DOI: https://doi.org/10.17816/uroved55409

Assessment of copulative function and severity of lower urinary tract symptoms in patients with benign prostatic hyperplasia after transurethral enucleation

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AIM: was to conduct a comparative assessment of copulative function and the severity of lower urinary tract symptoms (LUTS) in patients with benign prostatic hyperplasia (BPH) who underwent laser and bipolar transurethral enucleation of the prostate and who treated conservatively.
MATERIALS AND METHODS: 143 BPH patients aged 50 to 80 years (mean age 65 years) with complaints of copulatory and urinary disorders were under observation. All patients were divided into two groups. The 1st (main) group included 102 patients who underwent surgical treatment: transurethral laser enucleation of the prostate (n = 55) and transurethral bipolar enucleation of the prostate (n = 47). Patients of the 2nd group (n = 41) received conservative treatment. Control examinations were performed before treatment, 4, 12 and 24 weeks after it.
RESULTS: All 102 patients of group 1, regardless of the type of surgery, noted retrograde ejaculation four weeks after surgery. In the majority of patients of the 1st group during these periods weakening of orgasm was noted, in a significant number – deterioration of erection and decreased libido were noted. Upon further observation, by the 12th week after the operation, restoration of all components of the copulatory function was noted, with the exception of ejaculation. By the 24th week of observation, only in 2 patients of the 1st group the normal mechanism of ejaculation was restored. Surgical treatment of patients in group 1, regardless of the method of surgery, led to a significant decrease in the severity of LUTS, an increase in the maximum urine flow rate, a decrease in the volume of the prostate gland and the amount of residual urine. There were no significant differences in the dynamics of these indicators depending on the method of transurethral enucleation. The patients of the 2nd group also had an improvement in clinical parameters, but it was much less pronounced than in the 1st group.
CONCLUSION: Laser and bipolar transurethral enucleation of the prostate are effective surgical techniques that significantly improve the outflow of urine from the bladder, reduce the severity of LUTS and improve the sexual function of patients. Surgery is well tolerated by patients. At the same time, almost all patients operated on by these methods develop retrograde ejaculation.

Keywords: benign prostatic hyperplasia; transurethral laser enucleation of the prostate; transurethral bipolar enucleation of the prostate; copulative dysfunction; lower urinary tract symptoms.

To cite this article:
Vydryn PS, Kalinina SN, Burlaka OO, Aleksandrov MS. Assessment of copulative function and severity of lower urinary tract symptoms in patients with benign prostatic hyperplasia after transurethral enucleation. *Urology reports (St. Petersburg)*. 2021;11(2):123-132. DOI: https://doi.org/10.17816/uroved55409

Received: 17.12.2020 **Accepted:** 02.06.2021 **Published:** 23.06.2021

DOI: https://doi.org/10.17816/uroved55409

Оценка копулятивной функции и выраженности симптомов нижних мочевых путей у пациентов после трансуретральной энуклеации доброкачественной гиперплазии предстательной железы

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Цель исследования — провести сравнительную оценку половой функции и выраженности симптомов нижних мочевых путей (СНМП) у больных доброкачественной гиперплазией предстательной железы (ДГПЖ), перенесших лазерную и биполярную трансуретральную энуклеацию простаты, и леченных консервативно.

Материалы и методы. Под наблюдением находились 143 больных ДГПЖ в возрасте от 50 до 80 лет (средний возраст 65 лет) с жалобами на копулятивные нарушения и расстройства мочеиспускания. Все пациенты были разделены на две группы. В 1-ю (основную) группу вошли 102 больных, которым проводили хирургическое лечение: трансуретральную лазерную энуклеацию простаты (n = 55) и трансуретральную биполярную энуклеацию простаты (n = 47). Больным 2-й группы (n = 41) проводили консервативное лечение. Контрольные обследования выполняли до лечения, через 4, 12 и 24 нед. после его окончания.

