

VIDEOURODYNAMIC CHANGES AND THE IMPACT ON URINARY CONTINENCE AFTER LAPAROSCOPIC RADICAL PROSTATECTOMY

Hypothesis / aims of study

Laparoscopic radical prostatectomy (LRP) is the most popular surgical procedure to treat localized prostate cancer. Although the treatment is effective patients might suffer from stress urinary incontinence (SUI) after LRP. This study investigated the changes of videourodynamic parameters before and after LRP and the impact on urinary incontinence.

Study design, materials and methods

Male patients with localized prostatic cancer who underwent LRP received videourodynamic study at baseline and 1, 3 and 6 months after operation. The changes of urodynamic parameters such as first sensation of filling (FSF), full sensation (FS), detrusor pressure (Pdet), voided volume, cystometric bladder capacity (CBC), bladder compliance, maximum flow rate (Qmax), postvoid residual (PVR), maximal urethral closure pressure (MUCP) and functional profile length (FPL) were measured and compared among baseline and different postoperative time points. The bladder neck (BN) levels to the superior margin of the symphysis pubis after LRP was also measured (Fig.1) and compared in patients with postoperative stress urinary incontinence (SUI) at different time points.

Results

A total of 48 men aged 52 to 82 (mean 71) years were enrolled prospectively. All patients received VUDS at baseline and cystography 1 week after LRP, but only 33 and 32 repeated VUDS at 3 M and 6 M, respectively. Nevertheless, all patients were regularly followed up at out-patient clinic for their voiding conditions. Postoperatively, except FS increased and Pdet decreased at 6 M, the other urodynamic parameters of FSF, Qmax, PVR, volume, CBC and bladder compliance did not change significantly.

Interpretation of results

MUCP and FPL significantly decreased from 1 M to 6 M (Table 1). The BN levels were significantly associated with SUI at 6 M and 12 M (Table 2). Patients with postoperative SUI at 6 M had a significantly smaller FS and compliance, and higher incidence of bladder outlet obstruction at baseline (Table 3). However, there was no significant difference in urodynamic parameters, except for MUCP, between patients with and without SUI at 6 M (Table 4).

Concluding message

Patients who had SUI at 6 M or longer had lower MUCP and BN level after LRP. The other urodynamic parameters did not significantly change between SUI and non-SUI patients.

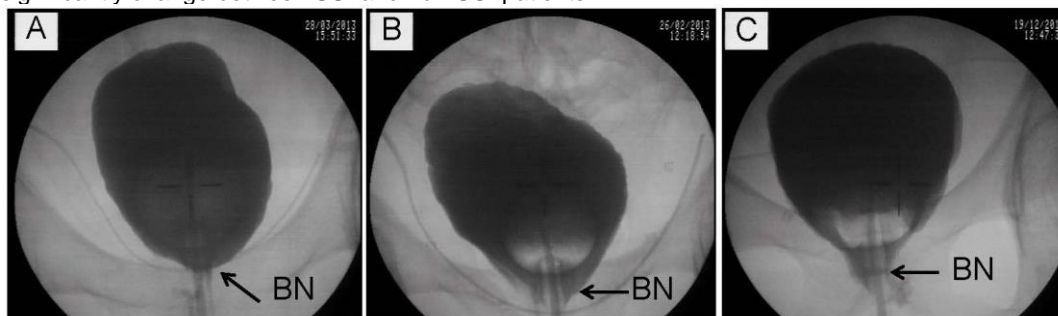


Fig 1. The bladder neck levels after laparoscopic radical prostatectomy. (A) level 0, the BN level at, (B) level -1, the BN level <2 cm lower, and (C) level -2, the BN level >2 cm lower than the superior margin of symphysis pubis.

