

Comparative Outcome of Short Term Versus Long Term Catheterization after Vaginal Hysterectomy

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Abstract

Background: Urinary catheterization after vaginal hysterectomy is commonly performed to evaluate urine output and to avoid urinary retention. The aim of this study was to determine the advantages of short term catheterization in comparison to long term catheterization after vaginal hysterectomy due to uterovaginal prolapse.

Materials and methods: This randomized clinical study was conducted for 1 year (July 2014- July 2015) in the Department of Obstetrics and Gynecology, Chittagong Medical College Hospital (CMCH) on 100 women with 2^o utero vaginal prolapse underwent vaginal hysterectomy. After selection and randomization women who had undergone vaginal hysterectomy were grouped two. Urinary catheter was removed after 24 hours in group A and after 72 hours in group B. Observations were recorded and statistical analysis performed.

Results: Study showed that duration of catheter did not affect the duration of first voiding time after removal of catheter (RR=0.934). 6% of women in group A and 2% women in group B had residual volume of urine >200 ml but residual volume of urine was significantly higher in group B (RR=0.714). Re-catheterization needed 6% patients in group A and 2% in group B (RR= 3.000). Urinary Tract Infection (UTI) was significantly higher 14% versus 2% in group B than group A (RR= 0.143). Mean duration of hospital stay after operation was 2.58 days in group A and 4.16 days in group B (RR= 0.480).

Conclusion: Short term catheterization is more beneficial than long term catheterization. Because it results in low incidence of urinary tract infection, less patient discomfort and reduces the mean hospital stay.

Key words : Urinary catheterization; Urinary tract infection; Vaginal hysterectomy.

Introduction

Genital prolapse is a common condition met in day to day gynecological practice.¹ Vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy are standard surgical techniques for treatment of vaginal prolapse.^{2,3} After vaginal operation for prolapse the use of indwelling catheter is usual as the patient is unable to pass urine on her own afford.⁴ So most gynecologists routinely catheterize their patients following Pelvic Organ Prolapse (POP) surgery and initial catheterization time varied from 1 to 7 days.⁵ The use of these prolonged catheterization protocols may be mandatory for prevention of post-operative retention of urine due to post-operative tissue swelling, pain, transient bladder atony, hematoma, hemostatic vaginal pack which is associated with risk of over distention and permanent detrusor damage and prevent optimal emptying of the bladder.^{4,6} But prevention of urinary retention by insertion of indwelling catheter also increases the risk of urinary tract infection. inconvenience for patients, costly and often prolongs hospitalization.^{7,8} The available information from urologic reports and institutionalized patients demonstrates a 3% to 10% increased risk of bacteriuria per day of catheterization.^{9,10} The best prevention for urinary tract infection is catheter removal as soon as possible.¹¹ Removal of catheter in first post-operative day should not affect natural urination.¹² It encourages patient rising from bed as soon as possible, reduces post-operative chest, bladder and alimentary tract complication, avoiding muscle wasting and ensures rapid recovery from operation and rapid turnover of patients in hospital.¹²

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Routine catheterization up to three days (72 hours) after vaginal hysterectomy is commonly used but continuing in-dwelling catheter after 24 hours has limited benefit in uncomplicated routine vaginal hysterectomy.⁴ The question of how long catheter should remain in situ after prolapse surgery has been debated for several years and has not yet been resolved. In our routine practice, the actual proportion of patients requiring prolonged catheterization remains unknown.¹³

Many studies have shown that short term catheter removal (After 24hrs) is beneficial. Only disadvantage is higher number of re-catheterization as removal of catheter after 24 hour increase the number of recatheterization, which may cause lower urinary tract infection. But higher incidence of urinary tract infection associated with prolonged catheterization concludes that catheterization for 3days after surgery is too long. So this study has been done to find out the advantage of early catheter removal (After 24 hrs) over late removal (72 hrs) following vaginal hysterectomy.

