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RESULTS OF EJACULATORY-PROTECTIVE LASER ENUCLEATION OF THE PROSTATE

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Introduction. Benign prostatic hyperplasia (BPH) is a condition that occurs in up to 1/3 of men over 50 years of age and can lead to lower urinary tract symptoms (LUTS) requiring surgical treatment. The main adverse event that men experience after surgical methods of alleviating LUTS is the ejaculatory dysfunction. Currently, surgical techniques are available that increase the chance of maintaining antegrade ejaculation after endoscopic treatment of BPH.
Aim. To evaluate the efficiency and safety of ejaculatory-protective laser enucleation of the prostate with respect to preservation of antegrade ejaculation and improvement of urinary parameters.
Materials and methods. From December 2020 to January 2023, 75 ejaculatory-protective laser enucleations of the prostate were performed in City Clinical Hospital No. 1 named after N.I. Pirogov, Moscow (study group). In addition, 61 patients underwent the classical laser enucleation technique (control group). The study included sexually active men with antegrade ejaculation, who were re-examined 18 months after surgical treatment. Comprehensive history data were collected using the questionnaires, such as IPSS (International Prostate Symptom Score) and IIEF-5 (International Index of Erectile Function). Moreover, ejaculatory function was assessed, and each patient underwent a wide range of clinical, laboratory and instrumental studies, including transrectal ultrasound of the prostate and bladder ultrasound with determination of the postvoid residual volume and uroflowmetry.
Results. In both groups, significant changes in IPSS, quality of life (QoL) were found, while there were no significant differences in IIEF-5 scores in patients who underwent the ejaculatory-protective technique, and, on the contrary, in those undergoing classical laser enucleation, a significant decrease in the total IIEF-5 score from 18.9±3.3 to 17.6±4.0 ($p<0.05$) was noted. According to the survey, 36 patients (48%) reported a preservation of antegrade ejaculation after the ejaculatory-protective laser enucleation. The chances in patients who underwent the ejaculatory-protective technique were 2.372 times higher than in the classical enucleation; the difference was significant (OR=0.361; 95% CI: 0.169–0.769). Roc analysis revealed that the highest chance of a preservation of antegrade ejaculation was observed with a prostate volume of 66.3 cc or less. A decrease in the total IIEF-5 score with a simultaneous increase in the frequency of ejaculatory dysfunction in patients who underwent the classical laser enucleation of the prostate may indicate a decrease in the perceived quality of sexual life after the loss of antegrade ejaculation. According to the instrumental studies in both groups, the maximum urine flow rate and postvoid residual volume 18 months after surgical treatment were significantly different ($p<0.05$) from the baseline parameters, indicating an improvement in the quality of urination regardless of the chosen technique.
Conclusion. Ejaculatory-protective laser enucleation of the prostate is a safe and effective alternative to standard technique of laser enucleation of the prostate.

K e y w o r d s: BPH, Laser enucleation of the prostate, ejaculation

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Introduction. More than 80% of men over 50 years are still sexually active and consider sexual life an important component of overall quality of life (QoL) [1, 16]. It is also well known that ejaculatory dysfunction is the most common complication after surgical treatment for benign prostatic hyperplasia (BPH) [14] and that most classical surgical techniques are associated with high rates of ejaculatory dysfunction (67-74%) [3]. As a result, postoperative ejaculatory dysfunction can have a significant negative impact on the quality of life of sexually active men, causing significantly increased levels of anxiety and depression [4]. Therefore, it is important to offer alternative methods of preserving ejaculation using conventional surgical devices, such as ThuLEP (Thulium Laser Enucleation of the Prostate) or HoLEP (Holmium Laser Enucleation of the Prostate).

