# Open surgical treatment in BPH – the experience over 10 years period of the Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest, Romania

Bulai Catalin[1,2], P. Geavlete[1,2], D. Georgescu[1,2], C. Ene[1,2], A. Militaru[1], A. Punga[1], B. Geavlete[1,2]

[1] *"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania;*
[2] *Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest, Romania*

**Abstract**

**Introduction.** This study aimed to evaluate the experience of 10 years in the Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest focusing on perioperative safety and morbidity but also on the evolution regarding the distribution of the number of interventions over time.

**Material and method.** A total of 268 patients diagnosed with benign prostatic hyperplasia (BPH) who underwent suprapubic prostatectomy for a period of 10 years (January 2010 - December 2020) in the Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest were included. The analyzed data was the age of the patients, the preoperatory symptoms, modifications in the bladder and prostate, and postoperative complications. Patients with malignant findings on histopathological examination were excluded.

**Results.** The median age was 74 years. The most common symptoms at admission were frequency in 223 (83.2%), weak stream in 215 (80.2%) and dysuria in 213 (79.5%). The most common complications at presentation were urinary tract infection 79 (29.5%), acute urinary retention 45 (16.8%) and bladder stones 40 (14.9%). The average volume of the prostate measured by ultrasound was 121.2 cm3. The comorbid medical conditions were hypertension, diabetes, and Parkinson's disease. In all cases, a transvesical prostatectomy was performed. The following changes were observed during the surgery: thickened bladder wall in 145 patients (54.1%), trabeculations in 120 cases (44.7%), bladder diverticula in 58 patients (21.6%), bladder stones in 40 (14.9%) cases and 50 (18.6%) patients had prostate with a median lobe comparatively with 218 patients (81.3%) with overall prostate enlargement.

**Conclusions.** Open prostate surgery is still required in the treatment plan for bulky prostate adenomas or in complications of BPH that indicate suprapubic prostatectomy at the expense of minimally invasive treatment methods. For superior results on operative safety and decreased risk of postoperative complications, patient comorbidities require careful management before surgery.

**Key words:** open prostatectomy, benign prostatic hyperplasia, surgery treatment

Correspondence to: Dr. Catalin Bulai, M.D.
"Saint John" Emergency Clinical Hospital, Department of Urology
3 Vitan-Barzesti st., district 4, code 042122, Bucharest, Romania
Tel: +40749184205; Fax: +40213345970
e-mail: catalinandreib@gmail.com

## Introduction

Benign prostatic hyperplasia is a condition of the elderly that progressively affects the quality of life through the onset of lower urinary tract symptoms [1]. Management of benign prostatic hyperplasia includes watchful waiting involving behavioral and dietary modifications to limit the progression and exacerbation of symptoms, drug treatment with two major classes of drugs with direct action on the prostate, respectively alpha-blockers and 5 alpha-reductase inhibitors, and last but not least the surgical treatment that is based on the principles of resection, enucleation, vaporization but also some modern alternative variants such as Aquablation [2].

When the prostate is larger than 80 mL, the 2021 EAU Guideline recommends open surgery as an alternative to bipolar transurethral enucleation of the prostate and holmium laser enucleation of the prostate [2]. The principle of prostatectomy is the enucleation of the adenoma with the help of the index and can be performed either transvesical (Freyer procedure) or retropubic (Millin procedure) [3,4]. The emergence of minimally invasive methods of prostate adenomatous tissue removal such as endoscopic prostate resection (TUR-P) [5], the use of laser for prostate ablation [6], thermotherapy [7], or transurethral needle ablation (TUNA) [8] has led to a gradual reduction in performing open surgical prostatectomy.

Several authors have tried to implement the principle of enucleation in as many minimally invasive procedures as possible to maintain surgical safety and efficiency as close as possible to the open surgery variant. Thus, at present for bulky prostate adenomas, there are Holmium laser enucleation of the prostate (HoLEP) [9] and Transurethral bipolar prostate enucleation (BPEP) [10], methods with results comparable to open surgical prostatectomy and recommended by specialized guides [2, 11, 12, 13,]

Also, for improved safety, efficacy, and postoperative recovery outcomes, alternative variants to open surgery such as Laparoscopic simple prostatectomy (LSP) [14] using laparoscopic extraperitoneal access and Robot-assisted simple prostatectomy (RASP) most commonly by transperitoneal approach [15] are being evaluated.

