

## CLINICAL SCIENCE

# Standard surgical treatment for benign prostatic hyperplasia is safe for patients over 75 years: Analysis of 100 cases from a high-volume urologic center

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**OBJECTIVES:** In this study, we aimed to determine the complications of standard surgical treatments among patients over 75 years in a high-volume urologic center.

**METHODS:** We analyzed 100 consecutive patients older than 75 years who had undergone transurethral prostatic resection of the prostate or open prostatectomy for treatment of benign prostatic hyperplasia from January 2008 to March 2010. We analyzed patient age, prostate volume, prostate-specific antigen level, international prostatic symptom score, quality of life score, urinary retention, co-morbidities, surgical technique and satisfaction with treatment.

**RESULTS:** Median age was 79 years. Forty-eight patients had undergone transurethral prostatic resection of the prostate, and 52 had undergone open prostatectomy. The median International Prostatic Symptom Score was 20, the median prostate volume was 83 g, 51% were using an indwelling bladder catheter, and the median prostate-specific antigen level was 5.0 ng/ml. The most common comorbidities were hypertension, diabetes and coronary disease. After a median follow-up period of 17 months, most patients were satisfied. Complications were present in 20% of cases. The most common urological complication was urethral stenosis, followed by bladder neck sclerosis, urinary fistula, late macroscopic hematuria and persistent urinary incontinence. The most common clinical complication was myocardial infarction, followed by acute renal failure requiring dialysis. Incidental carcinoma of the prostate was present in 6% of cases. One case had urothelial bladder cancer.

**CONCLUSIONS:** Standard surgical treatments for benign prostatic hyperplasia are safe and satisfactory among the elderly. Complications are infrequent, and urethral stenosis is the most common. No clinical variable is associated with the occurrence of complications.

**KEYWORDS:** Prostatic Hyperplasia; Prostatectomy; Transurethral Resection of Prostate; Aged; Quality of Life, Complications.

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## INTRODUCTION

Benign prostatic hyperplasia (BPH) represents an increase in the total number of stromal and epithelial cells within the prostate gland. It is associated with bothersome lower urinary tract symptoms that affect the individual's quality of life and interfere with day-to-day activities. BPH is now one of the most common diseases in the elderly. According to histological studies, more than 50% of men will face this diagnosis by the age of 60 (90% by the age of 85) (1).

Assuming that by the year 2030, 20% of the population of the United States will be older than 65 years (2), the rise in the incidence of lower urinary tract symptoms (LUTS) due to BPH makes it a public health question. LUTS involve an estimated annual impact of \$1.1 billion of direct costs (excluding outpatient pharmaceuticals) and indirect costs of approximately 38 million hours of lost productivity by these patients (3).

In recent decades, several new methods for treating BPH have been developed, both pharmaceutical and surgical. Several minimally invasive procedures are still favored by the international community due to their lower complication rates. However, it is necessary to remember that the perceived efficacy and long-term durability of these therapies remain to be proven; so far, the gold-standard treatments are still open prostatectomy (OP) and transurethral resection of the prostate (TURP) (4).

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No potential conflict of interest was reported.

Because BPH is associated with old age, OP and TURP are usually performed in patients with various comorbidities. Some studies have confirmed a direct effect of comorbidity on perioperative morbidity and mortality after these procedures (5,6). However, OP and TURP patient populations, especially in multicenter studies and meta-analyses with large numbers of patients, are generally approximately 65 to 75 years old (7,8).

A better understanding of the clinical characteristics of patients over 75 years old is important for preventing complications and improving clinical outcomes. In this study, we aimed to determine the complications (both clinical and urological) of standard surgical treatments among patients over 75 years in a high-volume urologic center.

## MATERIALS AND METHODS

We analyzed a selected group of 100 consecutive patients older than 75 years who had undergone TURP or OP for BPH from January 2008 to March 2010.

Exclusion criteria in this study were previous surgical treatment for BPH, diagnosis of prostate cancer and suspected neurogenic bladder. Preoperatively, all patients were subjected to anamnesis focused on urinary symptoms, according to the International Prostate Symptom Score (IPSS) and QOL (Quality Of Life) gradation. We also analyzed the available information from digital rectal examinations, prostate ultrasounds, prostate-specific antigen (PSA) levels, use of an indwelling bladder catheter due to urinary retention, presence of co-morbidities (arterial hypertension, diabetes and coronary diseases) and surgical technique. To analyze treatment outcome, patients were asked if they were satisfied with the treatment results. Urologic and non-urologic complications were recorded.