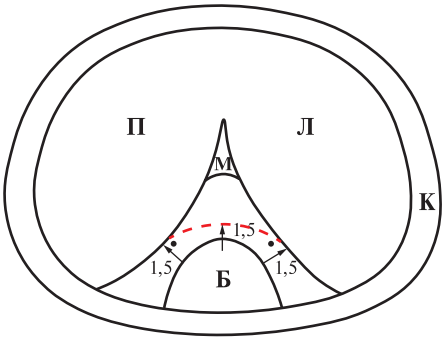


Fig. 1. Technique for maintaining the "ejaculatory hood" (author's drawing)

Aim. To evaluate the efficiency and safety of ejaculatory-protective laser enucleation of the prostate in terms of preserving antegrade ejaculation and improving urination quality.

Materials and methods. This study was carried out from December 2020 to January 2023 and is a single-center prospective study. It was conducted in accordance with the ethical standards of the medical institution and the Helsinki Declaration of 1964. The study was approved by the local ethics committee (Pirogov Russian National Research Medical University), meeting protocol No. 203 dated December 21, 2020.

Sexually active patients with preserved antegrade ejaculation who complained of obstructive lower urinary tract symptoms (LUTS) requiring surgical treatment, were included in the study. Non-inclusion criteria: age >85 years, International Index of Erectile Function-5 (IIEF-5) score <11, patients with ejaculatory dysfunction regardless of taking α1-adrenoblockers; previous endoscopic or open procedures on the pelvic organs for BPH; mental or neurological disorders, as well as patients who did not perform for follow-up studies; patients and those with detected incidental prostate cancer. All men included in the study underwent urological examination, which included digital rectal examination (DRE), serum prostate-specific antigen (PSA) testing, uroflowmetry with assessment of postvoid residual volume (PVR), and transrectal ultrasound of the prostate (TRUS) to calculate prostate volume. In addition, the IPSS (International Prostate Symptom Score) questionnaire was used to assess LUTS, the IIEF-5 questionnaire to assess sexual function. Patients were also questioned about the presence or absence of ejaculatory disorders.

A total of 136 patients were found to meet the inclusion criteria for the study. Ejaculatory-protective laser enucleation was performed in 75 patients, and 61 patients underwent classical laser enucleation of the prostate. After 18 months, patients underwent follow-up examinations, during which the questionnaires were filled out again and follow-up studies were performed.

Statistical analysis. Statistical analysis was performed using StatTech v. 3.1.10. To check the normality of the distribution of quantitative data, the Shapiro-Wilk tests (for samples of less than 50 cases) and Kolmogorov-Smirnov (for samples of more than 50) were used. If the data had a normal distribution, arithmetic mean (M), standard deviation (SD), and 95% confidence interval (95% CI) were used.

Comparison of two groups by quantitative variables having a normal distribution, provided that the variances were equal, was performed using Student's t-test. When comparing normally distributed quantitative indicators calculated for two related samples, the paired Student's t-test was used. Comparison of two groups by quantitative variables whose distribution differed from normal was performed using the Mann-Whitney U-test. Comparison of percentages in the analysis of four-field contingency tables was performed using Pearson's chi-square test.

For comparison of three or more related groups by a normally distributed quantitative variables, one-way analysis of variance with repeated measurements was used. The statistical significance of changes over time was assessed using Pillai's Trace. A posteriori analysis was carried out using the paired Student's t-test with Holm's correction.

Surgical technique. The first stage involved making an Ω-omega-shaped incision of the mucosa of the prostatic urethra, starting at 6 o'clock, 1-1.5 cm proximal to the verumontanum to enter the correct surgical layer between the adenomatous tissue and the surgical capsule of the prostate, and continuing it with "hockey stick-shaped" incisions while preserving the urethral mucosa flap 1-1.5 cm proximal and lateral to the verumontanum (*Fig. 1*). Then the dissection of the lateral lobes of the prostate continued to 7 o'clock and 5 o'clock.

The next stage involved enucleation of the middle and lateral lobes of the prostate. The enucleated tissue was evacuated with a Karl Storz morcellator (Germany). All surgical procedures were performed by one surgeon using a Fiberlase U1 laser energy source (IRE-Polus, Russia). The laser fiber used was a reusable optical fiber 550 μm (IPG Surgical Fiber HP), and the energy levels used for enucleation and coagulation were 60 and 15 W, respectively. The laser fiber was used with a Karl-Storz (Germany) 26 Fr resectoscope with an Iglesias-type continuous irrigation system and 0.9% NaCl solution.

