

Clinical characteristics and outcomes of men <60 years undergoing HoLEP: A retrospective single-center study

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Introduction Data on holmium laser enucleation of the prostate (HoLEP) in men ≤60 are limited.

This study aimed to characterize the clinical presentation and outcomes of this population.

Material and methods This retrospective study comprised 750 consecutive HoLEPs between 1/2020 and 11/2024. Patients were categorized by age: ≤60, 61–70, 71–80, and >80 years. The data retrieved from the medical records included age, International Prostate Symptom Scores (IPSS), uroflowmetry, preoperative prostate volume (via abdominal ultrasound), comorbidities, previous prostate surgery, presence of a preoperative indwelling urinary catheter or chronic retention, bladder stones, operative time, complications, hospital stay, and outcome.

Results Presentation with absolute indication (indwelling catheter and/or chronic retention) was more prevalent in the ≤60 and >80 age groups ($p < 0.001$). The youngest group had smaller prostate volume (78 vs 90 ml, $p = 0.004$), fewer comorbidities, shorter surgery (70 vs 90 minutes, $p < 0.001$), lower “beach balls” rate (2% vs 15%, $p = 0.008$), and shorter hospitalization (1 vs 1.5 days, $p < 0.001$). Younger patients had lower postoperative IPSS (4 vs 7 points, $p = 0.036$), while the quality of life scores were similar. The overall rate of incidental prostate cancer increased with age, but not significantly. The youngest group presented with only International Society of Urological Pathology (ISUP) 1, while older groups had a higher rate of ISUP grade ≥2 (0 vs 18–25%, $p < 0.05$). Complications were similar across age groups.

Conclusions HoLEP is an effective treatment for men of all ages. Men under 60 or over 80 were more frequently treated for absolute indications, while those aged 61–80 were more often treated for relative indications.

Key Words: benign prostatic hyperplasia (BPH) ↔ benign prostatic obstruction (BPO) ↔ HoLEP ↔ laser

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a common etiology of lower urinary tract symptoms (LUTS) in men. The European Association of Urology (EAU) guidelines on the management of non-neurogenic LUTS recently defined this condition as “benign prostatic obstruction” (BPO) to differentiate it from other causes of LUTS [1]. BPO undergoes an age-dependent progression, affecting roughly 8% of men in their 50s and approaching 80% among

those aged 80 years or older [2]. Likewise, the prevalence of BPO-related LUTS climbs from about 8% in men aged 31–40 years to nearly 90% in men aged 90 years and above [3]. The epidemiology, symptomatology, and treatment are well-reported in older populations [4–8]. However, the younger population affected by BPO has received far less attention, and its manifestations in younger men have not been well characterized [9, 10]. Initial management of bothersome BPO-related LUTS consists of lifestyle modifications and pharmacotherapy, mainly

with α -blockers and 5 α -reductase inhibitors. Nevertheless, a substantial proportion of patients ultimately require surgical intervention.

In the last two decades, holmium laser enucleation of the prostate (HoLEP) has expended its utility and has been acknowledged as the new gold-standard in the surgical treatment of BPO [11, 12]. However, the characteristics and the effectiveness of HoLEP in the young population have not been studied yet. The objective of this study is to characterize the baseline clinical features and evaluate the perioperative, functional, and safety outcomes of HoLEP in men under 60 years of age treated for BPO.

MATERIAL AND METHODS

This retrospective analysis was conducted on 750 consecutive men treated for BPO by HoLEP in our institution between January 2020 and November 2024. The retrieved demographic and clinical data included age, the International Prostate Symptom Score (IPSS), uroflowmetry, preoperative abdominal ultrasound (AUS) measurement of prostate volume, American Society of Anesthesiologists (ASA) score, previous BPH surgery, presence of a preoperative indwelling urinary catheter or chronic retention, concomitant bladder stones, operative time, complications, hospital stay, and outcome.