Результаты. Через 4 нед. после хирургического вмешательства у всех 102 больных 1-й группы независимо от типа операции отмечали ретроградную эякуляцию. У подавляющего большинства пациентов 1-й группы в эти сроки отмечали ослабление оргазма, у значительного числа — ухудшение эрекции и снижение либидо. При дальнейшем наблюдении к 12-й неделе после операции отмечено восстановление всех составляющих копулятивной функции за исключением эякуляции. К 24-й неделе наблюдения только у 2 пациентов 1-й группы восстановился нормальный механизм эякуляции. Хирургическое лечение пациентов 1-й группы независимо от метода операции приводило к достоверному снижению выраженности СНМП, повышению максимальной скорости потока мочи, снижению объема предстательной железы и количества остаточной мочи. Значимых различий в динамике этих показателей в зависимости от метода трансуретральной энуклеации не отмечено. У пациентов 2-й группы также было улучшение клинических показателей, но оно было значительно менее выражено, чем в 1-й группе.

Заключение. Лазерная и биполярная трансуретральная энуклеация предстательной железы являются эффективными хирургическими методиками, приводящими к существенному улучшению оттока мочи из мочевого пузыря, снижению выраженности СНМП и улучшению половой функции больных. Оперативные вмешательства хорошо переносятся пациентами. При этом практически у всех оперированных данными способами больных развивается ретроградная эякуляция.

Ключевые слова: доброкачественная гиперплазия предстательной железы; трансуретральная лазерная энуклеация простаты; трансуретральная биполярная энуклеация простаты; копулятивная дисфункция; симптомы нижних мочевых путей.

Как цитировать:
Выдрин П.С., Калинина С.Н., Бурлака О.О., Александров М.С. Оценка копулятивной функции и выраженности симптомов нижних мочевых путей у пациентов после трансуретральной энуклеации доброкачественной гиперплазии предстательной железы // Урологические ведомости. 2021. Т. 11. № 2. С. 123–132. DOI: https://doi.org/10.17816/uroved55409

Рукопись получена: 17.12.2020 **Рукопись одобрена:** 02.06.2021 **Опубликована:** 23.06.2021

Benign prostatic hyperplasia (BPH) is a multifactorial disease manifested by benign enlargement of the prostate gland that leads to infravesical obstruction and urinary dysfunction [1, 2]. BPH is one of the most significant medical and social problems of modern urology, owing to its high prevalence, a significant decrease in the quality of life, and risk of complications [3]. BPH is the most common disease in men aged >50 years. It accounts for more than a third of all registered diseases in men of this age group [4].

Currently, the term BPH refers to different notions, namely, histological BPH, benign enlargement of the prostate gland, and prostatic infravesical obstruction [5]. At the microstructural level, BPH presents as a hyperplasia of the glandular and stromal cells of the prostate gland. The histological signs of BPH are nearly absent in men aged <30 years and rare in patients aged 30–50 years; however, in men aged >50 years, the frequency of their detection is increasing. Thus, BPH is detected in 42% of men aged 51–60 years, in more than 70% of men age 61–70 years, and in 88% of those aged 81–90 years [6]. An increase in the size of the prostate gland is revealed in 20% of men aged 60–70 years and in 43% of those aged 80–90 years [5, 6]. The clinical manifestations of BPH are urinary disorders, collectively referred to as lower urinary tract symptoms (LUTS), which include accumulation, emptying, and post-micturition symptoms. The development of LUTS in patients with BPH is based on prostatic infravesical obstruction, leading, among other things, to structural and functional changes in the detrusor [7]. LUTS are nonspecific for BPH and may be clinical manifestations of other diseases [8]. Regardless of their causes, LUTS deteriorate significantly the quality of life of patients [9].

A Russian epidemiological study showed that the incidence of LUTS in men begins to increase from the age of 40 and moderate and severe LUTS are already detected in 30% of men aged 40–60 years [10]. Moreover, LUTS are more often noted in patients with comorbidities such as arterial hypertension, coronary heart disease, diabetes mellitus, and obesity. A close relationship was also found between the development of LUTS and erectile dysfunction [10]. According to modern concepts, metabolic syndrome is significant in the development of LUTS, erectile dysfunction, and BPH progression; in particular, it contributes to the dysregulation of NO-cyclic guanosine monophosphate and RhoA-Rho kinase and a vegetative nervous system [11].

