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EXPERIENCE IN PERFORMING LAPAROSCOPIC ROBOT-ASSISTED PROSTATECTOMY IN THE SURGICAL TREATMENT OF BENIGN PROSTATIC HYPERPLASIA

Ruslan H. Tserkovniuk[3,8], Viktor I. Gorovyi[2], Mykola D. Sosnin[3], Roman P. Moraru–Burlesku[4], Oleksandr M. Chaika[5,6], Valerii M. Kapshuk[7], Valentyn R. Taheiev[1]

[1]National Pirogov Memorial Medical University, Vinnytsya, Vinnytsia, Ukraine
[2]Vinnytsia Regional Clinical Hospital named after M. I. Pirogov, Vinnytsia, Ukraine
[3]Shupyk National Healthcare University of Ukraine, Kyiv, Ukraine
[4]Cherkasy Regional Oncology Dispensary of the Cherkasy Regional Council, Cherkasy, Ukraine
[5]CNE «City Clinical Hospital No. 1» of Odesa City Council, Odesa, Ukraine
[6]Odesa National Medical University, Odesa, Ukraine
[7]Zhmerynka Central Regional Hospital, Zhmerynka, Ukraine
[8]Communal Nonprofit Enterprise «Podilsky Regional Center of Oncology of the Vinnytsia Regional Council», Vinnytsia, Ukraine

Abstract

Aim. To evaluate the immediate (in-hospital) outcomes of laparoscopic robot-assisted prostatectomy in the surgical treatment of large benign prostatic hyperplasia (greater than 80 cm^3).
Materials and methods. The study presents the immediate (in-hospital) results of simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy in 55 patients with benign prostatic hyperplasia who underwent surgery at the «Innomed – Center for Endosurgery» Medical Center between 2019 and 2024 using the da Vinci S and da Vinci Si surgical systems.
Results. To exclude prostate cancer, serum prostate-specific antigen (PSA) testing, MRI, and/or prostate biopsy were performed. Intraoperative blood loss was assessed using the gravimetric method. Post-prostatectomy surgical complications were classified according to the Clavien–Dindo system, and urination was assessed pre- and postoperatively using uroflowmetry. The mean age of the patients was 66.7±4.3 years, mean body mass index – 25.6±3.5 kg/m^2, mean ASA (American Society of Anesthesiology) score – 1.8±0.2, mean prostate volume – 124.8±25.8 cm^3, mean operative time – 219.3±28.7 minutes, mean intraoperative blood loss – 125.7±33.4 ml, and mean postoperative hospital stay – 5.5±1.1 days. Postoperative bleeding occurred in one patient (1.8%) and was managed with electrocautery of the prostate bed vessels. No patients required blood transfusion due to bleeding or blood loss. Complications after laparoscopic robot-assisted prostatectomy occurred in one patient (1.8%) – hyperthermia after urethral catheter removal, which was resolved with antibacterial and anti-inflammatory therapy. Complications according to the Clavien–Dindo classification occurred in 2 patients (3.6%) and were consistent with published data. The mean maximum urinary flow rate (Q max, ml/s) before surgery was 7.9±2.4 ml/s, and after surgery – 25.4±2.9 ml/s ($p<0.05$).
Conclusions. Simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy is characterized by a minimal number of postoperative complications and enables effective restoration of urination in patients with large benign prostatic hyperplasia (greater than 80 cm^3).

Keywords: **large benign prostatic hyperplasia, laparoscopic robot-assisted transperitoneal transvesical prostatectomy, in-hospital complications, uroflowmetry**

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most common conditions affecting men over the age of 50, with approximately 30-50% of patients requiring surgical intervention [12, 15]. According to the 2024 guidelines of the European Association of Urology (EAU) [7], for large-volume BPH (greater than 80 ml), open prostatectomy

remains the first-line surgical option in the absence of equipment for minimally invasive procedures. However, open prostatectomy is a highly invasive surgery associated with a significant risk of intra- and postoperative bleeding from the prostate bed, often requiring blood transfusions and reoperations. It is also characterized by considerable postoperative pain, a high incidence of infectious complications (including postoperative wound suppuration), prolonged hospitalization, and an extended rehabilitation period [11, 12, 15].

To reduce and prevent these complications, laparoscopic prostatectomy was introduced into urological practice in 2002, followed by laparoscopic robot-assisted prostatectomy in 2008 [12, 13, 15, 16, 20]. Robotic-assisted laparoscopic surgery enables highly precise procedures in complex, confined anatomical spaces with minimal trauma to surrounding tissues and vital structures. Additionally, enhanced 3D visualization with magnification facilitates higher-quality minimally invasive interventions, promotes quicker recovery, and helps preserve the patient's reproductive function.