Results. The study included 136 men with a mean age of 65.9±6.5 years. The average duration of complaints of impaired urination was 4.5 years. When surveying patients using validated questionnaires, the average IIEF-5 score was 19.9±3.6, and when assessing the quality of urination, the average IPSS score was 22.3±3.7 points. The prostate volume according to TRUS was 78.3 (58.1-89.1) cm³, and the PVR was 100.0 (41.5-150.0) ml. According to uroflowmetry, the average Qmax was 8.2 (5.9-9.6) ml/s.

The table presents a comparison of both the preoperative results of each group and the results at the 18-month follow-up. The preoperative characteristics of each of the study groups were comparable, and there were no significant differences ($p>0.05$).

The preoperative functional characteristics of urination in patients, assessed by the IPSS score, uroflowmetry (Qmax), and bladder ultrasound (PVR) in each of the groups, significantly changed by the 18th month of follow-up ($p<0.05$). Overall satisfaction with urination according to the quality of life (QoL) indicator also became statistically significantly higher ($p<0.05$).

Statistical analysis comparing the results 18 months after surgical treatment did not yield significant differences in uroflowmetry, IPSS score, prostate volume (table), but when evaluating IIEF-5 in patients undergoing ejaculatory-protective laser enucleation, the total score did not change significantly ($p<0.05$),

and conversely, in patients undergoing the classical technique, the average score significantly decreased from 18.9±3.3 to 17.6±4.0, which can be interpreted as a decrease in the quality of erectile function due to the loss of antegrade ejaculation.

According to the patient survey, 18 months after surgical treatment, depending on the technique of laser enucleation of the prostate (classical or ejaculatory-protective), significant differences were found in the rate of preservation of antegrade ejaculation (p=0.0010, using Pearson's chi-square). The proportions of patients with preserved antegrade ejaculation in the classical and ejaculatory-protective laser enucleation groups were 9.8 and 48.0%, respectively.

When assessing the dependence of the probability of preserving antegrade ejaculation on the prostate volume using ROC analysis, the following curve was obtained (*Fig. 2*).

The area under the ROC curve was 0.839±0.068 with 95% CI: 0.706-0.972. The obtained model was significant (p<0.05).

The threshold value of prostate volume corresponding to the highest value of the Youden index was 66.3 cm³. Ejaculatory dysfunction was more often predicted with a prostate volume above or equal to this value. The sensitivity and specificity of the model were 92.3 and 66.7%, respectively.

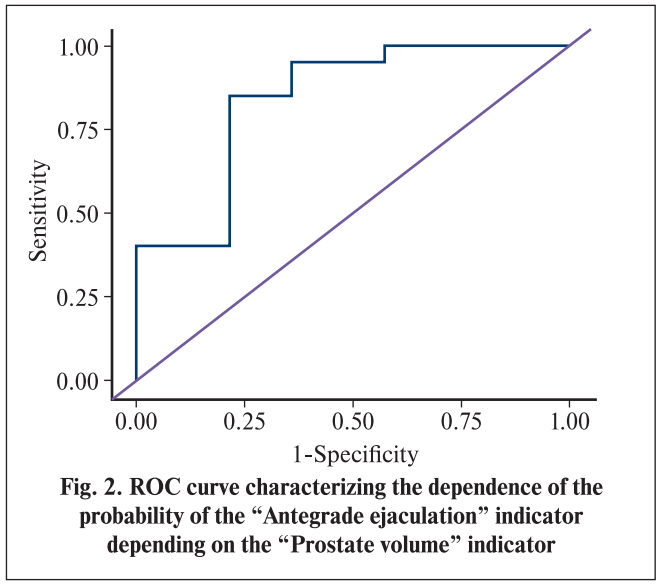


Fig. 2. ROC curve characterizing the dependence of the probability of the "Antegrade ejaculation" indicator depending on the "Prostate volume" indicator