The purpose of this study was to evaluate the 10 years' experience results of the Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest with special emphasis on perioperative safety and morbidity but also concerning the evolution of the interventions over time.

## Material and method

We evaluated retrospectively all patients with BPH who underwent open surgery in the Department of Urology, "St. John" Emergency Clinical Hospital between January 2010 - December 2020. Patients were previously diagnosed with BPH by clinical examination, digital rectal examination, transabdominal or transrectal prostate ultrasound with post-void residual urine measurement, biological patient status assessment, renal function assessment, total PSA, free PSA, coagulation profile, and urine culture for identification of a possible lower urinary tract infection. Patients with unbalanced associated pathologies were scheduled for surgery only after adequate rebalancing. From the initial assessment of patients, the following were recorded: age distribution, symptoms, and specific BPH complications present at hospitalization. All procedures were performed by experienced physicians who were not in the learning curve.

Intraoperative information such as the type of procedure performed, and bladder and prostate changes were extracted from the surgical protocols.

From the point of view of postoperative recovery, the most common complications were noted.

Also, the patients in whom the histopathological examination established a malignant prostate disease were excluded.

## Results

This is a retrospective study of 10 years (January 2010 - December 2020) on 268 patients diagnosed with BPH and treated by open surgery in the Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest.

The mean age of the patients was 74 ± 11.7 years. The distribution of patients' age is presented in table no. 1 of which it can be observed that the largest share of patients is in the age group between 70 - 79 years, respectively 34.7%.

*Table 1 – age distribution*

| Age | No. of patients | % |
|---|---|---|
| 50 – 59 years | 23 | 8.6 |
| 60 – 69 years | 72 | 26.8 |
| 70 – 79 years | 93 | 34.7 |
| 80 – 89 years | 67 | 25 |
| 90 – 99 years | 13 | 4.9 |
| Total | 268 | 100 |

The most common symptoms present at admission were frequency in 223 cases (83.2%), weak urine flow

in 215 (80.2%), and dysuria in 213 cases (79.5%). In 45 cases (16.8%) patients were hospitalized with acute urinary retention.

The other symptoms were urgency incontinence, nocturia, incomplete emptying of the bladder, postmicturition dribbling, hematuria, and urinary incontinence (Table 2). Symptoms were present overtime for an average of 7.6 ± 6.3 months (1 to 60 months).

*Table 2 – hospitalization symptoms*

| Symptoms | No. Of patients | Percent |
|---|---|---|
| Frequency | 223 | 83.2 |
| Weak stream | 215 | 80.2 |
| Dysuria | 213 | 79.5 |
| Acute urinary retention | 45 | 16.8 |
| Urgency incontinence | 151 | 56.3 |
| Nocturia | 134 | 50 |
| Incomplete emptying of the bladder | 107 | 39.9 |
| Postmicturition dribbling | 85 | 31.7 |
| Hematuria | 45 | 16.8 |
| Urinary incontinence | 11 | 4.1 |

All patients presented enlarged prostates at the digital rectal examination, with benign characters and the average volume of the prostate measured by transrectal or transabdominal ultrasound was 121.2 $cm^3$ (90 - 285).

The most common complications of BPH at admission were urinary tract infection in 79 cases (29.5%), acute urinary retention present in 45 patients (16.8%), and bladder stones in 40 (14.9%) patients. The rest of the complications were: hematuria in 45 patients (16.8%), inguinal hernia in 31 cases (11.6%), bilateral hydronephrosis, and renal failure in 25 patients (9.3%). All patients with urinary tract infection received antibiotic treatment before surgery according to the result of the antibiogram and the operation was performed after the patient presented a sterile urine culture result. Patients with renal failure as a complication of prolonged urinary retention were operated only after the level of nitrogen retention products got back to normal limits. Among the associated pathologies, the most common were hypertension in 83 (31%) patients, diabetes in 32 (11.9%) cases, and Parkinson's disease diagnosed in 21 (7.8%) patients.

