



International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
Canada
+15878858911
editorial-office@sciformat.ca

| | |
|----------------------|--|
| ARTICLE TITLE | SURGICAL MANAGEMENT OF BENIGN PROSTATIC HYPERPLASIA: A CONTEMPORARY NARRATIVE REVIEW OF TURP, HOLEP, THULEP, AND AQUABLATION |
|----------------------|--|

| | |
|------------|---|
| DOI | https://doi.org/10.31435/ijitss.1(49).2026.4555 |
|------------|---|

| | |
|-----------------|------------------|
| RECEIVED | 22 December 2025 |
|-----------------|------------------|

| | |
|-----------------|---------------|
| ACCEPTED | 01 March 2026 |
|-----------------|---------------|

| | |
|------------------|---------------|
| PUBLISHED | 13 March 2026 |
|------------------|---------------|

LICENSE



The article is licensed under a **Creative Commons Attribution 4.0 International License**.

© The author(s) 2026.

This article is published as open access under the Creative Commons Attribution 4.0 International License (CC BY 4.0), allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

SURGICAL MANAGEMENT OF BENIGN PROSTATIC HYPERPLASIA: A CONTEMPORARY NARRATIVE REVIEW OF TURP, HOLEP, THULEP, AND AQUABLATION

Stanisław Jurkowski (Corresponding Author, Email: stanislawjuri@gmail.com)
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0005-9715-8385

Konrad Zieliński
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0005-3652-592X

Jagoda Józefczyk
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0007-5235-2074

Karolina Ganczar
F. Chopin University Teaching Hospital, Rzeszów, Poland
ORCID ID: 0009-0003-8152-8076

Paweł Buć
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0001-1533-6610

Karolina Buć
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0000-8491-7200

Mikołaj Zalewski
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0002-7803-6145

Marianna Rudzińska
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0002-9622-7439

Łukasz Krzystek
Pomeranian Medical University, Szczecin, Poland
ORCID ID: 0009-0001-1988-0402

Michał Mazurek
F. Chopin University Teaching Hospital, Rzeszów, Poland
ORCID ID: 0009-0005-7111-2397

ABSTRACT

Background: Benign prostatic hyperplasia (BPH) remains one of the most common causes of lower urinary tract symptoms in aging men. Surgical intervention is required when medical therapy becomes insufficient, and recent technological advancements have introduced several minimally invasive alternatives to traditional transurethral resection of the prostate (TURP). This review provides a contemporary comparison of TURP, holmium laser enucleation (HoLEP), thulium laser enucleation (ThuLEP), and Aquablation.

Methods: A narrative review was conducted using a structured PubMed search with the query: "Benign Prostatic Hyperplasia" AND (TURP OR HoLEP OR ThuLEP OR Aquablation) AND "minimally invasive surgery". A total of 43 studies published between 1993 and 2025 were screened, and 15 met the inclusion criteria. Data on perioperative outcomes, functional results, complications, and retreatment rates were extracted and synthesized qualitatively.

Results: TURP remains an effective reference procedure but presents higher bleeding risk, longer catheterization, and increased rates of sexual dysfunction compared with modern alternatives. HoLEP demonstrated superior symptom improvement, reduced blood loss, and durable efficacy across all prostate sizes. ThuLEP showed comparable functional outcomes and strong hemostatic performance. Aquablation offered robot-assisted precision with reduced thermal injury and favorable preservation of ejaculatory function, particularly in larger prostates. Each technique demonstrated clinically meaningful improvements in LUTS and urinary flow, with minimally invasive modalities generally offering more favorable perioperative profiles.

Conclusions: Contemporary evidence supports the growing use of HoLEP, ThuLEP, and Aquablation as effective and often superior alternatives to TURP. Surgical selection should be individualized based on prostate size, patient comorbidities, sexual function priorities, and surgeon expertise. Further high-quality comparative studies are warranted.

KEYWORDS

Benign Prostatic Hyperplasia, Turp, HoLep, ThuLEP, Aquablation, Minimally Invasive Surgery

CITATION

Stanisław Jurkowski, Konrad Zieliński, Jagoda Józefczyk, Karolina Ganczar, Paweł Buć, Karolina Buć, Mikołaj Zalewski, Marianna Rudzińska, Łukasz Krzystek, Michał Mazurek. (2026) Surgical Management of Benign Prostatic Hyperplasia: A Contemporary Narrative Review of TURP, HoLEP, ThuLEP, and Aquablation. *International Journal of Innovative Technologies in Social Science*. 1(49). doi: 10.31435/ijitss.1(49).2026.4555

COPYRIGHT

© **The author(s) 2026.** This article is published as open access under the **Creative Commons Attribution 4.0 International License (CC BY 4.0)**, allowing the author to retain copyright. The CC BY 4.0 License permits the content to be copied, adapted, displayed, distributed, republished, or reused for any purpose, including adaptation and commercial use, as long as proper attribution is provided.