Discussion. Endoscopic treatment remains the most effective method of treating LUTS in BPH, and the use of laser technologies has been widely developed due to its enormous potential in terms of acceptable prostate volume, safety, and short learning curve [13]. Nevertheless, an undesirable consequence of all methods of endoscopic resection and enucleation of BPH is ejaculatory dysfunction [3]. In fact, this is one of the main reasons that make men refuse the surgical treatment, which subsequently leads to compensatory detrusor hypertrophy and subsequent loss of its function, bladder stones, and in some cases, bilateral hydronephrosis with impaired kidney function.

A better understanding of the ejaculation mechanism has led to the development of modified surgical techniques aimed at preserving antegrade ejaculation [5, 8]. According to a study by Gil-Vernet et al., closure of the bladder neck is not the only necessary mechanism for antegrade ejaculation [5], and in their video study, they clearly show a dynamic transrectal ultrasound of the prostate, where during ejaculation, the verumontanum undergoes caudal displacement, momentarily coming into contact with the opposite wall of the urethra, after which sperm is ejected from the ejaculatory ducts due to the contraction of the musculus ejaculatorius, which point the external openings of the ejaculatory ducts to an antegrade direction. These scientific data emphasize the importance of tissue located around the verumontanum, especially in its proximal part. Researchers have described the zone located between the verumontanum and the external urethral sphincter as a "high-pressure ejaculation zone," the competence of which is carried out by closing

Table

Results of classical and ejaculatory-protective technique 18 months after surgery

Indicators	Classical technique (n=61)	Ejaculatory-protective technique (n=75)	p-value
IIEF before surgery	18.9±3.3	20.0±3.9	0.074
IIEF after 18 months	17.6±4.0	20.6±3.3	<0.05
p-value	**<0.05**	**0.074**	
IPSS before surgery	23.4±3.3	22.2±4.5	0.061
IPSS after 18 months	5.5±3.2	5.3±2.9	0.072
p-value	**<0.05**	**<0.05**	
QoL before surgery	5.0±0.8	4.9±1.0	0.312
QoL after 18 months	1.9±0.9	1.9±0.9	<0.05
p-value	**<0.05**	**<0.05**	
Qmax before surgery	8.4 [5.8–11.4]	7.9 [6.0–9.0]	0.054
Qmax after 18 months	23.1 [17.6–26.0]	22.1 [16.6–26.6]	0.716
p-value	**<0.05**	**<0.05**	
PVR before surgery	110.0 [22.5–170.0]	85.0 [30.0–200.0]	0.763
PVR after 18 months	0.0 [0.0–0.0]	0.0 [0.0–0.0]	0.652
p-value	**<0.05**	**<0.05**	
Prostate volume (cc) before surgery	74.1 [55.3–92.6]	85.5 [60.0–100.0]	0.253
Prostate volume (cc) after 18 months	30.1 [22.5–40.0]	27.5 [23.2–30.4]	0.219
p-value	**<0.05**	**<0.05**	

the bladder neck together with paracollicular tissue, and on the opposite side by the external urethral sphincter [9]. Based on these mechanisms, ejaculatory-protective techniques have a success rate of 36 to 96% [7]. Existing modern minimally invasive techniques such as Urolift®, Rezum®, Aquabeam®, iTIND®, and prostatic arteries embolization, which give promising results for preserving ejaculatory function due to the absence of destruction of tissues around the verumontanum and bladder neck, however, most of these methods are expensive and remain unavailable in many centers around the world, and also show lower functional results compared to the "gold standards" of surgical elimination of LUTS [8].

Performing laser enucleation of the prostate, which provides good efficiency in terms of eliminating LUTS, in combination with a technique that preserves antegrade ejaculation, seems to help achieve a better quality of life in patients who have undergone surgical treatment for BPH.

