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CLINICAL OUTCOMES OF TRIAL WITHOUT CATHETER IN ACUTE URINARY RETENTION DUE TO BENIGN PROSTATIC ENLARGEMENT: A 24-HOUR VERSUS 5 DAY APPROACH

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ABSTRACT:

Introduction: In older men, benign prostatic hyperplasia (BPH)-induced acute urine retention (AUR) is a urological emergency. The best time to remove a catheter is still up for debate, despite the fact that Trial without Catheter (TWOC) is currently a common conservative technique. While delayed TWOC (after 5 days) may increase success rates by enabling greater recovery with α-blocker medication, early TWOC (after 24 hours) may lower infection risk and hospital stay.

Materials & Methods: This non-randomized controlled study was carried out at the Ayub Teaching Hospital's Department of Urology in Abbottabad between October 2025 and December 2025. 186 patients with acute urinary retention between the ages of 50 and 80 years were included. Patients with severe bladder or urethral abnormalities (such as strictures, stones, pelvic injuries, acute prostatitis, or cancers), neurogenic bladder or other neurologic diseases that impair bladder function, deranged renal function tests, and contraindications to TWOC were not included. Patients were split into two groups according to hospital protocol and doctor discretion rather than at random. Trial without Catheter (TWOC) was performed on patients in Group A 24 hours later, and on patients in Group B 5 days later. To evaluate the effectiveness of TWOC, the post-void residual (PVR) volume was measured after the procedure, and the need for re-catheterization was recorded.

Results: A statistically significant difference was seen in the TWOC success rate, which was 52.69% in group A and 69.89% in group B ($p = 0.096$). However, group B experienced considerably more problems, including urine leakage, infection, hematuria, and catheter blockage (40.86% vs. 22.58%, $p = 0.007$).

Conclusion: After a urinary retention episode in BPE, the success rate of TWOC is found to be much higher with longer catheterization times. When the urinary catheter is removed on Day 5 of the retention episode, the chances of success are much higher than when it is removed on Day 1, although the risk of morbidity or catheter-related infections is not significantly increased. **Keywords:** acute urinary retention, benign prostatic hyperplasia, trial without catheter.

INTRODUCTION:

Acute urine retention (AUR) caused by benign prostatic hyperplasia (BPH) is a urological emergency that necessitates immediate catheterization and has historically frequently resulted in prostatic surgery.[1] In the past, the majority of patients underwent trans urethral resection of the prostate (TURP), which was the mainstay of treatment. However, more recently, a Trial Without Catheter (TWOC) has become a standard approach worldwide, in which the catheter is temporarily removed to see if the patient can urinate on their own without the need for additional catheterization.[2] Alpha-blockers are frequently recommended prior to TWOC to increase the likelihood of success since they alleviate symptoms and enhance urine flow by addressing the elevated sympathetic activity in the prostatic smooth muscles, which frequently leads to AUR.[3]

Higher 30-day death rates and a higher chance of postoperative complications have been linked to emergency surgery. Additionally, the increased use of Trial Without Catheter (TWOC) has been prompted by the morbidity linked to extended catheterization. About 60% of patients are able to empty spontaneously with TWOC, which involves removing the catheter after two to three days of α–blocker medication.[4]

A large, double-blind, placebo-controlled experiment showed that α_1-blockers had a positive effect on

TWOC success. 360 men with AUR were randomly randomized to receive either a placebo or alfuzosin 10 mg once daily for two to three days prior to TWOC.[5] A small number of studies have also demonstrated that, despite having a lower risk of catheter-related infections, pain, discomfort, and hospital stays, earlier TWOC combined with concurrent alpha blocker use had greater failure rates than late removal combined with concurrent alpha blocker use. A 2023 study found that TWOC had a greater success rate when performed three to seven days following catheterization.[6] Extended catheterization (>3 days) was linked to higher comorbidity and longer hospital stays because of adverse events, according to a global analysis of 6,074 men. Catheterization for more than three days was associated with higher TWOC success rates, according to this survey's univariate analysis. The length of catheterization before TWOC, however, was no longer a significant factor in multivariate analysis. Given that prolonged catheterization significantly raises the risk of problems like catheter blockage, urine leakage, and urinary tract infections. Therefore, in order to lower comorbidities and medical expenses, efforts should be

undertaken to shorten catheterization times.[7,8]