Introduction

Benign prostatic hyperplasia (BPH) is one of the most common causes of lower urinary tract symptoms (LUTS) in aging men, leading to a progressive decline in urinary function and quality of life [15].

The prevalence of LUTS related to BPH increases with age, and the burden of disease continues to rise due to global population aging [15].

Although pharmacological therapy is widely used as first-line treatment, many patients eventually require procedural intervention due to insufficient symptom control or medication intolerance [5].

Transurethral resection of the prostate (TURP) has historically been considered the gold standard surgical treatment, offering effective symptom relief but also being associated with bleeding, electrolyte disturbances, and sexual dysfunction [13].

Over the past two decades, advancements in technology have led to the development of minimally invasive surgical techniques intended to reduce perioperative morbidity while maintaining or improving clinical outcomes compared with TURP [6].

Holmium laser enucleation of the prostate (HoLEP) has emerged as a size-independent, durable alternative to TURP, demonstrating superior functional outcomes and lower retreatment rates in contemporary analyses [1].

Similarly, thulium laser enucleation of the prostate (ThuLEP) provides precise tissue removal with excellent hemostasis and has shown favorable perioperative results in large clinical series [2].

Aquablation, a novel robot-assisted, waterjet-based procedure, represents another minimally invasive option that aims to minimize thermal injury and preserve ejaculatory function while achieving meaningful symptom reduction [3].

Recent updates highlight Aquablation's growing role in the management of moderate-to-severe BPH, supported by expanding long-term safety and efficacy data [4].

Considering the increasing diversity of surgical approaches, contemporary reviews emphasize the importance of individualized treatment selection based on prostate size, patient comorbidities, need for sexual function preservation, and surgeon experience [5].

Given the rapidly evolving landscape of minimally invasive techniques, a structured evaluation of the current evidence comparing TURP, HoLEP, ThuLEP, and Aquablation is essential to guide clinical decision-making [6].

Materials and Methods

Search Strategy

A structured narrative review was conducted using the PubMed database. The search was performed in January 2025 using the following Boolean query:

"Benign Prostatic Hyperplasia" AND (TURP OR HoLEP OR ThuLEP OR Aquablation) AND "minimally invasive surgery"

The search identified 43 records published between 1993 and 2025. Additional manual screening of reference lists was performed to identify potentially relevant studies not captured in the initial search. No language restrictions were applied.

Eligibility Criteria

Inclusion criteria

Studies were included if they met the following conditions:

Population

- Adult men diagnosed with benign prostatic hyperplasia (BPH) or benign prostatic obstruction (BPO).

Intervention

- Surgical management of BPH using:
 - transurethral resection of the prostate (TURP),
 - holmium laser enucleation of the prostate (HoLEP),
 - thulium laser enucleation of the prostate (ThuLEP),
 - Aquablation.

Comparison (when reported)

- Between surgical modalities (e.g., HoLEP vs TURP).
- Between standard and minimally invasive approaches.
- Comparison of perioperative and functional outcomes.

Outcomes

- Perioperative variables (operative time, catheterization time, hospitalization).
- Functional outcomes (IPSS, Qmax, PVR).
- Complications and retreatment rates.
- Safety and efficacy assessments.

Study design

- Randomized clinical trials.
- Prospective and retrospective cohort studies.
- Systematic or narrative reviews providing outcome data on the included techniques.

Exclusion criteria

- Animal studies.
- Case reports or series with fewer than 10 patients.
- Studies lacking outcome data relevant to BPH surgery.
- Conference abstracts or non-peer-reviewed material.

PICOS Framework

P (Population)

Adult male patients with symptomatic benign prostatic hyperplasia.

I (Intervention)

TURP, HoLEP, ThuLEP, or Aquablation.

C (Comparison)

Alternative surgical techniques, standard of care, or baseline values.

O (Outcomes)

Functional improvement, perioperative parameters, complication profile, retreatment rates.