It is important to note that all patients preoperatively attended an evaluation with specialists; patients who were considered to be at high risk of complications (cardiological or other) after an analysis of their global health status and comorbidities were not treated with surgery.

Statistical analysis was performed using SPSS® 19.0 software for Windows® (IBM Incorporated, Armonk, New York), and significance was defined as  $p < 0.05$ . All data are presented as median (range) unless specified otherwise. We determined the risk factors for complications using the chi-square and Student's-t tests.

## RESULTS

The median patient age was 79 years (75 to 91). Forty-eight patients were subjected to TURP and 52 to OP. Hypertension, diabetes and coronary disease were present in 69%, 24% and 26% of the cases, respectively.

Median preoperative IPSS was 20 (8 to 31), and 51% of patients were using an indwelling bladder catheter. Median prostate volume was 83 g (24 to 417), and median PSA level was 5.0 ng/ml (0.2 to 60). After a median follow-up period of 17 months (1 to 40), 83% of patients were satisfied with the treatment.

Overall, complications were present in 20% of cases. Regarding urological complications, 10% presented urethral stenosis, 2% had bladder neck sclerosis, 2% had urinary fistula, 2% had late macroscopic hematuria and 2% had persistent urinary incontinence. Among clinical complications, 1% presented acute renal failure requiring dialysis, and 2% presented myocardial infarction. One patient died due to infarction.

Incidental carcinoma of the prostate was present in 6% of cases (5% T1a and 1% T1b). One case had incidental urothelial bladder cancer. Even though patients who presented complications had larger prostates, higher PSA levels and higher rates of hypertension, diabetes and coronary disease, no variable was statistically associated with the occurrence of complications (Table 1).

## DISCUSSION

This study demonstrates that traditional surgical treatments for BPH can be performed in patients older than 75 years with acceptable complication rates and good functional results. No variable was statistically associated with the occurrence of complications; therefore, no comorbidity taken alone can be considered an absolute contra-indication for these procedures.

With the increase in the number of aging males in most populations, an improved understanding of the clinical characteristics of this selected population is important for improving surgical outcomes. On average, patients with BPH who are candidates for surgical treatment are older than before. Choi et al. (18) compared the characteristics of patients who underwent surgery in 1985 to 1989, in 1995 to 1999 and in 2005 to 2009. The mean ages of the men were 65.4, 65.9 and 69.3 years, respectively. Likewise, the prevalence of hypertension, a history of surgery, and "other complications" (e.g., stroke, cancer and cardiac conditions) increased significantly over time. The prevalence of hypertension increased from 22% in the first period to 43% in the last, and the prevalence of diabetes increased from 8% to 13%.

Due to the relative morbidity of TURP and OP, minimally surgical alternatives have been proposed for the treatment of BPH. Among these alternatives, transurethral needle ablation of the prostate with radiofrequency and transurethral microwave thermotherapy (TUMT) have been frequently performed in the United States. Their main advantage is the fact that they are performed under local anesthesia in an outpatient fashion. However, systematic reviews of the literature have concluded that they do not achieve the same level of efficacy as the classic methods with respect to any subjective or objective variable. Further, their efficacy declines in the long term, with a significantly higher rate of secondary treatment than encountered with classic methods [20-22].

**Table 1 - Patient characteristics according to the incidence of complications.**

	Complications (n = 20)	No complications (n = 80)	p-value
Age (years)	79.3	79.7	0.72
IPSS	15.8	19.6	0.14
QoL score	4.1	4.1	0.86
Prostate volume (g)	124.8	92.2	0.20
PSA (ng/ml)	8.8	7.8	0.66
Urinary retention	55%	52%	0.80
Hypertension	80%	66%	0.23
Diabetes	30%	22%	0.48
Coronary disease	40%	22%	0.11
Surgery			0.42
TURP	17%	83%	
OP	23%	77%	

Laser therapies are also surgical alternatives that might be considered for high-risk surgical patients. Among these, the photoselective vaporization of the prostate with the GreenLight laser and holmium laser enucleation of the prostate are the two most performed methods. Both techniques are associated with shorter catheter time and hospital stay. Studies with a longer follow-up are necessary to establish the role of laser techniques in the surgical treatment of BPH.

Regarding patients' expectations about prostate surgery, Zwergel et al. (12), in a study with a follow-up of more than 15 years after TURP reported satisfaction rates of 79% satisfied, 12% neutral, and 9% dissatisfied with their micturition, which is similar to our data (83% satisfied).

