

Comparison of 1 Versus 3 Day Post-Operative Catheterization after Anterior Colporrhaphy”

¹Ahmadi Shahnaz, ²Rahmani Elham, ³Ahmadi Kambiz and ⁴Kalani Sara

¹Department of Gynecologic Obstetric, Iran University of Medical Sciences, Tehran, Iran

²Department of Gynecologic Obstetric, Bushehr University of Medical Science, Bushehr, Iran

³Department of Statistics, University of Birjand, Birjand, Iran

⁴Department of Medicine Student, Bushehr University of Medical Science, Bushehr, Iran

Abstract: With attention to the fact that after anterior colporrhaphy surgery and stitches on vaginal mucus, inserting urinary catheter is requested, according to scientific references and in order to prevent from urinary retention, it has been said that the catheter should be inserted for 3 day. But inserting the catheter leads to infections of bladder and pain. So, in present study, we compared the removal of the catheter 24 versus 72 h after the surgery, considering urinary infections, urinary retention, patient's ease and hospitalization. Within two groups of 70 patients which has been assimilated based on basic factors) divided in to two groups accidentally with excel table) urinary catheter fixed for 1 and 3 day. After that, patients were compared considering urinary retention, urinary infections and the rate of patient's satisfaction. Urinary retention was 28.6% in the test group and 22.9% in controlling group which was not statistically meaningful ($p = 0.78$). Urinary infections was 22.9% in the test group and 34.3% in controlling group ($p = 0.42$) and the rate of patient's satisfactions was 57.1% in the test group and 40% in controlling group ($p = 0.23$). The hospitalization period in test group and in control group was 2.91 ± 0.61 and 3.94 ± 0.59 day, respectively with a significant difference ($p = 0.001$). The results showed that short time catheterizations is more satisfactory in comparison long catheterizations.

Key words: Anterior colporrhaphy, urinary retentions, urinary infections, surgery, catheterizations

INTRODUCTION

Pelvic organ prolapse is a common age-related disease (Toz *et al.*, 2015; Nussler *et al.*, 2015). Its rate of occurrence increases with age (Nussler *et al.*, 2015; Swenson *et al.*, 2015). A survey conducted showed that about 12% of women are possibly exposed to surgery during their life in order to recover from prolapse (Nussler *et al.*, 2015; Swenson *et al.*, 2015). The anterior wall of the pelvic is the most common site for prolapse, it accounts for eighty percent of cases (Gleason *et al.*, 2012).

Prolapse has various causes and is associated with weakness of the connective tissue and pelvic muscles as well as neural damage (Gleason *et al.*, 2012). Patients may have no symptoms or they may experience some special symptoms such as low urination, pelvic pain and some problems related to kidney acceptance, excretion incontinency, backache and dyspareunia (Gleason *et al.*, 2012). Non-surgical therapeutic approaches of prolapse includes reinforcement of the pelvic muscles and surgical therapy which consists of a multi-dimensional approach such that each patient has her private treatment

(Gleason *et al.*, 2012). Moreover, regarding the previous treatments received by the patients and the level of their activity and health conditions, this therapy differs in each patient. It is predicted that the necessity of prolapse treatment will increase over the next 30 year to about 45% due to increase in the population of women above 50 year and excessive parturition (Nussler *et al.*, 2015; Gleason *et al.*, 2012).

The most dangerous factor for prolapse is vaginal delivery. After comparing parameters such as age, race and body mass index, it is found that women with at least a vaginal delivery are affected by prolapse twice more than women without parturition (Gleason *et al.*, 2012). Other risk factors for prolapse include hysterectomy, overweight, previous record of prolapse surgery and race (Gleason *et al.*, 2012). Prolapse is often recognized by urinary disorder symptoms such as excretion incontinency, urinary block symptoms, urinary frequency and urgency; on the other hand, other symptoms like urinary retention, kidney function disorder, pain or anuria may appear (Gleason *et al.*, 2012). Other symptoms for prolapse consist of pelvic pain, some problems in kidney acceptance (such as irregularity, dribbling,

tenesmus and excretion incontinency), backache, pelvic pain and dyspareunia (Toz *et al.*, 2015; Gleason *et al.*, 2012). Treatment choice usually depends on the severity of the symptoms and the amount of prolapse along with the general health of the patient and the level of their activity.