S (Study type)

Clinical trials, observational studies, systematic reviews, and high-quality narrative reviews.

Data Extraction

Data extraction was performed manually using a predefined template. The following information was collected from each study:

- Author, year of publication, and country.
- Study design and sample size.
- Surgical technique evaluated (TURP, HoLEP, ThuLEP, Aquablation).
- Baseline clinical characteristics.
- Perioperative and functional outcomes.
- Complications and adverse events.
- Follow-up duration and retreatment rates.

Extraction was carried out independently by two reviewers; discrepancies were resolved by discussion.

Outcome Measures

Primary outcomes

- Functional improvement (IPSS, Qmax).
- Objective measures of obstruction (PVR).
- Durability and retreatment rates.

Secondary outcomes

- Operative time.
- Length of hospital stay.
- Catheterization duration.
- Perioperative complications (bleeding, infection, capsular perforation).
- Sexual and ejaculatory function (when reported).

Data Synthesis

Due to heterogeneity among study designs, patient populations, and outcome measures, a meta-analysis was not performed. Instead, a narrative synthesis was conducted. Studies were grouped by surgical technique (TURP, HoLEP, ThuLEP, Aquablation), and results were compared qualitatively with emphasis on:

- efficacy,
- perioperative safety,
- complication rates,
- durability of symptom relief.

Findings were summarized to provide an evidence-based comparative overview of contemporary surgical options for BPH.

Results

A total of 15 studies met the inclusion criteria and were analyzed, covering outcomes of TURP, HoLEP, ThuLEP, and Aquablation in the surgical management of benign prostatic hyperplasia [1].

Across the included literature, TURP remained an effective reference procedure, consistently demonstrating significant improvements in urinary flow parameters and symptom relief [13].

However, TURP was also associated with higher perioperative bleeding risk and longer catheterization times compared with laser-based techniques [13].

HoLEP emerged as one of the most robustly supported modalities, with meta-analytic evidence confirming superior functional outcomes, reduced blood loss, and lower retreatment rates compared with TURP [1].

Several studies reported that HoLEP maintained efficacy across all prostate sizes, making it a size-independent alternative to TURP [5].

Additionally, contemporary data demonstrated that HoLEP enabled early mobilization and even same-day discharge in selected patients with large glands ≥ 175 cc [9].

ThuLEP demonstrated similarly favorable perioperative characteristics, with large-volume clinical experience reporting low blood loss, short hospitalization, and consistent symptom improvement [2].

ThuLEP also showed strong hemostatic properties attributed to the continuous-wave thulium laser, contributing to reduced transfusion requirements compared with TURP [2].

Comparative analyses further indicated that thulium-based enucleation offers outcomes closely matching those of HoLEP, particularly regarding Qmax improvement and postoperative IPSS scores [10].

Recent clinical experience with bipolar transurethral enucleation also demonstrated meaningful symptomatic improvement and low perioperative complication rates in early surgeon learning curves [8].

Aquablation was shown to be an effective minimally invasive option, using a high-velocity waterjet under real-time ultrasound guidance to selectively ablate adenomatous tissue [3].

Evidence from updated reviews highlighted consistent improvements in LUTS symptoms with reduced thermal injury and a high rate of ejaculatory function preservation [4].

Aquablation demonstrated shorter resection times than many laser techniques, especially in prostates larger than 80 g, due to its robotically standardized resection pattern [4].

Regarding sexual outcomes, laser-based procedures such as HoLEP and transperineal laser ablation showed lower rates of ejaculatory dysfunction compared with TURP in randomized and retrospective analyses [11].

Studies comparing laser enucleation with plasmakinetic or bipolar techniques emphasized the advantage of laser modalities in limiting thermal spread and capsular damage [14].

Complication rates varied across techniques.

TURP exhibited a higher incidence of bleeding and TUR syndrome compared to laser enucleation [13].

Laser techniques demonstrated reduced intraoperative blood loss, shorter catheterization, and lower overall complication rates, which was consistent across multiple comparative studies [1].

Aquablation showed a distinct complication profile, with low thermal injury-related events but slightly higher early postoperative bleeding requiring tamponade in selected cases [3].

Across all techniques, operative time varied depending on prostate size and surgeon experience.

HoLEP and ThuLEP required longer learning curves but demonstrated stable operative times once proficiency was achieved [5].

Aquablation exhibited shorter procedure times due to its automated resection phase [4].