Despite these advantages, the 2024 EAU guidelines [7] have not yet established a formal recommendation level for robot-assisted laparoscopic prostatectomy for BPH due to a lack of sufficient studies from leading European centers. In contrast, the American Urological Association (AUA, 2023) [19] recommends the use of laparoscopic robot-assisted prostatectomy for the surgical treatment of large BPH (greater than 80 cm^3). Laparoscopic robot-assisted prostatectomies for BPH are performed using either a multi-port or single-port da Vinci robotic system, via a transperitoneal or extraperitoneal approach. According to the literature [1, 16], urologists more frequently use the transperitoneal approach. When using a single-port robotic system, access to the prostate is gained extraperitoneally through the anterior wall of the bladder. When using a multi-port robotic system, access to the prostate is achieved either through the bladder dome (Retzius-sparing simple prostatectomy), the anterior wall (neck) of the bladder, or the anterior wall of the prostatic capsule (transcapsular prostatectomy according to T. Millin).

The da Vinci S robotic surgical system was first introduced in Ukraine in 2018 at the private «Innomed – Center for Endosurgery» in Vinnytsia and was later upgraded to the da Vinci Si model. The first robot-assisted prostatectomy for benign prostatic hyperplasia in Ukraine was performed by Assoc. Prof. R.H. Tserkovniuk in 2018 [14-16]. Our initial results of robot-assisted prostatectomy for benign prostatic hyperplasia were presented in our previous publications [14-16].

AIM

To evaluate the immediate (in-hospital) outcomes of simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy in the surgical treatment of large benign prostatic hyperplasia (greater than 80 cm^3).

MATERIALS AND METHODS

In a private medical center «Innomed – Center for Endosurgery,» 55 simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomies were performed between 2018 and 2024 using the da Vinci S and da Vinci Si robotic platforms. All surgeries were performed by Associate Professor R. H. Tserkovniuk.

Indications for surgery in these patients included: acute (including recurrent) urinary retention; severe lower urinary tract symptoms unresponsive to conservative therapy; recurrent hematuria caused by BPH; bladder stones; recurrent urinary tract infections (cystitis, pyelonephritis) secondary to BPH. Patients with prostate cancer were excluded from the study.

All patients underwent a preoperative assessment including:

- Questionnaires: International Prostate Symptom Score (IPSS) and Quality of Life (QoL) index;
- Digital rectal examination of the prostate;
- Laboratory tests: complete blood count, urinalysis, urine culture, blood urea and creatinine levels, serum prostate-specific antigen (PSA);
- Uroflowmetry;
- Ultrasound of kidneys and bladder with measurement of post-void residual urine;
- Transrectal ultrasound of the prostate to determine prostate volume;
- Additional investigations as needed: MRI and/or prostate biopsy to exclude malignancy, and cystoscopy to rule out bladder tumors;

Cardiopulmonary evaluation, including echocardiography, electrocardiography with cardiologist consultation, and duplex ultrasound of the lower extremity veins to exclude deep vein thrombosis.

Preoperative physical status was assessed using the American Society of Anesthesiologists (ASA) classification [12, 15]. Body mass index (BMI) was calculated for all patients. Intraoperative blood loss was measured using the gravimetric (weight-based) method.

Intra- and postoperative complications were classified using the Clavien–Dindo classification system [3].

Uroflowmetry was conducted preoperatively and on the day of discharge using the domestic uroflowmeter «Potik-K» (Dnipro, Ukraine) [9] to determine maximum urinary flow rate (Qmax, ml/s). The maximum urinary flow rate (Qmax, mL/s) provides an objective means to evaluate and statistically compare urination before and after surgery.

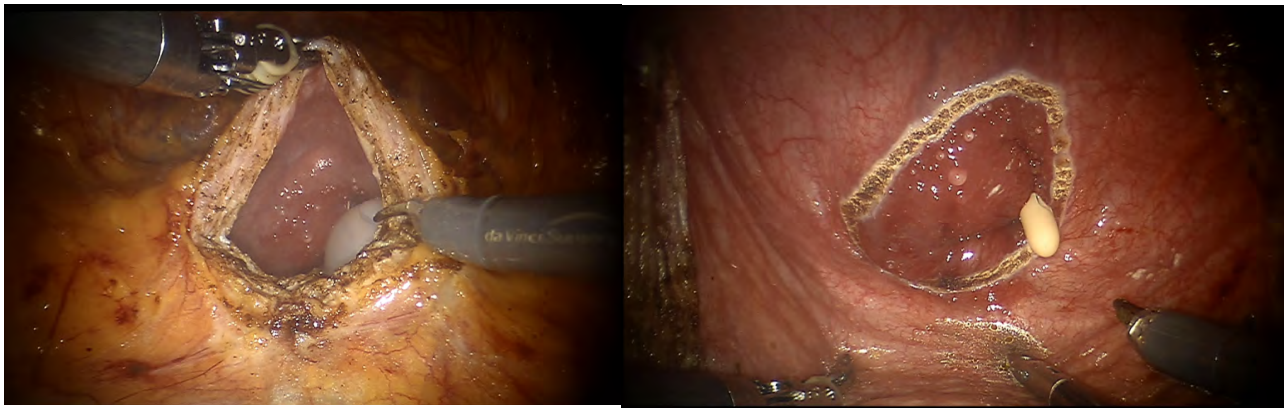
Qmax was measured pre- and postoperatively in patients who were admitted without a urethral catheter and retained the ability to void spontaneously.