Materials and methods

It is a randomized controlled trial carried out among 100 women with 2° utero vaginal prolapse undergoing vaginal hysterectomy in the gynecology ward of chittagong medical college hospital from July 2014 to June 2015. All women who had undergone vaginal hysterectomy with pelvic floor repair were included in this study. But women who had some co-morbidities like previous history of urinary tract infection, impaired renal function. Diabetes mellitus and previous history of retention of urine and voiding difficulty were excluded in this study. The patients were randomized by use of closed envelope into either short term catheterization group (Group-A) or long term catheterization group (Group-B). A transurethral Foley's catheter (Bardia 16) was inserted in the operation theatre immediately after surgery in all patients. In the short term catheterization group, the catheter was removed on the morning of first post operative day (After 24 hours) after surgery. In the long term catheterization group, the catheter was removed on the morning of the 3rd post-operative day (After 72 hours). Before removal of the catheter, urine sample was taken for routine microscopic examination test for both groups. Urinary bladder volume after first voiding was

measured using an ultrasound scanner after removal of the catheter (Within 6 hours) in the Radiology & Imaging dept. of CMCH & in another pathological laboratory. If they had failed to void or when there was no urge within 6 hours after the catheter removal or when residual volume was more than 200 ml, Foley catheter was reinserted for a further period of three days. Baseline information was collected from both study groups in a preformed data collection sheet. Once a patient had been randomized, they were followed up till they discharged from hospital. Outcome of the women was obtained in the same data collection sheet. Protocol was ethically reviewed and approved by the ethical review committee of Chittagong Medical College. Institutional clearance was obtained from the Principal and Hospital Director of Chittagong Medical College Hospital, Chattogram.

Results

During observation among 100 patients transurethral catheter was kept for 24 hours in 50 patients in group A and 72 hours in 50 patients in group B.

The highest number of study population was from the age group of 50-60 years which was 35% followed by the age group of 40-50 years, 60-70 years, 30-40 years and 70-80 years which was 32%, 18%, 10% and 5% respectively. Majority of the women were lower middle class (46% vs 42%) followed by lower class (38% vs 48%) and middle class (16% vs 10%). Among all the cases 69% were illiterate and educational status of 25% was primary level, 5% was secondary level and only 1% was higher secondary level. Study showed that majority of women had 1-2 hrs first voiding time after removal of catheter in both groups (31% vs 36%, 67% in total).

Figure 1 shows that 3 (6%) women in group A and 1(2%) women in group B had residual volume of urine > 200 ml. Most of patientse.g 35(70%) patients in group A and 22(44%) patients had residual volume urine < 50 ml. Residual urine volume was significantly higher in group B. (p=0.018, RR=0.714 when residual urine volume was divided into <100ml and >100ml).

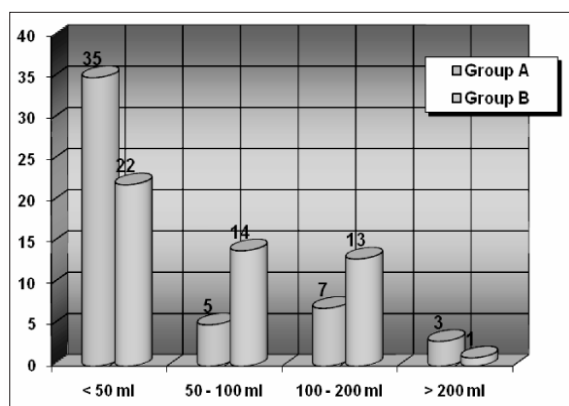


Figure 1 : Bar Chart of residual urine volume among the study groups

Table I shows presence of urinary symptoms such as dysuria & suprapubic pain in both groups (2% vs 5%, 7% in total. RR=0.400).