In older men, benign prostatic hyperplasia (BPH)-induced acute urine retention (AUR) is a urological emergency. The best time to remove a catheter is still up for debate, despite the fact that Trial without Catheter (TWOC) is currently a common conservative technique. While delayed TWOC (after 5 days) may increase success rates by enabling greater recovery with α-blocker medication, early TWOC (after 24 hours) may lower infection risk and hospital stay. There is, however, a dearth of local data contrasting these two strategies. The purpose of this study is to ascertain the success rate of a trial without a catheter in patients who present to the urology department of Ayub Teaching Hospital Abbottabad with acute urine retention due to an enlarged prostate after 24 hours and 5 days.

METHODOLOGY:

This non-randomized controlled study was carried out at the Ayub Teaching Hospital's Department of Urology in Abbottabad between October 2025 and December 2025. The ethical review committee approved the trial before it started. The WHO sample size calculator was used to determine the sample size, which had an 80% power and a 95% confidence level. Trial Without Catheter (TWOC) was expected to be 50% effective in Group A (TWOC after 24 hours)[9] and 70% effective in Group B (TWOC after 5 days).[10] 186 will be the sample size (93 in each group). Acute urinary retention (a sudden, usually painful suprapubic discomfort caused by a distended bladder due to the inability to void, despite continuous and forceful attempts to urinate, assessed on the patient's history and clinical examination) is successfully catheterized in patients between the ages of 50 and 80. Included were patients who were started on alpha blockers after catheterization. Patients with severe bladder or urethral abnormalities (such as strictures, stones, pelvic injuries, acute prostatitis, or cancers), neurogenic bladder or other neurologic diseases that impair bladder function, deranged renal function tests, and contraindications to TWOC were not included.

Patients were split into two groups according to hospital protocol and doctor discretion rather than at random. Trial without Catheter (TWOC) was performed on patients in Group A 24 hours later, and on patients in Group B 5 days later. To evaluate the effectiveness of TWOC, the post-void residual (PVR) volume was measured after the procedure, and the need for re-catheterization was recorded. The PVR volume was less than 100 mL, as determined by ultrasound, and there was no need for re-catheterization within 24 hours

of the catheter being removed. Any other circumstance is regarded as its failure. Prior to the intervention, baseline data was collected for each participant. Age, height, weight, body mass index (BMI), and pertinent medical history were among the demographic information recorded. Prostate volume was measured in milliliters (mL), and prostate size was assessed using pelvic ultrasonography. The International Prostate Symptom Score (IPSS) questionnaire was used to gauge the severity of the symptoms. Ultrasound was also used to quantify the post-void residual volume (PVR), which is the volume of pee left in the bladder after voiding.

IBM SPSS software, version 25.0, was used to analyze the data. The dataset was summarized using descriptive statistics: quantitative variables like age, BMI, duration of retention, prostate volume, Postvoid residual volume (baseline + post-TWOC), PSA, and IPSS QoL score were expressed as Mean ± Standard Deviation (SD), while categorical variables like group, comorbidities, prostate intervention history, urine culture result, TWOC outcome, re-catheterization, and follow-up results were presented as frequencies and percentages. Either the Chi-square test or Fisher's exact test was used to assess the effectiveness of treatment between Group A and Group B, with a p-value of ≤0.05 being regarded as statistically significant.

RESULTS:

