ANALYSIS OF THE EFFECTIVENESS OF AN INTEGRATED APPROACH TO THE PREVENTION OF URINARY INCONTINENCE BEFORE RADICAL PROSTATECTOMY

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DOI: 10.47750/pnr.2023.14.02.285

Abstract

The high prevalence of urinary incontinence (UI) in men after radical prostatectomy determines the relevance of the search and development of new methods of treatment of urinary incontinence. Different results of introducing preventive measures before surgical treatment of men are absent in domestic and foreign literature. In this regard, developing more effective methods of preventing cancer before surgery is necessary, reducing the recovery time for postoperative complications and ensuring maximum patient rehabilitation.

Keywords: prostate cancer, prevention, urinary incontinence, methods.

Introduction

In Russia, prostate cancer ranks 2nd in the structure of oncological morbidity in men (11.9%), while there is an annual increase in the incidence. In 2021, radical treatment was carried out on more than 15,000 newly diagnosed prostate cancer patients.

Taking into account the availability of many options for radical treatment of prostate cancer with satisfactory oncological results, more and more attention is being paid to functional outcomes, among which urine retention is the most significant for the patient, outstripping concerns about the preservation of erectile function. At the same time, any intervention in the area of the external urinary sphincter, both operative and radiation, carries the risk of iatrogenic damage to it and, consequently, the development of stress UI. Focal treatment methods are no exception when the risk of developing UI can reach 19 % [1, 2, 3].

Nevertheless, the most common damage to the sphincter occurs during radical prostatectomy (RPE). Better knowledge of anatomy and the use of nerve-sparing techniques significantly reduced but did not eliminate the risk of developing UI. The robot-assisted RPE also showed no significant improvement concerning the risk of incontinence. According to meta-analysis data, a year after the robot-assisted prostatectomy, 7% of patients are forced to use one or more pads per day and another 9% - 1 safety pad per day.

As the analysis of scientific data has shown, there are the following data on the frequency of urinary incontinence (UI) depending on the intervention: posadilon RPE – 5-48%, nerve-sparing RPE – 1.3– 3.4%, robotic RPE – 16%, external radiation therapy – 1-16%, brachytherapy – 0-19%, cryoablation - 4.4%, high-intensity focused ultrasound ablation – 12% [4,5].

Among all the factors affecting the outcome of the operation, only the surgeon's experience can reliably reduce the risks of this complication. In ineffective conservative treatment, including pelvic floor muscle training and behavioural therapy, surgical correction of UI is indicated.

Various sling operation options were presented for patients with mild and moderate UI in the 90s of the last century. Implantation of an artificial urinary sphincter gives good results. However, it is associated with several limitations and is currently considered the "gold standard" for treating patients with severe UI.

The most significant experience and the best results were obtained using the self-retaining trans obturator retrobulbar sling (TRS) AMS AdVance. The mechanism of its action is to support the external sphincter of the urethra, which makes it possible to achieve its full coaptation (circular contraction). At the same time, there is no mechanical compression of the urethra.

The undoubted advantages of the sling include that it allows you to preserve the natural act of urination and has a low frequency of complications.

Materials and methods.

In our study, we applied our technology to prevent urinary incontinence after radical prostatectomy, an integrated approach based on several prevention methods. Until now, preference has been given only to certain types of it.

During the study, a retrospective assessment was made of the information on 250 patients with prostate cancer who underwent posadilon RE with pelvic lymphadenectomy in 2019 – 2021. In the Department of urology at the D.D. Pletnev City Clinical Hospital, the patients were aged 50 to 70 years, and the average age was 66.5 ± 7.2 years.

Diagnosis and staging of the disease according to the classification of TNM revision 2009 at the preoperative stage was carried out based on the following:

1) the level of prostate-specific antigen (PSA) in the blood serum;

2) finger rectal examination;

3) the results of the pathohistological examination of the material of multifocal biopsy of the prostate gland under the control of transrectal ultrasound;

4) magnetic resonance imaging;

5) X-ray computed tomography;

6) ultrasound examination (ultrasound) of the abdominal cavity and pelvis;

7) chest x-ray;

8) scanning of skeletal bones.

After the proposed comprehensive approach to preventing UI after RPE, we evaluated the quality of life of these patients. "The survey was based on a questionnaire based on the KHQ questionnaire (King's health questionnaire) and the Spielberger–Khanin questionnaire, which characterizes the psychological state of the patient, assessed by the level of situational anxiety (SA) (concerns related to the state of health at the time of the examination) and personal anxiety (PA) caused by the patient's reaction to his state of health.

The analysis of the results of the KHQ questionnaire was carried out according to a modified methodology proposed by A.A. Zheleznaya et al., according to which the normal state of health corresponds to 26-30 points, good quality of life – 31-50 points, satisfactory quality of life – 51-70 points and poor quality of life – 71-90 points" [2].