Table I : Comparison of urinary symptoms in both the study groups after vaginal hysterectomy (n=100)

| Urinary symptoms | | STUDY GROUPS | | | | Total n | p Value | RR |
|------------------|---------|--------------|-----------|-----------|-----------|---------|---------|----------------------------------|
| | | Group A N | Group A % | Group B n | Group B % | | | |
| Dysuria | Present | 2 | 4.0 | 5 | 10.0 | 7 | 7.0 | p = 0.240 ^{NS} 0.400 |
| | Absent | 48 | 96.0 | 45 | 90.0 | 93 | 93.0 | |
| Supra-pubic Pain | Present | 2 | 4.0 | 5 | 10.0 | 7 | 7.0 | p = 0.240 ^{NS} 0.400 |
| | Absent | 48 | 96.0 | 45 | 90.0 | 93 | 93.0 | |

* NS = Not Significant (p > 0.05), RR= Relative Risk.

Urinary tract infection was present 1 cases (2%) in group A and 7 cases (14%) in group B and 8% in total. UTI was significantly higher in group B (Table II).

Table II : Comparison of urinary tract infection in both study groups

| Urinary tract infection | STUDY GROUPS | | | | Total n | p value | RR |
|-------------------------------|--------------|-----------|-----------|-----------|---------|---------|---------------------------------|
| | Group A N | Group A % | Group B n | Group B % | | | |
| Pus Cells in Urine >5 per HPF | 1 | 2.0 | 7 | 14.0 | 8 | 8.0 | p = 0.027 ^S 0.143 |
| Pus Cells in Urine <5 per HPF | 49 | 98.0 | 43 | 86.0 | 92 | 92.0 | |
| Total | 50 | 100.0 | 50 | 100.0 | 50 | 100.0 | |

* S = Significant (p < 0.05).

Among 100 patients re-catheterization was needed in 4 patients among them 3(6%) in group A and 1(2%) in group B though the difference was not statistically significance. Re-catheterization was done in those patients who had residual volume of urine more than 200 ml (Table III)

Table III : Comparison of number of re-catheterization in both study groups

| Re-catheterization | STUDY GROUPS | | | | Total n | p value | RR |
|--------------------|--------------|-----------|-----------|-----------|---------|---------|----------------------------------|
| | Group A N | Group A % | Group B n | Group B % | | | |
| Needed | 3 | 6.0 | 1 | 2.0 | 4 | 4.0 | p = 0.307 ^{NS} 3.000 |
| Not Needed | 47 | 94.0 | 49 | 98.0 | 96 | 96.0 | |
| Total | 50 | 100.0 | 50 | 100.0 | 50 | 100.0 | |

* NS = Not Significant (p > 0.05).

Figure 02 shows that mean duration of hospital stay was 2.58 days in group A and 4.16 days in group B. Hospital stay was significantly lower in group A than group B. (When hospital stay was divided into < 3 days and > 3 days).

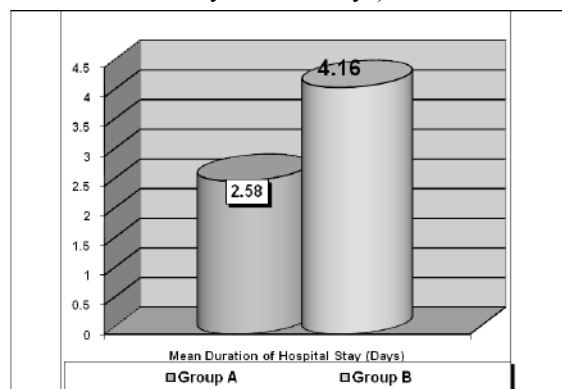


Figure 2 Bar Chart of mean duration of hospital stay among the study groups.

Discussion

In-dwelling catheter use after major uncomplicated genital prolapse surgery has been standard method of practice of bladder treatment after operation. Therefore gynecologists have justified, the routine use to indwelling urinary catheter after operation but it is harmful to the patient. The commonly used one is Foley catheter and it can be used for both short and long periods of time.¹⁴-But use of Foley catheter is associated with increased bacteria and positive urine culture.¹⁵ Our routine clinical practice suggests that long time catheterization limits patient mobilization and hence lengthen hospital stay.¹⁶ Many studies have showed that short term catheterization is preferable as it reduces patient’s discomfort, urinary tract infection and hospital stay which ultimately result in early patient ambulation and reduce their hospital cost. Present study tried to compare the effectiveness and benefit between short term and long term catheterization following vaginal prolapse surgery.

