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**ORIGINAL RESEARCH**

# A prospective randomised controlled trial to compare the urinary catheter removal after 24 hours verses 72 hours following vaginal hysterectomy with cystocele repair

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**Abstract**

**Objective:** To evaluate the risks and benefits associated with early (24 hours) and late (72 hours) urinary catheter removal following vaginal hysterectomy with cystocele repair.

**Materials and Methods:** Candidates for vaginal repair surgery were 200 women with utero vaginal prolapse with cystocele with or without rectocele stage II to stage IV according to the Pelvic Organ Prolapse Quantifications System, without stress urine incontinence and without recurring urinary tract infections. At the time of the intervention, a urinary catheter (Foley 16) was placed, and it was randomly removed from two groups of patients 24 hours (100 patients) and 72 hours (100 patients) later. Preventive intravenous antibiotics were given for 24 hours to first group and 72 hours for second group. Urine culture was used to detect urinary tract infection (UTI). All the candidates were observed post operatively for any acute urinary retention (AUR) after 8 hours of catheter removal. Calculating percentage frequencies and looking for differences using the chi-square test ($x^2$).

**Results:** 4%, and 11%, respectively, of the participants in groups 1 and 2 had UTI. Urinary catheterization time and the presence of UTI were not statistically significantly associated ($x^2$ =3.53, p=0.06). AUR was found among 5% and 1% of the participants respectively in group 1 and 2. AUR was not statistically significantly associated (p=0.18). Recatheterization was 2% and 1% respectively in group 1 and 2, which again is statistically not significantly associated (p=0.56). 2% and 100% respectively, of the participants in groups 1 and 2 had hospital stay for more than 3 days with is statistically significant (p= <0.01)

**Conclusion:** Catheter removal after 24 hours of vaginal hysterectomy with cystocele repair reduces the hospital stay, UTI rates and catheter related discomfort of the patient and increases the patient satisfaction level.

**Keywords:** Urinary Catheter; Prolapse; Vaginal Surgery; Urinary Tract Infection; Post-Operative Urinary Retention; Urine Culture

## Introduction

In cases of pelvic organ prolapse (POP), vaginal reconstruction surgery has its own intra-operative risks, including bleeding, vaginal infection, bladder, ureteral, or intestinal injury, as

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well as postoperative risks, including febrile morbidity, urine retention, and urinary tract infections. [1,2] Transurethral bladder catheterization is utilised during vaginal prolapse surgery to regulate urine production, lower the risk of bladder injury, and avoid post-operative urinary retention. There are two common types of urinary catheters. Suprapubic catheters implanted through the abdomen to lower the risk of urinary tract infection and transurethral catheters left in situ for at least 24 hours to prevent acute post-operative urine retention (AUR).

Over the time, the amount of time the catheter remains in the bladder has decreased. It typically relies more on individualised expertise than knowledge supported by evidence. All of this results in a wide range of catheter durations in the bladder. [3] Following a vaginal hysterectomy with cystocele repair, regular bladder catheterization is normal for up to five days. Prolonged catheterization has detrimental impacts on postoperative wellbeing as well as raises the risk of UTI, prevents early ambulation, and extends hospital stay. [3-7] Contrarily, short-term catheterization allows for early mobilisation following surgery while reducing hospital costs and length of stay. [8-10] After gynaecological surgery, the time needed for bladder draining to prevent urinary retention varies greatly. [11]

Early catheter removal can cause AUR because of the reflex pain at the surgical site, and overfilling the bladder after prolapse surgery could harm the surgical result. [6] Rather than being supported by research, the length of the catheter stay following surgery is determined by habit. After urogenital surgery, a Cochrane study of catheter policy was unable to provide any conclusive advice. [12] As a result, the goal of the current study was to examine the postoperative consequences of early versus late urinary catheter removal following vaginal hysterectomy and assess their usefulness.

**Materials and methods**

The study was planned as a prospective, randomised one. Patients were chosen between March 2021 and March 2022. The Institutional Ethical Committee gave the study their seal of approval. After learning about the study, each patient who was included in it completed a consent form. The inclusion criteria were utero-vaginal prolapse with a cystocele, stage II or more on the POP-Q scale, and that indicated a need for site-specific vaginal repair surgery. Women with stage I prolapse, stress urinary incontinence, a history of urinary retention, preoperative urinary tract infection, renal function compromise parameters (blood urea >40 mg/dl, serum creatinine >1 mg/dl), diabetics, patients with intraoperative bladder injury, and participants who refused to provide informed consent were excluded from the study. The participants in the study were admitted to the hospital where they underwent a comprehensive physical examination and had their medical histories documented. The following factors were recorded: age, menopausal status, prolapse stage (POP-Q), and the kind of intervention used. All patients had a urinary catheter (Foley 16) placed at the time of the intervention. Spinal anaesthesia was administered to the patients. Following the intervention, a liquid diet was initiated after 6 to 8 hours after assessing the bowel sounds and then a regular diet was resumed after 24 hours. Intravenous antibiotics were given to all patients. Two groups of patients who underwent vaginal repair surgery using native tissues were involved in this randomised clinical research. The same surgical team performed surgeries on all of the patients. An independent researcher's sealed, sequentially-numbered envelopes were used for randomization.

Following surgery, the urine catheter was withdrawn in two groups—groups 1 and 2—24 and 72 hours postoperatively, according to randomization. If the patient did not void on their own after 2-3 hours of catheter removal, patient was given analgesics, hot fomentation and motivation to pass urine by herself, a re-catheterization was done after 8 hours of watchful

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expectancy. Urine culture and a microscopic analysis of the urine were routinely carried out on the third day following the operation. A positive urine culture with >100,000 CFU/ml was considered to be postoperative bacteriuria and the patients were given oral antibiotics per culture report for 5 days. Length of stay was outlined as the period of time between surgery and hospital discharge. The re-catheterization rate, the chance of UTI based on urine culture results, and the length of hospital stay were the variables that were examined. The calculation of the percentage frequencies from the statistical analysis was taken into consideration, and the chi-square test ($x^2$) was employed to look for associations.