Quantitative characteristics were analyzed statistically using nonparametric and variational statistics methods using computer programs "Excel 2007" and "Statistica 8.0". The average values in the groups were expressed as the average and the standard error (M ± m). The reliability of the differences between the groups was assessed using the Student's criterion – t, and the severity of correlations between individual indicators – using the Spearman correlation coefficient – r. The differences were considered significant at $p<0.05$" [1].

Results and discussion

Based on the presented research methodology, we examined patients according to each of their methods from the integrated approach proposed by us and determined changes in their quality of life.

1st method of prevention of urinary incontinence after radical prostatectomy is to perform urethrosuspension with the installation of a loop (sling) Argus system.

Subjective assessment of their health according to the KHQ questionnaire by patients at various times after REM showed that immediately after surgery, the overwhelming number of patients assessed their condition as poor (71.4%), another 25% of patients considered their health satisfactory, and only 3.6% of patients felt almost healthy (Table 1).

Table 1 - Dynamics assessment of the health status of patients at different times after RPE (according to the questionnaire on KHQ)

Time after operation	Patient's condition in %			
	Normal	Good	Satisfactory	Bad
10 days	0	3,5	25,1	70,5
3 months	0	32,5	51,0	16,6

6 months	17,9	60,1	10,1	12,3
9 months	11,6	32,2	48,4	9,1
1 year	20,1	37,5	35,6	8,1
2 years	7,1	53,1	24,8	15,8
3 years	12,9	47,8	33,9	6,1

However, as the time passed after the operation increased, the situation gradually changed. The proportion of patients with an assessment of their state of health as poor already three months after surgery decreased almost four times by six months – more than five times, with subsequent small fluctuations.

2nd method of prevention of urinary incontinence (UI) after radical prostatectomy is using a self-retaining trans obturator retro bulbar sling (TRS) AMS AdVance.

The distribution of patients according to the initial degree of UI was as follows: mild UI – in 6, medium – in 8, and severe stress UI – in 4 patients. The average amount of urine lost was 270 ml (average 297 ml). The average value of the number of gaskets used is 3 (average 2.8 ± 1). No residual urine was detected in any patient. According to the QoL questionnaire, the average was 5 points (average 4.7 ± 0.6); according to YOUR – 59.4 ± 12.5 points. The characteristics of patients before treatment are presented in Table 2.

Table 2 - Characteristics of patients before the operation - implantation of TRS

Indicator	Average value	Average value range
Age, years	66,2	65,8 – 73,5
The amount of urine lost, ml	270	265 - 295
Number of gaskets used, pieces	3	2,8 – 4,1
QoL questionnaire score, points	5	4,7 – 6,2
YOUR questionnaire score, points	59,4	57,6 – 65,1
Time to operative correction of UI, months	21	21,1 – 24,1
Distribution by the degree of UI, n - Light - Average - Heavy		6 8 4

After three months, the recovery rate was 85.2% (n = 14), improvement was 7.9% (n = 4), and lack of effectiveness was 7.8% (n = 4). Thus, success was achieved in 91.8% of cases (n = 14).

3rd method of urinary incontinence prevention after radical prostatectomy is using perioperative levels of exercise. Pelvic floor muscle training belongs to the 1st line not only for treating urinary incontinence that occurred in the period from 6 to 12 months after prostatectomy but also as a preventive measure to prevent UI before RPE.

The duration of pelvic floor muscle training under control was 14.3±3.2 (1-25) weeks. During this time, four patients acquired the persistent skill of isolated contraction of the pelvic floor muscles. Regular training increased the strength of pelvic muscle contractions and alleviated the symptoms of urinary incontinence in 5 patients. First of all, this was reflected in a decrease in the number of pads used and the ability to retain urine when the urge arises. The rest of the patients noted only a subjective improvement in their condition.

There was a significant early recovery of retention function in patients engaged in pelvic floor muscle training compared with patients who did not engage in such activity.

Conclusion

The analysis of the life quality and psychological state of the patients under consideration after the installation of the Argus sling system demonstrated a significant improvement in both the quality of life and the psychological state. If before the operation, all patients assessed their condition as poor according to the King questionnaire (98.7%), then after installing the Argus system, 33.8% of patients assessed their state of health as normal, 47.1% – as good, 16.1% – as satisfactory, and only 6.5% of patients did not notice improvement and still assessed their state of health how bad.

In our study, recovery was achieved in 14 out of 18 cases. After two implantations, improvement was noted. In 2 patients with severe stress UI, the sling installation did not yield the expected results. In addition to reducing or eliminating urine loss,

significant improvement in quality of life was noted in all patients after successful implantation.

Training the pelvic floor muscles under the control of biofeedback is an effective method of treating various types of urinary incontinence. The absence of contraindications and adverse reactions puts this method in the 1st line of treatment for urinary incontinence that occurs after prostatectomy and is used as a prophylaxis of UI before RPE.

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