To evaluate the anterior and posterior compartment of prolapse, the speculum can be used. During the evaluation of each compartment, each patient is asked to do maneuver valsalva, in order to determine the whole extent of prolapse. If the result from the valsalva method is not in harmony with the description of the patient or with her symptoms, doing examination in standing form while forcing an empty bladder is a useful method. The stages for prolapse are shown in this table.

Studies have shown that patients suffering from prolapse show the absolute spectrum of urinary symptoms and sometimes some patients may not show any clear symptoms, the most important point is that the objective information about the function of bladder and urethra must be taken (Gleason *et al.*, 2012). The basic aim of prolapse surgery is the improvement of those symptoms created by prolapse and in most cases, restitution of vaginal normalcy as well as sexual function may be restored and retained without any complications (Rock and Jones III, 2015). The surgical treatment of the vagina is related to the laparotomy or laparoscopy or a combination of these two (Gleason *et al.*, 2012).

Complications of anterior colporrhaphy: After anterior colporrhaphy surgery, some symptoms including swellings, hardening, pains in muscles of sexual and urinary parts may be created (Rock and Jones III, 2015; Brunicardi and Anderson, 2014; Pant 2007). After that, an excessive stretch may occur resulting in destruction of bladder muscles tone (Atony), consequently urinary retention occurs (Brunicardi and Anderson, 2014). Urinary retention is the most common complication and its occurrence differs in various studies (Gleason *et al.*, 2012; Chai and Pun, 2011). However, it has been reported between 5-70% in other prevalence studies (Darrah *et al.*, 2009). The existence of completely different studies about the rate of urinary retention prevalence after surgery is because of different etiologies in this issue and lack of the same criteria for its evaluation. The most exact method for evaluating the amount of urine in bladder is ultrasound; this can be a proper guidance for assessing the urinary retention after surgery (Darrah *et al.*, 2009).

Urinary retention after surgery is estimated by measuring if the quantity of urine retained is ≥ 200 mL by ultrasound 8 h after removing catheters or the remaining urine was estimated at 150 CC for patients who cannot empty their bladder 6 h after removing the catheters (Chai and Pun, 2011).

Other complications related to surgery of anterior colporrhaphy are catheters-dependent urinary infections (Doppa *et al.*, 2014; Darrah *et al.*, 2009) that must be taken into consideration in estimating the time needed for keeping the catheters because it is estimated as the cause of $>30\%$ of hospital infections (Ercole *et al.*, 2013). Therefore, the urinary catheters are improvised for several days in order to prevent complications after surgery (Movahed and Rahmani, 2010).

Along with reaching the lowest rate of complications, a study has been designed in which the standard and long term catheterization for 3 day is compared with 1 day or short term catheterization after the surgery of anterior colporrhaphy from women hospitalized in Bushehr Shohadaye Khalijfars hospital in 2013-2015.

MATERIALS AND METHODS

In a prospective randomized clinical trial which was performed on 70 women candidates for anterior colporrhaphy surgery who were admitted in to Shohadaye Khalijfars hospital in Bushehr, a written informed consent was obtained from all patients after full explanation of the procedure. Also the study was approved by Institutional Ethical Review Board. Those patients who complained about vaginal prolapse were examined by speculum in lithotomy condition using maneuver valsalva. After confirming prolapse based on the inclusion and exclusion criteria, the patients were studied. The inclusion criteria included prolapse of vaginal anterior with grades 2 and 3, age between 25-49 year old and body mass index of $19-24 \text{ kgm}^{-2}$.

The exclusion criteria consisted of vaginal anterior prolapse grade 1 and 4, diabetes, connective tissue diseases, different kinds of true urinary incontinency, having a history of hysterectomy. Urinary analysis and culture examination was done prior to surgery in all patients. The presence of positive urinary culture or >100000 colony count in each milliliter of urine or >10 pieces of leukocyte in each microscopy field was considered as a urinary infection. Patients with urinary infection were omitted from the study. Candidate patients for surgery were given enema at night before the surgery and all patients were treated with prophylaxis thirty minutes before surgery. The surgery was done by one surgeon and by using the delay absorb thread No. 0 and with general anesthesia. After the surgery, the antibiotic was not regularly given except for patients who had abnormal urinary symptoms and unusual urinary analysis in urinary sample 48 h after the surgery.