**Results**

For this study, 200 women in total were included. They were divided into two groups, with 100 being placed in group 1 and 100 being placed in group 2. The reasons why each woman underwent vaginal surgery were similar. Table 1 displays the age and menopausal status. There were no significant intraoperative issues necessitating the withdrawal of a patient from the study. Patients were separated into four age groups: those under 51, between 51 and 60, between 61 and 70, and those over 71. The standard deviation was 10.62, with a mean age of 63.49. The majority of vaginal hysterectomies with pelvic floor reconstruction were performed on women between the ages of 60 and 69. Most patients (90.5%) are postmenopausal females. According to the POP-Q quantification system, the degree of prolapse at the time of surgery was 22.5% with POP-Q II, 35% with POP-Q III, and 42.5% with POP-Q IV (Table 1).

**Table 1: Participant characteristics**

| Groups | 1(24 hrs) N=100 (%) | 2 (72 hrs) N=100 (%) | Total N=200 (%) |
|---|---|---|---|
| Premenopausal | 11 | 8 | 9.5 |
| Postmenopausal | 89 | 92 | 90.5 |
| Age ≤50 | 11 | 8 | 9.5 |
| Age 51–60 | 15 | 13 | 14 |
| Age 61- 70 | 63 | 66 | 64.5 |
| Age ≥71 | 11 | 13 | 12 |
| POP QII | 23 | 22 | 22.5 |
| POP Q III | 34 | 36 | 35 |
| POP Q IV | 43 | 42 | 42.5 |

In groups 1 and 2, UTI was seen in 4% and 11% of patients postoperatively, respectively. UTI presence was not associated with bladder catheterization time in a statistically meaningful way. 3% of all patients were found to have AUR, with group 1 making up the majority of cases. 5% of the 100 patients in group 1 got AUR but two of them needed re-catheterization. One of the patients in group 2 had retention and needed re-catheterization . As the difference between AUR was not statistically significant, there were no differences between the groups. Most patients stayed in the hospital for 28 to 30 hours in group 1 and 78 to 80 hours in group. 100% patients in group 2 had hospital stay more than 72 hours but only 2% patients in group 1 ($p<0.01$) which is statistically significant (Table 2). 2.4% of patients in group 1 and 13% of patients in group 2 had positive bacterial cultures, respectively E. coli (67%), Klebsiella pneumoniae (22%) and Proteus mirabilis (11%), were the most prevalent bacteria.

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**Table 2: A comparison of the rates of UTI, AUR and hospital stay in the groups**

| Groups | 1(24 hrs) N=100 (%) | 2 (72 hrs) N=100 (%) | Total N=200 (%) | Chi Square | p value |
|---|---|---|---|---|---|
| UTI | 4 | 11 | 7.5 | 3.53 | 0.06 |
| AUR | 5 | 1 | 3 | 2.74 | 0.18 |
| Re-catheterization | 2 | 1 | 1.5 | 0.34 | 0.56 |
| Hospital stays 3 days | 2 | 100 | 51 | 192.08 | <0.01 |

## Discussion

The practise of keeping a urine catheter in the bladder for an extended period of time following surgery has evolved over time. Evidence and practical experience have demonstrated that there was no additional benefit to extending the use of a urinary catheter. In order to monitor the urine output and avoid postoperative urinary retention, the urinary catheter is frequently utilised. The procedure of catheterizing the bladder is not risk-free. UTIs acquired in hospitals are linked to urinary catheter use. Catheterization lengthens costs money to cure, and is uncomfortable for patients.

The authors of a prior study that examined catheter removal after one day and three days [13] talked about preoperative precautions to avoid acute urine retention. A group of patients who had their urinary catheters removed right away after surgery was described in another study. [10] The authors advised carefully monitoring the patient's voiding and withdrawing the urine catheter three hours after insertion.

Due to the lingering effects of regional anaesthetic following the administration of intra-spinal opioids, the prompt removal of the catheter may make it difficult to ambulate and recover bladder function. These factors were taken into account in our study and it was decided to remove the catheter 24 hours following the procedure. Studies indicate that the shorter catheterization group had a greater retention rate. [14,15] It is supported by other research too which revealed that the early removal group's retention rates were higher than those of the late removal group. [6,10,13,14,16-19] According to Hakvoort et al. [6], 40% of anterior colporrhaphy patients needed a repeat catheterization if the catheter was withdrawn within 24 hours. In a similar vein, Alessandri et al. [8] discovered a somewhat high rate of re-catheterization (18.8%) in the rapid removal group in a randomised clinical investigation of women after vaginal hysterectomy.

If a bladder catheterization is not necessary, there is a 1% risk of developing bacteriuria while hospitalised, although bacteriuria was detected in 3% to 4% of cases with catheterisation. [20] In surgical patients who have bladder drainage for at least 24 hours following surgery, using prophylactic antibiotics lowers the incidence of bacteriuria and other infection-related symptoms. [19]

## Conclusion

Our study has demonstrated that following vaginal surgery for pelvic organ prolapse, a permanent urine catheter is not required for more than 24 hours. It is safe to catheterize for a brief period of time and remove the catheter after 24 hours without increasing retention or infecting the urine system. Prolonged catheterization prolongs the hospital stay, cost and discomfort to the patient without providing any additional benefits to the patient.

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ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

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