In 1998, Ronzoni et al. published the first pilot study investigating the ejaculatory technique of transurethral resection of the prostate, which involved 45 men who had more than 1 cm of the prostatic urethra preserved above the verumontanum (supracollicular tissue). Approximately 80% of patients noted the preservation of antegrade ejaculation [15]. A.G. Martov et al. in 2014 also published their experience in performing ejaculatory-protective transurethral resection of the prostate; the technique consisted not only in preserving the supracollicular tissue of the prostatic urethra mucosa but also the paracollicular mucosa around the verumontanum for a length of 1-1.5 cm [11]. The ejaculatory-protective technique allowed for completely preserved ejaculation in 48.7% of patients and partially in 25.6%. Kim et al. in 2015 published a study involving 52 men, half of whom underwent ejaculatory-protective HoLEP; only 46.2% of patients noted the preservation of antegrade ejaculation [6].

In a larger study carried out by Talab et al., 160 patients who underwent ejaculatory-protective photoselective vaporization of the prostate (with preservation of supracollicular and paracollicular tissue) were analyzed. A mean follow-up period was 74 months. This study reported preservation of antegrade ejaculation in 86.6% of cases with simultaneous elimination of LUTS [17].

In 2021, Bozzini et al., in a prospective study involving 283 patients who underwent ejaculatory-protective ThuLEP, noted that 203 (71%) patients reported preservation of antegrade ejaculation three months after surgical treatment. In addition, there was an increase in positive outcomes to 219 patients (77%) six months after the enucleation, while significant improvements in Qmax and IPSS indicators were achieved [2].

In 2023, A.G. Martov continued scientific research regarding the ejaculatory-protective technique using ThuLEP. The study involved 84 patients maintaining sexual activity, who were distributed according to the presence of the middle lobe of the prostate (n=54) or only lateral lobes (n=30). The results showed the absence of antegrade ejaculation after the ejaculatory-protective ThuLEP technique in patients with a middle lobe and, conversely, in patients without a middle lobe of the prostate, complete preservation of antegrade ejaculation was noted in 57.0% of cases [10].

In our study, both techniques led to an improvement in the quality of urination according to validated IPSS questionnaires and uroflowmetry. The chances of preserving antegrade ejaculation in patients who underwent the ejaculatory-protective technique were 2.372 times higher compared to the classical technique, and the differences in chances were significant (OR = 0.361; 95% CI: 0.169-0.769) (*Fig. 3*).

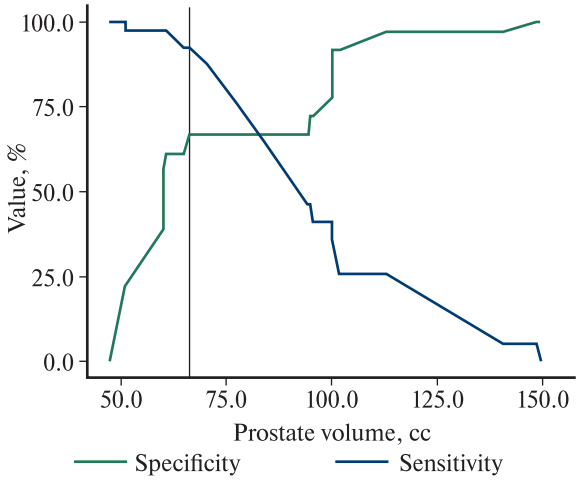


Fig. 3. Analysis of the sensitivity and specificity of the model depending on the threshold values of the prostate volume

When assessing erectile function in patients who underwent ejaculatory-protective laser enucleation of the prostate, no significant change in IIEF-5 was noted (p=0.074). In those who underwent the classical technique of laser enucleation of the prostate, the average IIEF-5 score significantly decreased from 18.9±3.3 to 17.6±4.0 (p<0.05). These results indicate the importance of the fact that the ejaculatory dysfunction can lead to a decrease in the perceived quality of erectile function. This thesis is consistent with the conclusion of a meta-analysis carried out in 2024, which demonstrates the positive impact of the ejaculatory-protective technique not only on the frequency of preservation of antegrade ejaculation after surgical treatment but also on sexual function as a whole [12].

