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Original article

Short term catheterization versus long term catheterization after vaginal prolapsed surgery: A randomized control trial in Dhaka National Medical College & Hospital

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Abstract:

Objective: **This study was undertaken to determine whether short term bladder catheterization would be more beneficial than the routinely practiced long term catheterization after vaginal hysterectomy for prolapsed uterus.**

Materials and methods: **This randomized controlled trial was conducted in Obstetrics and Gynecology Department of Dhaka National Medical College Hospital from January 2009 to January 2011. A total of 106 women were included in this study. They were randomized into short term catheterization group where transurethral catheter was removed after 24 hours of surgery and long term catheterization group where catheter was removed on 3rd post operative day.**

Result: **Mean time of first voiding after removal of catheter was almost equal in both groups (2.82±1.42 hours and 2.74±1.52 hours). Duration of catheter did not affect the duration of first voiding time after removal of catheter (P>0.05). None of the women had residual volume of urine >200 ml in both groups. Mean residual volume is significantly high in long term catheterization group (P<0.05). Urinary tract infection was also significantly high in long term catheterization group (P<0.05) and majority of the infection were caused by E. coli.**

Conclusion: **Short term catheterization is more beneficial in terms of lower incidence of urinary tract infection and prevention of bladder over filling as compared to long term catheterization after vaginal prolapsed surgery.**

Key words: **Catheterization, vaginal prolapse surgery, urinary tract infection.**

Introduction :

Urinary catheter, although a necessary procedure, has certain complication such as increasing the symptomatic and asymptomatic urinary tract infection, discomfort and pain. It is estimated that 15% to 25% of all the hospitalized patients have indwelling urethral catheters, mainly as an investigative purposes or to assist accurate measurement of urine output, routinely after an operation, treat urinary retention or during acute illness.[1] The use of urinary catheters after genitourinary surgery is accepted practice to enable drainage and prevent over distention of the bladder. This is necessary in vaginal prolapse surgery because of the increased risk of urinary retention but not a harmless procedure. Anterior colporraphy is performed in this case primarily for urinary incontinence and therefore these patients may already have some degree of detrusor instability or dysfunction.[2] The risk of catheter related urinary tract infection increase with the length of time a catheter is in situ.[3] The best prevention for related urinary tract infection is catheter removal as soon as possible. The number of post-operative voiding problems appeared to be equal between one and three days of prolonged catheterization.[4] In our routine practice, the actual proportion of patients requiring prolongation of catheterization remains unknown. Moreover, bladder catheterization increases the occurrence of urinary tract infections, and is likely to have a negative impact on the

well being of patients after surgery and to prolong hospital stay.[5] Thakur et al[6] found that short term catheterization is more beneficial in term of lower incidence of urinary tract infection and febrile morbidities after vaginal prolapsed surgery. Hakvoort et al[7] concluded that disadvantages of prolong catheterization outweigh the advantages. So this study was undertaken to see whether lower incidence of urinary tract infection and prevention of bladder over filling can be achieved without prolonged catheterization.

Materials and Methods:

A randomized controlled trial was conducted in Obstetrics and Gynecology Department of Dhaka National Medical College & Hospital from January 2009 to January 2011. After admission and prior to vaginal prolapsed surgery, urine samples were taken for culture sensitivity and Benedic reaction. Patients with diabetes mellitus & samples showing signs of a urinary tract infection preoperatively were excluded. All patients had a transurethral Foley catheter (Bardia 14) inserted in the operation theater immediately after surgery. Patients were randomized by use of closed envelope at admission into either short term catheterization group (group-1) or long term standard prolonged catheterization group (group-2). In the long term catheterization group, the catheter was removed on the morning of the 3rd post operative day (after 72 hours). In the short term catheterization group, the catheter was removed on the morning (after 24 hours) after surgery. Before removal of the catheter, a urine sample was taken for culture. A urinary tract infection was defined as the presence of $>10^5$ colony forming units/ml in the culture. Urinary bladder volumes after first voiding were measured using an ultrasound scanner after removal of the catheter (within 8 hours). After urinary catheter removal, patients were encouraged to spontaneously void following urge to micturate and following feeling of urge, if they could not void or when there was no urge within 8 hours after the catheter removal, Foley catheter was reinserted for a further period of three days. Data were analyzed by using SPSS version 12

Results :

During the study period 56 patients were enrolled in group-1 and 50 patients were in group-2. Mean time of first voiding after removal of catheter was almost equal in both groups i.e. 2.82±1.42 hours in group-1 and 2.74±1.52 hours in group-2. Majority of women had 1-2 hrs first voiding time after removal of catheter in both groups. Duration of catheter did not affect the duration of first voiding time after removal of catheter (Table-I).

Table-I: First voiding time after removal of catheter in both study groups

1st voiding time after removal of catheter (hrs)	Group-1 n=56(%)	Group-2 n=50(%)	p value
<1	11(19.64)	02(4)	
1-2	30(53.67)	41(82)	
>2-3	5(8.93)	3(6)	
>3-4	2(3.57)	3(6)	
>4-5	05(8.93)	0(0)	
>5-6	03(5.36)	1(2)	
Mean(±SD)	2.82±1.42	2.74±1.52	0.77*

*'t' test

None of the women had residual volume of urine >200 ml in both groups (Table-II). Forty two (75%) women in group-1 had residual volume of urine <50 ml. whereas only 13 (26%) women had the same residual urinary volume in group-2. Fourteen (25%) women had residual volume of 50-200 ml in group-1, similarly thirty seven women (74%) in group-2. Mean residual volume is significantly high in group-2 than group-1 (101±52.38 ml and 59.19±37.87 ml, P<0.05) [Table-II].

