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Postoperative Urinary Retention and Duration of Catheterization after Surgery for Pelvic Organ Prolapse (POP); A 5-year Experience

Samia Aijaz[1], Urooj Kashif[2], Novera Ghayoor Chughtai[3*], Summera Malik[4], Fehmida Parveen[6]
1Department of Gynecology and Obstetrics, Aga Khan University Hospital, Pakistan
2Department of Gynecology and Obstetrics, Aga Khan University Hospital, Pakistan
3Department of Gynecology and Obstetrics, Aga Khan University Hospital, Pakistan
4Department of Gynecology and Obstetrics, Aga Khan University Hospital, Pakistan
5Associate Professor, Liaquat University of Medical and Health Sciences, Pakistan

Abstract

Objective: To compare the postoperative urinary retention in relation to the duration of catheterization after surgery for Pelvic Organ prolapse (POP) among women.

Methods: A retrospective study was conducted at the Department of OBGYN. Patients who underwent pelvic organ prolapse (POP) surgery between the years 2013 to 2017 were included in the study. Preoperative evaluation including examination under anesthesia defined type and grade of POP. Data with complete medical record was reviewed and type of surgery, blood loss, operative time, type of anesthesia, duration of catheterization and urinary retention were recorded. Data was divided into group A - retention postoperatively and group B - without urinary retention. Duration of catheterization was compared between the two groups.

Results: In our study, post-operative urinary retention was significantly associated with duration of indwelling catheterization (p=0.013). Lowest rate of urinary retention was found in patients with catheterization for at least 48 hours. Upon stratification, operative time was significantly associated with postoperative urinary retention (p=0.012).

Conclusion: Postoperative urinary retention is a common complication following pelvic surgery, adding to significant anxiety and patient discomfort. This study revealed optimum duration of catheterization to be 48 hours which can result in improved patient outcome.

Keywords: Catheterization, Pelvic Organ Prolapse (POP), Urinary retention

Introduction

Pelvic Organ Prolapse is the descent of pelvic organs and their associated vaginal walls through the vaginal opening. Pelvic Organ prolapse (POP) is a common gynecological condition and its prevalence increases with age [1].

Pelvic Organ Prolapse surgery has many complications. One major complication is transient postoperative urinary retention (POUR), which involves incomplete emptying of the bladder and occurs in 15-45% of women. Different studies on POP report a variety of figures on the incidence of urinary retention after POP surgery, ranging from 1.4% to 40% [1-4].

Standard practice after POP surgery is Routine transurethral catheterization [5]. This has become an increasing trend these days. Urinary retention may occur if catheters are removed early due to overfilling of the bladder after surgery (3). In addition, transurethral catheterization carried out for a prolonged period also causes adverse effects such as urinary tract infection. As a result, hospital stays are extended, and post-operative recovery is delayed [6-10]. A study by Hakvoort et al. showed urinary tract infections could decrease by as much as tenfold by reducing prolonged catheterization [3]. In this study, the average number of catheterization days was low and nearly 60% of patients (in the group for which catheterization was carried for a short period of time) did not require prolongation of catheterization [3].

Nowadays, there is a trend to further reduce the time period of transurethral catheterization [1]. This comes primarily after a Cochrane review on Catheter studies following urogenital surgery and randomized controlled trials analyzing catheterization after POP surgery [1].

There is no agreement on when the catheter should be removed, even though there is ample research addressing this. A report on the occurrence of UR according to the postoperative day of catheter removal is also lacking. Likewise, more evidence needs to be gathered to provide a complete solution for this problem.

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At our practice, protocols for indwelling catheterization (IDC) after POP surgery range from 24 to 72 hours. This study demonstrates a 5-year experience of urinary retention in POP surgery patients in relation to duration of catheterization.

Due to the current scarcity of literature on the subject, we planned to conduct this study in our setting.

Material/Subjects/Patients and Methods:

A retrospective analysis was conducted, and data was retrieved from the electronic health system between the year 2013 to 2017 after taking approval from the ethical review committee of Aga khan University hospital # 2018-0630-632. Data was extracted from patient's medical record with no encounter with patient's, so the requirements of written informed consent were waived by the ERC.

All patients aged between 30-80 years who underwent prolapse surgery at Aga Khan University Hospital were recruited using the convenient sampling technique. Patients with concurrent UTI/anti-incontinence surgery, urethral abnormalities, diabetic neuropathy, iatrogenic bladder injury, and women in whom a complicated surgical procedure was anticipated were excluded.

