Original Article
Özgün Araştırma

Endourol Bull. 2025;17(3):164-169. doi: 10.54233/endourolbull-1748348

Clinical Outcomes of Rezum Treatment in High-Risk Elderly Patients with Long-Term Urinary Catheters: A Retrospective Study

Uzun Süreli Üriner Sonda Kullanan Yüksek Riskli Yaşlı Hastalarda Rezum Tedavisinin Klinik Sonuçları: Retrospektif Bir Çalışma

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ABSTRACT

Objective: This study aimed to evaluate the efficacy and safety of Rezum water vapor therapy in elderly male patients with long-term urinary catheterization and high anesthetic risk, as indicated by American Society of Anesthesiologists (ASA) scores of 3–4.

Material and Methods: We retrospectively analyzed 15 elderly male patients with ASA scores of 3–4 who had been using indwelling urinary catheters and underwent Rezum therapy between January and December 2023. Outcomes assessed at 1 and 6 months post-treatment included the International Prostate Symptom Score (IPSS), quality of life (QoL), prostate volume (PV), and post-void residual urine (PVR) volume. Time to catheter removal was also recorded.

Results: The study cohort consisted of 15 elderly male patients with a mean age of 83.2 years (73-90 years old). Catheter removal was attempted at an average of 21 ± 4.5 days post-procedure. While 13 patients tolerated catheter removal successfully, two patients developed acute urinary retention and required re-catheterization. In these patients, the catheter was maintained for at least an additional 14 days. By the third postoperative month, all patients had achieved catheter independence.

At 1 month post-treatment, the mean IPSS was 20.07 ± 1.62, improving to 18.13 ± 1.51 at 6 months. QoL scores increased from a baseline of 1.60 ± 0.51 to 3.33 ± 0.49 at 1 month and further to 3.67 ± 0.49 at 6 months PVR decreased from 136.7 ± 53.7 mL at 1 month to 92.0 ± 33.4 mL at 6 months. PV reduced from 91.07 ± 18.7 mL to 65.27 ± 13.4 mL. No Clavien-Dindo grade ≥2 complications were observed.

Conclusions: Rezum therapy appears to be a safe and effective minimally invasive alternative for high-risk elderly male patients with indwelling catheters who are not suitable candidates for conventional surgical interventions.

Keywords: ASA score, benign prostatic hyperplasia, elderly patients, high surgical risk, minimally invasive therapy, urinary catheter, Rezum

Cite As: *Avci, AE Cakiroglu B. Clinical Outcomes of Rezum Treatment in High-Risk Elderly Patients with Long-Term Urinary Catheters: A Retrospective Study. Endourol Bull. 2025;17(3):164-169.* https://doi.org/10.54233/endourolbull-1748348

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Received : July 22, 2025 ***Accepted*** : September 27, 2025

ÖZET

Amaç: Bu çalışmanın amacı, Amerikan Anesteziyologlar Derneği (ASA) skorları 3–4 olan uzun süreli üriner kateter kullanımı ve yüksek anestezi riski bulunan yaşlı erkek hastalarda Rezum su buharı tedavisinin etkinliğini ve güvenliğini değerlendirmektir.

Gereç ve Yöntemler: Ocak–Aralık 2023 tarihleri arasında Rezum tedavisi uygulanan, ASA skoru 3–4 olan ve kalıcı üriner kateter kullanan 15 yaşlı erkek hasta retrospektif olarak analiz edildi. Tedavi sonrası 1. ve 6. aylarda Uluslararası Prostat Semptom Skoru (IPSS), yaşam kalitesi (QoL), prostat hacmi (PV) ve işeme sonrası artık idrar hacmi (PVR) değerlendirildi. Sondanın çekilme süresi de kaydedildi.

Bulgular: Ortalama yaşı 83,2 yıl olan 15 yaşlı erkek hasta çalışmaya dahil edildi. Sonda çıkarma işlemi ortalama 21 ± 4,5 gün sonra denendi. On üç hasta sondasız idrar yapmayı başardı, ancak iki hastada akut üriner retansiyon gelişti ve tekrar sondalanmaları gerekti. Bu hastalarda sonda en az 14 gün daha tutuldu. Üçüncü ayın sonunda tüm hastalar sonda bağımsızlığına ulaşmıştı.

