

COMPARISON OF TWO DIFFERENT WAYS OF PASSING URETHRAL CATHETER AFTER TRANSURETHRAL RESECTION OF THE PROSTATE

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ABSTRACT

OBJECTIVES: To determine and compare the rate of success of two methods of passing urethral catheter following TURP using silicone Foley catheter: passing the urethral catheter with introducer into an empty bladder and passing the catheter without introducer into bladder filled with normal saline.

PATIENTS AND METHODS: This was a prospective study carried out between October, 2013 and November, 2016 on 64 patients. Patients who had TURP for BPH were divided into 2 groups based on method of passing urethral catheter after the procedure: Group A: passing silicone urethral catheter with introducer into an empty bladder after TURP. Group B: passing silicone urethral catheter without introducer with bladder filled with normal saline. The outcomes of comparing the groups were computed using appropriate statistical tools.

RESULTS: Catheter was passed at single attempt for 15 patients in group A and 14 patients in group B. Successful passage of the catheter was achieved at 2 attempts for 7 patients in group A and 13 patients in group B. Whereas success was achieved at 3 attempts for 10 patients in group A and 5 patients in group B. On comparing the success of attempts to pass the catheter in each group, $\chi^2 = 0.721$, $p = 0.396$. Fisher exact test also did not reveal any significance, $p = 0.286$.

CONCLUSION: Passing silicone Foley urethral catheter into a bladder filled with normal saline after TURP is as effective as passing the catheter with the aid of introducer and guarantees no further injury to the urethra.

KEYWORDS: TURP, urethral catheter, introducer

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INTRODUCTION

Transurethral resection of the prostate (TURP) has been available for over 10 decades globally. Despite the availability of various procedures for the surgical treatment of benign prostatic hyperplasia (BPH) it is the current gold standard for operative management of symptomatic BPH and has excellent long term efficacy¹.

Conventionally, Foley catheter is placed through the urethra into the bladder after TURP. The catheter allows bladder irrigation to prevent blood clot retention and drains urine. Also, when the catheter is put under traction, the balloon of the catheter compresses the bladder neck and the prostatic fossa reducing bleeding.

Normally, the catheter insertion is done after irrigation had been stopped and the resectoscope sheath removed. Invariably, all the irrigation fluid leaks out leaving the bladder empty at the end of the procedure. A direct attempt at inserting catheter into the empty bladder then becomes difficult or sometimes even impossible. There is also a risk of undermining the bladder neck and creating a false passage while attempting to pass the catheter. Occasionally, the catheter coils up in the prostatic fossa failing to reach the bladder cavity. These difficulties have been attributed to the exaggerated curved anatomy of the posterior urethra particularly after a deep resection of the prostate².

To facilitate the passage of the catheter into the bladder and to reduce the risk of false passages and undermining of the bladder neck, a catheter introducer is often used to curve the catheter, allowing it to follow the anatomy of the urethra closely. Even with the introducer, the curve is thought to be sometimes too oblique; resulting still in difficult catheterization and

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formation of false passage, rectal perforation, bladder perforation which might even provoke severe bleeding³.

The urethra is very delicate and in some regards the catheter introducer is a dangerous instrument and can cause urethral injury if not carefully manipulated. Ordinarily, it should best be avoided while attempting to pass urethral catheter in any setting. It would be desirable if the catheter could be passed without aid of the introducer at the end of a TURP. We propose a new but simple technique of easily passing the Foley urethral catheter after TURP without using an introducer. We assume that filling the bladder to full capacity after deep resection of the prostate straightens out the steep bladder neck, fills up the prostatic fossa and levels out the bladder cavity and the prostatic fossa thereby facilitating easy passage of the catheter.

No study has been found from our literature search that has investigated the success of passing a silicone Foley urethral catheter into the bladder after TURP after filling the bladder with normal saline.

This study determines and compares the rate of successful attempts of two methods of passing urethral catheter following TURP using Foley catheter passed into empty bladder without introducer: Passing the urethral catheter with introducer into an empty bladder and passing the urethral catheter without introducer into a full bladder.

PATIENTS AND METHODS

This was a hospital-based prospective study carried out at a multi-specialty hospital in Jos, North-central Nigeria comparing the conventional technique of passing urethral catheter after TURP using an introducer with our simple innovation way of passing the catheter. The study was between October, 2013 and November, 2016.