In summary, all four techniques—TURP, HoLEP, ThuLEP, and Aquablation—demonstrated clinically meaningful improvements in LUTS and urinary flow, with laser enucleation techniques and Aquablation generally offering more favorable perioperative safety profiles compared with TURP [6].

Discussion

The findings of this review indicate that contemporary minimally invasive surgical techniques for benign prostatic hyperplasia provide significant clinical benefits while reducing perioperative morbidity compared with traditional approaches such as TURP [5].

Although TURP remains an effective and widely used procedure, its limitations—including bleeding risk, electrolyte disturbances, and the potential for postoperative ejaculatory dysfunction—have driven the search for safer alternatives [13].

Laser-based enucleation techniques, particularly HoLEP, have demonstrated superior functional outcomes and durability compared with TURP, largely due to their precise enucleation capabilities and improved hemostasis [1].

HoLEP has consistently shown efficacy across all prostate sizes, which distinguishes it from TURP and makes it especially valuable in the management of large gland volumes [5].

Additionally, the feasibility of same-day discharge after HoLEP in selected patients underscores the efficiency and safety of the procedure in modern urological practice [9].

ThuLEP, utilizing a continuous-wave thulium laser, demonstrates similar advantages, offering reduced bleeding, shorter catheterization times, and reliable symptom improvement [2].

Its strong vaporization and coagulation properties further contribute to its favorable perioperative profile, supporting its use as a valid alternative to HoLEP, especially in centers with thulium laser expertise [2].

Comparative evidence suggests that ThuLEP achieves functional outcomes closely parallel to HoLEP, reinforcing its relevance among contemporary BPH surgical options [10].

Aquablation represents an innovative addition to minimally invasive BPH surgery, combining high-velocity waterjet resection with robotic precision and real-time ultrasound guidance [3].

Recent evidence highlights its clinical effectiveness, particularly in large prostates, with advantages including reduced thermal injury and high rates of ejaculatory function preservation [4].

However, its distinct complication profile—most notably early postoperative bleeding—requires careful perioperative management and may limit its applicability in certain patient populations [4].

Sexual function outcomes continue to play a significant role in procedure selection, with evidence indicating that laser ablation techniques and Aquablation may offer better preservation of ejaculatory function compared with TURP [11].

Because postoperative sexual dysfunction affects quality of life and treatment satisfaction, the superior functional preservation of modern techniques represents an important clinical advantage [11].

Despite the advantages of minimally invasive surgery, several challenges persist.

Laser procedures, particularly HoLEP and ThuLEP, are associated with steep learning curves, which may limit their widespread adoption in lower-volume centers [5].

Equipment costs and the need for specialized training represent additional barriers to universal implementation, although long-term clinical benefits may offset these challenges [6].

Similarly, while Aquablation automates the resection phase, its adoption requires access to advanced robotic platforms and may result in increased procedural costs [3].

Overall, the evidence demonstrates a consistent shift toward minimally invasive, tissue-sparing approaches that reduce perioperative morbidity while maintaining or improving functional outcomes [1].

As the technology continues to evolve, surgical decision-making will increasingly rely on individualized approaches that consider prostate size, patient comorbidities, sexual function priorities, and surgeon experience [5].

Additional evidence from bipolar transurethral enucleation studies supports the general trend toward enucleating rather than resecting techniques, showing good perioperative safety in early experiences [7].

The comparative data presented in this review highlight the growing role of laser enucleation and Aquablation as viable and often superior alternatives to TURP in contemporary urological practice [6].

Limitations

Several limitations must be acknowledged when interpreting the findings of this narrative review.

First, the included studies varied considerably in design, population characteristics, and outcome measures, which limits the comparability of results across surgical techniques [5].

The heterogeneity in definitions of perioperative complications, functional endpoints, and follow-up duration restricts the ability to draw uniform conclusions regarding long-term efficacy [6].

Second, although TURP, HoLEP, ThuLEP, and Aquablation were all represented, the quantity of high-quality randomized controlled trials remains limited, with many available studies relying on retrospective analyses or single-center experiences [1].

This is particularly evident for ThuLEP and Aquablation, where evidence is largely derived from observational studies rather than multicenter randomized trials [2].

Third, the learning curve associated with advanced techniques such as HoLEP and ThuLEP may influence perioperative outcomes reported in earlier studies, as surgical proficiency strongly impacts operative time, complication rates, and functional results [5].

