

Biofeedback pelvic floor muscles training for the treatment of urinary incontinence in men after laparoscopic radical prostatectomy



Abstract #311

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Introduction

Urinary incontinence (UI) after laparoscopic radical prostatectomy (LRP) is a common complication and has a negative effect on the patient's quality of life (QOL).

Approximately 90% of patients experience UI after LRP and approximately 10% experience UI at 1 year after LRP.

Although artificial urethral sphincter placement is recommended as the gold standard of treatment for these patients, inherent incidences of adverse events, such as device infection and malfunction, urethral erosion, and atrophy, have been reported.

These risks deter possible placements of the artificial urethral sphincter in patients. However, patients with prolonged UI for > 1 year after LRP are reluctant to accept a lower QOL caused by UI.

There is concern about the long-term negative effects of urinary incontinence on the quality of life of these patients. Generally, pelvic floor muscle training (PFMT) is recommended as the first choice of conservative treatment for all patients immediately after PRP.

This happens because the main cause of UI is insufficient urethral closure because of urinary sphincter dysfunction following intraoperative nerve damage. PFMT promotes urethral closure by increasing the strength of the pelvic floor muscle (PFM).

To reduce urine leakage after LRP, patients must relearn how to contract PFM to adequately close the urethra.

For the best training in isolated pelvic floor muscle contraction in patients, a biofeedback (BFB) method is used.

Objective: To evaluate the effectiveness of PFMT with BFB method for restoring urinary continence in patients after LRP.

Methods

This study was conducted at a first medical university in Saint-Petersburg. The study protocol was approved by the Research Ethics Committee of the authors' institute. Each study participant provided written informed consent.

The study included male patients who underwent LRP and complained of stress urinary incontinence (SUI) persisting averaged 3.4 months after LRP.

The exclusion criteria were as follows: < 20 g per day of urinary leakage, urgency UI, disability-associated UI, severe mental disease or cognitive impairment, a known neurological disorder affecting the lower urinary tract function, restricted physical activity.

47 patients after LRP were randomized into 2 treatment groups. The doctor provided the patient with instruction on the anatomy of the pelvic floor and the mechanism of continence using a leaflet and an anatomical model of the pelvis.

- The first group - patients performed the exercises at home after verbal oral instructions from the doctor (n=24)
- The second group (n = 23), patients performed PFMT with biofeedback once a week for 1 month. After receiving PFMT with BFB session, the patient was instructed on the training load of PFMT at home.

The function of PFM, the severity of urinary leakage, and QOL related to UI were measured before and after treatment and at 1, 3, and 6 months after the start of treatment.

The strength of the pelvic floor muscles was assessed using the Oxford scale.

The two-day data of the 24-hour pad test were used to evaluate the severity of UI. All patients were writing bladder diaries and evaluating quality of life.

The patients had an average age of 68.9 years (range, 55-72 years) and average body mass index of 23.8 ± 1.9 kg/m².

Of them, 13 patients (54.2%) were employed; 6 patients (25.0%) were regularly taking medications for lower urinary tract symptoms; and 5 patients (20.8%) had received additional radiation or androgen deprivation therapy after LRP.

Results

There was also a significant increase in the strength of the pelvic muscles on the Oxford scale. The QoL of patients, assessed by the ICIQ-SF questionnaire, significantly improved only in patients of the 2nd group. When comparing the studied parameters in patients of the 1st and 2nd groups, 1 month after the start of treatment, there was significantly less use of pads by patients of the 2nd group ($t=2.8$; $p=0.01$) and a higher QoL according to the questionnaire revealed ICIQ-SF ($t=2.6$; $p<0.05$). A significant decrease in the severity of UI was noted in 14 (58.3%) of 24 patients of the 1st group and in 19 (82.6%) of 23 patients of the 2nd group (Fig. 1). In patients with PFMT+BFB, the result of a subjective assessment of the effectiveness of treatment on a 5-point scale is higher than in patients in the control group. The value of this indicator in the 1st group was 2.8 ± 1.1 points, and in the 2nd group - 3.6 ± 0.9 points ($t=2.5$; $p<0.05$). In patients of the 2nd group, at each weekly BFB session, the correctness of performing all 4 exercises for PFM was assessed using a hardware-software complex (Table 1, Fig.2).