Reich et al. (11), in a multicentric prospective evaluation that involved 10,654 patients, reported a 27.5% rate of preoperative catheterization. In our study, 51% of patients were using an indwelling bladder catheter. This high rate can be justified by our patients' larger prostates and previous acute urinary retention episodes. We think that the issue of preoperative catheterization may be related not only to public health and educational issues but also to cultural barriers that lead to a delayed search for medical help and, after receiving medical help, a delay in undergoing a proper urological evaluation.

The rates of urological complications in this study were 10% urethral stenosis, 2% bladder neck sclerosis, 2% urinary fistula, 2% late macroscopic hematuria and 2% persistent urinary incontinence. Varkarakis et al. (13), in a Greek study that analyzed complications after OP in 232 patients, identified long-term complications of bladder neck contraction in 3.3%, urethral strictures in 0.6% and meatal stenosis in 1.3% of the patients. In the study by Ahyai et al, consistent with our study, the most common urological late complication was urethral stenosis, which they observed in 4.1% of patients.

Our co-morbidity rates are slightly higher than others. In comparing our rates to the recent study of 1,878 patients by Hammarsten and Hogstedt (8), we noted higher proportions of patients with hypertension [69% *vs.* 46.1%], diabetes (24% *vs.* 18.2%) and cardiac disorders (26% *vs.* 17%). Additionally, with a median age of 79 years, our patients were ten years older. Due in part to their younger and healthier patients, Hammarsten and Hogstedt reported a 5.8% complication rate, which is quite lower than we found (20%). Ahyai et al. (7), in a meta-analysis of 27 studies (including 23 randomized controlled studies) with a total of 2,247 patients, reported an overall complication rate of 32.4%. In the consulted literature, postoperative death due to coronary disease ranges from 0.05 to 1%. These rates are consistent with our data.

No patient in our series developed postoperative urinary incontinence. This finding is important because our group previously demonstrated that patients older than 70 years have twice the probability of post-procedural incontinence. Additionally, the chances of bladder dysfunction, which may be the isolated cause of incontinence in approximately 25% of patients, rises 5.3% for each year added to patient age (20).

Incidental carcinoma of the prostate was found in 6% of cases. (5% T1a and 1% T1b). Previous studies have reported finding cancer in 7% to 14% of cases following non-oncological surgery (16-18).

The relatively small number of patients included and the lack of a control group of patients less than 65 years old are known limitations of this study. It is also important to note that the study only included men who were considered to be adequate candidates for surgery after clinical evaluation. This fact may constitute a possible selection bias, as the complication rates were likely reduced because we did not perform surgical therapy in patients with more adverse clinical conditions.

According to the data presented in this study, complications are infrequent, and standard surgical treatments for the treatment of BPH are safe for elderly patients. No clinical variable was associated with the occurrence of complications. In our study, most patients were satisfied after surgery.

## AUTHOR CONTRIBUTIONS

Marmioli R, Reis ST and Nakano E contributed to the medical records, literature review and manuscript writing. Antunes AA contributed to the medical records, literature review, manuscript writing and statistical analysis. Srougi M contributed to the literature review and manuscript writing.