Conservative treatment of BPH, which has been widely developed in recent decades, is indicated for patients with mild to moderate infravesical obstruction, predominance of accumulation symptoms over emptying symptoms, and presence of contraindications to surgical treatment [1, 12]. Various drugs can be used in patients with BPH. For this purpose, drug groups include alpha-adrenoblockers, 5-alpha-reductase inhibitors, type 5 phosphodiesterase inhibitors, M-cholinergic antagonists, herbal medicinal products, and bioregulatory peptides [1, 2, 13–16]. Although the mechanisms of their therapeutic action are different, they decrease the severity of the clinical manifestations of BPH. However, these drugs are not effective in all patients; some patients discontinued them because of the occurrence of adverse side effects, particularly impairment of sexual function [17, 18].

Surgical treatment of BPH is indicated in the presence of a severe infravesical obstruction, development of complications (such as recurrent urinary retention and bladder stones), as well as inefficiency of drug therapy [2, 3]. In this case, the main task includes the elimination of the prostatic obstruction and restoration of the urine outflow from the bladder. In recent years, minimally invasive surgeries using bipolar and laser technologies have become increasingly common in clinical practice [19]. These include transurethral laser enucleation of the prostate (TULEP) and transurethral bipolar enucleation of the prostate (TUBEP) [20]. These interventions are performed in patients with BPH, regardless of the prostate size and intake of anticoagulants [21–24]. The essence of these methods is reduced to the exfoliation of the hyperplastic tissue within the surgical capsule of the prostate gland, which enables complete coagulation of the vessels and reduction of the risk of hemorrhage and further complications.

In some patients with BPH, urination disorders are combined with impaired sexual function. Thus, studying the effect of surgical interventions on the prostate gland and on the sexual function of the patients is important. The incidence of erectile dysfunction after transurethral methods of surgical treatment of patients with BPH ranged from 4% to 40% [25]. The causes of postoperative erectile dysfunction are underestimated factors of concomitant pathology, a decrease in the erectile function before surgery, as well as damage to the cavernous nerves and branches of the pelvic plexus nerves during surgery [26]. Nevertheless, several studies do not

confirm the negative effect of transurethral surgeries on the sexual function of patients with BPH. Thus, Placer et al. [27] examined the effect of TULEP with a holmium laser (HoLEP) on the sexual function of 202 patients who were sexually active and revealed no significant differences in the results of the questionnaire survey using the International Index of Erectile Function (IIEF-5) questionnaire before and after surgery. In their study, Popov et al. [28] revealed a multidirectional effect of TULEP with a HoLEP on the copulatory function of patients with BPH; 79 patients were under supervision, and all of them had manifestations of copulatory dysfunction before surgery. After surgery, positive changes over time were observed in the erectile component of copulatory function, i.e., a decrease in the frequency of erectile dysfunction from 68.4% to 51.9%. Moreover, 3 months after surgery, the number of patients with retrograde ejaculation increased from baseline 37% to 43%; however, after 6 months, the opposite tendency was registered, with a decrease in the value of this indicator to 30%. Similar tendencies were also noted by other research groups [29–31]. Most authors indicate that, regardless of the method of transurethral intervention, including laser surgery, a significant number of patients have retrograde enucleation postoperatively, and its frequency varies from 30% to 97% [28–31]. Damage to the muscle fibers of the bladder neck is considered a probable cause of its occurrence.

Despite the increasing use of minimally invasive transurethral surgical interventions, their effect on sexual function and severity of LUTS in patients with BPH remains a subject of discussion. This is largely due to the interdisciplinary nature of the problem, with an intersection of urology, sexology, endocrinology, and neurology. Reports are insufficient on the simultaneous assessment of sexual function and lower urinary tract function in patients with BPH and a history of transurethral enucleation of the prostate. This circumstance was the reason for choosing the subject of this study.

This study aimed to conduct a comparative assessment of the sexual function and severity of LUTS in patients with BPH and a history of transurethral enucleation of the prostate and conservative treatment.

