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BIPOLAR ENUCLEATION OF PROSTATIC HYPERPLASIA: INITIAL RESULTS IN THE SAMARKAND REGION

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Abstract

Introduction. Benign prostatic hyperplasia (BPH) is one of the most common urological diseases among elderly males impacting patients' health and quality of life. Despite significant advances in BPH pharmacotherapy, the most effective method of treating BPH is surgery. Endoscopic enucleation of the prostate (EEP) has become currently a leading surgical treatment for BPH. One of the EEP modalities is transurethral bipolar enucleation of the prostate (b-TURP).

Purpose. Evaluation of the efficacy and safety of bipolar enucleation of the prostate (b-TURP) through the systematization of postoperative complications in patients with BPH. Initial results of b-TURP in the Samarkand region are provided.

Results. To assess postoperative complications of b-TUEP, the Clavien-Dindo classification system adapted for assessing postoperative complications of surgical methods for the treatment of BPH was used. 10 (27.8%) postoperative complications were observed in 9 (25%) patients. All registered complications were minor - I and II grade due to the adapted Clavien-Dindo classification. High efficiency of b-TUEP was indicated by positive changes of the main indicators in assessing of surgical interventions for BPH: IPSS (International Prostate Symptom Score) questionnaire, quality of life index (QoL), average urine flow rate (Qaver), prostate volume (Vpr) and residual urine volume (PVR). Three months after surgery IPSS score reduced from 23.6 before surgery to 7.3, QoL index - from 4.5 to 2.3, Qaver increased from 3.7 ml/sec to 12.6 ml/sec, Vpr reduced from 99.9 to 32.7 cm^3 and PVR - from 87.6 ml to 16.9 ml.

Conclusion. b-TUEP is a modern minimally invasive transurethral method of treating BPH. Positive dynamics of the main outcomes of surgical interventions for BPH indicate the high efficiency of this method. The low level of postoperative complications, most of which are minor deviations from the normal postoperative period, indicates the safety of the procedure.

Keywords: benign prostatic hyperplasia, bipolar enucleation, complications, Clavien-Dindo.

БИПОЛЯРНАЯ ЭНУКЛЕАЦИЯ ГИПЕРПЛАЗИИ ПРЕДСТАТЕЛЬНОЙ ЖЕЛЕЗЫ: ПЕРВЫЕ РЕЗУЛЬТАТЫ В САМАРКАНДСКОЙ ОБЛАСТИ

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Аннотация

Введение. Доброкачественная гиперплазия предстательной железы (ДГПЖ) является одним из наиболее распространенных урологических заболеваний среди мужчин пожилого возраста, влияющих на здоровье и качество жизни пациентов. Несмотря на значительные

успехи в фармакотерапии ДГПЖ, наиболее эффективным методом лечения ДГПЖ является хирургическое вмешательство. Эндоскопическая энуклеация предстательной железы (ЭЭП) в настоящее время стала ведущим хирургическим методом лечения ДГПЖ. Одним из видов ЭЭП является трансуретральная биполярная энуклеация простаты (б-ТУЭП).
Цель. Оценка эффективности и безопасности биполярной энуклеации предстательной железы (б-ТУЭП) путем систематизации послеоперационных осложнений у пациентов с ДГПЖ. Приведены первые результаты применения б-ТУЭП в Самаркандской области.
Результаты. Для оценки послеоперационных осложнений б-ТУЭП использовалась система классификации Clavien-Dindo, адаптированная для оценки послеоперационных осложнений хирургических методов лечения ДГПЖ. У 9 (25%) пациентов наблюдалось 10 (27,8%) послеоперационных осложнений. Все зарегистрированные осложнения были незначительными - I и II степени по адаптированной классификации Clavien-Dindo. О высокой эффективности б-ТУЭП свидетельствовала положительная динамика основных показателей оценки хирургических вмешательств при ДГПЖ: опросника IPSS (International Prostate Symptom Score - Международная шкала симптомов простаты), индекса качества жизни (QoL), средней скорости потока мочи (Qaver), объема простаты (Vpr) и объема остаточной мочи (OOM). Через три месяца после операции балл IPSS снизился с 23,6 до операции до 7,3, индекс QoL - с 4,5 до 2,3, Qaver увеличился с 3,7 мл/сек до 12,6 мл/сек, Vпр снизился с 99,9 до 32,7 см^3, а OOM – с 87,6 мл до 16,9 мл.
Заключение. b-ТУЭП - современный малоинвазивный трансуретральный метод лечения ДГПЖ. Положительная динамика основных результатов оперативных вмешательств при ДГПЖ свидетельствует о высокой эффективности данного метода. Низкий уровень послеоперационных осложнений, большинство из которых представляют собой незначительные отклонения от нормального течения послеоперационного периода, свидетельствует о безопасности процедуры.
Ключевые слова: доброкачественная гиперплазия предстательной железы, биполярная энуклеация, осложнения, Clavien-Dindo.

