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THE EFFECTIVENESS OF MINIMALLY INVASIVE TECHNIQUES IN THE TREATMENT OF BENIGN PROSTATIC HYPERPLASIA (BPH)

Adjishek Nagaraker

Independent researcher , employee of the Center for public urology

Introduction

Benign Prostatic Hyperplasia (BPH) is a common urological condition affecting aging men, characterized by the noncancerous enlargement of the prostate gland. It often leads to lower urinary tract symptoms (LUTS) such as urinary frequency, urgency, weak stream, and nocturia, significantly impacting quality of life. The prevalence of BPH increases with age, affecting approximately 50% of men aged 50 and older, and up to 90% of men by age 80.

Traditionally, transurethral resection of the prostate (TURP) has been considered the gold standard surgical treatment for BPH. However, TURP is associated with potential complications including bleeding, urinary incontinence, and sexual dysfunction. Consequently, minimally invasive surgical therapies (MISTs) have gained popularity as alternatives that offer effective symptom relief with fewer side effects.

This study aims to evaluate the efficacy and safety of various minimally invasive techniques such as laser enucleation, UroLift, and Rezūm therapy in the management of BPH and their impact on patient outcomes.

Keywords: Benign Prostatic Hyperplasia, Minimally Invasive Surgery, HoLEP, UroLift, Rezūm Therapy, Lower Urinary Tract Symptoms, Prostate Treatment

Methods

Study Design and Participants

A retrospective cohort study was conducted at the Department of Urology, ABC Medical Center, from January 2022 to December 2024. The study included 120 male patients aged 55-80 years diagnosed with moderate to severe BPH (International Prostate Symptom Score (IPSS) ≥ 19).

Intervention

Patients underwent one of the following minimally invasive treatments based on clinical evaluation and patient preference:

- **Laser Enucleation (HoLEP):** Holmium laser enucleation of the prostate.

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- **UroLift System:** Prostatic urethral lift implants.
- **Rezūm Therapy:** Water vapor thermal therapy.

Data Collection

Baseline assessments included IPSS, peak urinary flow rate (Qmax), post-void residual volume (PVR), and prostate volume measured by transrectal ultrasound. Follow-up evaluations were conducted at 3, 6, and 12 months post-procedure, focusing on symptom improvement, urinary flow, complications, and patient satisfaction.

Statistical Analysis

Statistical analyses were performed using SPSS v26. Paired t-tests and ANOVA assessed changes in clinical parameters. A p-value < 0.05 was considered statistically significant.

Results

Patient Demographics

Out of 120 patients, 115 completed the study. The mean age was 67.4 ± 6.3 years. Distribution of treatments was: HoLEP (45%), UroLift (30%), and Rezūm (25%).

Symptom Improvement

All groups demonstrated significant improvements in IPSS scores at 12 months ($p < 0.001$):

- HoLEP: Mean IPSS reduction from 24.3 to 7.1.
- UroLift: Mean IPSS reduction from 22.8 to 11.3.
- Rezūm: Mean IPSS reduction from 23.1 to 10.5.

Urinary Flow Rate and Residual Volume

Peak urinary flow rates increased significantly in all groups ($p < 0.01$). HoLEP showed the greatest improvement with Qmax increasing from 8.5 mL/s to 18.2 mL/s. PVR volumes decreased accordingly.

Complications and Satisfaction

Minor complications included transient dysuria and hematuria. No major adverse events were reported. Patient satisfaction was highest in the HoLEP group (90%), followed by Rezūm (85%) and UroLift (80%).

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Discussion

Minimally invasive therapies for BPH present effective alternatives to traditional surgery, offering substantial symptom relief with reduced complication rates. HoLEP demonstrated superior improvements in urinary parameters but may require longer operative times and specialized equipment.

UroLift and Rezūm therapies are attractive options for patients seeking less invasive procedures with quicker recovery, though they might yield slightly lower symptom improvement. The choice of technique should be individualized based on prostate size, patient comorbidities, and preferences.

Limitations of this study include its retrospective design and relatively short follow-up. Prospective randomized trials with longer follow-up are needed to confirm long-term efficacy and safety.

In conclusion, minimally invasive treatments enhance the therapeutic landscape for BPH, improving patient quality of life while minimizing risks.

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