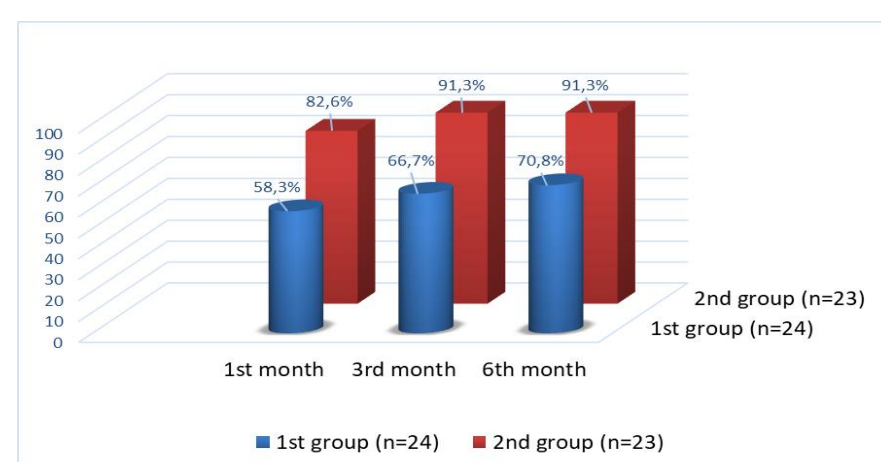


Fig. 1



Fig.2

Table 1
Dynamics of clinical parameters in patients with UI after LRP (M±σ)

	1st group (n=24)		2nd group (n=23)	
	Before treatment	1 month after the start of treatment	Before treatment	1 month after the start of treatment
Average number of pads per day, pcs.	4,9±1,0	3,6±0,9 t=6,9 p<0,001*	4,7±1,1	2,9±0,9 t=8,3 p<0,001* t=2,8 p=0,01**
Volume of urine lost (1-hour pad-test), g	45,8±18,8	32,0±13,6 t=4,3 p<0,001*	47,1±17,9	26,1±11,7 t=4,7 p<0,001* t=1,6; p>0,1**
Volume of urine lost (24-hour pad-test), g	468,3±176,0	311,1±137,3 t=3,7 p<0,01*	437,7±143,4	284,7±136,5 t=4,9 p<0,001* t=0,7; p>0,1**
The strength of the pelvic floor muscles on the Oxford scale, points	1,8±0,9	2,7±1,1 t=3,5 p<0,01*	1,7±1,0	2,9±1,1 t=4,3 p<0,001* t=0,5; p>0,1**
Sum of scores on the ICIQ-SF Quality of Life Questionnaire, points	19,4±2,0	18,1±2,2 t=1,7; p>0,1*	19,5±1,8	16,4±2,1 t=5,5 p<0,001* t=2,6 p<0,05**

Conclusions

Despite the high efficiency of biofeedback, its widespread use is still limited today. This is due both to the insufficient number of biofeedback devices and the lack of uniform standards for performing PFMT using biofeedback. The latter circumstance makes it difficult to compare the results of clinical trials with each other. In this regard, the development of general training protocols with the determination of their frequency, temporal characteristics of muscle contraction and relaxation, the number of repetitions per day, etc. seems to be very relevant.

In conclusion, our results indicate that PFMT + BFB can improve urinary incontinence lasting more than 3 months after LRP by increasing PFM strength. The use of biofeedback therapy for UI after RP is a pathogenetically substantiated method of treating this category of patients.

References

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