Tedavi sonrası 1. ayda ortalama IPSS skoru 20,07 ± 1,62 iken, 6. ayda 18,13 ± 1,51'e düştü. QoL skorları 1. ayda 3,33 ± 0,49'dan 6. ayda 3,67 ± 0,49'a yükseldi. PVR, başlangıçta 136,7 ± 53,7 mL iken 6. ayda 92,0 ± 33,4 mL'ye düştü. Prostat hacmi ise 91,07 ± 18,7 mL'den 65,27 ± 13,4 mL'ye geriledi. Clavien-Dindo ≥2 düzeyinde hiçbir komplikasyon gözlenmedi.

Sonuç: Rezum tedavisi, konvansiyonel cerrahi müdahalelere uygun olmayan kalıcı sondalı yüksek riskli yaşlı erkek hastalar için güvenli ve etkili bir minimal invaziv tedavi seçeneği olarak görünmektedir.

Anahtar Kelimeler: ASA skoru, benign prostat hiperplazisi, minimal invaziv tedavi, Rezum, üriner kateter

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a highly prevalent urological condition among older men. It remains a leading cause of lower urinary tract symptoms (LUTS), often resulting in a substantial decline in quality of life (1). Conventional surgical treatments, such as transurethral resection of the prostate (TURP), are generally effective but may carry elevated perioperative risks in older individuals, particularly those with significant comorbidities and high anesthetic risk, as defined by an American Society of Anesthesiologists (ASA) score of 3 or 4 (2).

In response to these challenges, there has been a growing interest in minimally invasive therapies that offer symptom relief with reduced morbidity. One such option is Rezum therapy, which delivers convective water vapor thermal energy to ablate hyperplastic prostatic tissue, thereby relieving bladder outlet obstruction (3). The safety and efficacy of Rezum have been well documented in the general population, demonstrating improvements in symptom scores, urinary flow, and quality of life.

However, data on the use of Rezum in frail, elderly patients with long-term urinary catheterization and elevated surgical risk are limited. This patient population is frequently excluded from clinical trials, despite their growing presence in real-world urology practice (4).

The present study aims to evaluate the clinical outcomes, procedural tolerability, and safety of Rezum therapy in high-risk elderly male patients with indwelling urinary catheters. By focusing on this underrepresented population, we aim to provide practical evidence that may support safer, effective management strategies for complex BPH cases.

MATERIALS AND METHODS

This retrospective study included 15 elderly male patients with indwelling urinary catheters and ASA physical status scores of 3 or 4, who underwent Rezum water vapor therapy between January and December 2023. All patients were treated at a single tertiary care center.

Demographic and clinical data were collected, including age, ASA score, duration of catheter use, and comorbidities. Baseline preoperative assessments included the International Prostate Symptom Score (IPSS), quality of life (QoL) score, prostate volume (PV), and postvoid residual urine volume (PVR).

Rezum therapy was performed under local anesthesia or intravenous sedation. The choice between in these method was determined by patient comorbidities, tolorance levels and anesthesiologist assesment to ensure maximum safety and comfort during the procedure. The procedure involved the transurethral delivery of convective water vapor to hyperplastic prostatic tissue using standard manufacturer protocols. The total number of vapor injections was recorded for each patient.

Postoperative catheter removal time (in days) was documented. Follow-up evaluations were conducted at 1 and 6 months after the procedure, with repeated assessments of IPSS, QoL, PV, and PVR.

Statistical analyses were descriptive. Continuous variables were expressed as means ± standard deviation (SD) and ranges. Changes in clinical parameters from baseline to follow-up were summarized using mean values. Due to the small sample size and retrospective design, no inferential statistical testing was conducted.

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the institutional review board of Hisar Hospital Intercontinental (21.07.2025/:25-39). Written informed consent was obtained from all participants or their legal guardians from all participants or their legal representatives.

RESULTS

The study cohort consisted of 15 elderly male patients with a mean age of 83.2 years (73-90 years old). Catheter removal was attempted at an average of 21 ± 4.5 days post-procedure. Thirteen patients were able to void spontaneously after catheter removal, whereas two patients experienced acute urinary retention. These patients required re-catheterization, and their catheters were maintained for at least an additional 14 days. Nevertheless, by the third postoperative month, all patients had successfully discontinued catheter use.

At 1 month post-treatment, the mean IPSS improved from a baseline of 20.07 ± 1.62 to 18.13 ± 1.51 at 6 months, indicating a sustained reduction in LUTS. QoL scores increased from a baseline of 1.60 ± 0.51 to 3.33 ± 0.49 at 1 month and further to 3.67 ± 0.49 at 6 months, reflecting meaningful improvement in patient-reported outcomes.