Statistical analysis of the collected data was carried out using methods of descriptive and variation statistics. Statistical significance of differences was evaluated using Student's t-test and Mann–Whitney U test. The STATISTICA (USA) software package was used for statistical calculations.

Surgical Technique

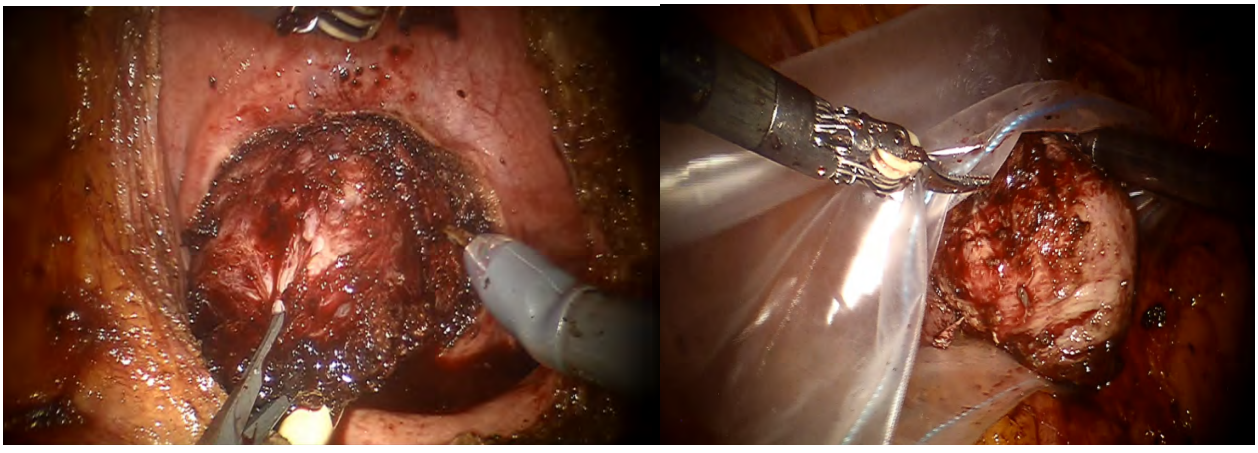
All patients received preoperative prophylactic antibiotic therapy and thromboprophylaxis. All procedures were performed under general endotracheal anesthesia with the patient positioned in the Trendelenburg position. The simultaneous laparoscopic robot-assisted prostatectomy was performed using a transperitoneal transvesical approach: in the first 25 patients, access was obtained via the dome of the urinary bladder (the superior bladder wall covered by peritoneum – the so-called Retzius-sparing approach) (Figures 1-3); in the next 30 patients, access was via the anterior bladder wall, following peritoneal incision along the median umbilical ligament to enter the Retzius space (Figures 4-5). Bladder stones were removed after incision of the bladder wall.

The laparoscopic robot-assisted technique allowed for the precise removal of hyperplastic prostatic nodules, stepwise hemostasis of the prostatic bed, and restoration of lower urinary tract continuity by creating a circular anastomosis between the bladder neck and the membranous urethra using Vicryl sutures (V-Loc 2-0). After placement of a 20-22 Ch Foley catheter into the bladder, the balloon was inflated with 30 mL, and the bladder wall was closed using Vicryl sutures (V-Loc 2-0).



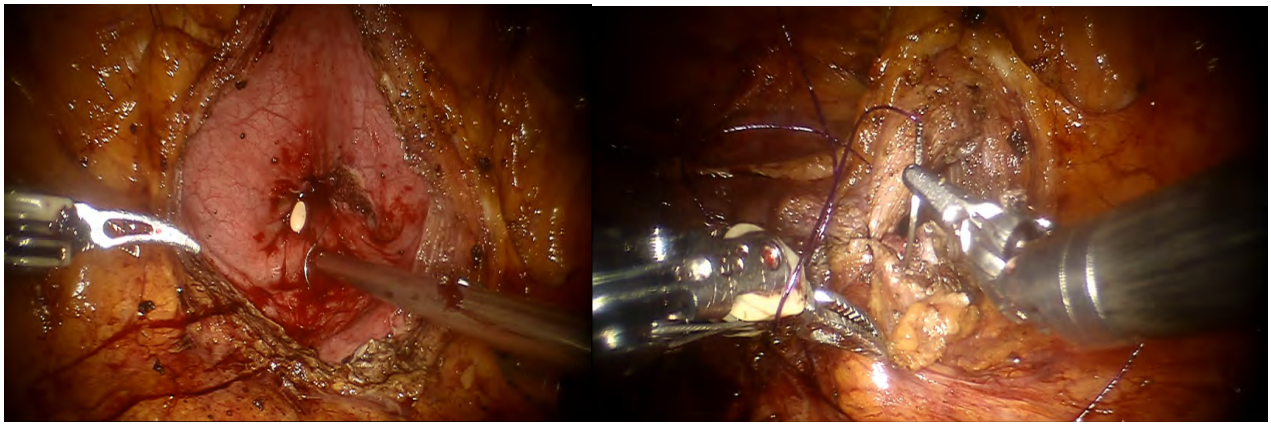
1a 1b

Figure 1. Incision of the bladder dome (superior wall covered by peritoneum). The Foley catheter balloon is visible in the region of the bladder neck (a). Circular incision of the bladder neck mucosa around the hyperplastic prostatic nodules (b).