Table-II: Residual volume of urine after the first voiding in both study groups

Residual volume of urine (ml)	Group-1 n=56(%)	Group-2 n=50(%)	p value
<50	42(75)	13(26)	
50-200	14(25)	37(74)	
>200	0(0)	0(0)	
Mean (±SD)	59.19±37.87	101±52.38	<0.001

*'t' test

Recatheterization was needed in eight women among them 05 (26.78%) in group-1 and 03 (14%) in group-2. Urinary residual volume was 50 ml, 80 ml, 100 ml, 40 ml, and 50 ml respectively in all these five cases after their first void. Amount of urine drained at the time of recatheterization was

600 ml, 800 ml, 800 ml, 1200 ml, and 700 ml respectively. Among three recatheterized Patients in group-2, urinary residual volume was 40 ml, 100 ml and 120 ml respectively after their first void and amount of urine drained at the time of recatheterization were 600 ml, 1000 ml and 1200 ml respectively (Table-III)

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Table-III: Recatheterization for urinary retention after the 1st void with normal residual volume in both study groups.

	No of patients (Recatheterisation)	Residual volume ml Mean ±SD	Timing of reccatheterisation (at 1st voiding)	Amount of urine drained at the time of reccatheterisation	p value	
Group-1 n=56 (%)	05 (26.78%)	50 ml. 80 ml. 100 ml. 40 ml. 50 ml. 64±25.09	3hr. 2hr. 3hr. 2 hr. 2hr.	600 ml 800 ml 800 ml 1200 ml 700 ml		0.16*
Group-2 n=50 (%)	03 (14%)	40 ml. 100 ml. 120 ml. 86.66±41.63	2 hr. 3hr. 3.hr	600 ml. 1000 ml. 1200 ml.		

* χ^2 test

Urinary tract infection was present 5 cases in group-1 and 17 cases in group-2 and it was significantly higher in group-2 (P<0.05) [Table-IV].

Table-IV: Urinary tract infection in both study groups

Urinary tract infection	Group-1 n=56(%)	Group-2 n=50(%)	p value
Negative	51(91)	15(66)	0.03*
Positive	05(08)	17(34)	

* χ^2 test

Among 5 cases in group-1, E.coli was found in 3 cases and K. pneumonia in 2 cases. In group-2, 15 cases were E.coli positive. 01 case K. pneumonia and another one case Staphylococcus aureus (Table-V).

Table-V: Causative organism of urinary tract infection in both study groups

Urinary tract infection	E.coli	K. pneumonia	Staph. aureus	Total
Group-1 (n=05)	03	02	0	05
Group-2 (n=17)	15	01	01	17
Total	18	03	01	22

Discussion :

Urinary catheterization after vaginal prolapsed surgery is used to prevent postoperative urinary retention. For either short or long term catheters the infection rate is about 5% per day and the duration of catheterization is the principal determinant of infection with long term indwelling catheter.[8] Indwelling catheter after gynaecological operation have been shown to affect the length of hospitalization, occurrence of febrile morbidity and the incidence of urinary tract infection.[9] Urinary tract infection accounts for 40% of hospital acquired infection and 80% of urinary tract infection in hospital are associated with urinary catheter.[10-11] Present study tried to compare the effectiveness and benefit between short term and long term catheterization following vaginal prolapsed surgery.

Prolong catheterization after vaginal prolapse surgery is believed to be preventing voiding problem post operatively. 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. Thakur et al[6] found similar findings in their study. So duration of catheterization did not affect first voiding time after removal of catheter. This may due to early voiding tendency due to bladder and urethral irritation following early removal of catheter.

The residual urinary volume (RUV) after removal of catheter can be taken as functional bladder parameter and the value <200 ml placed as normal. In this study none of the women had residual volume of urine >200 ml in both groups but mean residual volume of urine after removal of catheter is significantly high in long term catheterization group. Hakvoort et al[7] found immediate requirement of recatheterization where RUV> 200 ml in 40% cases in short term catheterization group which is alarmingly high. Schiotz et al[12] reported low urinary retention in short term catheterization group.

Recatheterization was needed for total five cases in group-1 and among them four (80%) cases might be due to post-operative pain resulting in disabled relaxation of the pelvic floor muscles with urinary retention and one (20%) case due to evidence of urinary tract infection. Recatheterization rate is higher in short term catheterization group in this study. Thakur et al[6] found similar result in their study. Hakvoort et al l[7] found 40% recatheterization in short term group is higher then the present study. Pant et al[13] found a lower incidence of recatheterization (5/257) in short term catheterization group. Thapa et al[14] found no recatheterization among the women in short term catheterization group and 3.7% cases in long term catheterization group in their study. Recatheterization with an indwelling catheter is debatable and the use of short term or intermittent catheterization may be more appropriate because of the establishment of a more natural filling and emptying cycle.

In this study, incidence of urinary tract infection is significantly low in short term catheterization group. Hakvoort et al[7] found ten times lower incidence of urinary tract infection in short term catheterization group. Pant et al[13] found higher incidence of urinary tract infection in five days catheterization group. This study showed, three days catheterization urine sample with more organism but only few of them produced symptom of urinary tract infection. Long duration catheterization increases the risk of catheter related urinary tract infection.

Majority of the infection were caused by E. coli followed by Klebsiella. Similar result was found by Thakur et al[6] and Thapa et al[14]. In a retrospective study conducted in five hospitals in Nepal found E. coli (49%), Staph aureus (23%) and Klebsiella (10%) as the causative organism in catheterized patients after gynecological operation.[15]

Conclusion :

Short term catheterization is more beneficial in terms of lower incidence of urinary tract infection and prevention of bladder over filling as compared to long term catheterization after vaginal prolapsed surgery.

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