

HoLEP Outcomes in Patients Receiving α 1-blockers Alone versus α 1-blockers plus 5 α -reductase Inhibitors

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What's known on the subject? and What does the study add?

Preoperative α 1-blocker and 5 α -reductase inhibitors (5-ARIs) therapies are commonly used for BPE, yet prior studies have reported inconsistent findings regarding whether 5-ARIs influence holmium laser enucleation of the prostate (HoLEP) performance or perioperative outcomes. This study adds to the current evidence by demonstrating that long-term preoperative use of α 1-blockers alone or in combination with 5-ARIs does not adversely affect surgical efficiency, complication rates, or postoperative functional recovery after HoLEP. Furthermore, surgical efficiency is preserved in patients receiving combination therapy despite larger preoperative prostate volumes.

Abstract

Objective: To evaluate whether preoperative use of α 1-blockers alone or in combination with 5 α -reductase inhibitors (5-ARIs) affects perioperative parameters, surgical dynamics, and postoperative outcomes in patients who underwent holmium laser enucleation of the prostate (HoLEP).

Materials and Methods: We retrospectively evaluated 144 patients who underwent HoLEP and categorized them into two groups: Group 1, patients who had used α 1-blockers; Group 2, patients who had used a combination of α 1-blockers and 5-ARI (dutasteride) for more than six months. Demographic characteristics, preoperative clinical parameters, intraoperative surgical metrics, and postoperative functional outcomes were compared.

Results: Group 2 patients were older (69.1 vs. 66.5 years; $p=0.047$) and had larger prostates (101.5 vs. 82 mL; $p=0.043$). Preoperative PSA, post-void residual urine volume, International Prostate Symptom Score, and maximum urinary flow rate were comparable between groups. Intraoperatively, enucleation time was slightly longer in the combination group (75 vs. 60 min; $p=0.022$), corresponding to their greater prostate volume; however, enucleation and morcellation efficiencies did not differ significantly. Hemoglobin drop, catheter removal time, hospitalization duration, and perioperative and postoperative complication rates were also similar. Both groups showed significant improvements in functional outcomes at one month postoperatively, with no significant differences between treatment groups.

Conclusion: There were no differences between patients who had used α 1-blockers alone preoperatively and those who had received preoperative combination therapy with α 1-blockers plus 5-ARIs in perioperative outcomes, surgical performance, complications, or functional results after HoLEP.

Keywords: 5-alpha reductase inhibitors, adrenergic alpha-1 receptor antagonists, holmium laser enucleation of the prostate, lower urinary tract symptoms, prostatic hyperplasia

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Introduction

α 1-blockers are commonly used as an initial pharmacological option for managing lower urinary tract symptoms (LUTS) caused by benign prostatic enlargement (BPE), largely because they provide relatively fast symptom relief with an acceptable safety and efficacy profile (1,2). They aim to reduce the tone of the prostate and the bladder neck by acting at receptor sites in smooth muscle (1,3). For patients presenting with moderate to severe LUTS accompanied by an enlarged prostate (>40 mL), guidelines support the addition of 5 α -reductase inhibitors (5-ARIs) as part of medical therapy (1,2). 5-ARIs reduce prostate volume, alleviate LUTS, and improve urinary flow rate by preventing the conversion of testosterone to its more potent form, dihydrotestosterone (1,4,5).

5-ARIs promote apoptosis of epithelial cells, leading to notable reductions in prostate size and PSA levels, changes that typically become evident after several months of therapy (1,6,7). In addition, they cause several histological changes in prostatic tissue, including reduced epithelial synthesis and proliferation, increased stroma-to-epithelium ratio, collagen fiber accumulation within the stroma, and decreased microvascularization through their anti-angiogenic effects (8).

Despite medical treatment, some BPE patients eventually require surgical intervention. Holmium laser enucleation of the prostate (HoLEP) has become an increasingly preferred surgical option over the years, offering efficient and safe treatment irrespective of prostate volume (9,10). Most patients undergoing HoLEP have a history of using α 1-blockers and/or 5-ARIs (11). Given the histological alterations induced by 5-ARIs in prostatic tissue, their potential impact on HoLEP outcomes warrants investigation. Therefore, the aim of this study was to evaluate whether preoperative use of α 1-blockers alone or in combination with 5-ARIs affects intraoperative and postoperative variables or complications in patients undergoing HoLEP.