MATERIALS AND METHODS

From March 2019 to October 2020, in the consultative and diagnostic center and urological clinic of the Mechnikov North Western State Medical University, located in the Alexandrovsky Hospital, 143 patients with BPH aged 50–80 (average age, 65) years were examined and treated. All patients complained of copulatory impairment and urinary disorders.

The inclusion criteria were as follows: male patients with BPH, aged ≥50 years, with severe urinary disorders [International Prostate Symptom Score (IPSS) >19], disease duration >1 year, prostate volume >40 cm^3, maximum urine flow velocity <10 ml/s, residual urine volume >50 ml, blood serum prostate-specific antigen level not >4 ng/ml, and a desire to improve the quality of erection, urination, and quality of life. All patients signed an informed consent form to participate in the study.

The exclusion criteria for the study were the presence of acute and active phases of chronic inflammatory diseases of the genital organs and urinary tract, neurogenic urinary disorders, Peyronie disease, malignant tumors of the urinary and genital organs currently or its history, bladder and ureter stones, urethral strictures, cardiovascular failure in the stage of decompensation, unstable angina pectoris, chronic alcoholism, chronic renal-hepatic failure, decompensated diabetes mellitus, as well as other diseases and conditions which, according to the researchers, prevented the patients from participation in this study.

All patients were distributed into two groups. Group 1 (main) included 102 patients with sexual dysfunction, in whom, among the clinical manifestations of BPH, emptying symptoms were predominant. These patients underwent surgical treatment with TULEP using a HoLEP (n = 55, subgroup 1.1) or TUBEP (n = 47, subgroup 1.2). Group 2 consisted of 41 patients with BPH having a predominance of accumulation symptoms and were on conservative treatment.

All patients underwent a comprehensive urological examination, which included assessment of complaints, disease history taking, physical examination, and laboratory and instrumental studies, including determination of the bulbocavernous reflex (BCR), determination of the serum level of testosterone, ultrasound examination of the prostate gland, and uroflowmetry.

The severity of LUTS was assessed by the results of the IPSS questionnaires filled out by the patients. To assess the impairment of erectile function, the IIEF-5 questionnaire was used, which consists of five questions that scored 1 to 5 points depending on the answer. A sum of

5–10 points corresponded to severe erectile dysfunction; 1–15, moderate; 16–20, mild dysfunction; and 21–25, absence of erectile dysfunction. Androgen deficiency was assessed using a specialized questionnaire Aging Male Symptoms (AMS) in three main domains, namely, psychological, somatic, and sexological. A total score of 17–26 points indicated unexpressed symptoms of androgen deficiency; 27–36, mild; 37–49, moderate; and >50, pronounced. The answer to question 17 (last) was used for an isolated assessment of libido, where 1–2 points were interpreted as normal libido and ≥3 points as decreased libido. The quality of orgasm was assessed on a 5-point scale, where 1 and 5 points corresponded to the absence of changes in orgasm and an extremely strong impairment of orgasm, respectively; ≥3 points were interpreted as a clinically significant decrease in orgasm.

Control examinations of patients were performed before treatment and at 4, 12, and 24 weeks after its cessation.

Statistical processing of the research results was performed using the SPSS12.0 software package for applied statistics, and statistical hypotheses were tested using Student's *t*-test and the χ^2 test.

RESULTS AND DISCUSSION

Before the start of treatment, all patients with BPH in groups 1 and 2 had sexual dysfunctions (Table 1). Among other sexual dysfunctions, 15 (14.7%) patients of group 1 and 6 (14.6%) patients of group 2 had decreased libido, 51 (50%) and 20 (48.8%) patients had poor erection, and 5 (4.9%) and 7 (17.1%) patients had impaired ejaculation, and 16 (15.7%) and 5 (12.2%) patients had orgasm dysfunction, respectively. The difference was significant only in the frequency of ejaculation disorders ($\chi^2 = 5.64$; $p < 0.05$). The presence of retrograde ejaculation in seven patients (5 from group 1 and 2 from group 2) was associated with the intake of alpha-adrenoblockers. A decrease in the severity of BCR was noted in 18 (12.6%) patients of both groups; moreover, this disorder was detected two times more often in group 1 than in group 2. Significant impairment of erectile function was also indicated by the results of the IIEF-5 questionnaire survey. The total IIEF-5 score was 14.2 ± 4.1 in group 1 and 18.9 ± 5.3 in group 2 (Table 2). The analysis of the AMS questionnaire data in groups 1 and 2 before treatment indicated the average severity of the manifestations of androgen deficiency; the values of the indicators were 38.3 ± 11.1 and 37.9 ± 10.8 points,

