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COMPARISON OF TRANSURETHRAL RESECTION OF THE PROSTATE (TURP) VERSUS TRANSURETHRAL INCISION OF THE PROSTATE (TUIP) FOR SMALL-SIZED (<30G) PROSTATE: A RANDOMIZED CONTROLLED TRIAL

Dr Danish Sagheer[*1], Dr Rafia Mehmood[2]

[*1]*PGR urology, Dr Faisal Masood teaching hospital, Sargodha*
[2]*House officer, Dr Faisal Masood teaching hospital, Sargodha*

[*1]danishsagheer3@gmail.com, [2]mehmood.rafia91@gmail.com

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Corresponding Author: *
Dr Danish Sagheer

Abstract

Background: *Benign prostatic hyperplasia (BPH) is a common cause of lower urinary tract symptoms (LUTS) in elderly men. While TURP remains the standard surgical option, TUIP has emerged as an alternative, especially for prostates under 30 grams.*

Objective: *To compare the efficacy and safety of TURP versus TUIP in men with prostate size <30 grams in terms of operative time, catheterization duration, hospital stay, urinary flow improvement, and perioperative complications.*

Study Design: *Randomized Controlled Trial.*

Setting & Duration: *This trial was conducted in the Department of Urology, DHQ Teaching Hospital, Sargodha, from 26th July 2024 to 25th January 2025.*

Patients & Methods: *Fifty male patients aged 60–80 years with symptomatic BPH and prostate size <30 grams were randomized to either TURP (n=25) or TUIP (n=25). Operative time, catheterization duration, hospital stay, and maximum urinary flow rate (Qmax) were compared. Data were analyzed using SPSS version 27. Independent t-tests were used for continuous variables and Chi-square test for categorical variables.*

Results: *TUIP was associated with significantly shorter operative time (19.8 ± 3.6 min vs. 76.36 ± 33.43 min; p<0.05), shorter hospital stay (2.08 ± 1.51 days vs. 4.08 ± 1.41 days; p<0.05), and shorter catheterization duration (2.4 ± 1.3 days vs. 3.84 ± 2.01 days; p<0.05). TUIP also resulted in greater improvement in Qmax (19.8 ± 2.5 ml/s vs. 17.16 ± 1.37 ml/s; p<0.05). Perioperative complication rates were comparable.*

Conclusion: *TUIP is an effective alternative to TURP for small prostates, with shorter operative time, faster recovery, and comparable symptom relief. Larger multicenter studies with longer follow-up are recommended.*

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most common urological conditions in aging men, with its prevalence rising significantly after the age of 60 years [1]. BPH causes lower urinary tract symptoms (LUTS) such as weak urinary stream, increased frequency, nocturia, and incomplete bladder emptying [2].

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While medical therapy remains the first-line treatment, some patients eventually require surgical intervention when symptoms persist or complications develop [3].

Transurethral resection of the prostate (TURP) has long been considered the gold standard for surgical management of BPH [4]. TURP involves resection of prostatic tissue to relieve obstruction but is associated with risks such as bleeding, retrograde ejaculation, erectile dysfunction, and, rarely, transurethral resection (TUR) syndrome. Notably, the risk of TUR syndrome is rare in small prostates due to lower irrigation fluid absorption [5].

Transurethral incision of the prostate (TUIP) is a less invasive alternative recommended primarily for prostates under 30 grams [6]. TUIP involves making one or two deep incisions at the bladder neck and prostatic urethra without removing tissue. This technique preserves more normal prostate tissue, potentially minimizing complications while still improving urinary flow [7]. Despite these theoretical advantages, TUIP remains underutilized in many settings, partly due to limited comparative evidence and surgeon preference for TURP [8].

Although some studies have compared these two procedures, there is still a lack of consensus regarding their relative benefits for small prostates. This gap is particularly relevant in resource-limited regions where shorter operative time, lower costs, and faster recovery can significantly impact patient care and hospital burden. Therefore, this randomized controlled trial aimed to compare the efficacy and safety of TURP versus TUIP for prostates less than 30 grams in a tertiary care setting.