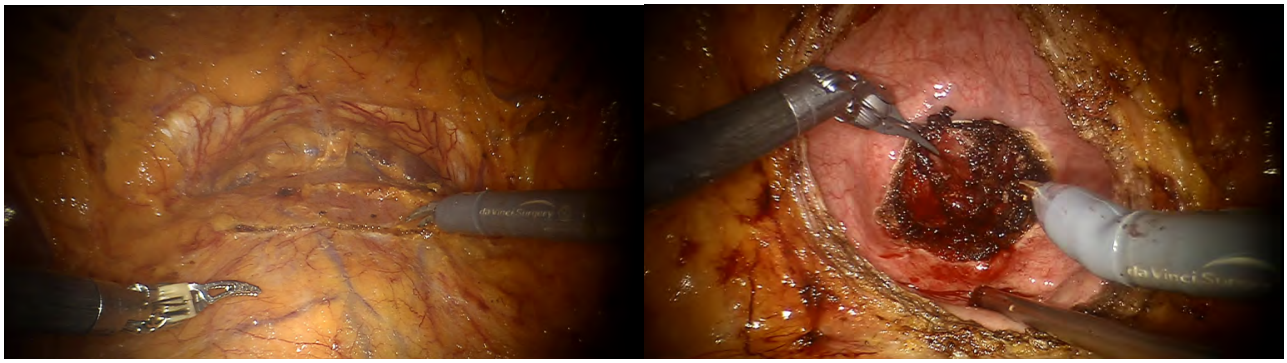
2a 2b

Figure 2. Removal of the hyperplastic prostatic nodules (a, b).



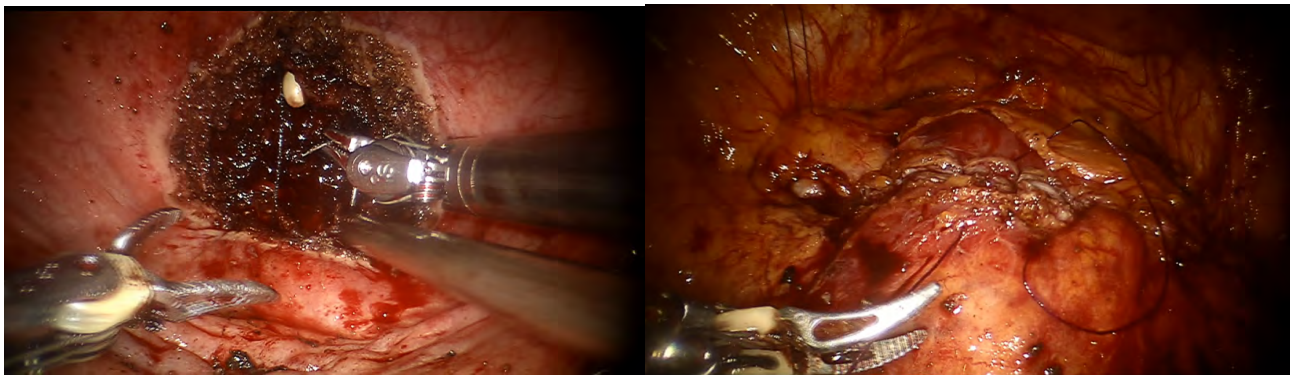
3a 3b

Figure 3. Formation of a circular anastomosis between the bladder neck and the membranous urethra according to Cacciamani G. et al. [2], using Vicryl sutures (V-Loc, 2-0) (a). Insertion of a three-way Foley catheter № 20 Ch into the urinary bladder and watertight closure of the bladder dome (superior wall) with a Vicryl suture (V-Loc, 2-0) (b).



4a 4b

Figure 4. Incision of the anterior bladder wall with a transverse cut 2 cm proximal to the bladder neck (a). Circular incision of the bladder neck mucosa above the hyperplastic prostatic nodules and their removal (b).



5a 5b

Figure 5. Formation of a circular anastomosis between the bladder neck and the membranous urethra (a). Closure of the incision in the anterior bladder wall with Vicryl suture (V-Loc, 2-0) (b).

Continuous irrigation of the urinary bladder with sterile saline was performed for the first 10-15 hours after surgery, and the Foley catheter was removed on the 5th day post-operation.

RESULTS AND DISCUSSION

The results of the examination and treatment of patients who underwent simultaneous laparoscopic robot-assisted transvesical prostatectomy are presented in Table 1.