With a mean age of 69.55 ± 7.32 years, the study's participants ranged in age from 50 to 80. The mean ages of the patients in groups A and B were 67.45 ± 5.92 and 68.50 ± 7.95 years, respectively. Of the 102 patients, most (54.84%) were between the ages of 66 and 80 years. Table I displays the distribution of the various variables. The average weight of the prostate was 61.10 ± 9.03 grams. Table II shows that groups A and B had average prostate sizes of 62.10 ± 8.82 and 59.94 ± 8.99 grams, respectively. In group A, the mean length of urine retention was 4.53 ± 2.13 days, while in group B, it was 3.94 ± 1.87 days. For group A, the mean IPSS and PSA were 2.78 ± 1.34 ng/ml and 11.23 ± 4.62, respectively, while for group B, they were 2.46 ± 1.29 ng/ml and 12.42 ± 4.58, respectively. Group A's baseline post-void urine volume was 69.43 ± 12.34 ml, whereas group B's was 70.12 ± 11.29 ml. As indicated in Table II, the post-TWOC post void urine volume was 28.54 ± 6.87 ml in group A and 22.43 ± 5.42 ml in group B (p-value = 0.0001). A statistically significant difference was seen in the TWOC success rate, which was 52.69% in group A and 69.89% in group B (p = 0.096) (Table III). However, as indicated in Table IV, group B experienced considerably more

problems, including urine leakage, infection, hematuria, and catheter blockage (40.86% vs. 22.58%, p = 0.007).

Table-I: Distribution of different variables (n=186).

		Group A (n=93)	Group B (n=93)
		Number (%)	Number (%)
Age (years)	**50-65**	41 (44.09%)	43 (46.24%)
	66-80	52 (55.91%)	50 (53.76%)
Prostate size	**≤50**	67 (72.04%)	64 (68.82%)
	>50	26 (27.96%)	29 (31.18%)
BMI (kg/m²)	**≤30**	57 (61.29%)	53 (56.98%)
	>30	36 (38.71%)	40 (43.01%)
DM	**Yes**	49 (52.69%)	45 (48.39%)
	No	44 (47.31%)	48 (51.61%)
HTN	**Yes**	43 (46.24%)	44 (47.31%)
	No	50 (53.76%)	49 (52.69%)
H/o prostatic intervention	**Yes**	11 (11.83%)	14 (15.05%)
	No	82 (88.17%)	79 (84.95%)
Urine culture	**Normal**	66 (70.97%)	63 (67.74%)
	UTI	27 (29.03%)	30 (32.26%)

Table-II: Descriptive statistics.

	Group A (n=93)	Group B (n=93)	Pvalue
	Mean ± SD	Mean ± SD	
Age (years)	67.45 ± 5.92	68.50 ± 7.95	**0.460**
Prostate size (grams)	62.10 ± 8.82	59.94 ± 8.99	**0.233**
BMI (kg/m²)	27.43 ± 5.31	26.89 ± 4.51	**0.456**
Duration of retention (days)	4.53 ± 2.13	3.94 ± 1.87	**0.046**
PSA (ng/ml)	2.78 ± 1.34	2.46 ± 1.29	**0.098**
IPSS			11.23 ±
Baseline post void urine volume (ml)			69.43 ±
Post-TWOC post void urine volume (ml)			28.54 ±

Table-III: Comparison of efficacy (n=186).

	Group A (n=93)	Gro
	Yes	No	Yes
Efficacy	49 (52.69%)	44 (47.31%)	65 (69

Table-IV: Comparison of complications (n=186).

	Group A (n=93)	Gro
	Yes	No	Yes
Complications	21 (22.58%)	72 (77.42%)	38 (40

DISCUSSION:

Acute urine retention is inhibition caused by benign prostatic hyperplasia that blocks the urethra. Prostatic cancer, urethral stricture, blood clots, constipation, acute prostatitis, urethritis, neurological reasons, anticholinergic and sympathomimetic medication effects, and overfilling the bladder, frequently when intoxicated, are other causes.[11] It is often advised to leave the catheter in place following initial urethral catheterization therapy, since it has been observed that 50% of patients experience acute urine retention within a week if the bladder is simply emptied and the catheter is removed right away.[12] However, the risk of problems such infection, trauma, strictures, and erosion increases with the length of time

the catheter is left in place. Therefore, although the ideal duration has not been determined, trial without catheter (TWOC) is advised after 2–7 days.[13] Starting alpha-blocker therapy prior to TWOC is advantageous and lowers the likelihood of recurrent acute urine retention when benign prostatic hyperplasia is the likely etiology. However, 40% of patients on alpha-blocker treatment are known to experience TWOC failure.[14]

Both groups of patients in our study had similar fundamental clinic-demographic features. It is consistent with Madduri et al.[15] that the mean age of onset in our study was 67.45 ± 5.92 years (mean ± standard deviation) for the monopolar group and 68.50 ± 7.95 years (mean ± standard deviation) for the bipolar group. The observed behavior might have something to do with the way BPH typically shows up later in life, after the age of sixty.