Materials and Methods

Patient Selection and Exclusion Criteria

Patients who had undergone HoLEP and had been on α 1-blocker therapy or a combined regimen of α 1-blockers and 5-ARIs for at least six months prior to surgery were retrospectively evaluated. Patients with a history of bladder or prostate cancer, patients diagnosed with prostate cancer during HoLEP, and patients with less than six months' medication use or with irregular medication use were excluded. In addition, six patients who received only 5-ARI therapy were excluded because the sample size was insufficient for statistical comparison. A total of 144 patients met the eligibility requirements and were analyzed after applying the exclusion criteria.

Group 1 consisted of patients who had used α 1-blockers regularly, while Group 2 included those who had used a combination of α 1-blockers and 5-ARIs for more than six months preoperatively. The two groups were compared with respect to demographic data, preoperative parameters, intraoperative and postoperative outcomes.

Surgical Technique

All HoLEP procedures were performed by the same surgeon, who had substantial experience with the technique, using a 60-W Holmium:YAG laser platform (Cyber Ho 60W, Quanta System, Italy). The operations were performed with a 550- μ m laser fiber in combination with a 27/28.5-Fr continuous-flow resectoscope (Tontarra Medizintechnik GmbH, Germany). En bloc enucleation of the prostatic adenoma was performed in all patients. Morcellation was performed using the Hawk Morcellator Set (Hangzhou HAWK Optical Electronic Instruments Co., China).

Ethical Considerations

All procedures were conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval for this study was obtained from the Marmara University Faculty of Medicine Ethics Committee for Non-Drug and Non-Medical Device Research (approval no: 09.2025.25-0850, date: 17.10.2025).

Statistical Analysis

Statistical analyses were performed using SPSS Statistics version 25 (IBM Corp., USA). The distribution of variables was evaluated both visually and analytically. Continuous data were reported as mean $\pm$ standard deviation for normally distributed variables or as median [interquartile range (IQR)] for non-normally distributed variables. Comparisons between groups were conducted using the independent samples t-test for parametric data and the Mann-Whitney U test for non-parametric or ordinal variables. Paired continuous variables were analyzed using the Wilcoxon signed-rank test. Categorical variables were presented as frequencies and percentages, and compared using either the chi-square test or Fisher's exact test, where applicable. A two-tailed p-value <0.05 was considered statistically significant. Effect sizes were calculated to complement p-values, using the r statistic for Mann-Whitney U tests and Phi (ϕ) or Cramer's V coefficients for categorical comparisons. Moreover, variables showing statistical significance or borderline associations in univariable analyses were considered potential confounders and included in multivariate regression analyses. Enucleation time and enucleation efficiency were analyzed as separate dependent variables, with age, diabetes mellitus, prostate volume, and preoperative medication status entered as independent variables.

Results

One hundred and forty-four individuals formed the study cohort. 106 patients (73.6%) were using α1-blockers only (Group 1), and 38 (26.4%) were using a combination of α1-blockers and 5-ARIs. All patients received dutasteride as 5-ARI therapy.

Baseline Characteristics

Baseline and 1-month postoperative characteristics of the two groups are shown in Table 1. The overall cohort had a mean age of 67.2 ± 6.8 years. Patients receiving combination therapy (Group 2) were older on average than those treated with α1-blockers alone (69.1 ± 6.5 vs. 66.5 ± 6.7 years; $p=0.047$, $r=0.191$). The two groups showed comparable rates of hypertension ($p=0.01$); however, diabetes mellitus was observed less frequently in Group 2 (10.5%) than in Group 1 (27.4%) ($p=0.034$, $\phi=0.18$).