Permission for the study was obtained from the hospital Research and Ethical committee. Informed consent was obtained from patients, who clearly understood that the study portends no harm to them, who were willing to participate and who fulfilled the criteria for inclusion into the study.

Patients with BPH whose prostate sizes were more than 50ml and who met the indications for TURP as well as consented to the study were the subject of the study. Patients who had channel TURP or in whom resection was for prostate size less than 50ml; patients who developed TURP syndrome or developed severe haemorrhage warranting termination of the procedure were excluded from the study.

The patients and the surgeons were not blinded to the procedures.

All the consenting patients whose prostate sizes were more than 50ml and had the TURP for various indications were blocked randomized into the 2 groups:

Group A: Passing silicone Foley urethral catheter, size 20 - 22Fr with introducer into an empty bladder after TURP.

Group B: Passing silicone urethral catheter without catheter introducer with bladder filled with 300-400ml of normal saline aiming to achieve a full bladder (the quantity used within the range depended on the capacity of the bladder).

Patients were thoroughly evaluated and had full blood count, serum electrolytes/urea/creatinine, chest X-ray, electrocardiogram (ECG) before surgery. Prostate size estimation was done preoperatively using abdominal ultrasound. Prostate biopsy was also carried out for patient with elevated PSA.

Surgical protocol followed standard technique and a 3-way silicone urethral catheter was inserted after each procedure to allow continuous bladder irrigation based on technique as randomly allocated.

Catheter insertion in empty bladder with catheter introducer

Was carried out immediately after the haemostasis was achieved and all the prostatic chips evacuated. The balloon of the catheter was first checked for leakage before insertion. Then a well lubricated size 20 - 22Fr silicone Foley urethral catheter was passed with the introducer. The introducer is a rigid curved metal strip. The tip of the introducer was placed in the eye of the catheter and stretch along the curved length of the introducer. Then the catheter together with the introducer was then gently passed into the bladder. The balloon was inflated to the desired volume before the introducer was removed by slipping the tip out of the eye of the catheter.

Catheter insertion after the bladder is filled to with 300 to 400ml of normal saline.

After evacuating the prostatic chips the bladder was refilled with 300 - 400ml of saline after turning off the outlet channel of the resectoscope to avoid the fluid from draining out. Obturator was also re-inserted through the inner resectoscope sheath to avoid the fluid from leaking. The resectoscope sheath was then carefully removed and a well lubricated size 20Fr - 22Fr waiting in readiness was inserted up into the bladder. Once the tip of the catheter was inside the bladder

cavity the fluid starts flowing out through the catheter drainage channel. The balloon inflated to the desired volume and bladder irrigation commenced.

The means, t-test and Fisher's exact test were carried out for numeric variable. Categorical variables were analysed using chi-square (χ^2). The p value was set at <0.05 level of significance. A computer based sample size calculator was used to estimate the sample size. Considering 0.05 two-sided significance level, a power of 80% and allocation ratio of 1:1, a sample size of 64 was estimated for the study.

RESULTS

A total of 64 patients underwent the monopolar TURP for BPH during the period under review. Both groups had no statistically significant difference in their baseline characteristics. The mean age in group A was 68 ± 5.30 years (51 - 86), while that in group B was 67 ± 8.31 years (56 - 84). The mean prostate volume for the total number of patients in all the groups was 65 ± 11.00 ml; while that for prostate specific antigen (PSA) was 5.13 ± 4.60 ng/ml. The means of the prostate volume, prostate specific antigen, operation time and other characteristics in each group are as shown in table 1.

Table 1: showing various variables observed for the patients within the 2 different groups that underwent TURP

	Group A	Group B	p
Age (years)	68.53	67.47	0.475
Prostate volume (ml)	67.64	64.34	0.844
PSA (mg/dl)	5.30	4.98	0.158
Operation time (mins)	69.41	68.38	0.280
Hospital stay (hrs)	62.25	57.00	0.170

Group A: Passing silicone catheter size 20 - 22Fr into empty bladder after TURP

Group B: Passing silicone urethral catheter, size 20 - 22Fr without introducer after the bladder was filled with 300 - 400 ml of normal saline after TURP

All the patients had spinal anaesthesia. The mean quantity of 5% dextrose-water used for irrigation at surgery was 30L. Most of the patients, 33(78.6%) had their catheters removed at 3-5 postoperative days. The mean duration of catheter stay for the patients in groups A and B were 2.09 ± 0.44 , 2.23 ± 0.62 respectively. Postoperatively, catheter was easily passed at single

attempt for, 15 patients in group A and 14 patients in group B. Successful passage of catheter was achieved at 2 attempts for 7 patients in group A and 13 patients in group B. Whereas success was achieved at 3 attempts for 10 patients in group A and 5 patients in group B (table 2):

Table 2: Showing percentages of successful attempt passage of the catheter after TURP in each group.