Table 1. The changes of urodynamic parameters after laparoscopic radical prostatectomy

	Baseline (n=48)	Postop 3 M (n= 33)	Postop 6 M (n= 32)	P- value
FSF (mL)	177 ± 48	122 ± 74.7	151 ± 84.6	0.057
FS (mL)	198 ± 88.2	183 ± 89.1	231 ± 108	0.035
CBC (mL)	314 ± 121	289 ± 104	307 ± 99.0	0.323
Compliance	74.8 ± 70.9	69.2 ± 56.8	68.2 ± 51.0	0.825
Pdet (cmH ₂ O)	41.8 ± 20.7	24.5 ± 12.9	25.4 ± 13.0	0.000
Qmax (mL/s)	14.7 ± 14.5	11.4 ± 5.42	11.3 ± 5.79	0.277
Volume (mL)	282 ± 134	278 ± 117	296 ± 107	0.618
PVR (mL)	31.9 ± 64.1	11.9 ± 33.3	11.1 ± 27.8	0.147
MUCP(cm ₂ O)	62.6 ± 20.0	44.2 ± 13.8	46.4 ± 12.0	0.000
FPL (mm)	48.7 ± 9.90	16.3 ± 6.68	16.8 ± 6.41	0.000

CBC: cystometric bladder capacity, FPL: functional profile length, FS: full sensation, FSF: first sensation of filling, MUCP: maximal urethral closure pressure, Pdet: detrusor pressure, PVR: postvoid residual, Qmax: maximum flow rate.

Table 2. The relationship of bladder neck levels and stress urinary incontinence at different time points

BN level	SUI at 3 M	SUI at 6 M	SUI at 12 M
0 (n=9)	2 (22.2%)	1 (11.1%)	0
-1 (n=24)	17 (70.8%)	12 (50%)	4 (16.7%)
-2 (n=15)	13 (86.7%)	10 (66.7%)	4 (26.7%)
Total	32 (66.7%)	23 (47.9%)	8 (16.7%)

BN: bladder neck, SUI: stress urinary incontinence.

Table 3. The baseline videourodynamic parameters between patients with and without stress urinary incontinence at 6 months after radical prostatectomy

VUDS findings	With SUI (n=23)	Without SUI (n=25)	P value
FSF (mL)	100.3 ± 47.3	129.6 ± 52.1	0.06
FS (mL)	159.8 ± 82.3	208.9 ± 72.5	0.04
Bladder compliance	44.4 ± 38.5	81.5 ± 90.8	0.09
Pdet.Qmax (cmH ₂ O)	49.3 ± 23.2	41.2 ± 17.0	0.18
Qmax (mL/s)	15.0 ± 15.5	14.9 ± 13.8	0.97
Voided volume (mL)	247.4 ± 119.8	278.2 ± 111.4	0.37
PVR (mL)	19.1 ± 43.6	40.7 ± 73.5	0.25
Bladder capacity (mL)	266.4 ± 110.6	319.0 ± 95.8	0.09
BOO index	19.3 ± 43.2	11.4 ± 28.8	0.47
DO	16 (76.2%)	15 (55.6%)	0.14
BOO	11 (52.4%)	6 (22.2%)	0.03

BOO: bladder outlet obstruction, DO: detrusor overactivity, FS: full sensation, FSF: first sensation of filling, Pdet: detrusor pressure, PVR: postvoid residual, Qmax: maximum flow rate, SUI: stress urinary incontinence.

Table 4. The videourodynamic parameters between patients with and without stress urinary incontinence at 6 months after LRP

VUDS findings	With SUI (n=14)	Without SUI (n=18)	P value
FSF (mL)	158.4 ± 96.3	133.4 ± 74.1	0.419
FS (mL)	215.1 ± 112.5	228.8 ± 105.1	0.729
Bladder compliance (mL/cmH ₂ O)	55.1 ± 47.1	82.6 ± 60.6	0.175
Pdet.Qmax (cmH ₂ O)	27.8 ± 13.5	29.2 ± 19.1	0.813
Qmax (mL/s)	10.1 ± 5.5	12.2 ± 7.64	0.398
Voided volume (mL)	256.6 ± 126.8	294.9 ± 119.7	0.388
PVR(mL)	50.7 ± 134.2	11.1 ± 25.6	0.295
Bladder capacity (mL)	307.3 ± 114.2	306.1 ± 113.5	0.976
MUCP	41.0 ± 9.96	49.4 ± 12.7	0.05
FPL	16.1 ± 8.12	16.7 ± 4.48	0.798

FPL: functional profile length, FSF: first sensation of filling, FS: full sensation, MUCP: maximal urethral closure pressure, Pdet: detrusor pressure, PVR: postvoid residual, Qmax: maximum flow rate.

Disclosures

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