Patients were randomized in two groups using computer-generated randomizes schedules. In case group (35 patient) Urine catheter removed 24 h after surgery and

in control group (35 patients) Urine catheter removed 72 h after surgery. All the patients whose remaining urine was >200 CC, 8 h after removal of the catheter or those patients who in spite of urinary necessity were unable to urinate and there was >150 CC urine in their bladder from ultrasound result, the urinary catheter were again fix for 24 h. Patients that lack urinary retention symptoms after removing the catheter were released. Some parameters such as the patient's staying time, the level of their satisfaction and the rate of urinary infections were examined after surgery.

Statistical analysis: Statistical analysis was done by SPSS Software Edition 18. In order to study the normality of dependent variables (such as age, the hospitalized time), the Kolmogorov-Smirnov test was applied. In cases with unusual distribution of dependent variables, independent non-parametric t-test (Mann-Whitney) was used. The results were explained in the form of mean±SD. The means between the two groups were compared by independent t-test. In addition, K-square test was applied for comparing qualitative variables between two groups.

RESULTS AND DISCUSSION

This study compared the effect of 1 day catheterization with 3 day catheterization from the rate of urinary retention and urinary infection point of view. Along with reaching this aim, the two groups must be parallelized based on their age, body mass index and the level of anterior prolapse of the vagina, so that the research just studies the mentioned factors. In this study, the age-related mean in 1 and 3 day catheterization groups was 39.4±3.2 and 38.8±2.8 year old, respectively and statistically there was no significant difference between them (p = 0.407).

About 34.3% of patients in 1 day prolapse group with grade 2 and 31.4% of them in 3 day prolapse group with grade 2 had vaginal anterior phlegm with no significant difference (p = 1.0). The two mentioned groups showed no significant difference with respect to the body mass index (p = 0.099) (Table 1 and 2).

These two groups were compared regarding the frequency of urinary retention from each other after surgery in the case group (with 1 day catheterization) and in the control group (with 3 day urinary catheterization), the result showed 28.6 and 22.9% urinary retention, respectively with no significant difference between the two groups (p = 0.78). Although, the necessity of repeating the catheterization process was higher in the case group (31.4% against 25.7%) but there was no

Table 1: The stages of prolapse

Stages	The grade of prolapse
0	There is no observed prolapse
1	The lowest part of prolapse is >1 cm above the hymen level
2	The lowest part of prolapse is <1 cm proximal or distal to hymen level
3	The lowest part of prolapse is <1 cm under the hymen level but it is >2 cm from the full length of the vagina
4	Full or almost full protrusion of the vagina

Table 2: Demographic of patients in two group

Variables	Test group Mean±SD	Control group Mean±SD	p-values
Age	39.4±3.2	38.8±2.8	0.407
BMI	20±2.1	20±2.4	>0.999

The p-values are obtained using t-test

Table 3: The grade of anterior prolapses in two groups

Variables	Treatment group (%)	Control group (%)	p-value
Prolapse 2	12 (34.3)	11 (31.4)	1.0
Prolapse 3	23 (65.7)	24 (68.6)	

Table 4: A comparison of consequences in urinary retention, second catheterization, positive urinary culture and the patient's level of satisfaction from the period of hospitalization between test and control group after anterior colporrhaphy surgery

Variables	Test group (%)	Control group (%)	p-values
Urinary retention			
Yes	10 (28.6)	8 (22.9)	0.78
No	25 (71.4)	27 (77.1)	
Re-catheterization			
Yes	11 (31.4)	9 (25.7)	0.79
No	24 (68.6)	26 (74.3)	
Positive urine culture			
Yes	8 (22.9)	12 (34.3)	0.43
No	27 (77.1)	23 (65.7)	
Patient satisfaction			
Yes	20 (57.1)	14 (40.0)	0.23
No	15 (42.9)	21 (60.0)	

significant difference (p = 0.79). As a result, the percentage of patients suffering from urinary infection that tested positive from culture in the 3 day group (34.3%) was also higher than the 1 day group (22.9%) but showed no significant difference statistically (p = 0.42). Moreover, the patient's level of satisfaction about catheterization and their hospitalization was higher in the test group but showed no significant difference (57.1% against 40.0%).