In all cases, a transvesical prostatectomy was performed. During the surgery, the following changes were noted in the bladder: thickened bladder wall in 145 patients (54.1%), trabeculations bladder in 120 cases (44.7%), bladder diverticula in 58 patients (21.6%), and bladder stones in 40 (14.9%) cases. In terms of prostate changes, 50 (18.6%) patients had a prostate with a median lobe and the remaining 218 (81.3%) had an overall prostate enlargement. The mean operating time was 86.9 minutes.

Along the immediate postoperative period, secondary coagulation was required and performed in 6 (2.2%) cases. We evaluated the bleeding risk by looking at the reduced mean hemoglobin level drop, bladder irrigation period, and blood transfusion rate. This study has outlined a reduced mean hemoglobin level drop of 3.1 g/dL, an average blood transfusion rate of 7.3%, and a mean irrigation period of 3.5 days. Also, the median catheterization period was 6.9 days and mean hospital stay 8.1 days.

Postoperative complications were urinary clot retention in 32 (11.9%) cases, wound infection in 28 (10.8%) patients, transient urinary incontinence in 27 (10.1%) cases and urinary tract infection in 25 (9.3%) cases.

*Table 3 – Postoperative complications*

| | No. of patients | % |
|---|---|---|
| Urinary clot retention | 32 | 11.9 |
| Wound infection | 28 | 10.5 |
| Transient urinary incontinence | 27 | 10.1 |
| Urinary tract infection | 25 | 9.3 |
| Epididymitis and orchitis | 12 | 4.5 |
| Cardiac failure | 3 | 1.1 |
| Renal failure | 3 | 1.1 |
| Pneumonia/atelectasis | 2 | 0.7 |
| Deep vein thrombosis | 1 | 0.4 |
| Acute myocardial infarction | 1 | 0.4 |
| Stroke | 1 | 0.4 |

Regarding the number of classical surgeries performed in the last decade, we noted a decrease in the number of operations, from 77 in 2010 to 4 in 2020 (Figure 1).

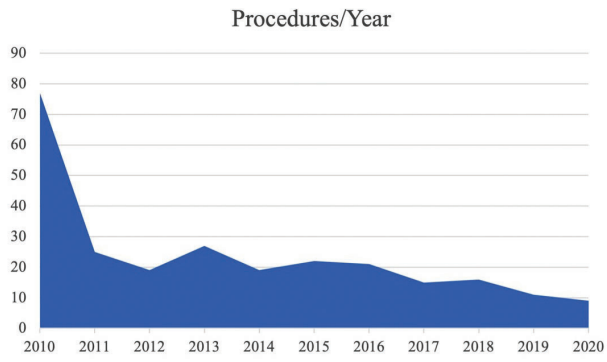



*Figure 1 - Distribution of surgeries per year*

## Discussions

Open surgery in the treatment of BPH was the treatment of choice until endoscopic prostate surgery occurred. Thus, after the 1970s, with the introduction and improvement of transurethral resection of the prostate, open prostate surgery began to gradually decrease in terms of the number of surgeries [16]. Also, this decrease can be observed today as new methods of minimally invasive treatment appear. Some surgical techniques such as laparoscopic or robotically assisted procedures have led to the reductions of classical open surgeries [17]. However, almost all new methods that appear are based on classical open surgery and require detailed knowledge of standard procedures. In the same vein, many hospitals do not have access to modern surgical methods and hence the fact that open prostatectomy is still present.

In this study, 268 patients who were treated for BPH through open surgery were retrospectively evaluated. The age distribution, the associated comorbidities, the symptomatology at admission, the operative results were followed.

Thus, the results of this study on the age distribution, 74 ± 11.7 years, respectively, are similar to studies in the literature in which patients with BPH who were operated on by suprapubic prostatectomy were evaluated, respectively 75.7 ± 5. [18]

The clinical symptomatology present at admission and the associated complications were not different from the studies in the literature in which frequency, weak urine flow, and dysuria predominated as symptoms [19,20]. Most often, the associated pathologies are present in elderly patients. Thus, in our study, the most common associated comorbidities were hypertension and diabetes, results which are similar to other specialized studies in the literature [21].

Bladder diverticula, bladder stones, and bladder trabeculations are changes that normally occur in patients with bulky prostates who seek specialized medical help long after the onset of symptoms.