Table 1

Results of the Examination and Treatment of Patients Who Underwent Simultaneous Laparoscopic Robot-Assisted Transperitoneal Transvesical Prostatectomy

Age of patients (years)	66.7 ± 4.3
Body mass index (kg/m^2)	25.6 ± 3.5
Prostate volume according to TRUS and MRI (cm^3)	124.8 ± 25.8
Number of patients who underwent prostate biopsy before surgery	6 (10.9%)
Bladder stones	4 (7.3%)
Intraoperative blood loss (ml)	125.7 ± 33.4
Duration of surgery (minutes)	219.3 ± 28.7
Postoperative bladder irrigation (hours)	10.1 ± 4.6
Duration of bladder drainage with urethral catheter (days)	5.1 ± 1.5
Postoperative bed days (days)	5.5 ± 1.1
Average maximum urine flow rate before surgery (ml/s) (measured in 30 patients)	7.9 ± 2.4
Average maximum urine flow rate after surgery (ml/s) (measured in 30 patients)	25.4 ± 2.9

The operative time and intraoperative blood loss were consistent with the data reported in the literature (Table 3). One patient (1.8%) experienced bleeding from the prostate bed immediately after surgery. He was re-operated under general anesthesia, and the bleeding sites from the prostate bed were coagulated using a resectoscope. Another patient (1.8%) developed hyperthermia after the removal of the Foley catheter due to urethro-prostatic reflexes of urine, which was treated with antibacterial and anti-inflammatory therapy. No other postoperative urological or non-urological complications (urethritis, epididymo-orchitis, pyelonephritis, urinary retention or incontinence after Foley catheter removal, myocardial infarction, pulmonary embolism, pneumonia, etc.) were observed. No patient required blood transfusion due to bleeding or blood loss. There were no fatal cases.

Complications following simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy are presented according to Clavien-Dindo in Table 2.

Table 2

Postoperative Complications Following Simultaneous Laparoscopic Robot-Assisted Transperitoneal Transvesical Prostatectomy According to Clavien-Dindo

Complication Grade	Complications (number of patients in absolute values and percentages) in patients after laparoscopic robot-assisted transperitoneal transvesical prostatectomy (n=55)	Complication Management
I	Hyperthermia after removal of the urethral drain (1-1.8%)	Antibacterial, antiinflammatory therapy
II	–	–
IIIa	–	–
IIIb	Early (within 24 hours after surgery) bleeding from the prostate bed (1-1.8%)	Electrocoagulation of vessels in the prostate bed
IVb	–	–
V	–	–
Total	2 (3.6%)	

The percentage of complications after performing simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy in our patients did not exceed the percentage of complications observed in various urological clinics, according to the literature data [1, 4-6, 8, 10, 17-19]. In open retropubic (transcapsular) and transvesical prostatectomies, the rate of postoperative complications is approximately ten times higher than that observed after robot-assisted prostatectomies [12, 15]. The results of performing laparoscopic robotic prostatectomies for benign prostatic hyperplasia (more than 20 cases), according to the literature, are presented in Table 3.

Thus, simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy is characterized by a minimal number of postoperative complications, despite the duration of the intervention.

To objectively assess the act of urination before and after the simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy, we conducted urodynamic studies in 30 patients with preserved urination before the surgery using the domestic uroflowmeter «Potik-K» (Dnipro). The maximum flow rate of urine (Qmax, ml/s) was measured before the surgery and on the day of discharge from the hospital. The average maximum urine flow rate before surgery was 7.9± 2.4 mL/s, and after surgery it was 25.4± 2.9 mL/s ($p<0.05$). Thus, simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy effectively restores the act of urination (to normal levels) in patients with benign prostatic hyperplasia of large sizes (greater than 80 cm^3).

Table 3

Results of Laparoscopic Robot-Assisted Prostatectomies for Benign Prostatic Hyperplasia

Author, year of publication	Number of cases	Surgical Access	Mean duration of surgery (min)	Mean blood loss (ml)	Prostate size (ml)	Mean length of stay
Matei D.V. et al. (2012)	35	Transperitoneal, transvesical	187	118	87	3,2
Leslie S. et al. (2014)	25	Transperitoneal, transvesical	214	143	88	4
Autorino R. et al. (2015)	487 (data from multiple clinics in Europe and the USA)	Transperitoneal, extraperitoneal	155	200	75	2
Pokorny M. et al. (2015)	67	Transperitoneal, transvesical	97	200	84	4
Garson O.D.M. et al. (2016)	79	Transperitoneal, transcapsular	152	390	80	Not specified
Pavan N. et al. (2016)	130	Transperitoneal, extraperitoneal	150	250	118,5	5
Umari P. et al. (2017)	81	Transperitoneal, transvesical (longitudinal to prostate capsule)	105	Not specified (blood transfusion in 1 patient – 1.2%)	89	4
Sorokin I. et al. (2017)	63	Transperitoneal, transvesical	160	327	136	2
Cacciamari G. et al. (2018)	23	Transperitoneal, transvesical	160,6	98,6	108,1	2,1
Dotzauer R. et al. (2020)	103	Transperitoneal, transvesical	182	248	127	9
Cho J.M. et al. (2021)	29	Transperitoneal, transvesical	174	Blood transfusion – 2 (6.9%)	58,7	3,9
Kirac M. et al. 2021)	42	Transperitoneal, transvesical (longitudinal)	112	210	128	1,6
Kim B.H., Byun H. J. (2022)	33	Transperitoneal, transvesical	128,6	Not specified	97,9	7,1
Golomb D. et al. (2022)	21	Transperitoneal, transvesical	185	100	152	1
Amenta M. et al. (2022)	25	Transperitoneal, transvesical	139	150	135	4
Choi S.W. et al. (2023)	62	32 – extraperitoneal retropubic, 30 – transperitoneal through the bladder dome	123,4 and 133,7 respectively	151.3 and 170.7, respectively	100.1 and 99.3, respectively	2.9 and 4.6, respectively
Novara G. et al. (2024)	87	Transperitoneal, transvesical (through the dome)	175	350	150	3
Larsen M. et al. (2024)	26	Transperitoneal, transvesical (through the anterior bladder wall)	116	134	130	1,6
Our data (Tserkovniuk R. H. et al., 2024)	55	Transperitoneal, transvesical (through the dome and anterior bladder wall)	219,3	125,7	124,8	5,5