PROSTATA BEZI GIPERPLAZIYASINING BIPOLYAR ENUKLEATSIYASI: SAMARQAND VILOYATIDA DASTLABKI NATIJALAR

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Annotatsiya
Kirish. Prostata bezining xavfsiz giperplaziyasi (PBXG) - keksa erkaklar orasida bemorlarning salomatligi va hayot sifatiga ta'sir qiluvchi eng keng tarqalgan urologik kasalliklardan biridir. PBXG farmakoterapiyasida sezilarli yutuqlariga qaramasdan, PBXGni davolashning eng samarali usuli jarrohlik aralashuvi hisoblanadi. Prostata bezining endoskopik enukleatsiyasi (EEP) hozirgi vaqtda PBXGda yetakchi jarrohlik davolash usuliga aylandi. EEP usullaridan biri bu prostata bezining transuretral bipolyar enukleatsiyasi (b-PTUE).
Maqsad. PBXG bor bemorlarda operatsiyadan keyingi asoratlarni tizimlashtirish orqali b-PTUE samaradorligi va xavfsizligini baholash. Samarqand viloyatida b-PTUE qo’llashning dastlabki natijalari keltirilgan.
Natijalar. b-PTUEning operatsiyadan keyingi asoratlarini baholash uchun PBXGni jarrohlik davolash usullarining operatsiyadan keyingi asoratlarini baholash uchun moslashtirilgan Klavien-Dindo tasniflash tizimi qo'llanildi. 9 (25%) nafar bemorda operatsiyadan keyingi 10 (27,8%) ta asoratlar kuzatildi. Barcha aniqlangan asoratlar yengil darajali edi - moslashtirilgan Klavien-Dindo tasnifi tufayli I va II darajaga to’g’ri keladi. b-PTUEning yuqori samaradorligi PBXGda jarrohlik

aralashuvlarni baholashda asosiy ko'rsatkichlarning – IPSS (International Prostate Symptom Score – Xalqaro prostata simptomlari shkalasi), hayot sifati indeksi (QoL), o'rtacha siydik oqimi tezligi (Qaver), prostata hajmi (Vpr) va qoldiq siydik hajmi (PVR) ijobiy o'zgarishlari bilan namoyon bo'ldi. Operatsiyadan uch oy o'tganda IPSS ko'rsatkichi operatsiyadan oldingi 23,6 dan 7,3 gacha, QoL indeksi - 4,5 dan 2,3 gacha tushdi, Qaver 3,7 ml/sek dan 12,6 ml/sek gacha ko'tarildi, Vpr 99,9 dan 32,7 sm^3 gacha va PVR 87,6 ml dan 16,9 ml gacha kamaydi.

Xulosa. b-PTUE - PBXGni davolashning zamonaviy minimal invaziv transuretral usulidir. PBXGda jarrohlik aralashuvlarning asosiy natijalarining ijobiy dinamikasi ushbu usulning yuqori samaradorligini ko'rsatadi. Operatsiyadan keyingi asoratlarning yengil darajasi, ularning aksariyati normal operatsiyadan keyingi davrning kichik og'ishlari ekanligi, aralashuvning xavfsizligini anglatadi.

Kalit so'zlar: prostata bezining xavfsiz giperplaziyasi, bipolyar enukleatsiya, asoratlar, Klavyen-Dindo.

Introduction. Benign prostatic hyperplasia (BPH) and lower urinary tract symptoms (LUTS) due to BPH is one of the chronic diseases among elderly males impacting patients' health and quality of life. It is acknowledged that male lower urinary tract symptoms are mainly attributed to BPH, although a variety of different diseases that may result in LUTS development are known [9].