Between January 2013 to December 2017, 410 women underwent surgery for pelvic organ prolapse. 166 participants were recruited, Surgeries included were vaginal hysterectomy with or without anterior and posterior colporrhaphy and anterior and posterior colporrhaphy alone. 244 were excluded due to our exclusion criteria. (Fig;1)

Data was collected using (ICD-10-CM). Procedure codes 68.59 and 59.79 were used to identify women who underwent POP surgery. We used Baden Walker grading system for uterovaginal prolapse. Data with complete medical record was reviewed and type of surgery, estimated blood loss, operative time, type of anesthesia, duration of catheterization and urinary retention were recorded. Indwelling catheterization duration is between 24 to 72 hours in our institute, and it solely depended on physician's preference. We follow (Spontaneous filling protocol) Bladder protocol to allow bladder spontaneously to fill after removal of catheter. Urinary retention at our setup diagnosed on following critera: 1) Failure to void spontaneously after 4 hours of catheter removal 2) first residual urine volume after self-voiding 150 mL, a criterion of incomplete voiding.

Data were separated into two groups: group A, which included postoperative urine retention, and group B, which did not include urinary retention. The two groups' catheterization durations were compared.

Statistical Analysis:

Data was entered in SPSS version 19.0. Mean ± standard deviation computed for continuous variables like age, parity, type of surgery, operative time, and blood loss. Frequency and percentage were computed for the categorical variables including voided volume and residual volume. Chi-square test was applied to compare the groups for urinary retention. P-value < 0.05 was considered as significant.

Ethical Consideration:

We conducted the study after approval from the Ethical Review Committee (ERC) Aga khan university Hospital , reference number; 2018-0630-632 Since we extracted the data from patients' medical records with no encounter with the patients, the requirements of written informed consent were waived by the ERC. We maintained the confidentiality of all information by coding the information.

Results:

410 participants underwent surgery for pelvic organ prolapse. 166 participants were recruited who underwent vaginal hysterectomy and pelvic floor repair concomitant or alone during the study period.

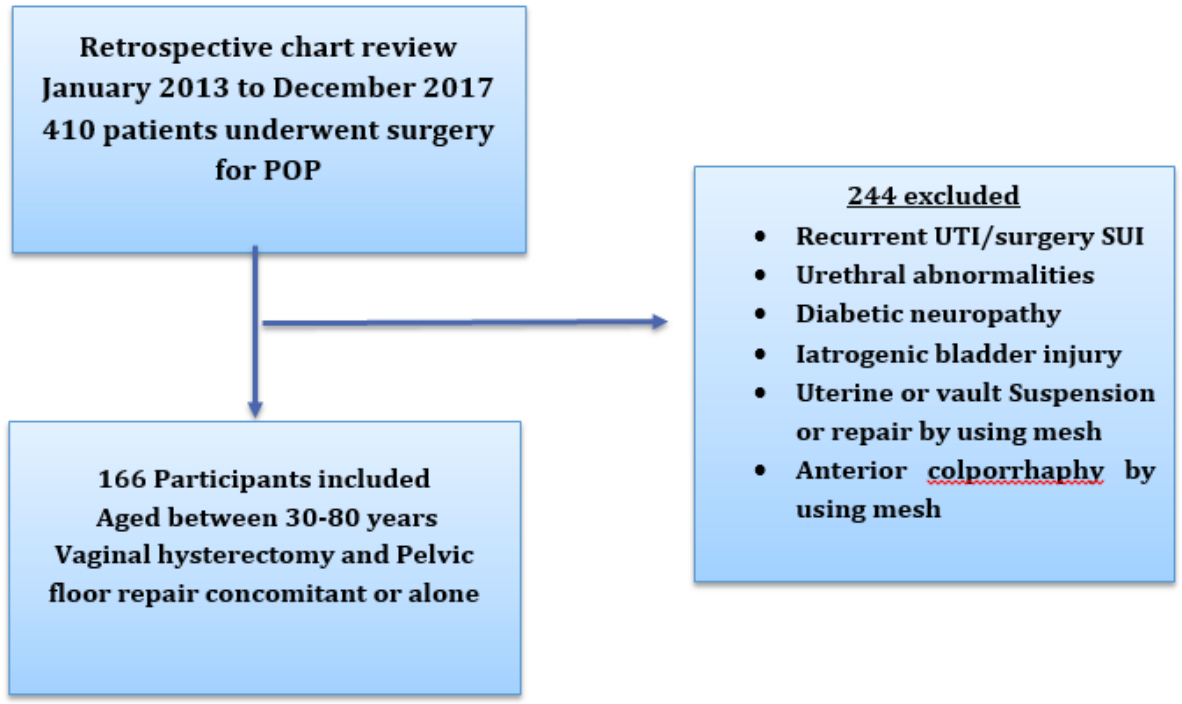

Fig:1 Flowchart of participants

Mean age of patients was 55.8 ± 12.2 years, and the mean (BMI) was 28.6 ± 6.2 kg/m^2. The mean duration of surgery was approximately two and a half hours with a mean blood loss of 345 ± 305 ml as illustrated in (Table 1).