CONCLUSIONS

1. Simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy is an effective surgical intervention for treating patients with benign prostatic hyperplasia of large sizes (greater than 80 cm^3) with a minimal number of early (hospital) complications.

2. It is necessary to evaluate and compare the immediate and long-term outcomes of simultaneous laparoscopic robot-assisted transperitoneal transvesical prostatectomy and open transvesical prostatectomy.

Perspectives for further research. Further research is needed to establish long-term postoperative outcomes and to evaluate the act of urination. A follow-up examination of patients is required at 3, 6, 12, and 24 months after surgery to determine the maximum urinary flow rate (Qmax) for the assessment of the act of urination. It is also necessary to compare the short-term and long-term outcomes of open

transvesical prostatectomy and laparoscopic robot-assisted transvesical prostatectomy. The maximum urinary flow rate – Qmax.

COMPLIANCE WITH ETHICAL REQUIREMENTS

Throughout the research and surgical treatment of patients, strict adherence to ethical principles and standards in accordance with international guidelines and ethical recommendations was maintained. All patients involved in the study were fully informed about the objectives, methods, potential risks, and benefits of the procedures, as well as any possible complications. Furthermore, each patient provided written informed consent to participate in the study, ensuring the voluntariness of their participation and the protection of their rights and freedoms.

The study was conducted in accordance with the ethical principles outlined in the Helsinki Declaration (updated 2013) and the guidelines of the European Association of Urology. The confidentiality of patients' personal data was guaranteed at all stages of the study, and the results were processed anonymously.

During the surgical procedures and postoperative monitoring, proper medical care was provided, taking into account the individual needs of the patients, ensuring their well-being and comfort. In the event of complications, appropriate medical assistance was provided, and all decisions regarding treatment were made based on objective medical indications.

Thus, the ethical standards governing medical practice were upheld at all stages of the research and treatment, ensuring a high level of quality and safety in the medical care provided.

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AUTHOR CONTRIBUTIONS

Tserkovniuk R. H.[A, B, D, F]

Horovyi V. I.[B, F]

Sosnin M. D.[C, D, F]

Moraru–Burlesku R.P.[B, F]

Chaika O. M.[E, F]

Kapshuk V. M.[E, F]

Taheiev V. R.[E, F]

REFERENCES

1. Autorino, R., Zargar, H., Mariano, M. B., Sanchez-Salas, R., Sotelo, R. J., Chlosta, P. L., Castillo, O., Matei, D. V., Celia, A., Koc, G., Vora, A., Aron, M., Parsons, J. K., Pini, G., Jensen, J. C., Sutherland, D., Cathelineau, X., Nuñez Bragayrac, L. A., Varkarakis, I. M., Amparore, D., … Porpiglia, F. (2015). Perioperative Outcomes of Robotic and Laparoscopic Simple Prostatectomy: A European-American Multi-institutional Analysis. European urology, 68(1), 86-94. https://doi.org/10.1016/j.eururo.2014.11.044
2. Cacciamani, G., Medina, L., Ashrafi, A., Landsberger, H., Winter, M., Mekhail, P., Desai, M., Aron, M., & Berger, A. (2018). Transvesical robot-assisted simple prostatectomy with 360° circumferential reconstruction: step-by-step technique. BJU international, 122(2), 344-348. https://doi.org/10.1111/bju.14203
3. Clavien, P. A., Barkun, J., de Oliveira, M. L., Vauthey, J. N., Dindo, D., Schulick, R. D., de Santibañes, E., Pekolj, J., Slankamenac, K., Bassi, C., Graf, R., Vonlanthen, R., Padbury, R., Cameron, J. L., & Makuuchi, M. (2009). The Clavien-Dindo classification of surgical complications: five-year experience. Annals of surgery, 250(2), 187-196. https://doi.org/10.1097/SLA.0b013e3181b13ca2
4. Cho, J. M., Moon, K. T., & Yoo, T. K. (2020). Robotic Simple Prostatectomy: Why and How?. International neurourology journal, 24(1), 12-20. https://doi.org/10.5213/inj.2040018.009
5. Cho, J. M., Moon, K. T., Lee, J. H., Choi, J. D., Kang, J. Y., & Yoo, T. K. (2021). Open simple prostatectomy and robotic simple prostatectomy for large benign prostatic hyperplasia: Comparison of safety and efficacy. Prostate international, 9(2), 101-106. https://doi.org/10.1016/j.prnil.2020.11.004
6. Dotzauer, R., La Torre, A., Thomas, A., Brandt, M. P., Böhm, K., Mager, R., Borgmann, H., Jäger, W., Kurosch, M., Höfner, T., Ruckes, C., Haferkamp, A., & Tsaur, I. (2021). Robot-assisted simple prostatectomy versus open simple prostatectomy: a single-center comparison. World journal of urology, 39(1), 149-156. https://doi.org/10.1007/s00345-020-03168-1
7. Gravas, S., Cornu, J. N., Gacci, M., et al. (2024). EAU guidelines on management of non-neurogenic male lower