The management of patients receiving anticoagulant or antiplatelet therapy remains clinically challenging, although current evidence suggests that minimally invasive approaches may be performed safely in this population when appropriate perioperative precautions are taken [12].

Similarly, the outcomes of Aquablation may vary between centers depending on operator experience, patient selection, and perioperative management strategies [3].

Fourth, several studies reported only short- or mid-term follow-up, limiting the ability to evaluate the durability of symptom relief and the true long-term retreatment rates for each modality [4].

Furthermore, variability in prostate size across studies influences the comparability of outcomes, as certain techniques—particularly Aquablation and HoLEP—may demonstrate different efficacy profiles in small versus large glands [1].

Finally, although this review incorporated 15 relevant studies, the reliance on abstract-only data for some articles may have limited the depth of outcome interpretation [15].

Given these constraints, the findings should be interpreted cautiously, and further well-designed randomized controlled trials with standardized outcome reporting are needed to strengthen comparative evidence across surgical modalities [6].

Conclusions

The contemporary surgical management of benign prostatic hyperplasia demonstrates a clear shift toward minimally invasive, tissue-sparing techniques that offer improved perioperative safety profiles and durable functional outcomes [5].

While TURP remains an effective and widely practiced gold-standard procedure, its higher rates of bleeding, electrolyte disturbances, and sexual dysfunction highlight the growing need for safer alternatives [13].

HoLEP has emerged as a highly effective size-independent technique with superior symptom relief, reduced blood loss, and lower retreatment rates compared with TURP, making it one of the most robustly validated surgical options available [1].

ThuLEP provides comparable functional outcomes and perioperative advantages, supported by strong hemostatic properties and consistent clinical performance in large patient cohorts[2].

Aquablation represents an innovative addition to the therapeutic landscape, offering robot-assisted, ultrasound-guided precision with favorable preservation of ejaculatory function and promising results in larger prostates[4].

However, differences in complication profiles, learning curves, and equipment requirements emphasize that procedure selection should be individualized based on prostate size, patient comorbidities, and surgeon expertise [5].

Overall, the evidence supports the increasing adoption of HoLEP, ThuLEP, and Aquablation as effective alternatives to TURP, each contributing unique advantages to modern BPH management [6].

Continued high-quality randomized controlled trials with standardized outcome reporting are essential to refine comparative effectiveness and guide future clinical decision-making [1].

Disclosure

Author's contributions

Conceptualization: Stanisław Jurkowski, Paweł Buć

Methodology: Łukasz Krzystek, Mikołaj Zalewski

Software: Konrad Zieliński, Karolina Buć

Check: Marianna Rudzińska, Jagoda Józefczyk

Formal Analysis: Michał Mazurek, Stanisław Jurkowski

Investigation: Karolina Ganczar, Jagoda Józefczyk, Paweł Buć

Resources: Łukasz Krzystek, Karolina Ganczar, Mikołaj Zalewski

Data curation: Michał Mazurek, Konrad Zieliński,

Writing - Original draft: Stanisław Jurkowski, Jagoda Józefczyk

Writing - Review & editing: Karolina Buć, Mikołaj Zalewski

Visualization: Łukasz Krzystek, Jagoda Józefczyk, Marianna Rudzińska

Supervision: Michał Mazurek, Konrad Zieliński

Project administration: Karolina Buć, Paweł Buć

All authors have read and agreed with the published version of the manuscript.

Funding Statement: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: Not applicable.

Conflict of Interest Statement: The authors have declared no conflicts of interest.

Declaration of the use of generative AI and AI-assisted technologies in the writing process: In preparing this work, the authors used ChatGPT for the purpose of improving language and readability. After using this tool, the authors have reviewed and edited the content as needed.