Conclusion. Classical and ejaculatory-protective laser enucleation of the prostate are equally effective in eliminating LUTS and are safe. Ejaculatory-protective enucleation of the prostate is a surgical technique that increases the chance of preserving antegrade ejaculation but does not allow achieving a 100% efficiency. This surgical technique can be offered to sexually active patients in order to eliminate LUTS and increase the chance of preserving antegrade ejaculation after treatment.

REFERENCES

1. *Loran O.B.* Menopausal disorders in men. OGGI Production. 1999. C. 88. Russian (Лоран О.Б. Климактерические расстройства у мужчин. OGGI Production. 1999. С. 88).
2. *Bozzini G., Berti L., Aydoğan T.B., Maltagliati M., Roche J.B., Bove P., Besana U., Calori A., Pastore A.L., Müller A., Micali S., Sighinolfi M.C., Rocco B., Buizza C.* A prospective multicenter randomized comparison between Holmium Laser Enucleation of the Prostate (HoLEP) and Thulium Laser Enucleation of the Prostate (ThuLEP). World J Urol. 2021 Jul;39(7):2375-2382. doi: 10.1007/s00345-020-03468-6. Epub 2020 Sep 30. PMID: 32997262.
3. *DeLay K.J., Nutt M., McVary K.T.* Ejaculatory dysfunction in the treatment of lower urinary tract symptoms. Transl Androl Urol. 2016 Aug;5(4):450-9. doi: 10.21037/tau.2016.06.06. PMID: 27652217;