Patients in the combination-therapy group had a significantly larger preoperative prostate volume compared with those treated with α1-blocker monotherapy (101.5 vs. 82 mL; $p=0.043$, $r=0.17$). Preoperative PSA, maximum urinary flow rate (Q_{max}), quality-of-life score (QoL), and post-void residual urine volume (PVR) did not differ significantly between the two groups ($p>0.05$, $r<0.14$). However, preoperative International Prostate Symptom Score (IPSS) was significantly higher in Group 2 (24 vs. 22; $p=0.036$, $r=0.183$).

At the one-month postoperative assessment, both groups showed marked improvement in LUTS. Median IPSS decreased from 23 to 8 in the overall cohort, and QoL improved from 5 to 1. Postoperative Q_{max} significantly rose from 7 mL/s to 18 mL/s, and median PVR dropped from 150 mL to 39.5 mL. There were no significant intergroup differences in postoperative PSA ($r=0.20$), prostate volume, Q_{max} , IPSS, QoL, or PVR ($p>0.05$, $r \leq 0.20$).

Table 1. Baseline and one-month postoperative characteristics according to preoperative medication use

Variables	Overall n=144	Group 1 (alpha blocker) n=106 (73.6%)	Group 2 (alpha blocker + 5-ARI) n=38 (26.4%)	p
Age, years	67.2±6.8	66.5±6.7	69.1±6.5	0.047
Hypertension				
No	85 (59%)	63 (59.4%)	22 (57.9%)	0.869
Yes	59 (41%)	43 (40.6%)	16 (42.1%)	
Diabetes mellitus				
No	111 (77.1%)	77 (72.6%)	34 (89.5%)	0.034
Yes	33 (22.9%)	29 (27.4%)	4 (10.5%)	
Preoperative assessment				
PSA, ng/dL	3.9 (2.1-6.3)	4.35 (2.29-6.68)	2.98 (1.95-4.74)	0.105
Prostate volume, mL	86 (65-116.3)	82 (64.3-110)	101.5 (68.8-150)	0.043
Q _{max} [*] , mL/s	7 (5-10)	8 (5-10)	7 (6-11)	0.974
IPSS	23 (18-27)	22 (17-26)	24 (20.3-29)	0.036
QoL	5 (4-5)	4 (4-5)	5 (4-5)	0.182
PVR, mL	150 (68-295)	150 (70-270)	140 (61-360)	0.803
Presence of a median lobe				
No	62 (43.1%)	50 (47.2%)	12 (31.6%)	0.096
Yes	82 (56.9%)	56 (52.8%)	26 (68.4%)	
Preoperative Hgb, g/dL	14.3 (13.3-15.2)	14.1 (13.3-15.1)	14.4 (13.2-15.4)	0.433
Postoperative Hgb, g/dL	13.4 (12.4-14.4)	13.4 (12.3-14.4)	13.3 (12.5-14.6)	0.829
Postoperative 1-month assessment				
PSA, ng/dL	0.55 (0.14-1.08)	0.67 (0.30-1.14)	0.20 (0.09-0.84)	0.088
Q _{max} [*] , mL/s	18 (15-21)	18 (15-21)	17.5 (15.3-21.8)	0.877
IPSS	8 (5-12)	9 (5-13)	6.5 (4-11.8)	0.077
QoL	1 (1-2)	1 (1-2)	1 (1-2)	0.102
PVR, mL	39.5 (20-60)	40 (20-60)	35 (6-60)	0.32

Continuous variables are shown as mean ± SD or median (IQR), categorical variables as n (%). Data were analyzed using Student's t-test, Mann-Whitney U test, and chi-square/Fisher's exact test, as appropriate

PSA: Prostate-specific antigen, Q_{max} : Maximum urinary flow rate, IPSS: International Prostate Symptom Score, QoL: Quality of life, PVR: Post-void residual urine volume, Hgb: Hemoglobin, 5-ARI: 5-alpha reductase inhibitor, IQR: Interquartile range, SD: Standard deviation