Blood thinners were discontinued before surgery, except for patients who had been defined by cardiologists, neurologists, or vascular surgeons as being at high risk for thromboembolic events. These patients received enoxaparin bridging until 12 hours before surgery and renewal as soon as possible after the intervention. All surgeries were performed under general or spinal anesthesia by a single experienced surgeon who used a 22–26 FR resectoscope, an en-bloc enucleation technique with early apical release, and a high-power laser machine (Lumenis Pulse™ 120H, Boston Scientific) by either a standard or modulated pulse (MOSES, Boston Scientific) at a setting of 2 j/50 Hz for enucleation and 1 j/40 Hz for coagulation. The morcellation was carried out with either Storz® Drillcut™ or Wolf® Piranha devices. Broad-spectrum antibiotics or other antibiotics, according to the urine culture, were administered perioperatively. The catheter was removed, and the patients were released home the following day. Further details on our approach and discharge policy can be found elsewhere [13]. The patients were categorized into four age groups: group 1 (≤ 60 years), group 2 (61–70 years), group 3 (71–80 years), and group 4 (> 80 years).

Statistical analysis

Continuous variables were reported as medians and interquartile ranges (IQRs). Statistical comparisons for continuous variables were performed with the Mann-Whitney U test for independent samples and the Pearson χ^2 /exact test for categorical variables. All statistical analyses were two-sided, with significance as $p < 0.05$. SPSS software was used for all statistical analyses (IBM SPSS Statistics, Version 29, IBM Corp., Armonk, NY, USA, 2022).

Bioethical standards

The study protocol was reviewed and approved by the Institutional Review Board (approval number: 0610-21-TLV). Because the research involved a retrospective analysis of pre-existing, de-identified clinical data, the Board granted a waiver of informed consent in accordance with the principles outlined in the Declaration of Helsinki. All data were anonymized before analysis; no direct identifiers or protected health information were retained.

RESULTS

The study cohort was stratified into four age groups: 46 patients (6.1%) in group 1 (≤ 60 years), 224 (30.0%) in group 2 (61–70 years), 375 (50.0%) in group 3 (71–80 years), and 105 (14.0%) in group 4 (> 80 years).

Baseline and preoperative characteristics

Table 1 summarizes baseline data. Prostate size increased stepwise with age: men in Group 1 had the smallest glands (median 78 ml; $p = 0.004$ vs groups 2–4). Presentation with an indwelling catheter for chronic retention showed a bimodal pattern, being most common in the youngest (group 1) and oldest (group 4) cohorts ($p < 0.001$; Figure 1). On preoperative uroflowmetry, patients in Group 1 had a maximal flow rate of 8 ml/s compared to 14 ml/s for patients in group 2 ($p = 0.027$). However, the post-void residual was higher in group 2 (555 ml vs 283 ml) ($p = 0.031$). Preoperative prostate magnetic resonance imaging (MRI) was obtained more frequently in the youngest group compared to the oldest group (20% vs 6%, $p = 0.024$). No patient in group 1 had undergone prior outlet surgery, whereas 21 men > 70 years had a surgical history for BPO ($p = 0.010$). ASA scores rose with age, confirming a heavier comorbidity burden

in groups 3–4 ($p < 0.001$). Despite these differences, baseline International Prostate Symptom Score (IPSS) and quality-of-life (QoL) indices were comparable across all four age strata.

Perioperative metrics

Key perioperative outcomes are presented in Table 2. Operative time and enucleated-tissue weight were lowest in group 1 ($p < 0.001$ for both). “Beach-ball” tissue fragments during morcellation were encountered more often in the oldest patients (group 4, $p = 0.008$). Length of stay likewise increased with age, with Group 4 exhibiting the longest median admission ($p < 0.001$).

Postoperative outcomes and complications

Patients in group 1 reached a lower postoperative IPSS ($p = 0.036$), and there was a trend toward a more prominent reduction in IPSS among these patients (Figure 2). The postoperative improvement of QoL was similar in all groups. Overall complication rates were evenly distributed among age groups (Table 2).

Pathology

The incidence of incidental prostate cancer rose progressively with age but did not attain statistical