Treatment of BPH, both medical and surgical, is a pressing issue in modern urology. Despite significant advances in BPH pharmacotherapy, the most effective method of treating BPH is surgery. BPH surgery is one of the most rapidly developing areas of urology. Armamentarium of various modalities for destruction of hyperplastic tissue in the prostate is big and it is being replenished with new methods. Currently, absolute priority in the surgical treatment of BPH is assigned to the so-called methods of endoscopic enucleation of the prostate (EEP), which combines existing types of enucleation of prostatic hyperplasia tissue [1,3,6].

Endoscopic enucleation of the prostate (EEP) has become currently a leading surgical treatment for benign prostatic hyperplasia (BPH), traditionally managed by transurethral resection of the prostate (TURP). EEP involves complete adenoma removal along the surgical capsule and can be performed using different energy sources, such as holmium, thulium, GreenLight and diode lasers, or bipolar electrocautery. In several meta-analyses comparing the efficacy and safety of EEP versus TURP was obtained that EEP compares favourably with TURP for BPH. Enucleation techniques provide notable benefits in bleeding control, faster recovery and durable obstruction relief. Anatomical enucleation yields functional outcomes at least equal and often superior to TURP. Energy source choice may reflect resources and surgeon preferences [4,11].

The existing methods of electroenucleation of the prostate gland include monopolar (m-TURP) and bipolar (b-TURP) enucleation of the prostate. Laser methods are represented by HoLEP (Holmium Laser Enucleation of The Prostate), ThuLEP (Thulium Laser Enucleation of the Prostate), ThuFLEP (Thulium Fiber Lazer Enucleation of the Prostate), GreenLEP (green laser enucleation "Greenlight"), DiLEP (diode laser enucleation of the prostate) and other methods. Resection methods are giving way to enucleation methods, since the latter are radical [4,5].

Due to European Association of Urology Guidelines on management of non-neurogenic male LUTS bipolar (plasmakinetic) enucleation of the prostate should be offered to men with moderate-to-severe LUTS as an alternative to transurethral resection of the prostate [1].

Purpose. The purpose of this study was to evaluate the efficacy and safety of bipolar enucleation of the prostate (b-TURP) through the systematization of postoperative complications in patients with BPH. Initial results of b-TURP in the Samarkand region are presented.

Material and methods. We studied the results of bipolar transurethral enucleation of the prostate (b-TUEP) in 36 patients with clinically significant BPH. Surgical treatment was performed in the private medical clinic "Bionur medservis" in Samarkand from 2023 to February 2024. Patients' average age was 68.0±1.1.

Bipolar transurethral enucleation of prostatic hyperplasia was performed on Karl Storz equipment using plasmakinetic energy supplied to the vapoenucleating electrode through a 26 Fr resectoscope (Fig. 1).

Fig. 1. Vapoenucleating electrode (Karl Storz).

In most cases, enucleation was performed “en-block” with initial incision of the prostatic urethral mucosa above the verumontanum. After reaching the surgical capsule of the adenoma and entering into the proper layer (space between hyperplastic tissue and adenoma’s surgical capsule), the middle lobe (if present) was separeted and/or sequential enucleation of the lateral lobes was performed as a single block. Morcellation of the enucleated prostatic hyperplasia tissue was performed using the Hawk Shaver YSB-III morcellator (Hawk, Minitech Co., People's Republic of China).

The effectiveness of the intervention was assessed using IPSS (International Prostate Symptom Score) scale, quality of life index (QoL), average urine flow rate (Qaver), prostate volume (Vpr) and residual urine volume (PVR). All mentioned parameters were determined before surgery, as well as at 1 month and 3 months after surgery.

The safety of b-TUEP was assessed by registration of postoperative complications that developed after surgery. To assess postoperative complications, we used Clavien-Dindo classification system adapted to assess postoperative complications of surgical methods for the treatment of BPH. This adaptation is based on the criteria for the normal postoperative course of surgical treatment of BPH proposed by Giyasov Sh.I. et al. (2022), as well as the criteria for postoperative complications [5].

Results. Among 36 patients who underwent b-TUEP, 15 patients had a urethral catheter and 3 had cystostomy drainage.

The main preoperative parameters used to evaluate the effectiveness of bipolar enucleation of the prostate in the treatment of patients with clinically significant BPH, as well as their dynamics 1 month and 3 months after surgery are presented in Table 1.

Table 1.

Postoperative outcomes of patients after b-TUEP(n=36).