urinary tract symptoms (LUTS), including benign prostatic obstruction (BPO). European Association of Urology.
8. Kiraç, M., Ergin, G., Kibar, Y., Köprü, B., & Biri, H. (2021). Robotic simple prostatectomy is a safe and effective technique for benign prostatic hyperplasia: Our single center initial short-term follow-up results for 42 patients. Turkish journal of urology, 47(4), 313-318. https://doi.org/10.5152/tju.2021.21094
9. Kvyatkovska, T. A., et al. (2019). Urofloumetriia [Uroflowmetry]. Dnipro: Lira.
10. John, H., Wagner, C., Padevit, C., & Witt, J. H. (2021). From open simple to robotic-assisted simple prostatectomy (RASP) for large benign prostate hyperplasia: the time has come. World journal of urology, 39(7), 2329-2336. https://doi.org/10.1007/s00345-020-03508-1
11. Smith, J. A., et al. (2018). Hinman's atlas of urological surgery (4th ed.). Elsevier Saunders.
12. Horovyi, V. I., Shaprinskyi, V. O., Baralo, I. V., & Kapshuk, O. (Eds.). (2021). Zalobkova prostatektomiia v khirurhichnomu likuvanni dobroiakisnoi hiperplazii prostaty: Posibnyk [Retropubical prostatectomy in surgical treatment of benign prostatic hyperplasia: A manual]. Vinnytsia: «TVORY».
13. Horovyi, V. I., Shaprynskyi, V. O., Kapshuk, O. M., Moraru-Burlesku, R. P., Dovgan, I. I., Balatskyi, O. R., Metashop, O. S., & Taheiev, V. R. (2024). Modern surgical approaches to the prostate and methods of prostatectomy in patients with benign prostatic hyperplasia (literature review). Reports of Vinnytsia National Medical University, 28(2), 360-368. https://doi.org/10.31393/reports-vnmedical-2024-28(2)-30
14. Horovyi, V. I., Shaprynskyi, V. O., Kapshuk, O. M., Sosnin, M. D., Tserkovniuk, R. H., Moraru-Burlesku, R. P., Kapshuk, V. M., Balatskyi, O. R., Dovgan, I. I., & Metashop, O. S. (2024). Dosvid vykonannia laparoskopichnoi robot-asystovanoi prostatektomii u khvorykh na dobroiakisnu hiperplaziiu prostaty [Experience of laparoscopic robot-assisted prostatectomy in patients with benign prostatic hyperplasia]. Halytski Urologichni Chytannia: Tezy dopovidei [Halytski Urological Readings: Conference Proceedings], 23-25.
15. Horovyi, V. I., Shaprinskyi, V. O., Kapshuk, O. M., Tserkovniuk, R. H., Moraru-Burlesku, R. P., & Yatsyna, O. I. (Eds.). (2023). Khirurhichne likuvannia dobroiakisnoi hiperplazii prostaty velykykh rozmiriv: Cherezmikhurova prostatektomiia (vidkryta, laparoskopichna, robot-asystovana) [Surgical treatment of large benign prostatic hyperplasia: Transvesical prostatectomy (open, laparoscopic, robot-assisted)]. Vinnytsia: TVORY.
16. Horovyi, V. I., Shaprynskyi, V. O., Tserkovniuk, R. G., Sosnin, M. D., Kapshuk, O. M., Moraru-Burlesku, R. P., Dovgan, I. I., Balatskyi, O. R., Metashop, O. S., Taheiev, V. R., & Livakovskyi, S. K. (2024). Laparoscopic robot-assisted prostatectomy in patients with benign prostatic hyperplasia (literature review). Kharkiv Surgical School, (6), 79-89. https://doi.org/10.37699/2308-7005.6.2024.14
17. Pavan, N., Zargar, H., Sanchez-Salas, R., Castillo, O., Celia, A., Gallo, G., Sivaraman, A., Cathelineau, X., & Autorino, R. (2016). Robot-assisted Versus Standard Laparoscopy for Simple Prostatectomy: Multicenter Comparative Outcomes. Urology, 91, 104-110. https://doi.org/10.1016/j.urology.2016.02.032
18. Pokorny, M., Novara, G., Geurts, N., Dovey, Z., De Groote, R., Ploumidis, A., Schatteman, P., de Naeyer, G., & Mottrie, A. (2015). Robot-assisted simple prostatectomy for treatment of lower urinary tract symptoms secondary to benign prostatic enlargement: surgical technique and outcomes in a high-volume robotic centre. European urology, 68(3), 451-457. https://doi.org/10.1016/j.eururo.2015.03.003
19. Sandhu, J. S., Bixler, B. R., Dahm, P., Goueli, R., Kirkby, E., Stoffel, J. T., & Wilt, T. J. (2024). Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia (BPH): AUA Guideline Amendment 2023. The Journal of urology, 211(1), 11-19. https://doi.org/10.1097/JU.0000000000003698
20. Sotelo, R., Clavijo, R., Carmona, O., Garcia, A., Banda, E., Miranda, M., & Fagin, R. (2008). Robotic simple prostatectomy. The Journal of urology, 179(2), 513-515. https://doi.org/10.1016/j.juro.2007.09.065