REFERENCES

1. Chen, F., Chen, Y., Zou, Y., Wang, Y., Wu, X., & Chen, M. (2023). Comparison of holmium laser enucleation and transurethral resection of prostate in benign prostatic hyperplasia: A systematic review and meta-analysis. *Journal of International Medical Research*, 51(8), Article 3000605231190763. <https://doi.org/10.1177/03000605231190763>
2. Zebić, N., Terzić, V., & Krajina, V. (2023). Thulium:YAG laser enucleation of the prostate (ThuLEP): Our experience in 246 patients. *Acta Clinica Croatica*, 62(Suppl. 2), 104–109. <https://doi.org/10.20471/acc.2023.62.s2.14>
3. Taktak, S., Jones, P., Haq, A., Rai, B. P., & Somani, B. K. (2018). Aquablation: A novel and minimally invasive surgery for benign prostate enlargement. *Therapeutic Advances in Urology*, 10(6), 183–188. <https://doi.org/10.1177/1756287218760518>
4. Vermeulen, L. P., Ordones, F. V., Zarrabi, A. D., & Gilling, P. J. (2025). Making waves: An update on aquablation. *Urologic Clinics of North America*, 52(4), 535–545. <https://doi.org/10.1016/j.ucl.2025.07.009>
5. Srinivasan, A., & Wang, R. (2020). An update on minimally invasive surgery for benign prostatic hyperplasia: Techniques, risks, and efficacy. *World Journal of Men's Health*, 38(4), 402–411. <https://doi.org/10.5534/wjmh.190076>
6. Chung, A. S. J., & Woo, H. H. (2018). Update on minimally invasive surgery and benign prostatic hyperplasia. *Asian Journal of Urology*, 5(1), 22–27. <https://doi.org/10.1016/j.ajur.2017.06.001>
7. Mallikarjuna, C., Nayak, P., Ghose, S. M., Reddy, P. C., Ragoori, D., Bendigeri, M. T., & Reddy, S. (2018). Transurethral enucleation with bipolar energy for surgical management of benign prostatic hyperplasia: Our initial experience. *Indian Journal of Urology*, 34(3), 219–222. https://doi.org/10.4103/iju.IJU_71_16
8. Kim, H., Noh, J., Jung, G., & Jeong, S. J. (2025). Surgical outcomes of transurethral enucleation with bipolar energy for benign prostatic hyperplasia: Single surgeon's initial experience. *BMC Urology*, 25(1), Article 27. <https://doi.org/10.1186/s12894-025-01706-w>
9. Assmus, M. A., Large, T., Lee, M. S., Agarwal, D. K., Rivera, M. E., & Krambeck, A. E. (2021). Same-day discharge following holmium laser enucleation in patients assessed to have large gland prostates (≥ 175 cc). *Journal of Endourology*, 35(9), 1386–1392. <https://doi.org/10.1089/end.2020.1218>
10. Gu, M., Liu, C., Chen, Y. B., Xu, H., Fu, S., Chen, Q., & Wang, Z. (2018). Comparison of Vela and holmium laser enucleation of the prostate: A retrospective clinical trial with a 12-month follow-up. *International Urology and Nephrology*, 50(5), 819–823. <https://doi.org/10.1007/s11255-018-1840-y>
11. Bertolo, R., Iacovelli, V., Cipriani, C., Carilli, M., Vittori, M., Antonucci, M., Maiorino, F., Signoretti, M., Petta, F., Travaglia, S., Panei, M., & Bove, P. (2023). Ejaculatory function following transperineal laser ablation vs TURP for benign prostatic obstruction: A randomized trial. *BJU International*, 132(1), 100–108. <https://doi.org/10.1111/bju.16008>
12. Liang, X., Wu, W., Huang, Y., Zhang, S., Huang, J., Zeng, T., Zhong, F., Yong, L., Duan, X., Chao, C., Gurioli, A., Deng, T., & Wu, W. (2020). Safety of surgery in benign prostatic hyperplasia patients on antiplatelet or anticoagulant therapy: A systematic review and meta-analysis. *Urology Journal*, 18(2), 151–159. <https://doi.org/10.22037/uj.v16i7.5974>
13. Geremew, L. M., Gelaw, S. A., & Beyene, A. D. (2022). Assessing the complications of monopolar transurethral resection of the prostate (M-TURP) using Clavien-Dindo complications grading system. *Ethiopian Journal of Health Sciences*, 32(3), 605–612. <https://doi.org/10.4314/ejhs.v32i3.17>
14. Zhao, Z., Zeng, G., Zhong, W., Mai, Z., Zeng, S., & Tao, X. (2010). A prospective, randomised trial comparing plasmakinetic enucleation to standard transurethral resection of the prostate for symptomatic benign prostatic hyperplasia: Three-year follow-up results. *European Urology*, 58(5), 752–758. <https://doi.org/10.1016/j.eururo.2010.08.026>
15. Wei, J. T., Dauw, C. A., & Brodsky, C. N. (2025). Lower urinary tract symptoms in men: A review. *JAMA*, 334(9), 809–821. <https://doi.org/10.1001/jama.2025.7045>