8	N.S.
Qmax	13.9±7.0	19.7±8.1	0.0356
PVR	32±86	14±39	N.S.
(IPSS)			
Total	8.6±4.2	7.2±5.2	N.S.
Stream	1.1±1.0	0.9±1.3	N.S.
QOL	2.7±1.4	2.2±1.8	N.S.

N.S.: not significant

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Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Hokkaido University Hospital**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**