The characteristics of subjects in both groups in present study were similar with no statistically significant differences between two groups regarding age, parity, duration of prolapse, socio-economic condition or educational status. In this study the age of the cases were evaluated. The highest number of study participants was from the age group of 50-60 years which was 35%. The mean age of the study population was 54.64 years. This findings corresponds with preliminary study by Shrestha B et al which showed mean age 53.35(\pm 10.94).¹⁷

In present study majority of the women were lower middle class which was 44%. Among all the cases 69% were illiterate and only 1% was higher secondary level. The most of the population was multiparous. Women having >5 children were 31%. Regarding menopausal status 81% population were post- menopausal and 19% were premenopausal. In present study most of the women gave history of utero-vaginal prolapse for <5 years duration which was 55%. Majority of the participants had voiding difficulty which was 84% (44% vs 40%).

Prolong catheterization after vaginal prolapse surgery is believed to be preventing voiding problem post operatively.¹⁸ But mean time of first voiding after removal of catheter was almost equal in both groups in this study. Majority of women had 1-2 hrs first voiding time after removal of catheter in both groups and duration of catheter did not affect the first voiding time in both groups when first voiding time was divided into < 2 hours and > 2 hours). Thakur et al found similar findings in their study.¹⁹

The Residual Urinary Volume (RUV) after removal of catheter can be taken as functional bladder parameter and the value <200 ml placed as normal.¹⁸ In this study 6% of the women in group A and 2% in group B had residual volume of urine >200 ml but residual volume of urine after removal of catheter is significantly high in long term catheterization group when residual urine volume was divided into <100ml and >100ml). Another study showed that none of the women had residual volume of urine >200ml in both group and mean residual volume in significantly high in long term group than short term catheterization group (10152.38 ml and 59.1937.87 ml)¹⁸.

In our study, re-catheterization was needed in three patients (6%) of group A, (In early catheter removal group after 24 hours of surgery) in comparison to group B (72 hours of catheter removal), in whom re-catheterization were needed in one (2%) patient (RR=3.000). The findings are similar to the studies, B Shrestha et al (6% versus 0%) khatun et al (26.78% vs 14%), Choudhury et al (10% versus 3%) and Hakvoort et al (40% versus 9%) short term versus long term catheter group.^{17,18,1} Thakur et al found similar result in their study.¹⁹

All these researches prove that short term catheterization requires re-catheterization more than long term catheterization even though they are in minimum percentage. Thapa et al had similar study, but she had contrast result, short time catheterization following vaginal surgery had less incidences of urinary retention than long term catheterization (0% versus 2%).²⁰ Dunn et al also had similar result, the early removal of in-dwelling catheters after operation was not associated with need for recatheterization.²¹ These two results in contrast to all above, may be due to limited size of study. Result may be different if size is enlarged.

In present study 4% women experienced urinary symptoms in group A and 10% in group B ($p > 0.05$, RR=0.400) which was not significant. Pant P R showed that in case of catheterized for 12 to 24 hours, only 8 patients had urinary symptoms out of which 3 patients had frequency and burning micturition.⁴

Urinary tract infection in our study was more common in long term catheterization group than short term as in most of the past researches. Our study has shown that UTI occurred in 2% in group A and 14% in group B ($p = 0.027$, RR=0.143). So long term catheterization could be one of the cause of urinary infection after vaginal hysterectomy and pelvic floor repair. Similar to this study, Shrestha et al found urinary infection, 18% versus 30 ($p = 0.16$) and Alonzo-Sosa et al, (4% versus 20%), Khatun et al, (5 cases versus 17 cases, $p < 0.05$), Thapa et al (6.2% versus 11.1%), Hjalmar and Tom (40% versus 80%) and Hakvoort et al (4% versus 40%) also found urinary tract infection in short term versus long term catheterization group.^{17,11,18,20,22,1} These all studies concluded that long term catheterization increases the bacterial infections.