Резюме

ДОСВІД ВИКОНАННЯ ЛАПАРОСКОПІЧНОЇ РОБОТ-АСИСТОВАНОЇ ПРОСТАТЕКТОМІЇ ПРИ ХІРУРГІЧНОМУ ЛІКУВАННІ ДОБРОЯКІСНОЇ ГІПЕРПЛАЗІЇ ПРОСТАТИ

Руслан Г. Церковнюк[3,8], Віктор І. Горовий[2], Микола Д. Соснін[3], Роман П. Морару–Бурлеску[4], Олександр М. Чайка[5,6], Валерій М. Капшук[7], Валентин Р. Тагеєв[1]

[1]Вінницький національний медичний університет ім. М. І. Пирогова, м. Вінниця, Україна
[2]Вінницька обласна клінічна лікарня ім. М. І. Пирогова, м. Вінниця, Україна
[3]Національний університет охорони здоров'я України імені П. Л. Шупика, м. Київ, Україна
[4]КНП «Черкаський обласний онкологічний диспансер Черкаської обласної ради», м. Черкаси, Україна
[5]КНП «Міська клінічна лікарня № 1» Одеської міської ради, м. Одеса, Україна
[6]Одеський національний медичний університет, м. Одеса, Україна
[7]Комунальне некомерційне підприємство «Жмеринська центральна районна лікарня», м. Жмеринка, Україна
[8]КНП «Подільський регіональний центр онкології Вінницької Обласної Ради», м. Вінниця, Україна

Мета. Оцінити безпосередні (стаціонарні) результати лапароскопічної робот-асистованої простатектомії при хірургічному лікуванні великої доброякісної гіперплазії передміхурової залози (понад 80 см^3).
Матеріали та методи. У дослідженні представлені безпосередні (стаціонарні) результати одночасної лапароскопічної робот-асистованої трансперитонеальної трансвезикальної простатектомії у 55 пацієнтів із доброякісною гіперплазією передміхурової залози, яким було проведено хірургічне втручання в Медичному центрі «Інномед – Центр ендохірургії» у 2019-2024 роках з використанням хірургічних систем da Vinci S та da Vinci Si.
Результати. Для виключення раку передміхурової залози проводили тестування рівня простатспецифічного антигену (ПСА), МРТ та/або біопсію простати. Інтраопераційну крововтрату оцінювали за гравіметричним методом. Післяопераційні ускладнення класифікували за системою Клавієна–Діндо, а сечовипускання оцінювали до та після операції за допомогою урофлоуметрії. Середній вік пацієнтів становив 66,7±4,3 року, середній індекс маси тіла – 25,6±3,5 кг/м^2, середній бал за шкалою ASA (Американське товариство анестезіологів) – 1,8±0,2, середній об'єм передміхурової залози – 124,8±25,8 см^3, середня тривалість операції – 219,3±28,7 хвилини, середня інтраопераційна крововтрата – 125,7±33,4 мл, середня тривалість перебування в стаціонарі – 5,5±1,1 діб. Післяопераційна кровотеча виникла в одного пацієнта (1,8%) і була зупинена електрокоагуляцією судин ложа простати. Жодному пацієнтові не знадобилося переливання крові через кровотечу або втрату крові. Ускладнення після лапароскопічної робот-асистованої простатектомії виникли в одного пацієнта (1,8%) – гіпертермія після видалення уретрального катетера, яка була усунена шляхом призначення антибактеріальної та протизапальної терапії. Ускладнення за класифікацією Клавієна–Діндо спостерігалися у 2 пацієнтів (3,6%) і відповідали опублікованим даним. Середній максимальний об'ємний потік сечі (Q max, мл/с) до операції становив 7,9±2,4 мл/с, після операції – 25,4±2,9 мл/с ($p<0,05$).
Висновки. Одночасна лапароскопічна робот-асистована трансперитонеальна трансвезикальна простатектомія характеризується мінімальною кількістю післяопераційних ускладнень і забезпечує ефективне відновлення сечовипускання у пацієнтів із великою доброякісною гіперплазією передміхурової залози (понад 80 см^3).

Ключові слова: **доброякісна гіперплазія простати великих розмірів, лапароскопічна робот-асистована трансперитонеальна черезміхурова простатектомія, стаціонарні ускладнення, урофлоуметрія**

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