The hospitalization period in test group and in control group was 2.91±0.61 and 3.94±0.59 day respectively with a significant difference (p = 0.001). (Table 3 and 4). A study by Hakvoort *et al.* (2004) on this subject in which urinary catheters were inserted for 4 day for a group and removed on the 5th day. In another group, the catheters were removed one day after the surgery. In addition, some factors such as the amount of urine retained, urinary infection and the period of hospitalization were compared between two groups. The level of urinary retention in the 1 day group is >4 day group but the level of their urinary infection and the

period of their hospitalization were <4 day group. It is known that the disadvantages of long-term catheterization are more than its advantages, hence it must be done just when it is really needed (Hakvoort *et al.*, 2004; Thakur *et al.*, 2007) conducted a study in the women's room of the educational hospital TU in Maharajguni, on 100 patients and the 1 and 3 day catheterization were compared. The results obtained from this study showed that the level of urinary infection in the short-term catheterization group was lower than the other, the rate of urinary retention in this group was also found to be higher than the other. However, urinary retention has not been reported in the long-term catheterization group (Thakur *et al.*, 2007).

In another study conducted by Hakvoort *et al.* (2004) the catheterization was done after the surgery for all patients and their catheters were removed after 1 day. Those patients whose urine content was >150 mL were divided into two groups, one of them used catheters when they needed to urinate while another one improvised the catheters for 3 day.

In the first group, the amount of urinary infection was 12% but its amount in the second group was 33%, so the first group needed a very short time for catheterization. The level of patient's satisfaction was the same in the two groups (Hakvoort *et al.*, 2011).

Another, research was performed by Wanderstin in 2010 using two groups, they improvised the catheters for 1 and 3 day, respectively. The results showed that the period of catheterization and hospitalization in the first group was significantly decreased but in the second group, the level of urinary retention was less than the other (3.79% versus 9.90%). However, the level of urinary infection was not significantly different in the two groups (Steen *et al.*, 2011).

Also, in this case, a research was conducted by Weemhoff *et al.* (2010) and Kamilya *et al.* (2010) in which the removal of urinary catheters was compared between 2-5 day, after anterior colporrhaphy surgery. It was concluded that removing the catheters in the second day required further improvising compared to the fifth day but the level of urinary infection and the period of hospitalization was less in this group.

In another research, Adly concluded that in the group in which the urinary catheters were removed earlier, they needed further catheterization three to four times more than the other group whereas in the second group whose catheters were removed after 5 day, the probability of urinary infection was 14 time more than the other. It was concluded that removing the catheters in the first 24 h is more appropriate (Fattah and Santoso, 2013).

In recent studies performed by Joshi *et al.* (2014) on seventy patients, the short-term and long-term catheterizations were compared regarding the level of

urinary infection and urinary retention. Thus, they concluded that the short-term catheterization does not increase the level of urinary infection and the patients in this group felt less pain and illness compared to the others. However, the rate of further catheterization was higher in this group than the other but the difference was not statistically clear (Joshi *et al.*, 2014).

According to different studies, the urinary catheters were removed on the 1st to 5th day as well as 3 h after surgery or even immediately after prolapse surgery (Glavind *et al.*, 2007). Although, based on these studies, the period of keeping the catheters is challenging in a research published by Pant (2007), it was determined that when the catheters were removed earlier, the level of urinary infection was low in seven out of eleven studies (Phipps *et al.*, 2006). In our research, the two groups recorded no significant difference from the frequency of urinary retention point of view from each other ($p = 0.78$). Despite the necessity for repetition of the catheterization process, it was more in the 1 day group than the others (31.8% against 25%), there was no significant difference in this case ($p = 0.79$). Whereas in other studies, the level of urinary retention in the 1 day group was more than the 3 day group. The reason for the lack of difference might be because all the patients had cystoceles grade 2 and the intense cystocels had been omitted from the study.

In the present research, the percentage of patients suffering from urinary infection and having a positive culture result in the three-day group (38.8%) was also higher than the 1 day group (22.7%) but this difference was not statistically significant ($p = 0.42$) this may be due to the small size of the studied sample.

In this study, the average hospitalization period in the 1 day catheterization group and the 3 day group was 3.91 ± 0.61 and 4.95 ± 0.59 day, respectively and there was a significant difference between them ($p = 0.0001$). Consequently, the patient's level of satisfaction in 1 day catheterization group was >3 day group (57.1% against 40% in the 3 day group) but it was not statistically significant ($p = 0.001$).

CONCLUSION

In this study, short-term or 1 day catheterization increased the level of patient's satisfaction compared to the group whose patients kept the catheters for several days ($p = 0.001$). However, in other aspects such as decreasing the level of urinary infection, there was no significant difference between these two groups ($p = 0.42$). Also, there was no significant difference between them from evaluating the urinary retention ($p = 0.78$). Therefore, it seems that although the short-term catheterization showed no remarkable results from the decline of the level of urinary infection, it increased the level of patient's satisfaction.

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