MATERIALS AND METHODS

Study Design: Randomized Controlled Trial.

Setting: Department of Urology, DHQ Teaching Hospital, Sargodha, from 26th July 2024 to 25th January 2025.

Participants: Male patients aged 60–80 years with symptomatic BPH and prostate size <30g were included. Exclusion criteria were suspected prostate cancer, previous prostate surgery, neurogenic bladder dysfunction, or urethral stricture disease.

Sample Size & Sampling: Sample size of 50 patients was calculated using the WHO calculator (CI 95%, margin of error 5%). Non-probability convenience sampling was used.

Randomization: Patients were randomized to TURP or TUIP groups using computer-generated random numbers and allocation concealment with sealed opaque envelopes.

Surgical Procedures:

TURP: Performed using a resectoscope to remove obstructing prostatic tissue circumferentially.

TUIP: Two deep incisions at 5- and 7-o'clock positions using a Collins knife without tissue removal.

Outcome Measures:

Primary: Operative time, catheterization duration, hospital stay, Qmax improvement.

Secondary: Perioperative complications (bleeding, urinary incontinence, sexual dysfunction).

Data Analysis: Data were analyzed using SPSS version 27. Continuous variables were compared using the Independent Samples t-test; categorical variables using the Chi-square test. A p-value <0.05 was considered significant.

RESULTS

Fifty male patients, mean age 68.7 ± 5.0 years, were enrolled and randomized equally to TUIP (n=25) and TURP (n=25). The mean preoperative prostate volume was 28.3 ± 1.4g. Common symptoms included poor urinary stream, increased frequency, nocturia, and incomplete voiding. The mean preoperative Qmax was 8.3 ± 1.9 ml/s across both groups.

Primary Outcomes:

Operative time: TUIP 19.8 ± 3.6 min, TURP 76.36 ± 33.43 min ($p<0.05$)

Hospital stay: TUIP 2.08 ± 1.51 days, TURP 4.08 ± 1.41 days ($p<0.05$)

Catheterization duration: TUIP 2.4 ± 1.3 days, TURP 3.84 ± 2.01 days ($p<0.05$)

Qmax improvement: TUIP 19.8 ± 2.5 ml/s, TURP 17.16 ± 1.37 ml/s ($p<0.05$)

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Secondary Outcomes:

Minimal complications were observed. Minor bleeding occurred in 1 TUIP patient and 2 TURP patients. One TURP patient had transient urinary incontinence. No significant postoperative sexual dysfunction was reported during the short follow- up.

DISCUSSION

The present randomized controlled trial demonstrates that TUIP provides significant perioperative advantages over TURP in patients with small prostates (<30 grams). TUIP resulted in significantly shorter operative time, shorter catheterization duration, shorter hospital stay, and slightly better improvement in Qmax. These findings are consistent with earlier studies. Abd-El Kader et al. [6] found TUIP and TURP provide comparable symptom relief but TUIP achieves shorter operating time and faster recovery. Sciacqua et al. [3] emphasized that minimally invasive approaches like TUIP can reduce perioperative morbidity while maintaining symptom improvement.

Lerner et al. [5] confirmed that TUIP is an effective option in patients with smaller glands and no significant median lobe enlargement. The low complication rate in the TUIP group aligns with Miernik and Gratzke [2], who reported reduced risk of bleeding and TUR syndrome due to minimal tissue manipulation.

Compared to modern ablative techniques like Aquablation, TUIP remains a straightforward, cost-effective option [4]. Franco et al. [1] also noted TUIP's relevance in settings with limited resources and basic endoscopic equipment.

However, TUIP is not recommended for larger prostates or significant median lobe hypertrophy [7]. This emphasizes the importance of proper patient selection.

Limitations: This study is limited by its small sample size, single-center design, and short follow-up duration. Future multicenter studies with longer follow-up are needed to validate long-term outcomes.

CONCLUSION

TUIP is a safe and effective minimally invasive alternative to TURP for prostates under 30 grams, providing comparable or superior symptom relief with shorter operative time and faster recovery. Larger multicenter studies are recommended to confirm long-term outcome

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