Intraoperative Outcomes

Intraoperative and postoperative outcomes according to preoperative medication use are presented in Table 2. En bloc enucleation of prostatic adenoma was performed in all patients without the need to convert to a two- or three-lobe technique during the operation. The median resected prostate volume was slightly higher in Group 2 (71 vs. 60 mL), although this difference was not statistically significant ($p=0.149$, $r=0.121$). The enucleation time (75 vs. 60 min; $p=0.022$, $r=0.191$) and total surgical time (97.5 vs. 90 min; $p=0.021$, $r=0.192$) were significantly longer in the combination therapy group, whereas morcellation time showed a borderline difference ($p=0.063$, $r=0.155$). Despite longer surgical time, enucleation ($p=0.569$, $r=0.048$) and morcellation ($p=0.352$, $r=0.078$) efficiencies were comparable between the groups. In multivariate linear regression analysis adjusting for age, diabetes mellitus, prostate volume and preoperative medication status; prostate volume emerged

as the only independent predictor of enucleation time ($\beta=0.472$, $p<0.001$). Preoperative combination therapy with α -blockers and 5-ARI was not independently associated with enucleation time ($p=0.072$). Furthermore, none of the evaluated variables, including prostate volume and preoperative medication status, were identified as independent predictors of enucleation efficiency after adjustment for potential confounders (Table 3). This finding suggests that although the procedures lasted longer in patients receiving combination therapy, the surgical efficiency per unit of tissue removed remained similar, which likely reflects the larger preoperative prostate volumes observed in this group.

The requirement for bipolar coagulation after enucleation and the rate of intraoperative complications, such as capsular perforation, subtrigonal undermining, bladder mucosal injury, and bladder perforation, were similar between groups ($p=0.593$, $\phi=0.05$; $p=0.725$, Cramer's $V=0.12$, respectively). Although the overall cohort demonstrated a statistically significant yet clinically

Table 2. Comparison of intraoperative and postoperative outcomes according to preoperative medication use

Variables	Overall n=144	Group 1 (alpha blocker) n=106 (73.6%)	Group 2 (alpha blocker + 5-ARI) n=38 (26.4%)	p
Resected prostate tissue, mL	60 (44-80)	60 (40-80)	71 (45-88.8)	0.149
Enucleation time, min	65 (55-80)	60 (50-75)	75 (55-95)	0.022
Morcellation time, min	20 (15-30)	20 (15-26.3)	25 (15-35)	0.063
Total surgical time, min	90 (70-105)	90 (70-100)	97.5 (75-131.3)	0.021
Enucleation efficiency, mL/min	0.91 (0.67-1.23)	0.92 (0.70-1.22)	0.87 (0.63-1.24)	0.569
Morcellation efficiency, mL/min	2.93 (2.22-3.67)	3.00 (2.29-3.90)	2.75 (2.00-3.50)	0.352
Need for bipolar cauterization following enucleation				
No	107 (74.3%)	80 (75.5%)	27 (71.1%)	0.593
Yes	37 (25.7%)	26 (24.5%)	11 (28.9%)	
Intraoperative complications				
No	118 (81.9%)	89 (84%)	29 (76.3%)	0.725
Capsular Perforation	10 (6.9%)	6 (5.7%)	4 (10.5%)	
Subtrigonal undermining	10 (6.9%)	7 (6.6%)	3 (7.9%)	
Bladder mucosal injury	5 (3.5%)	3 (2.8%)	2 (5.3%)	
Open repair due to bladder perforation	1 (0.7%)	1 (0.9%)	0	
Catheter removal day	2 (2-3)	2 (2-3)	2 (2-3)	0.329
Postoperative 1. month complications				
No	115 (79.9%)	86 (81.1%)	29 (76.3%)	0.129
Incontinence	27 (18.8%)	20 (18.9%)	7 (18.4%)	
Urethral stricture	1 (0.7%)	0	1 (2.6%)	
Delayed bleeding	1 (0.7%)	0	1 (2.6%)	
Postoperative 6. month complications				
No	131 (91%)	99 (93.4%)	32 (84.2%)	0.069
Incontinence	9 (6.3%)	6 (5.7%)	3 (7.9%)	
Urethral stricture	4 (2.8%)	1 (0.9%)	3 (7.9%)	
Continuous variables are shown as median (IQR), categorical variables as n (%). Data were analyzed using Mann-Whitney U test, and chi-square/Fisher's exact test, as appropriate IQR: Interquartile range, 5-ARI: 5-alpha reductase inhibitor				