One of the most important aspects of open prostate surgery is the intraoperative bleeding risk. In our study, the mean hemoglobin level drop was 3.1 g/dL, mean blood transfusion rate 7.3%, and the mean irrigation period was 3.5 days. When we compared these results with other studies from the literature, we observed that hemoglobin level drop value was along the lines of the data reported, 2 - 3.2 g/dL respectively [22,23]. Regarding the blood transfusion rates the previous publications in this field emphasized a range between 6.8-10% [22,24] which allows us to frame our study with a result of 7.3% within the limits reported. When we are discussing open surgery in terms of short-term adverse events such as re-catheterization for acute urinary retention (11.9%) and urinary tract infection (9.3%), these outcomes remained valid according to the available literature that evaluated these aspects [25,26].

However, in some cases, the endoscopic procedures cannot be performed, for example, the impossibility of placing the patient in a lithotomy position, very large prostates that deform the local anatomy and can make difficult the transurethral approach, complications of benign prostatic hyperplasia (BPH), or lack of equipment to perform such procedures. Under such conditions, classical open surgery remains the best treatment solution [27].

One of the main points which led to the decreasing trend of open prostate surgery was established by alternatives methods mentioned in guidelines such as HoLEP and BPEP. Due to this fact, bipolar plasma enucleation is an optimal alternative when we discuss costs, methods, and morbidity results. [28]

Suprapubic prostatectomy maintains its place in treatment options for bulky prostate adenoma, either by being the promoter of modern techniques such as laparoscopic prostatectomy or robotic-assisted prostatectomy or situations where access to modern minimally invasive surgery is limited. In the same manner, we notice a decrease in perioperatively mortality and morbidity when we talk about a technique that dates back almost over 70 years. All these circumstances still keep this procedure in the specialized guides.

## Conclusions

Open prostate surgery is still required in the treatment plan for bulky prostate adenomas or in complications of BPH that indicate suprapubic prostatectomy at the expense of minimally invasive treatment methods. For superior results on operative safety and decreased risk of postoperative complications, patient comorbidities require careful management before surgery.

*Disclosure of potential conflicts of interest*
*The authors do not have anything to disclose.*