Table 1. Patient characteristics

Feature	Group 1 n = 46 (6%)	Group 2 n = 224 (30%)	Group 3 n = 375 (50%)	Group 4 n = 105 (14%)	p
Age (years)	58 (56–59)	67 (64–69)	75 (73–77)	85 (83–87)	N/A
Abdominal ultrasound Volume (ml)	78 (50–100)	88 (55–115) ^a	90 (70–125) ^a	90 (70–130) ^a	0.004
Maximal flow rate (ml/s)	8 (7–10)	14 (11–15) ^a	8 (5–10)	6 (5–11)	0.368
Chronic urinary retention	21 (46%)	63 (28%) ^a	130 (35%)	53 (51%)	<0.001
Post-void residual (ml)	283 (190–375)	555 (200–600) ^a	617 (300–900)	414 (220–600)	0.273
Preoperative catheter	24 (52%)	64 (29%) ^a	146 (39%) ^a	55 (52%)	<0.001
Previous BPH surgery	0 (0%)	1 (0.4%)	14 (4%)	7 (7%)	0.010
Preoperative MRI	9 (20%)	39 (17%)	51 (14%)	6 (6%) ^a	0.024
IPSS	26 (19–31)	24 (19–31)	22 (19–26)	22 (16–28)	0.345
IPSS QoL	5 (5–6)	5 (5–6)	5 (5–6)	6 (5–6)	0.293
ASA 3+	5 (10%)	39 (18%)	93 (25%) ^a	63 (60%) ^a	<0.001

^a Indicates a significant value ($p < 0.05$) on post-hoc analysis compared to group 1

BPH – benign prostatic hyperplasia; IPSS – international prostate symptoms score; MRI – magnetic resonance imaging; QoL – quality of life

Table 2. Perioperative and postoperative outcomes

Feature	Group 1 n = 46	Group 2 n = 224	Group 3 n = 375	Group 4 n = 105	p
Surgery time, minutes	70 (50–90)	75 (60–90)	80 (65–100)	90 (70–120) ^a	<0.001
Hospital stay, days	1 (1–1.5)	1 (1–1)	1 (1–2)	1.5 (1–2) ^a	<0.001
Specimen weight, gr	50 (25–76)	58 (40–80)	66 (46–92) ^a	71 (52–101) ^a	<0.001
Surgical efficiency (gr/min)	0.67 (0.50–1)	0.7 (0.5–1)	0.8 (0.61–1.07)	0.9 (0.57–1.2) ^a	0.005
“Beach balls”	1 (2%)	13 (6%)	35 (10%)	16 (15%) ^a	0.008
Complications	3 (7%)	19 (9%)	30 (8%)	11 (11%)	0.706
Incidental prostate cancer					
Overall	3 (7%)	16 (7%)	30 (8%)	11 (10%)	>0.05
ISUP ≥2	0	4 (25%) ^a	7 (23%) ^a	2 (18%) ^a	<0.05
Postoperative IPSS	4 (3–5)	5 (4–8)	6 (5–8) ^a	7 (4–8) ^a	0.036
ΔIPSS	20 (18–23)	19 (15–22)	17 (11–20)	15 (14–17)	0.064
Postoperative IPSS QoL	1 (0–2)	1 (1–2)	1 (1–2)	1 (1–2)	0.176
ΔIPSS QoL	4 (3–5)	4 (3–5)	4 (3–5)	5 (4–5)	0.910

^a Indicates a significant value ($p < 0.05$) on post-hoc analysis compared to group 1

IPSS – International Prostatic Symptoms Score; ISUP – International Society of Urological Pathology; QoL – Quality of life

significance. All cancers detected in group 1 (7%) were ISUP grade 1, whereas the proportions of ISUP grade ≥ 2 disease were 25%, 23%, and 18% in groups 2–4, respectively ($p < 0.05$).

Subgroup analysis: men <50 vs 50–59 years

Within Group 1, men <50 years ($n = 3$) had significantly smaller prostates than those aged 50–59 years (median 50 ml vs 81 ml; $p = 0.040$). The youngest patient (45 years) presented with a 47 ml adenoma and an indwelling catheter. Intraoperatively, an obstructive median lobe required targeted enucleation, whereas the diminutive lateral lobes were left untouched; all other cases followed the standard en-bloc HoLEP technique.

DISCUSSION

Symptomatic BPO among younger men is not well-characterized in comparison to older men. We compared the manifestations of BPO among

men who underwent HoLEP surgery in four age groups to better understand the influence of age on presentation, symptomatology, surgical approach, and outcome.

BPH is a histopathological transformation occurring in 70% of men above 60 and 80% of men above 80. It represents the leading cause of symptomatic BPO [2, 14–16]. These symptoms are commonly progressive, starting from LUTS, which may be alleviated by lifestyle modifications, medical treatment, or surgical treatment [1, 17]. It may progress to cause complications, such as acute and chronic urinary retention, recurrent urinary tract infection, bleeding, formation of bladder stones, and various degrees of kidney injury that mandate surgical treatment [17].