Table 3. Multivariate linear regression analyses evaluating predictors of enucleation time and enucleation efficiency

	Enucleation time, min		Enucleation efficiency, mL/min	
	β (standardized)	p	β (standardized)	p
Age (years)	0.101	0.171	-0.074	0.393
Diabetes mellitus	0.042	0.571	-0.070	0.417
Preoperative medication status*	0.136	0.072	-0.054	0.535
Prostate volume (mL)	0.472	<0.001	0.133	0.122

*Preoperative medication status: α -blocker monotherapy vs. α -blocker + 5 α reductase inhibitor combination therapy

acceptable median decrease in hemoglobin (0.8 g/dL; IQR=0.3-1.3; $p<0.001$), hemoglobin decreased in 85.7% of patients in the α 1-blocker group and in 91.9% of patients receiving combination therapy, and the extent of this decline remained similar in both groups ($p=0.775$, $r=0.024$), indicating that preoperative 5-ARI use did not affect intraoperative bleeding.

Postoperative Outcomes and Complications

The median time to catheter removal was two days in both groups ($p=0.329$, $r=0.08$). At one month, stress urinary incontinence occurred in 18.8% of patients overall, without significant intergroup difference ($p=0.129$, Cramer's $V=0.2$). Delayed bleeding and urethral stricture were rare (<3%). The overall complication rates were low: 6.3% for incontinence and 2.8% for urethral stricture; the outcomes were statistically indistinguishable across groups at the 6-month follow-up ($p=0.069$, Cramer's $V=0.19$).

Discussion

LUTS associated with BPE are among the most common benign conditions affecting older men and can significantly impair QoL. Although prevalence varies by region, BPE-related LUTS affect approximately 27.9% to 37.6% of men over the age of 40 worldwide (12). α 1-blockers and 5-ARIs are widely and effectively used in medical management (13,14). Despite medical therapy, some patients eventually require surgery for persistent symptoms or related complications (1,2,15). HoLEP has become a reliable and beneficial surgical option for these patients (16).

The vast majority of patients with LUTS receive guideline-recommended medical treatment as first-line therapy. In the large cohort reported by Monn et al. (11), 79% of HoLEP patients had a history of α 1-blocker and/or 5-ARI use. Given the histological and structural changes induced by long-term 5-ARI therapy in the prostate gland, the potential impact of these medications on surgical efficacy and perioperative complications remains an important area of investigation (14).

In previous studies, HoLEP patients were generally compared based whether they received 5-ARIs (alone or in combination) versus no medication or α 1-blocker monotherapy. Similarly, in our study, we compared patients treated with α 1-blockers alone

with those treated with a combination of α 1-blockers and 5-ARIs. In the study by Bultó Gonzalvo et al. (17), patients in the 5-ARI group were significantly older (71.8 vs. 69.0 years; $p=0.001$) and had larger prostate volumes (100.6 vs. 90.6 mL; $p=0.04$). They also showed a borderline lower PSA level (4.7 vs. 5.6 ng/mL; $p=0.072$) and higher PVR (201.6 vs. 138.6 mL; $p=0.054$), while Q_{max} and IPSS were similar between groups (17). In contrast, Warner et al. (18) and Sugie et al. (19) reported no between-group differences in age, prostate volume, preoperative PSA, Q_{max} , PVR, or IPSS among patients using 5-ARIs and those who did not. Shigemura et al. (20) found that the dutasteride group had a smaller prostate volume (67.1 vs. 76.3 mL; $p=0.007$) and borderline-lower PSA levels (6.3 vs. 9.4 ng/mL; $p=0.06$), while age, Q_{max} , and PVR did not differ significantly between groups.