Numerous studies have been carried out globally that examine several aspects that influence the success of TWOC in patients with BPH, such as the patient's age, their American Urological Association (AUA) score, and whether or not they are receiving alpha-blocker medication. The efficiency of various alphablocker kinds in TWOC success, among many other criteria, has been compared in previous studies. There is a dearth of information and research examining the effect of longer catheterization days on TWOC success rates. Critics of prolonged catheterization advocate for removing the catheter after the usual three days, citing the higher morbidity associated with a seven-day catheterization because of the possibility of hematuria, urinary tract infections[16], and limitations in daily activities and movement. Aseptic procedures, the use of antibiotics in vulnerable populations[17], the use of leg bags and plug bags with lock-out valves[18], and multimodal catheter management can all prevent this. Furthermore, an additional four days of catheterization results in a very slight difference in catheterization complications, but it also significantly increases the success rate of TWOC and may prevent TURP surgery and related consequences. In a time when non-invasive and minimally invasive treatment approaches are common, our research has demonstrated that longer catheterization times for TWOC are associated with higher success rates when other variables, such as patient age, prostate volume, and AUA score, are standardized.

In contrast to our study, which found a significant difference of 5 days of catheterization and a significant reduction in re-catheterization, another study conducted in India found that prolonged catheterization does not significantly affect the chances of

success after TWOC.[19] The overall success rate of TWOC was approximately 61% after 5 days of catheterization in a large worldwide survey published by the British Journal of Urology.[20] Days of catheterization, or early vs late TWOC, are a topic of significant dispute in the literature[21] with urologists offering concrete explanations on both sides. Similar to our findings, another study revealed a marginally higher TWOC success rate following a longer catheterization period. With a slight variation in the adverse effects associated with catheterization, our study has demonstrated that a seven-day catheterization increases the likelihood of success and results in a significantly lower rate of re-catheterization when compared to an early threeday TWOC.[22]

In a prospective, randomized, placebo-controlled study, patients with acute urinary retention (AUR) caused by benign prostatic obstruction were randomly assigned to receive either a placebo or sustainedrelease (SR) alfuzosin, an α_1-selective adrenergic blocker, at a dosage of 5 mg twice daily for 48 hours. 24 hours after starting therapy, the catheter was removed, and 55% of patients taking alfuzosin were able to successfully empty.[9]

Total 260 men with acute urinary retention due to benign prostatic hyperplasia participated in a randomized controlled experiment in which they were given silodosin for three or seven days before having their catheters removed. There was no statistically significant difference in the TWOC success rate between the 3-day and 7-day groups, which were 57% and 68%, respectively ($p = 0.096$). Nonetheless, the 7-day group experienced considerably more problems, including urine leakage, infection, hematuria, and catheter blockage (48.5% vs. 16.2%, $p < 0.001$). The scientists came to the conclusion that although silodosin makes TWOC more successful, longer catheterization is linked to more side effects and does not improve success rates.[10]

However, our study's shortcomings include a limited sample size and variations in variables that impact the success rate of TWOC, such as prostate volume. Although we made an effort to reduce this by using suitable inclusion and exclusion criteria and significantly standardizing these parameters among the patients in our study, we intend to address these aspects and their influence on the effectiveness of TWOC in subsequent research.

CONCLUSION:

After a urinary retention episode in BPE, the success rate of TWOC is found to be much higher with longer catheterization times. When the urinary catheter is removed on Day

5 of the retention episode, the chances of success are much higher than when it is removed on Day 1, although the risk of morbidity or catheter-related infections is not significantly increased. A relatively longer catheterization period can be crucial in protecting the patient from needless surgical procedures like TURP and the complications that arise in the event of TWOC failure and re-catheterization. This states that following an acute bout of urine retention in BPE, five days of catheterization is preferable than twenty-four hours of catheterization.

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