Surgical interventions are more common among older men (>60 years old) and are rarely performed in middle-aged men (40–60 years old) [18]. Mmaje et al. assessed the clinical outcomes of HoLEP by age stratification in a series of 311 patients [19]. Their study included 22 (7%) patients aged 50–59 years who had postoperative results similar to those of older men in terms of overall morbidity, hospital stay, and 1-year functional outcomes. A recent review analyzed current BPH interventions for extreme age groups, defined by the authors as “young” for men aged 18–50 years and “elderly” for men 70 years and older (the 51–69 year-old group was excluded) [20]. Those authors found only one case report that met the inclusion criteria for their young group [21]. It described a 27-year-old man who presented with acute urinary retention, an MRI prostate volume of 100 ml, and suspected use of exogenous androgenic steroids. He was successfully treated by HoLEP, which resulted in the removal of 63 gr of benign tissue [21]. Gild et al. reported outcomes of HoLEP by age, prostate volume, and history of blood-thinning agents in a series of 1,816 patients [22]. They found shorter enucleation and morcellation times, as well as shorter postoperative catheterization in patients aged ≤ 60 compared to older patients. That study provided intra- and postoperative characteristics but not the indications for surgery. Their patients were operated on for symptomatic BPO. However, young adults most commonly experience LUTS related to storage, but not obstructive symptoms [23]. Thus, their symptoms are more likely to be irritative [20].

Our results show that men under 60 years of age are primarily operated on due to absolute indications and had a preoperative catheter. In patients who did not have a catheter before surgery, a different basic urodynamics was observed, with lower flowmetric profiles and post-void residuals. In this

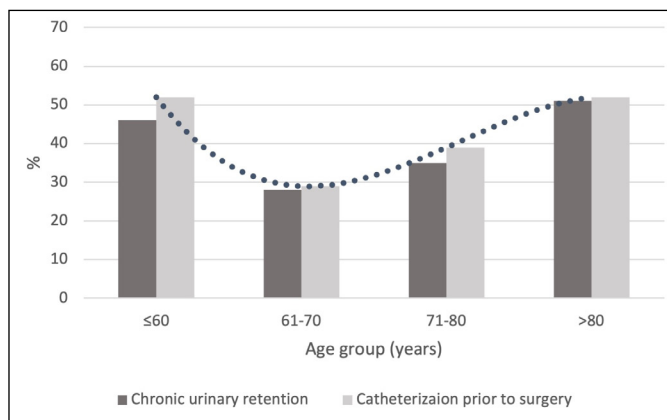


Figure 1. The rate of absolute indication for surgical treatment by age group.

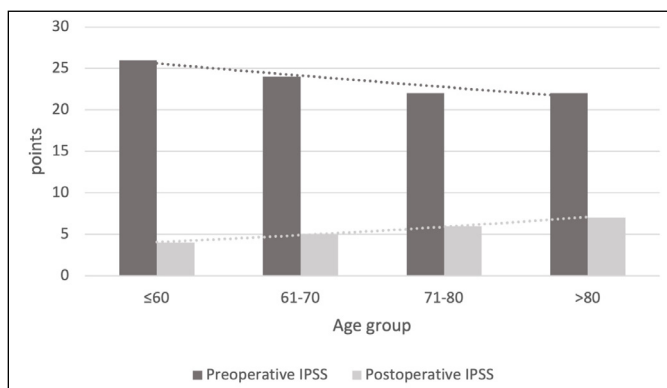


Figure 2. Outcomes by International Prostate Symptom Score (IPSS).

context, it has been shown that the maximal flow rate predicts better than the post-void residual the presentation of BOO, with specificity of 70% when the threshold is 10 ml/s [24]. An invasive complete urodynamic study (UDS) is not a routine procedure before HoLEP surgery. This is further supported by the EAU guidelines, which weakly recommend UDS for men <50 years before surgery.

Preservation of sexual function is another important issue when considering surgical intervention, with perception and expectancy being age-related as well. While younger men are interested in maintaining erectile, ejaculatory, and fertility functions, the preservation of erectile abilities is most important to older men [25]. Selective enucleation of the median lobe, without enucleation of the lateral lobes, has been demonstrated as an option for patients with a protruding median lobe who are willing to preserve ejaculatory function. A retrospective series showed that only 2 out of 40 patients who underwent selective enucleation of the median lobe had a new ejaculatory dysfunction [26]. Ejaculatory preservation techniques are also described for TURP with good results in terms of preservation of antegrade ejaculation and sexual satisfaction [27]. Because prostate size in many younger men falls within the traditional TURP range, the choice of surgical approach should be individualized, matching prostate characteristics with the patient's wish to preserve antegrade ejaculation.