Table 1. Copulatory disorders in patients with BPH of groups 1 and 2 before and 4, 12 and 24 weeks after the end of treatment (*n* = 143)

Таблица 1. Копулятивные нарушения у пациентов с доброкачественной гиперплазией предстательной железы 1-й и 2-й групп до и через 4, 12 и 24 недели после окончания лечения (*n* = 143)

Group	Decreased libido	Decreased erection	Premature ejaculation	Retrograde ejaculation	Weakened orgasm
Before treatment					
1 (*n* = 102)	15 (14.7%)	51 (50%)	0	5 (4.9%)	16 (15.7%)
2 (*n* = 41)	6 (14.6%)	20 (48.8%)	5 (12.2%)	2 (4.9%)	5 (12.2%)
After 4 weeks					
1.1 (*n* = 55)	18 (32.7%)	24 (43.6%)	0	55 (100%)*	50 (90.9%)*
1.2 (*n* = 47)	20 (42.6%)	25 (53.2%)	0	47 (100%)*	45 (95.7%)*
2 (*n* = 41)	6 (14.6%)	15 (36.6%)	5 (12.2%)	2 (4.9%)	5 (12.2%)
After 12 weeks					
1.1 (*n* = 55)	10 (18.2%)	12 (21.8%)	0	55 (100%)*	19 (34.5%)*
1.2 (*n* = 47)	12 (25.5%)	13 (27.7%)	0	47 (100%)*	21 (44.7%)*
2 (*n* = 41)	5 (12.2%)	6 (14.6%)	3 (7.3%)	1 (2.4%)	3 (7.3%)
After 24 weeks					
1.1 (*n* = 55)	3 (5.5%)	10 (18.2%)	0	54 (98.2%)*	10 (18.2%)**
1.2 (*n* = 47)	4 (8.5%)	11 (23.4%)	0	46 (97.9%)*	14 (29.8%)*
2 (*n* = 41)	3 (7.3%)	5 (12.2%)	1 (2.4%)	0	1 (2.4%)

* The difference with the value in group 2 is significant ($p < 0.01$); ** the difference with the value in group 2 is significant ($p < 0.05$).

Table 2. Clinical parameters of patients with BPH in groups 1 and 2 before and 4, 12 and 24 weeks after the end of treatment, $M \pm m$ (n = 143)

Таблица 2. Клинические показатели пациентов с доброкачественной гиперплазией предстательной железы 1-й и 2-й групп до и через 4, 12 и 24 недели после окончания лечения, $M \pm m$ (n = 143)