Postvoid residual urine volume decreased from a mean of 136.7 ± 53.7 mL at baseline to 92.0 ± 33.4 mL at 6 months, indicating improved bladder emptying. PV also showed a significant reduction, from 91.07 ± 18.7 mL at baseline to 65.27 ± 13.4 mL at 6 months.

A summary of clinical outcomes is presented in Table 1, highlighting the changes in IPSS, QoL, PVR, and PV from baseline through follow-up. Figure 1 illustrates the trends in clinical improvement over time. These findings support the clinical benefit of Rezum therapy in reducing LUTS and enhancing urinary function in high-risk older men with catheter dependence.

Table 1. Changes in clinical parameters over time following Rezum therapy.

Parameter	Baseline	1 Month	6 Months
IPSS		20.07	18.13
QoL	1.6	3.33	3.67
PVR (ml)		136.7	92.0
Prostate Volume (ml)	91.07		65.27

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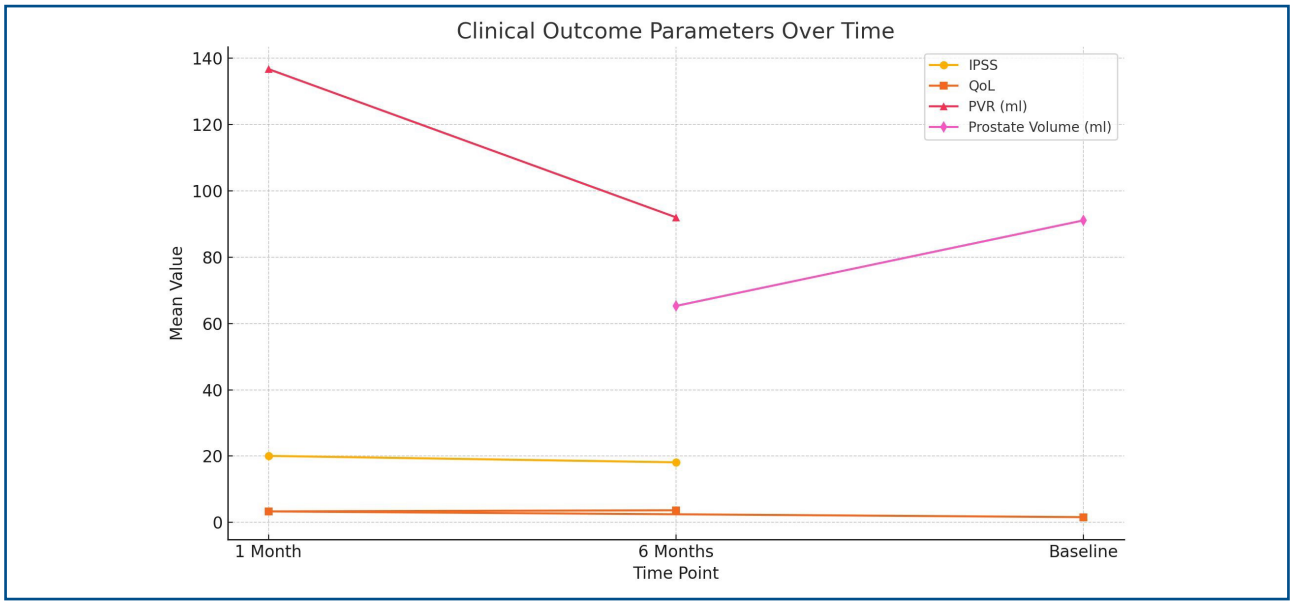

Figure 1. Trends in International Prostate Symptom Score (IPSS), quality of life (QoL), post-void residual urine volume (PVR) and prostate volume (PV) at baseline, 1 month and 6 months after Rezum therapy