Our study presents epidemiological and clinical data on the presentation and indications for surgery in symptomatic BPO among men under 60 years of age. Comparable findings are sparse in earlier studies. All patients in this age group were naïve to previous surgical BPO treatments, and their indication profiles emulated those of the oldest group (Figure 1). In contrast, patients aged 61–80 were mainly operated upon based on relative indication. The significantly shorter surgery time in Group 1 is likely due to a smaller prostate volume. However, we also found that the efficiency of tissue removal (gr/min) is lower in this group. This phenomenon is

well described in the literature as a prostate volume dependency, with increased efficiency in its removal in larger prostates [28, 29].

The incidental prostate cancer detection rate was similar among the four study groups. However, group 1 was characterized by ISUP 1-only diagnosis, while the other groups presented a significantly higher rate of clinically significant prostate cancer (ISUP ≥ 2). Finally, we found a trend toward a more substantial reduction in postoperative IPSS in young patients, strengthening our conviction that HoLEP benefits these cases.

Our study is not without limitations, among them its retrospective design, description of the experience at a single institution, the relatively small number of patients aged ≤ 60 years, and the focus of our assessment on HoLEP. Moreover, complete urodynamic data are not available for study. However, we believe that the preoperative epidemiological and clinically assessed data are valuable contributions to the knowledge of this group of younger patients.

CONCLUSIONS

Men <60 years who undergo HoLEP for BPO constitute a small but distinct subset that differs from older patients by having their surgery for absolute indications, presenting smaller glands, needing shorter operative times, yet achieving a comparable symptom relief. Our findings support HoLEP as a reliable surgical option for men under 60 years of age.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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ETHICS APPROVAL STATEMENT

The study protocol was reviewed and approved by the Institutional Review Board (approval number: 0610-21-TLV).