Patient group	IIEF-5, score	AMS, score	IPSS, score	Testosterone scores, nmol/L	V_{Pr}, cm^3	V_{Res}, ml	Q_{max}, ml/s
Before treatment							
1 (n = 102)	14.2 ± 4.1	38.3 ± 11.1	25.1 ± 4.8*	11.2 ± 2.6	88.2 ± 15.2*	79.6 ± 23.1*	6.8 ± 2.2*
2 (n = 41)	18.9 ± 5.3	37.9 ± 10.8	15.2 ± 3.5	13.4 ± 3.4	43.9 ± 6.1	25.4 ± 9.2	11.3 ± 3.5
After 4 weeks							
1.1 (n = 55)	12.8 ± 4.5*	37.9 ± 11.2	15.2 ± 4.8	12.1 ± 3.1	27.1 ± 6.1*	20.3 ± 7.8	14.3 ± 6.7
1.2 (n = 47)	12.9 ± 5.7*	37.4 ± 10.9	15.9 ± 4.5	12.0 ± 2.8	27.3 ± 7.3*	20.6 ± 9.0	14.5 ± 6.6
2 (n = 41)	20.1 ± 4.9	38.3 ± 9.2	14.2 ± 3.3	13.4 ± 3.2	41.8 ± 6.2	22.4 ± 8.6	14.1 ± 3.5
After 12 weeks							
1.1 (n = 55)	20.2 ± 4.5	36.5 ± 9.2	9.1 ± 3.2	12.7 ± 2.9	19.0 ± 5.4*	10.1 ± 6.5	15.2 ± 4.5
1.2 (n = 47)	19.9 ± 4.2	36.9 ± 9.8	9.5 ± 3.6	12.5 ± 2.8	19.4 ± 6.1*	12.3 ± 6.1	15.0 ± 4.2
2 (n = 41)	20.8 ± 4.5	37.1 ± 7.6	13.7 ± 2.9	13.8 ± 3.0	40.9 ± 5.9	19.8 ± 7.6	14.9 ± 3.1
After 24 weeks							
1.1 (n = 55)	22.8 ± 2.4	36.3 ± 8.8	7.1 ± 2.1	13.5 ± 2.2	18.9 ± 5.2*	8.0 ± 3.2	22.6 ± 2.4
1.2 (n = 47)	21.1 ± 3.7	36.6 ± 7.5	7.5 ± 2.2	13.0 ± 2.4	19.2 ± 4.2*	8.4 ± 3.1	21.9 ± 3.8
2 (n = 41)	21.8 ± 2.5	36.7 ± 7.2	8.1 ± 2.2	14.1 ± 2.9	38.5 ± 6.3	12.0 ± 6.1	15.1 ± 3.2

* The difference with the value in group 2 is significant ($p < 0.05$). *Note.* V_{Pr}, prostate volume; V_{Res}, residual urine volume; Q_{max}, maximum volumetric urine flow rate.

respectively. Compared with group 2, group 1 had significantly higher total IPSS score, larger volume of the prostate gland and amount of residual urine, and lower maximum volumetric urine flow rate ($p < 0.05$).

At 4 weeks after surgery, all 102 patients of group 1, regardless of the surgery type (TULEP or TUBEP), noted retrograde ejaculation. During these periods, majority of the patients in group 1 (90.9% in subgroup 1.1 and 95.7% in subgroup 1.2) reported an impaired orgasm. A decrease in erection was found in 24 (43.6%) patients after TULEP and in 25 (53.2%) patients after TUBEP, and decreased libido was noted in 18 (32.7%) and 20 (42.6%) patients, respectively (Table 1). None of the patients in group 1 had premature ejaculation, while this disorder was found in 5 (12.2%) patients in group 2, probably because they had chronic prostatitis. With further follow-up, a positive tendency was observed in relation to copulatory function in group 1. The frequency of detecting decreased libido in patients undergoing TULEP (subgroup 1.1) decreased after 12 weeks to 18.2% and 24 weeks after surgery up to 5.5%. In patients who underwent TUBEP (subgroup 1.2), at 4 weeks after surgery, complaints of decreased libido decreased from 42.6% up to 25.5% after 12 weeks and up to 8.5% after 24 weeks. A similar tendency in group 1 was observed for the frequency of impairment of orgasm and, to a lesser extent, of erectile dysfunction. After surgery, no patients complained of premature ejaculation. Moreover, during the entire follow-up period, retrograde ejaculation persisted in the majority of patients who underwent surgery (Table 1). The results of the IIEF-5 questionnaire survey showed that if group 1 observed a slight increase in erectile dysfunction at week 4 after surgery, in comparison with the condition before surgery, then a pronounced positive dynamics was noted by week 12. During these periods, the average IIEF-5 scores were 20.2 ± 4.5 in subgroup 1.1 and 19.9 ± 4.2 in subgroup 1.2, and the difference when compared with the values at week 4 after surgery was significant ($p < 0.05$). By week 24, group 1 had an even greater improvement in erectile function.