Table 1. Demographics of the Study Participants

Parameter	Mean	Std. Deviation
Age in years	55.8	12.2
Weight in kg	66.5	14.1
Height in cm	151.1	16.7
Body Mass Index in kg/m^2	28.6	6.2
Parity	4.0	2.3
Duration of surgery in hours	2.4	0.7
Intraoperative blood loss ml	345.0	305.7

Duration of the indwelling catheter was significantly associated with postoperative urinary retention (p=0.013) (Table 2). Lowest rate of postoperative retention was found in patients who were catheterized for at least 48 hours.

Table 2. Association between Duration of Indwelling Catheter and Postoperative Urinary Retention

Duration of Indwelling Catheter	Post-operative Urinary Retention		P-value
	Yes	No	
24 hours	5 (26.3%)	14 (73.7%)	0.013
48 hours	7 (6.4%)	102 (93.6%)	
72 hours	7 (18.4%)	31 (81.6%)	

Upon stratification, operative time of surgery was significantly associated with postoperative urinary retention (p=0.012). Furthermore, it was revealed that most of the underweight patients, i.e., 3 (75%) suffered from postoperative retention (p<0.001) (Table 3).

Table 3. Risk Factors of Postoperative Retention Among Patients

Parameters	Post-operative Urinary Retention		P-value
	Yes	No	
Age Group			
Less than or equal to 45 years	1(3.1%)	31(96.9%)	0.082
More than 45 years	18(13.4%)	116(86.6%)	
Parity			
0-1 Children	0(0%)	9(100%)	0.538
2-3 Children	10(12.3%)	71(87.7%)	
4 or more	9(11.8%)	67(88.2%)	
Duration of Surgery			0.012
1 to 2 hours	13(18.8%)	56(81.2%)	
More than 3 hours	6(6.2%)	91(93.8%)	
Type of Anesthesia			
General	13(9.6%)	122(90.4%)	0.114
Spinal	6(19.4%)	25(80.6%)	
Febrile Illness			
Yes	-	3 (100%)	0.693
No	19 (11.7%)	144 (88.3%)	
Body Mass Index			
Below 18.5	3 (75%)	1 (25%)	0.001
18.5—24.9	6 (15%)	34 (85%)	
25.0—29.9	5 (7.9%)	58 (92.1%)	
30.0 and above	5 (8.5%)	54 (91.5%)	
Duration of Hospital stay			
1-3 days	3(15.8%)	21(21%)	0.604
>3 days	16(84.2%)	79(79%)	

Discussion

Postoperative retention of urine may be a temporary or permanent condition, causing serious discomfort to the patient [11]. In the current study, the incidence of urinary retention was studied among patients who underwent POP in relation to the duration of catheterization.

It was found that the duration of catheterization was linked to postoperative urinary retention. Additionally, it reported that the occurrence of retention was lowest in patients who had been catheterized for at least 48 hours. A similar study by Vijjeswarapu et al., also evaluated the factors associated with urinary retention following surgical interventions for pelvic organ prolapse [12]. Contrary to the associations found in the present study, Vijjeswarapu et al., found a strong link between the stage of prolapse and the incidence of urinary retention. According to the study, 77.8% of the population with stage III prolapse suffered from urinary retention postoperatively, making it a strong predictor for postoperative urinary retention.

A study by Rajan et al., compared the removal of urinary catheter 3 hours and 24 hours after vaginal surgery, and assessed the outcomes. The study showed that of the 6.5% patients with urinary retention, 9% belonged to the group where the duration of catheterization was 3 hours, while 4% of patients who were catheterized for 48 hours

developed urinary retention [13]. Thus, the study concluded that shorter duration of catheterization was associated with a much higher occurrence of urinary retention, which is a finding consistent with our study.

Our study found no association between age and post-operative catheterization and urinary retention. However, these findings were inconsistent with the study conducted by Baldini et al., who reported that the incidence of postoperative urinary retention increased with an increase in age [14]. This implies that there may be an age-related progressive degeneration of neuronal function in the elder patients, which causes weakening of the bladder [15].

A study by Summitt et al., assessed the post-operative results of vaginal hysterectomy with regards to the impact of bladder catheterization. The results concluded that early catheter removal was associated with urinary retention and inability to void, therefore requiring re-catheterization [16]. A randomized study by Sekhwavat et al., evaluated the rates of post-operative urinary retention in 90 women who had undergone pelvic surgery. The findings were consistent with our study, revealing that early catheter removal was associated with a much higher incidence of urinary retention and pain [17]. However, studies by Glavind et al., [2] Hakvoort et al., [3] and Liang et al., [18] showed contrary results, revealing that urinary retention was infrequently seen in patients with early catheter removal or shorter duration of catheterization.

Our study was limited due to a small sample size and a retrospective study design. Further research is warranted, which would also evaluate additional factors such as the degree or stage of prolapse, and how it associates with the occurrence of urinary retention post operatively.

Conclusion

Postoperative urinary retention is a common complication following pelvic surgery, adding to significant anxiety and patient discomfort. This study revealed optimum duration of catheterization to be 48 hours which can result in improved patient outcome.

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