References

1. Gravas S, Gacci M, Gratzke C, et al. Summary Paper on the 2023 European Association of Urology Guidelines on the Management of Non-neurogenic Male Lower Urinary Tract Symptoms. *Eur Urol*. 2023; 84: 207-222.
2. Lim KB. Epidemiology of clinical benign prostatic hyperplasia. *Asian J Urol*. 2017; 4: 148-151.
3. Russo GI, Urzi D, Cimino S. Epidemiology of LUTS and BPH. In: *Lower Urinary Tract Symptoms and Benign Prostatic Hyperplasia* [Internet]. Elsevier; 2018 [cited 2025 Jun 19]. p. 1–14. Available at: <https://linkinghub.elsevier.com/retrieve/pii/B9780128113974000019>
4. Wei JT, Calhoun E, Jacobsen SJ. Urologic diseases in America project: benign prostatic hyperplasia. *J Urol*. 2005; 173: 1256-1261.
5. Yilmaz M, Esser J, Suarez-Ibarrola R, Gratzke C, Miernik A. Safety and Efficacy of Laser Enucleation of the Prostate in Elderly Patients – A Narrative Review. *Clin Interv Aging*. 2022; 17: 15-33.
6. Castellani D, Pirola GM, Gasparri L, et al. Are Outcomes of Thulium Laser Enucleation of the Prostate Different in Men Aged 75 and Over? A Propensity Score Analysis. *Urology*. 2019; 132: 170-176.
7. Piao S, Choo MS, Kim M, Jeon HJ, Oh SJ. Holmium Laser Enucleation of the Prostate is Safe for Patients Above 80 Years: A Prospective Study. *Int Neurourol J*. 2016; 20: 143-150.
8. Elshal AM, Elmansy HM, Elhilali MM. Transurethral laser surgery for benign prostate hyperplasia in octogenarians: safety and outcomes. *Urology*. 2013; 81: 634-639.
9. Heiman J, Agarwal D, Komanapalli S, et al. Outcomes of octogenarians undergoing holmium laser enucleation of prostate. *World J Urol*. 2022; 40: 1751-1754.
10. Savin Z, Veredgorn Y, Taha T, et al. En bloc holmium laser enucleation of prostate in octogenarians and nonagenarians: clinical characteristics and outcome. *Lasers Med Sci*. 2023; 38: 196.
11. Michalak J, Tzou D, Funk J. HoLEP: the gold standard for the surgical management of BPH in the 21(st) Century. *Am J Clin Exp Urol*. 2015; 3: 36-42.
12. Shvero A, Calio B, Humphreys MR, Das AK. HoLEP: the new gold standard for surgical treatment of benign prostatic hyperplasia. *Can J Urol*. 2021; 28 (S2): 6-10.
13. Savin Z, Dekalo S, Herzberg H, et al. Improving Prostatic Preoperative Volume Estimation and Planning before Laser Enucleation. *J Pers Med*. 2022; 12: 1761.
14. Berry SJ, Coffey DS, Walsh PC, Ewing LL. The development of human benign prostatic hyperplasia with age. *J Urol*. 1984; 132: 474-479.
15. Bosch JLHR, Bangma CH, Groeneveld FPMJ, Bohnen AM. The long-term relationship between a real change in prostate volume and a significant change in lower urinary tract symptom severity in population-based men: the Krimpen study. *Eur Urol*. 2008; 53: 819-825.
16. Tamalunas A, Westhofen T, Schott M, et al. The clinical value of holmium laser enucleation of the prostate in octogenarians. *Low Urin Tract Symptoms*. 2021; 13: 279-285.
17. Sandhu JS, Bixler BR, Dahm P, et al. Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia (BPH): AUA Guideline Amendment 2023. *J Urol*. 2024; 211: 11–19.
18. Dyussenbayev A. Age Periods Of Human Life. *ASSRJ* [Internet]. 2017 Mar 25 [cited 2025 Jan 7];4(6). Available at: <http://scholarpublishing.org/index.php/ASSRJ/article/view/2924>
19. Mmeje CO, Nunez-Nateras R, Warner JN, Humphreys MR. Age-stratified outcomes of holmium laser enucleation of the prostate. *BJU International*. 2013; 112: 982-989.
20. Brandt TW, Luizzi JM, Caras RJ. Evaluation of Current Surgical BPH Interventions for Young and Elderly Men. *Curr Urol Rep*. 2024; 25: 79-91.
21. Napier-Hemy TP, Liu AKL, Floyd MS, et al. Acute urinary retention in a 27-year-old male secondary to benign prostatic hyperplasia treated with Holmium Enucleation of the Prostate (HoLEP). *Urologia*. 2023; 90: 426-429.
22. Gild P, Lenke L, Pompe RS, Vetterlein MW, et al. Assessing the Outcome of Holmium Laser Enucleation of the Prostate by Age, Prostate Volume, and a History of Blood Thinning Agents: Report from a Single-Center Series of >1800 Consecutive Cases. *J Endourol*. 2021; 35: 639-646.
23. de Groat WC, Yoshimura N. Anatomy and physiology of the lower urinary tract. *Handb Clin Neurol*. 2015;130: 61-108.
24. Oelke M, Höfner K, Jonas U, De La Rosette JJ, Ubbink DT, Wijkstra H. Diagnostic Accuracy of Noninvasive Tests to Evaluate Bladder Outlet Obstruction in Men: Detrusor Wall Thickness, Uroflowmetry, Postvoid Residual Urine, and Prostate Volume. *European Urology*. 2007; 52: 827-835.
25. Helgason ÁR, Adolfsson J, Dickman P, et al. Sexual Desire, Erection, Orgasm and Ejaculatory Functions and Their Importance to Elderly Swedish Men: A Population-based Study. *Age Ageing*. 1996; 25: 285-291.
26. Press B, Gardezi M, Kim DD, et al. Ejaculatory Preserving Holmium Laser Enucleation of the Median Lobe: Preserving Sexual Function While Improving Urinary Outcomes. *Urology*. 2023; 173: 175-179.
27. Rouf MA, Kumar V, Agarwal A, Rawat S. Ejaculation preserving HoLEP/TURP for benign prostatic hyperplasia: myth or reality. *J Clin Urol*. 2022; 15: 315–22.
28. Anil H, Güzel A, Yıldız A, Akdemir S, Karamık K, Arslan M. Predictive factors affecting morcellation efficiency in holmium laser enucleation of the prostate. *Investig Clin Urol*. 2023; 64: 388–394.
29. Boxall NE, Georgiades F, Miah S, Dragos L, Armitage J, Aho TF. A call for HoLEP: AEEP for mega-prostates (≥ 200 cc). *World J Urol*. 2021; 39: 2347-2353. ■