DISCUSSION

This study addresses a significant gap in the literature by evaluating the clinical outcomes of Rezum therapy in a particularly vulnerable population: elderly, catheter-dependent patients with high surgical risk. The findings of this study indicate that Rezum therapy substantially improved lower urinary tract symptoms and quality of life in this high-risk group. Reductions in IPSS, QoL improvement, and decreases in prostate volume and post-void residual urine underscore the clinical efficacy of this minimally invasive procedure. The catheter-free rates observed in our study are consistent with those in the previous literature. Wong et al. reported a 100% catheter-free rate post-Rezum in 10 patients with urinary retention (5). Similarly, McVary et al. found that 70.3% of catheter-dependent patients resumed spontaneous voiding following the procedure (6). Elterman et al. confirmed these outcomes, with 15 of 16 patients achieving catheter independence (7). Bassily et al. and Eredics et al. also reported high success rates in patients with multimorbidity [8-10]. Collectively, these findings demonstrate that Rezum therapy can restore spontaneous urination in patients previously dependent on catheters. The reduction in prostate volume and post-void residual urine in our cohort further supports the physiological benefits of thermal ablation using water vapor. Previous reports have highlighted similar outcomes for prostate size and PVR metrics (11–13). Our results contribute to this body of evidence by confirming its effectiveness in the elderly and frail populations. Anesthetic management plays a crucial role in the tolerability and feasibility of RT.. In our study, both sedation and intravenous sedation were used to enhance patient comfort. These findings were corroborated by Bal et al., who demonstrated high procedural success and patient preference for both oral sedation with local anesthesia (OSLA) and deep intravenous sedation (DIS) and also emphasized the acceptability of minimal sedation in a recent prospective study. This adaptability renders Rezum suitable for office-based and resource-limited settings (9).

A crucial component of our study was the continuation of antiplatelet and anticoagulant medication. None of the patients discontinued aspirin, clopidogrel, or warfarin, and no significant hemorrhagic complications were observed. Eredics et al. similarly reported no increased perioperative risk among patients who remained on chronic anticoagulation (10). This suggests that Rezum may offer a significant safety advantage over TURP or other resective procedures that typically necessitate cessation of such therapies. While the current literature provides a foundation for the efficacy and safety of Rezum, there remains a need for comparative, long-term data. Future studies should investigate not only symptom improvement and catheter independence but also cost-effectiveness, quality of life scores, and functional outcomes in comparison with TURP, HoLEP, and emerging minimally invasive techniques (14–16).

Furthermore, sub-analysis by comorbidity profile (e.g., cardiovascular disease, neurogenic bladder) could enhance patient selection and preprocedural planning (17–20). In conclusion, the safety profile, tolerability, and effectiveness of RT support its role as a first-line minimally invasive therapy in the elderly, high-risk patients with BPH, and chronic catheter use. The ability to avoid general anesthesia, maintain antithrombotic therapy, and perform the procedure in an outpatient setting makes it a valuable addition to the urologist's armamentarium. The limitations of this study include its retrospective design, small sample size, and lack of a control group. Future prospective studies with larger cohorts and longer follow-up periods are recommended to validate these findings further and define the long-term efficacy and safety of Rezum in high-risk patient populations.

Limitations and Future Directions

This study has several limitations that must be considered when interpreting the results. The retrospective design constrains the ability to establish causality, and the small sample size may diminish the statistical power and generalizability of the findings. Furthermore, the absence of a control group limits its ability to be compared with other treatment modalities. The follow-up period was restricted to six months; thus, long-term outcomes concerning symptom recurrence, necessity for re-intervention, or sustained catheter independence remain unknown. Future research should prioritize prospective multicenter trials with larger patient populations and extended follow-up duration. Randomized controlled studies comparing Rezum therapy with traditional surgical treatments or alternative minimally invasive options in high-risk elderly patients would provide more robust evidence for clinical decision-making. Additionally, future comparative studies with TUR-P, HoLEP or other minimally invasive methods should be considered to strengthen evidence in this high-risk population.

CONCLUSION

Rezum therapy is an effective and safe treatment option for elderly male patients with a high surgical risk and long-term catheter dependency, offering significant improvements in lower urinary tract symptoms, quality of life, and bladder function. It serves as a viable alternative to traditional surgical treatments, particularly for patients who are unsuitable candidates for more invasive procedures.

Data Availability Statement: Data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest regarding the publication of this article.

Informed Consent: Written informed consent was obtained from all participants or their legal representatives.

Funding: This research received no specific grants from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval: This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Review Board of Hisar Hospital Intercontinental (21.07.2025/25-39).