Prostate size in men increases by approximately 1.6% per year with age (21). Guidelines recommend administering 5-ARIs to patients with pronounced LUTS and enlarged prostate volumes, because these medications reduce prostate size and lower measured PSA levels (1). Consistent with these expectations, patients in our 5-ARI group were older, had larger preoperative prostate volumes, and had worse baseline IPSS scores. Although the difference was not statistically significant, PSA levels tended to be lower in group 2 (2.98 vs. 4.35 ng/mL; $p=0.105$). There were no significant differences between the groups for preoperative Q_{max} or PVR.

Studies examining the intraoperative effects of 5-ARI use have reported variable findings. Warner et al. (18) observed significantly higher enucleation efficiency in the 5-ARI group (0.81 vs. 0.63 g/min; $p=0.01$) among patients with comparable prostate volumes (92.8 vs. 83.4 mL; $p=0.23$), while no differences were found in resected tissue weight, morcellation efficiency, or hemoglobin change between the groups. In contrast, Bultó Gonzalvo et al. (17) reported that patients in the 5-ARI group who had larger prostates underwent a greater volume of tissue resection (66.8 vs. 56.4 mL; $p=0.016$), but no significant differences were observed in enucleation time, morcellation time, enucleation efficiency, morcellation efficiency, or perioperative hemoglobin changes. Dense prostate tissue may affect enucleation and morcellation times in patients using ARI and reduce morcellation effectiveness (11). However, other studies have reported no significant impact of 5-ARI use on operative duration, enucleation or morcellation

efficiency, or the amount of resected tissue (19,22). Dutasteride is thought to reduce perioperative bleeding by decreasing microvessel density in the bladder neck (19). Sato et al. (22) found a significantly smaller decrease in hemoglobin in the dutasteride group (0.3 vs. 0.6 g/dL; $p=0.03$). However, many studies have shown that hemoglobin changes after HoLEP remain within clinically acceptable limits, and that preoperative 5-ARI use does not cause significant differences between groups in perioperative decrease in hemoglobin (17-20). Patients in the combination therapy group were significantly older and had larger preoperative prostate volumes, which may have contributed to the longer operative and enucleation times observed. However, multivariate analysis demonstrated that prostate volume, rather than preoperative medication use, was the only independent predictor of enucleation time, confirming that these baseline differences were confounding factors that influenced operative duration. Although the associated effect sizes were small, suggesting limited clinical relevance, surgical performance was preserved. Notably, no differences were observed between the groups in enucleation or morcellation efficiency, and none of the evaluated variables independently predicted enucleation efficiency after adjustment for confounders. Taken together, these findings indicate that while baseline differences in age and prostate volume may prolong operative time, preoperative 5-ARI use does not significantly affect surgical efficiency or overall surgical effectiveness. Similarly, the reduction in hemoglobin levels did not differ between groups.

HoLEP is increasingly used as a safe surgical option owing to its ability to markedly improve functional outcomes while maintaining a low incidence of adverse events. Studies evaluating patients receiving different medications or combinations thereof have shown that the use of α 1-blockers and/or 5-ARIs does not affect the surgical success of HoLEP. Our findings are consistent with the existing literature. All patient groups experienced marked improvements in functional, parameters including Q_{max} , PVR, IPSS, and QoL scores, compared with their preoperative baseline values; there were no significant differences between treatment groups (17,18,20). Likewise, previous studies have reported that complication rates during and after surgery were similar across the groups (17,18,23). The time to catheter removal and the length of hospital stay also did not differ significantly between the groups (18,20).

As in similar studies, the retrospective nature of our data did not allow us to evaluate the impact of the duration of 5-ARI use on surgical outcomes (18,20,22). Nevertheless, no clinically relevant differences were observed within the overall group of patients receiving 5-ARI therapy. Current evidence does not clearly demonstrate a difference in surgical outcomes between patients using 5-ARIs for shorter versus longer durations. Further

prospective studies are required to clarify the potential influence of treatment duration.

In this study, effect size analyses were used as a complementary approach to conventional p-values. Although some parameters demonstrated statistically significant differences, the consistently small effect sizes indicate limited clinical relevance. Similarly, non-significant findings were characterized by negligible or small effect sizes. When the magnitude of the observed effects is taken into account, α 1-blocker monotherapy and combination therapy with α 1-blockers and 5-ARIs administered prior to HoLEP appear to have clinically comparable surgical efficacy and complication profiles within this cohort.