Mean hospital stay is also reduced in short term catheterization in comparison to long term group in this study (2.58 days versus 4.16 days) when hospital stay was divided into < 3days and > 3days. This is also similar to the study of Shrestha et al (3.42 days in group A versus 4.48 days in group B), Alonzo-Sosa et al (2 days versus 3 days).^{17,11} Kamilya et al (1.64 vs 4.09) and Duerr (2.94 versus 3.46 days).^{23,24} In spite of re-catheterization, early removal of indwelling catheters immediately after uncomplicated hysterectomy seems to decrease ambulation and hospital stay.²⁵ All these results of above researches conclude that short duration catheterization reduces mean catheterization time and thereby reduce hospital stay. Despite, early removal of catheter after vaginal hysterectomy needs re-catheterization in few patients, there may be much more chances of urinary infections in long term catheterization group. Early ambulation in short term catheter group reduces mean hospital stay. This type of result is found in most of the researches, which concludes short term catheterization should be practiced for cost effectiveness and to reduced complications.

Limitations

There are some limitations of the present study. Some are mentioned below:

- i) Present study was done in one center.
- ii) Sample size was small.
- iii) Culture sensitivity of the urine to identify the causative organism was not done which is necessary for the treatment of urinary tract infection.

Conclusion

Short term catheterization is more beneficial than long term catheterization. Shorter duration of catheterization is preferable as it results in low incidence of urinary tract infection, less urinary symptoms, low residual volume of urine and shorter hospital stay after removal of catheter. So despite early removal of catheter after vaginal hysterectomy needs re-catheterization in few patients, short-term catheterization can be applied after vaginal hysterectomy.

Recommendations

- i) Further studies should be carried out involving large number of participants in multiple centers.
- ii) Research work is also necessary to identify the factors that increase the risk of re-catheterization and the way to reduce re-catheterization.

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Contribution of authors

SA-Conception, acquisition of data, manuscript writing & final approval.

SS-Design, interpretation of data, critical revision & final approval.

NS-Acquisition of data, data analysis & final approval.

FNM-Interpretation of data, critical revision & final approval.

MAH-Data analysis, critical revision & final approval.

PW-Acquisition of data, manuscript writing & final approval.

Disclosure

All the authors declared no competing interest.

References

1. Hakvoort RA, Elberink R, Vollebregt A, ploeg T, Emanuel MH. How long urinary bladder catheterization should be continued after vaginal prolapsed surgery? A randomized controlled trial comparing short term versus long term catheterization after vaginal prolapsed surgery. *BJOG*. 2004; 111:828-832.
2. Woods Dr. Bender BS. Long term urinary tract catheterization. *Med Clin North Am*. 1989;73(6): 1441-1454.
3. Hill N, Gupta A, Zakaryan A, Morey R. The success of 6 hour hospital discharge on patients having vaginal repair operations using a new conscious sedation technique. *ObstetGynaecol*. 2011;31(2):149-151
4. Pant PR. An effective short duration postoperative catheterization after vaginal hysterectomy and pelvic floor repair. *Journal of Institute of Medicine*. 2006;28(1):33-35.
5. Hilton P. Bladder drainage: A survey of practices among gynaecologists in the British Isles. *Br J Obstet Gynaecol*. 1988; 95(11):1178-1189.
6. Hakvoort RA Burget MP, Emanuel MH, Roovers JP. A nationwide survey to measure practice variation of catheterization management in patients undergoing vaginal prolapse surgery. *IntUrogynecol J Pelvic Floor Dysfunct*. 2009;20(7):813-818.
7. Tambyah PA, Makis DG. Catheter-associated urinary tract infection is rarely symptomatic: a prospective study of 1,497 catheterized patients. *Arch intern Med*. 2000;160(5):678-682.
8. Warren JW. Catheter associated urinary tract infections. *Infect dis clin North Am*. 1997;11(3):609-622.