REFERENCES

1. Cakiroglu B, Gözüküçük R, Sinanoglu O. Efficacy and safety of 120 W Greenlight photoselective vaporization of the prostate in patients receiving anticoagulant drugs. J Pak Med Assoc. 2013;63(12):1464-1467.
2. Çakıroğlu B. Minimally invasive connective water vapor energy method for benign prostatic hyperplasia. Urologia. 2024;91(2):298-305. https://doi.org/10.1177/03915603231216191
3. Cakiroglu B, Acar İC, Uyanık BS. Outcomes of Rezum water vapor therapy for benign prostate obstruction with 1-year follow-up: Largest real-world data from Turkey. Cent European J Urol. 2025;78:144-150. https://doi.

org/10.5173/ceju.2024.0224

4. Alcina EL, Arjona MF, Guzmán EF, Zuazu JR, Jochamowitz IS. Expert consensus on Rezūm: Indications, surgical technique, and postoperative care. BJUI Compass. 2025;6(2):e491. https://doi.org/10.1002/bco2.491
5. Wong A, Mahmalji W. The role of Rezūm in the treatment of patients with acute urinary retention secondary to BPH. Aging Male. 2020;23(5):1620-1626. https://doi.org/10.1080/13685538.2021.1901273
6. McVary KT, Holland B, Beahrs JR. Water vapor thermal therapy to alleviate catheter-dependent urinary retention secondary to BPH. Prostate Cancer Prostatic Dis. 2020;23(2):303-308. https://doi.org/10.1038/s41391-019-0187-5
7. Elterman D, Shepherd S, Saadat SH, et al. Prostatic urethral lift vs. convective water vapor ablation for BPH: 3-year outcomes. Can J Urol. 2021;28(5):10824-10833.
8. Bassily D, Wong V, Phillips JL, et al. Rezūm for retention: retrospective review of water vapor therapy in men with BPH. Prostate. 2021;81(14):1049-1054. https://doi.org/10.1002/pros.24201
9. Bal DS, Urichuk M, Panchendrabose K, et al. Anesthetic options for Rezūm water vapor therapy. Can Urol Assoc J. 2024;18(5):E137-E141. https://doi.org/10.5489/cuaj.8535
10. Eredics K, Wehrberger C, Henning A, et al. Rezūm water vapor therapy in multimorbid patients with urinary retention and catheter dependence. Prostate Cancer Prostatic Dis. 2022;25(2):302-305. https://doi.org/10.1038/s41391-021-00462-w
11. Gupta N, Rogers T, Holland B, et al. Three-year treatment outcomes of water vapor thermal therapy compared to drug therapy in BPH: MTOPS trial data. J Urol. 2018;200(2):405-413. https://doi.org/10.1016/j.juro.2018.02.3088
12. McVary KT, Gange SN, Gittelman MC, et al. Minimally invasive prostate convective water vapor energy ablation: a multicenter, randomized, controlled study. J Urol. 2016;195(5):1529-1538. https://doi.org/10.1016/j.juro.2015.10.181
13. McVary KT, Roehrborn CG. Three-year outcomes of the Rezūm study: convective radiofrequency thermal therapy. Urology. 2018;111:1-9. https://doi.org/10.1016/j.urology.2017.10.023
14. Miller LE, Chughtai B, McVary K, et al. Systematic review and meta-analysis of Rezum therapy for BPH. Medicine (Baltimore). 2020;99(30):e21365. https://doi.org/10.1097/MD.0000000000021365
15. Baboudjian M, Alegorides C, Fourmarier M, et al. Water vapor thermal therapy versus state artery embolization in frail patients. Prog Urol. 2022;32(2):115-120. https://doi.org/10.1016/j.purol.2021.03.001
16. Roehrborn CG, Gange SN, Gittelman MC, et al. Convective thermal therapy: durable 2-year results. J Urol. 2017;197(6):1507-1516. https://doi.org/10.1016/j.juro.2016.12.045
17. Alegorides C, Fourmarier M, Eghazarian C, et al. Rezūm water vapor therapy: one-year results. Prog Urol. 2020;30(12):624-631. https://doi.org/10.1016/j.purol.2020.05.004
18. McVary KT, Gittelman MC, Goldberg KA, et al. Final 5-year outcomes of the Rezūm randomized trial. J Urol. 2021;206(3):715-724. https://doi.org/10.1097/JU.0000000000001778
19. Garden EB, Shukla D, Ravivarapu KT, et al. Rezūm therapy for large prostates: initial experience. World J Urol. 2021;39(8):3041-3048. https://doi.org/10.1007/s00345-020-03548-7
20. Haroon UM, Khan JS, McNicholas D, et al. The Rezūm system in Ireland: early outcomes. Ir J Med Sci. 2022;191(1):421-426. https://doi.org/10.1007/s11845-021-02552-z