## References


1. Welch G, Weinger K, Barry MJ. *Quality-of-life impact of lower urinary tract symptom severity: results from the Health Professionals Follow-up Study.* Urology 2002;59(2):245e50.
2. S. Gravas (Chair), J.N. Cornu, M. Gacci, C. Gratzke, T.R.W. Herrmann, C. Mamoulakis, M. Rieken, M.J. Speakman, K.A.O. Tikkinen Guidelines Associates: M. Karavitakis, I. Kyriazis, S. Malde, V. Sakalis, R. Umbach. *The Non-neurogenic Male* LUTS Guidelines. 2021
3. Freyer PL. *A new method of performing prostatectomy.* Lancet 1900; 1:774-775
4. T Millin. *Retropubic adenomectomy.* J Urol. 1948 Mar;59(3):267-80.
5. R. Hartung, *"Transurethral prostatectomy (TURP): still the gold standard?"* Journal d'Urologie, vol. 101, no. 1, pp. 18–21, 1995.
6. Y. Arai, S. Ishitoya, K. Okubo, and Y. Suzuki, *"Transurethral interstitial laser coagulation for benign prostatic hyperplasia: treatment outcome and quality of life,"* British Journal of Urology, vol. 78, no. 1, pp. 93–98, 1996.
7. M. A. Cabelin, A. E. Te, and S. A. Kaplan, *"Transurethral vaporization of the prostate: current techniques,"* Current urology reports, vol. 1, no. 2, pp. 116–123, 2000.
8. M. J. Naslund, *"The cost comparison TUNA versus TURP,"* Journal of Urology, vol. 157, p. 155, 1997.
9. Neill, M.G., et al. *Randomized trial comparing holmium laser enucleation of prostate with plasmakinetic enucleation of prostate for treatment of benign prostatic hyperplasia.* Urology, 2006. 68: 1020.
10. Zhao, Z., et al. *A prospective, randomised trial comparing plasmakinetic enucleation to standard transurethral resection of the prostate for symptomatic benign prostatic hyperplasia: three-year follow-up results.* Eur Urol, 2010. 58: 752.
11. Naspro, R., et al. *Holmium laser enucleation of the prostate versus open prostatectomy for prostates >70 g: 24-month follow-up.* Eur Urol, 2006. 50: 563.
12. Kuntz, R.M., et al. *Holmium laser enucleation of the prostate versus open prostatectomy for prostates greater than 100 grams: 5-year follow-up results of a randomised clinical trial.* Eur Urol, 2008. 53: 160.
13. Geavlete, B., et al. *Bipolar plasma enucleation of the prostate vs open prostatectomy in large benign prostatic hyperplasia cases - a medium term, prospective, randomized comparison.* BJU Int, 2013. 111: 793.
14. Mariano, M.B., et al. *Laparoscopic prostatectomy with vascular control for benign prostatic hyperplasia.* J Urol, 2002. 167: 2528
15. Sotelo, R., et al. *Robotic simple prostatectomy.* J Urol, 2008. 179: 513.
16. Tubaro A., de Nunzio C. *The current role of open surgery in BPH.* EAU–EBU Update Ser. 2006;4:191–201.
17. Mark Ferretti, John Phillips. *Prostatectomy for benign prostate disease: open, laparoscopic and robotic techniques.* Can J Urol. 2015 Oct;22 Suppl 1:60-6.
18. Zhang Y, Du C-J, Xu G, Chen J-M, Jing X (2007), *Transurethral holmium laser enucleation for prostate adenoma greater than 100 g.* Zhonghua nan ke xue = National journal of andrology 13(12): 1091–1093.
19. K. Kurokawa, Y. Tamura, H. Ogura et al., *"Open surgery of elderly patients with benign prostatic hypertrophy,"* Acta Urologica Japonica, vol. 36, no. 10, pp. 1167–1172, 1990.
20. A. Tubaro, S. Carter, A. Hind, C. Vicentini, and L. Miano, *"A prospective study of the safety and efficacy of suprapubic transvesical prostatectomy in patients with benign prostatic hyperplasia,"* Journal of Urology, vol. 166, no. 1, pp. 172–176, 2001.
21. J. Concato, R. I. Horwitz, A. R. Feinstein, J. G. Elmore, and S. F. Schiff, "Problems of comorbidity in mortality after prostatectomy," Journal of the American Medical Association, vol. 267, no. 8, pp. 1077–1082, 1992.
22. Rao JM, Yang JR, Ren YX, He J, Ding P, Yang JH. *Plasmakinetic enucleation of the prostate versus transvesical open prostatectomy for benign prostatic hyperplasia >80 mL: 12-month follow-up results of a randomized clinical trial.* Urology 2013; 82(1):176-181.
23. Xu A, Zou Y, Li B, Liu C, Zheng S, Li H, Xu Y, Chen B, Xu K, Shen H. *A randomized trial comparing diode laser enucleation of the prostate with plasmakinetic enucleation and resection of the prostate for the treatment of benign prostatic hyperplasia.* J Endourol. 2013; 27(10):1254-1260
24. Varkarakis I, Kyriakakis Z, Delis A, Protogerou V, Deliveliotis C. *Long-term results of open transvesical prostatectomy from a contemporary series of patients.* Urology 2004; 64(2):306-310.
25. D. K. Kiptoon, G. A. O. Magoha, and F. A. Owillah, *"Early postoperative outcomes of patients undergoing prostatectomy for benign prostatic hyperplasia at Kenyatta National Hospital, Nairobi,"* East African Medical Journal, vol. 84, no. 9, supplement, pp. S40–S44, 2007.
26. A. G. Hill and P. Njoroge, *"Suprapubic transvesical prostatectomy in a rural Kenyan hospital,"* East AfricanMedical Journal, vol. 79, no. 2, pp. 65–67, 2002.
27. K. Kurokawa, Y. Tamura, H. Ogura et al., *"Open surgery of elderly patients with benign prostatic hypertrophy,"* Acta Urologica Japonica, vol. 36, no. 10, pp. 1167–1172, 1990.
28. Bogdan Geavlete, Catalin Bulai, Cosmin Ene, Ionel Checherita, Petrisor Geavlete. *Bipolar vaporization, resection, and enucleation versus open prostatectomy: optimal treatment alternatives in large prostate cases?* J Endourol. 2015 Mar;29(3):323-31.