9. Cardosi RJ, Cardosi RP, Grendys EC, Fiorica JV, Hoffman MS. Infectious urinary tract morbidity with prolonged bladder catheterization after radical hysterectomy. *Am J ObstetGynecol.* 2003;189:380-384.
10. Ojha N. Bacteriuria following Foley catheterization after gynecological and obstetrical surgery. *NJOG.* 2008;3(1): 35-38.
11. Alonzo-Sosa JE, Flores-Contreras JT, Paredes-Canul M. Methods for transurethral catheterization for 1-3 days for pelvic floor relaxation in the post-operative period. *Gynecolobstet (Mex).* 1997;65:455-457.
12. Choudhury FR, Rashid M, Rumana R, Uddin ABMZ, Ava NN. Short term versus long term catheterization after urogenital prolapse surgery. *ShaheedSuhrawardy Med Coll. J* 2011;3:41-43.
13. Tahmin K, Begum SN. Short term versus Conventional catheterization after genital prolapse surgery. *Bang. J. ObstetGynaecol.* 2011;26(2):68-71.
14. Cafasso J. Urinary catheters. 2012 [Retrieved on 20 April 2015]. Available from <http://www.healthline.com/health/urinary-catheters>.
15. Ouladsahebmadarek E, Sayyah-Melli M, Jafari-shobeiri M. A randomized clinical trial to compare immediate versus delayed removal of foley catheter following abdominal hysterectomy and laparotomy. *Pak J Med Sci.* 2012;28(3):380-383.
16. Sivanesan K. Duration of transurethral in-dwelling catheter (TIC) following vaginal prolapse surgery. *SL. J ObstetGynaecol.* 2012;34:25-26.
17. Shrestha B, Marhatha R, Kayastha S, Jaishi S. Short-term versus long-term catheterization after vaginal prolapse surgery. *Nepal Med Coll J.* 2012;15(2):102-105.
18. Khatun HA, Arzu J, Haider ZA. Short term catheterization versus long term catheterization after vaginal prolapsed surgery. *J. Dhaka National Med. Coll. Hos.* 2012; 18(02):4-8.
19. Thakur N, Gurung G, Rana A. A randomized controlled trial comparing short term versus long term catheterization after vaginal prolapsed surgery. *NJ ObstetGynaecol.* 2007;2:29-34.
20. Thapa M, Shrestha J, Pradhan BN, Pandhye SM. Bacteriuria and urinary retention following gynaecological surgery: Comparing short vs long term catheterization. *J Nepal Health Res Council.* 2010;8:107-109.
21. Dunn TS, Shlay J, Forshner D. Are in-dwelling catheters necessary for 24 hours after hysterectomy? *Amer J ObstetGynecol.* 2003;189:435-437.
22. Schiotez HA, Tanbo TG. Post-operative voiding, bacteriuria and urinary tract infection with Foley catheterization after gynaecological surgery. *ActaObstetGynecolScand.* 2006;85:476-481.
23. Kamilya G, Seal SL, Mukherji J, Bhattacharyya SK, Hazra A. A randomized controlled trial comparing short versus long-term catheterization after uncomplicated vaginal prolapse surgery. *J ObstetGynaecol Res.* 2010;36(1):154-34.
24. Duerr HA. Short-term versus long-term catheterization after vaginal prolapse surgery: Which is better? April 13, 2011. [Retrieved on May 15, 2015]. Available from <http://hcp.obgyn.net/urogynecology/content/article/170982/1839729>.
25. Alessandri F, Mistrangelo E, Lijoi D, Ferrero S, Ragni N. A prospective randomized trial comparing immediate versus delayed catheter removal following hysterectomy. *Acta obstetrician et Gynecol.* 2006;85:716-720.