## REFERENCES

- McConnell JD, Barry MJ, Bruskewitz RC. Clinical Practice Guidelines, Number 8: Agency for Health Care Policy and Research. Rockville, MD: US Department of Health and Human Services; 1994. Benign prostatic hyperplasia: diagnosis and treatment. AHCPR publication no. 94-0582. Gavrillo LA, Heuveline P: Aging of population. In: Demeny P, McNicoll G, editors. The Encyclopedia of Population. New York: Macmillan; 2003.
- Wei JT, Calhoun E, Jacobsen SJ. Urologic Diseases in America Project: benign prostatic hyperplasia. *J Urol.* 2005;173:1256-61, <http://dx.doi.org/10.1097/01.ju.0000155709.37840.fe>.
- Kacker R, Williams SB. Endourologic Procedures for Benign Prostatic Hyperplasia Review of Indications and Outcomes. *Urol J.* 2011;8:171-6.
- Concato J, Horwitz RJ, Feinstein AR, Elmore JG, Schiff SF. Problems of comorbidity in mortality after prostatectomy. *JAMA.* 1992;267:1077-82, <http://dx.doi.org/10.1001/jama.1992.03480080047025>.
- Holman CD, Wisniewski ZS, Semmens JB, Rouse IL, Bass AJ. Mortality and prostate cancer risk in 19,598 men after surgery for benign prostatic hyperplasia. *BJU Int.* 1999;84(1):37-42.
- Ahyai SA, Gilling P, Kaplan SA, Kuntz RM, Madersbacher S, Montorsi F, et al. Meta-analysis of Functional Outcomes and Complications Following Transurethral Procedures for Lower Urinary Tract Symptoms Resulting from Benign Prostatic Enlargement. *Eur Urol.* 2010;58(3):384-97, <http://dx.doi.org/10.1016/j.eururo.2010.06.005>.
- Hong JY, Yang SC, Ahn S, Kil HK. Preoperative Comorbidities and Relationship of Comorbidities With Postoperative Complications in Patients Undergoing Transurethral Prostate Resection. *J Urol.* 2011;185(4):1374-8, <http://dx.doi.org/10.1016/j.juro.2010.11.086>.
- Hammarsten J, Hogstedt B. Hyperinsulinaemia as a risk factor for developing benign prostatic hyperplasia. *Eur Urol.* 2001;39(2):151-8, <http://dx.doi.org/10.1159/000052430>.
- Michel MC, Heemann U, Schumacher H, Mehlburger L, Goepel M. Association of hypertension with symptoms of benign prostatic hyperplasia. *J Urol.* 2004;172(4 Pt 1):1390-3.
- Reich O, Gratzke C, Bachmann A, Seitz M, Schlenker B, Hermanek P, et al. Morbidity, mortality and early outcome of transurethral resection of the prostate: a prospective multicenter evaluation of 10,654 patients. *J Urol.* 2008;180(1):246-9.
- Zwergel U, Wullich B, Lindenmeir U, Rohde V, Zwergel T. Long-term results following transurethral resection of the prostate. *Eur Urol.* 1998;33(5):476-80, <http://dx.doi.org/10.1159/000019638>.
- Varkarakis I, Kyriakakis Z, Delis A, Rotogerou V, Delivelioti C. Long-term results of open transvesical prostatectomy from a contemporary series of patients. *Urology.* 2004;64(2):306-10, <http://dx.doi.org/10.1016/j.urolgy.2004.03.033>.
- Simforoosh N, Abdi H, Kashi AH, Zare S, Tabibi A, Danesh A, et al. Open Prostatectomy Versus Transurethral -Resection of the Prostate, Where Are We Standing in the New Era? *Urol J.* 2010;7(4):262-9.
- Jones JS, Follis HW, Johnson JR. Probability of finding T1a and T1b (incidental) prostate cancer during TURP has decreased in the PSA era.

- Prostate Cancer Prostatic Dis. 2009;12(1):57-60, <http://dx.doi.org/10.1038/pcan.2008.14>.
15. Martino P, Palazzo S, Battaglia M, Lucarelli G, Selvaggi FP. Incidental prostatic cancer: repeat TURP or biopsy? Urol Int. 2004;73(3):193-7, <http://dx.doi.org/10.1159/000080826>.
16. Dellavedova T, Ponzano R, Racca L, Minuzzi F, Dominguez M. Prostate cancer as incidental finding in transurethral resection. Oncologic Urology Arch. Esp. Urol. 2010;63(10):855-61.
17. Choi SY, Kim TH, Myung SC, Moon YT, Kim KD, Kim YS, et al. Impact of changing trends in medical therapy on surgery for benign prostatic hyperplasia over two decades. Korean J Urol. 2012;53(1):23-8, <http://dx.doi.org/10.4111/kju.2012.53.1.23>.
18. Bruschini H, Simonetti R, Antunes AA, Srougi M. Urinary incontinence following surgery for BPH: the role of aging on the incidence of bladder dysfunction. Int Braz J Urol. 2011;37(3):380-6, <http://dx.doi.org/10.1590/S1677-55382011000300012>.
19. Bouza C, López T, Magro A, Navalpotro L, Amate JM. Systematic review and meta-analysis of Transurethral Needle Ablation in symptomatic Benign Prostatic Hyperplasia. BMC Urol. 2006;6:14, <http://dx.doi.org/10.1186/1471-2490-6-14>.
20. Metcalfe C, Poon KS. Long-term Results of Surgical Techniques and Procedures in Men with Benign Prostatic Hyperplasia. Curr Urol Rep. 2011;12(4):265-73, <http://dx.doi.org/10.1007/s11934-011-0193-1>.
21. Kaye JD, Smith AD, Badlani GH, Lee BR, Seideman BA, Ost MC. High-Energy Transurethral Thermotherapy with CoreTherm Approaches Transurethral Prostate Resection in Outcome Efficacy: A Meta-Analysis. J Endourol. 2008;22(4):713-8, <http://dx.doi.org/10.1089/end.2007.0039>.