PMCID: PMC5002000.
4. *Feldman H.A. et al.* Impotence and its medical and psychosocial correlates: Results of the Massachusetts Male Aging Study. Journal of Urology. 1994;1(151):54-61. doi: 10.1016/s0022-5347(17)34871-1.
5. *Gil-Vernet J.M. Jr., Alvarez-Vijande R., Gil-Vernet A., Gil-Vernet J.M.* Ejaculation in men: a dynamic endorectal ultrasonographical study. Br J Urol. 1994 Apr;73(4):442-8. doi: 10.1111/j.1464-410x.1994.tb07612.x. PMID: 8199835.
6. *Kim M., Song S.H., Ku J.H., Kim H.J., Paick J.S.* Pilot study of the clinical efficacy of ejaculatory hood sparing technique for ejaculation preservation in Holmium laser enucleation of the prostate. Int J Impot Res. 2015 Jan-Feb;27(1):20-4. doi: 10.1038/ijir.2014.22. Epub 2014 Jul 10. PMID: 25007827.
7. *Kotov S.V., Semenov A.P., Yusufov A.G., Guspanov R.I.* Effect of endoscopic enucleation of the prostate on erectile and ejaculatory function. Urology Herald. 2023;11(4):128-140. https://doi.org/10.21886/2308-6424-2023-11-4-128-140. Russian (Котов С.В., Семенов А.П., Юсуфов А.Г., Гуспанов Р.И. Влияние эндоскопической энуклеации гиперплазии предстательной железы на эректильную и эякуляторную функции. Вестник урологии. 2023;11(4):128-140. https://doi.org/10.21886/2308-6424-2023-11-4-128-140).
8. *Lebdai S., Chevrot A., Doizi S., Pradere B., Delongchamps N.B., Benchikh A., Cornu J.N., Della Negra E., Fourmarier M., Misraï V., Theveniaud P.E., Descazeaud A., Robert G.;* CTMH-AFU group. Do patients have to choose between ejaculation and miction? A systematic review about ejaculation preservation technics for benign prostatic obstruction surgical treatment. World J Urol. 2019 Feb;37(2):299-308. doi: 10.1007/s00345-018-2368-6. Epub 2018 Jul 2. PMID: 29967947.
9. *Lebdai S., Ben Boujema M., Benard A., Barry Delongchamps N., Benchikh A., Bruyere F., Della Negra E., Descazeaud A., Doizi S., Fourmarier M., Mallet R., Misrai V., Pelegrin T., Rouscoff Y., Ruffion A., Villers A., Saillour F., Robert G.* Standardized technique for ejaculation preservation during prostatic endoscopic ablative surgery. World J Urol. 2023 Nov;41(11):3041-3049. doi: 10.1007/s00345-023-04592-9. Epub 2023 Sep 16. PMID: 37715788.
10. *Martov A.G., Ergakov D.V., Asliev K.A., Baykov N.A.* Ejaculation-sparing enucleation of benign prostate hyperplasia: is it almost feasible? Urology Herald. 2023;11(1):59-69. https://doi.org/10.21886/2308-6424-2023-11-1-59-69. Russian (Мартов А.Г., Ергаков Д.В., Аслиев К.А., Байков Н.А. Эякуляторно-протективная энуклеация доброкачественной гиперплазии предстательной железы: это вообще возможно? Вестник урологии. 2023;11(1):59-69. https://doi.org/10.21886/2308-6424-2023-11-1-59-69)..
11. *Martov A.G., Andronov A.S., Dutov S.V., Baykov N.A.* Ejaculatory-protective transurethral resection of the prostate. Urologiia. 2014;(4):69-75. Russian (Мартов А.Г., Андронов А.С., Дутов С.В., Байков Н.А. Эякуляторно-протективная трансуретральная резекция предстательной железы. Урология. 2014;(4):69-75).
12. *Ramez M.* Ejaculatory-sparing transurethral prostatectomy: a meta-analysis of randomized controlled trials. Sexual Medicine Reviews. 2024;4(12):754–760.
13. *Nair S.M., Pimentel M.A., Gilling P.J.* A Review of Laser Treatment for Symptomatic BPH (Benign Prostatic Hyperplasia). Curr Urol Rep. 2016 Jun;17(6):45. doi: 10.1007/s11934-016-0603-5. PMID: 27053186.
14. *Popov S.V., Orlov I.N., Grin' Ye.A., Malevich S.M., Gul'ko A.M., Topuzo T.M., Kyzlasov P.S., Povelitsa E.A.* Erectile dysfunction: new technologies and approaches in diagnostics and treatment. Urology Herald. 2020;8(2):78-92. https://doi.org/10.21886/2308-6424-2020-8-2-78-92. Russian (Попов С.В., Орлов И.Н., Гринь Е.А., Малевич С.М., Гулько А.М., Топузов Т.М., Кызласов П.С., Повелица Э.А. Новые технологии и подходы в диагностике и лечении эректильной дисфункции. Вестник урологии. 2020;8(2):78-92. https://doi.org/10.21886/2308-6424-2020-8-2-78-92)
15. *Ronzoni G., De Vecchis M.* Preservation of anterograde ejaculation after transurethral resection of both the prostate and bladder neck. Br J Urol. 1998 Jun;81(6):830-3. doi: 10.1046/j.1464-410x.1998.00658.x. PMID: 9666766.
16. *Rosen R., Altwein J., Boyle P., Kirby R.S., Lukacs B., Meuleman E., O'Leary M.P., Puppo P., Robertson C., Giuliano F.* Lower urinary tract symptoms and male sexual dysfunction: the multinational survey of the aging male (MSAM-7). Eur Urol. 2003 Dec;44(6):637-49. doi: 10.1016/j.eururo.2003.08.015. PMID: 14644114.
17. *Talab S.S., Bachmann A., Choi B.B., Muir G., Tabatabaei S.* 2016 Ejaculation-preserving photoselective vaporization of prostate (EP-PVP) does not compromise outcomes of prostate de-bulking procedure. Journal of Urology [Internet]. 2012 Apr 1 [cited 2025 Feb 20];187(4S):e814. Available from: https://doi.org/10.1016/j.juro.2012.02.2179

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