No.	Indicator	Before surgery	1 month after surgery	3 months after surgery
1.	IPSS	23.6±0.7	8.5±0.5*	7.3±0.3*
2.	QoL	4.5±0.1	3.2±0.06*	2.3±0.08*
3.	Qaver, ml/s	3.7±0.3	10.4±0.4*	12.6±0.4*
4.	Vpr., cm^3	99.9±7.3	34.2±1.7*	32.7±1.6*
5.	PVR, ml	87.6±17.9	26.0±3.2*	16.9±1.7*

*P <0.05 compared to preoperative period values.

Intraoperative complications included 2 (5.6%) cases of minor capsule injury that did not require any additional measures to manage it. In 1 (2.8%) patient, delayed morcellation of enucleated prostate hyperplasia tissue was performed due to pulmonary edema that developed during the intervention.

Postoperative catheterization time was 1.2±0.3 days. The average length of hospital stay after surgery was 2.8±0.2 days.

Among 36 patients who underwent b-TUEP, 10 (27.8%) postoperative complications were observed in 9 (25%) patients. Postoperative complications of b-TUEP were assessed using the Clavien-Dindo classification system adapted for assessing surgical methods of BPH treatment.

According to this classification system, postoperative complications of b-TUEP were distributed as follows:

Complications of the I grade were registered in 5 (13.9%) cases and included:

1 (2.8%) case of remaining of a hemostatic urethral catheter for more than 72 hours;

1 (2.8%) case of one-day fever above 38°C;

3 (8.3%) cases of urinary incontinence lasting more than 1 month, but less than 3 months.

Complications of the II grade developed in 5 (13.9%) cases and included:

1 (2.8%) case of urinary tract infection (UTI) – acute pyelonephritis;

3 (8.3%) cases of hematuria requiring the administration of hemostatic agents;

1 (2.8%) case of urinary incontinence lasting more than 3 months.

Complications of grade III a, III b, IV a, IV b and V were not observed.

Discussion. Surgical treatment is most effective for eliminating of the infravesical obstruction caused by BPH. Currently there is a tend to shift from resection methods to enucleation methods. Transurethral resection of BPH is traditionally considered the "gold standard" of BPH surgery, against which new surgical methods of surgical treatment of BPH are usually assessed.

In systematic review and meta-analysis comparing the efficacy and safety of EEP versus TURP by Vo L.T. et al. (2025) twenty-eight randomized controlled trials (RCTs) with 3085 patients (1538 patients underwent EEP and 1547 underwent TURP) were included. EEP was associated with significantly improved IPSS, Qmax and PVR compared with TURP. Perioperative outcomes favoured EEP, including shorter catheterisation time, reduced hospital stay and lower transfusion rates. No significant differences were observed in long-term incontinence or bladder neck contracture, though EEP yielded lower stricture rates and reoperation rates for recurrent BPH [11].

In another systematic review and meta-analysis was obtained that EEP had a significantly lower reoperation rate and better functional outcomes (Q_{max} and IPSS) at long term compared with TURP. It may also be beneficial in terms of IIEF-5, PVR, and PSA level [10].

Bipolar plasmakinetic enucleation of the prostate in the treatment of massive benign prostatic hyperplasia enucleation has the advantages of complete gland resection, good surgical effect, improved surgical safety, and reduced intraoperative and postoperative complications [7].

Among enucleation techniques holmium laser enucleation of the prostate (HoLEP) was the most extensively studied technique, followed by holmium laser enucleation of the prostate (ThuLEP) and b-TUEP, while ThuFLEP gaining emerging interest. There has been a notable lack of high-quality RCTs for GreenLEP, DiLEP and m-TUEP [8].

In our study, all patients who underwent b-TUEP demonstrated positive dynamics of the main parameters for the assessment of surgical intervention for prostate hyperplasia (IPSS, QoL, Qaver, Vpr, PVR), compared with preoperative values. As a uroflowmetric indicator, we used the average urinary flow rate, the values of which are improved after b-TUEP as well. All registered postoperative complications were assessed as I and II grade complications according to the adapted Clavien-Dindo classification system, no additional invasive interventions under general or local anesthesia were required. In none of the cases was there a need for repeated intervention

Conclusions. b-TUEP is a modern minimally invasive transurethral method of treating BPH. Positive dynamics of the main outcomes of surgical interventions for BPH indicate the high efficiency of this method. The low level of postoperative complications, most of which are minor deviations from the normal postoperative period, indicates the safety of the procedure.

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