From a clinical perspective, the present findings indicate no differences in surgical efficiency or postoperative outcomes following HoLEP between patients receiving long-term preoperative α 1-blocker monotherapy and those receiving a combination of α 1-blockers and 5-ARI. Therefore, in patients with severe symptoms who are receiving α 1-blocker therapy and are likely to require surgical intervention, the addition of 5-ARI and the subsequent postponement of surgery do not appear to affect surgical or perioperative outcomes. When planning surgery, consideration of prostate volume, which emerged as the only independent predictor of enucleation time in multivariate analysis, may be useful in guiding surgical strategy, whereas enucleation efficiency does not seem to be independently influenced by prostate volume in experienced hands. Although these findings are largely consistent with previous HoLEP studies, the present study adds clinically meaningful insight by incorporating effect size analyses and adjusted multivariate models to disentangle the impact of preoperative medical therapy from that of baseline anatomical differences. By demonstrating that prolonged enucleation time is primarily attributable to prostate volume rather than to differences in prior LUTS treatment, our results provide a clearer interpretation of operative dynamics and offer reassurance that preoperative α 1-blocker therapy or combination therapy does not compromise HoLEP performance.

Study Limitations

Several limitations should be acknowledged, beginning with the inherent restrictions of its retrospective design. Although the distribution of our cohort was generally consistent with earlier reports, the sample size of the 5-ARI combination group remained relatively small compared to the α -blocker monotherapy group. Another limitation of this study is the retrospective assessment of preoperative 5-ARI exposure, which precluded precise determination of treatment duration. Therefore, stratified analyses according to different durations of 5-ARI use could not be performed. This study is limited by the

absence of a detailed histopathological evaluation—including parameters such as chronic prostatitis, stromal-to-glandular ratio, and microvascular changes—and by the lack of standardized documentation of subjective surgical difficulty. The lack of postoperative sexual function data, including International Index of Erectile Function-5 scores, represents a limitation of this study. Furthermore, the entire surgical series was performed by a single surgeon with extensive experience. While this enhances internal consistency, it limits the generalizability of the findings to other centers and surgeons. Baseline differences in age and prostate volume between the study groups may constitute potential confounding factors, particularly with respect to operative duration, and should be considered when interpreting the findings. Confirmation and extension of these findings will rely on prospective studies conducted in larger multicenter populations.

Conclusion

In this study, preoperative use of α 1-blockers alone or in combination with 5-ARIs did not influence the functional outcomes, complication rates, or perioperative safety profile of HoLEP. Although patients receiving combination therapy had larger prostates and experienced longer enucleation and operative times, surgical efficiency, changes in hemoglobin, postoperative recovery, and symptomatic improvement were comparable between the groups. These findings indicate that long-term preoperative use of either α 1-blocker monotherapy or combined α 1-blocker and 5-ARI therapy does not affect HoLEP performance or postoperative outcomes. HoLEP remains a highly effective and safe treatment option. To more clearly define the potential effect of long-term use of α 1-blocker alone or of α 1-blocker plus 5-ARIs on surgical dynamics, prospective multicenter studies with larger cohorts are required.

Ethics

Ethics Committee Approval: Ethical approval for this study was obtained from the Marmara University Faculty of Medicine Ethics Committee for Non-Drug and Non-Medical Device Research (approval no: 09.2025.25-0850, date: 17.10.2025).

Informed Consent: Because the study was designed retrospectively no written informed consent form was obtained from the patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: G.Ö., D.D., T.E.Ş., Concept: G.Ö., E.G., T.E.Ş., Design: G.Ö., M.Ç., H.K.Ç., T.T., Data Collection or Processing: T.A., M.Ç., D.D., E.G., Analysis or Interpretation: G.Ö., T.A., H.K.Ç., T.T., T.E.Ş., Literature Search: G.Ö., Writing: G.Ö., T.E.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

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