The analysis of the androgenic status indicators according to the AMS questionnaire did not show significant changes after surgery in group 1. In addition, no change was found in the serum testosterone levels (Table 2). Assessment of the severity of LUTS according to the IPSS questionnaire showed a significantly positive trend

in group 1. If the score was 25.1 ± 4.8 before surgery, then the score decreased to 15.2 ± 4.8 (subgroup 1.1) and 15.9 ± 4.5 (subgroup 1.2) at week 4 after surgery, up to 9.1 ± 3.2 and 9.5 ± 3.6 at week 12, and up to 7.1 ± 2.1 and 7.5 ± 2.2 at week 24 after surgery, respectively. Over time, positive changes were also noted in the IPSS score in group 2. During treatment, the IPSS score decreased from the initial value by 6.6% at week 4, by 9.7% at week 12, and by 46.7% at week 24 (Table 2).

The improvement of the severity of LUTS according to the results of the questionnaire survey in group 1 was confirmed by the results of the physical examination. A significant ($p < 0.05$) increase was found in the maximum rate of urine flow by week 4 after surgery and even highly increased in the future. Patients who underwent surgery had significantly decreased volumes of residual urine and prostate gland. Positive changes in these indicators were nearly equal for subgroups 1.1 (TULEP) and 1.2 (TUBEP). Group 2 also had decreased residual urine volume and increased urination rate, but these changes were much less pronounced in group 1.

Patients tolerated transurethral enucleation of the prostate well. After surgical interventions by laser and bipolar methods, complications were detected in 25 (24.5%) patients. Of these patients, 17 (16.6%) experienced complications in the immediate period (4 weeks after surgery), including eight patients who underwent TULEP (seven cases of overactive bladder with urgent urinary incontinence and one case of acute urinary retention) and nine patients who underwent TUBEP (eight cases of overactive bladder and one case of acute urinary retention). In the long term, 12 weeks after surgery and later, complications were recorded in eight patients, which included four patients who underwent TULEP (three cases of overactive bladder and one case of bilateral epididymitis) and four patients who underwent TUBEP (three cases of overactive bladder and one case of unilateral epididymitis). In group 1, patients who underwent TULEP and TUBEP had the same average number of bed-days, i.e., 3.5 days.

In this study, collected data indicate that the transurethral enucleation of the prostate gland had a positive effect on sexual function and severity of LUTS in patients with BPH. Laser and bipolar enucleation were equally highly effective and well tolerated by patients; for all the parameters studied, no significant differences were noted between the two surgical techniques.

A special aspect of this study is attributed to the simultaneous evaluation of sexual dysfunction and LUTS before and after surgical treatment. This study included patients with BPH and sexual dysfunction. An even greater decrease in libido, erection, and orgasm quality was found at 4 weeks after surgery, regardless of its type (TULEP or TUBEP), than in those before surgery. A similar tendency was also found in other studies [27]. Furthermore, at 12–24 weeks after the transurethral enucleation of the prostate, the copulative function of patients who underwent surgery improved significantly, and the number of patients with diminished libido and erectile dysfunction decreased significantly, the quality of orgasm increased, and the IIEF-5 score significantly increased. Moreover, at 4 weeks after laser and bipolar transurethral enucleation of the prostate, retrograde ejaculation was found in all patients postoperatively, which persisted even at week 12 of the follow-up period, and only after 24 weeks, the normal mechanism of ejaculation was restored in 2 of 102 patients. All patients who underwent surgery had decreased BCR during the follow-up period. With conservative treatment, the positive effect was achieved more slowly and was less pronounced. The results obtained correspond to the data presented in international and Russian studies.

CONCLUSION

Laser and bipolar transurethral enucleation of the prostate gland are effective surgical techniques that improve significantly the outflow of urine from the bladder, reduce the severity of LUTS, and improve the sexual function of patients. Surgery is well tolerated. However, retrograde ejaculation develops in nearly all patients who underwent surgery using these methods. Patients must be notified about it before the intervention.

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