	Group A	Group B	Total
1 Attempt	15(46.9%)	14(43.8%)	29
2 Attempts	7(21.9%)	13(40.6%)	20
3 Attempts	10(31.2%)	5(15.6%)	15
Total	32(100%)	32(100%)	64

On grouping the attempts to pass the catheter into increasing degree of difficulty, out of the total of 32 patients in group B, the catheter was successfully passed at 1-2 attempts in 27 patients, while 3 attempts were required to pass the catheter in 5 patients. On the other hand, out of the 32 patients in group A, 1-2 attempts were required for successful passing of the catheter in 22 patients while 3 attempts were required to successfully pass the catheter in 10 patients (Table 3).

On comparing the success of attempts to pass the catheter in each group, $\chi^2 = 0.721$ (with 2 degrees of freedom), $p = 0.396$. Fisher exact test also did not reveal any significance, $p = 0.286$.

Table 3: Showing the number of attempts before successful passage of the catheter after TURP in each group.

	1-2 attempts	3 attempts	Total
Group A	22	10	32
Group B	27	5	32
Total	49	15	64

DISCUSSION

Insertion of urethral catheter just after TURP could prove challenging and sometimes impossible especially after deep resection of the prostate that leaves a steep or exaggerated curved posterior urethra. The difficulty may also arise when the bladder neck is undermined due to over resection of bladder neck or the proximal prostatic urethra^{1,2,4}.

Most urologists resort to use of introducer to facilitate the insertion of the Foley catheter. But the use of the introducer to facilitate the placement of the catheter is not without complications particularly urethral injury and creation of false passages³.

Our study suggests that insertion of catheter into the bladder when bladder is filled with fluid is as successful as using introducer to place the catheter thereby eliminating the need for introducer.

Other methods of insertion have been used to facilitate the insertion of catheter after TURP but they appear cumbersome and in some instances require additional instrumentation. The insertion of index finger into the rectum to push against the rectum and the prostatic fossa to guide the catheter tip into the bladder has been suggested. But this is done blindly and mostly when the bladder is not filled with fluid with the possibility of still failing to advance the catheter into the bladder.

Loewe⁵ and colleagues have equally described the technique of using a PeelAway® (Cook Urological, Spencer, IN) sheath placed on the resectoscope. The sheath is placed on the resectoscope at the beginning of the procedure. At the end of the procedure, the resectoscope is removed leaving behind the sheath in place. A Foley catheter is then passed through the sheath into the bladder, the balloon inflated and the sheath removed. The draw back with this sheath is that it is not always available as it does not form the routine armamentarium of the TURP set. It also leads to absolute increase in the diameter of the resectoscope with possible deleterious effect on the urethra.

Szewczyk⁶ and colleague proposed the use of Lunderquist-type guide (10Fr) for insertion of the Foley catheter in difficult situations after TURP. They used the Lunderquist-type wire normally used for percutaneous nephrolithotomy. In their technique, inserting the wire into lumen of size 22-24Fr catheter stiffens and guides the catheter into the bladder. They recognised that the manoeuvre requires a special type of Foley catheter (Council catheter) or a cut end of a normal Foley catheter. The cut end of the catheter is sharp and risk urethral injury.

Also, Rozanski⁷ and colleagues described a technique of using a size 22Fr Foley catheter with a hole created at the tip of the catheter. They inserted a 6Fr semi-rigid ureteroscope into the Foley with the tip of the ureteroscope projecting some millimetres beyond the tip of the catheter. The catheter is then passed into the bladder under direct vision. This technique eliminates the possibility of undermining the bladder neck, coiling of the catheter in the prostatic fossa or creating of false passage and urethral injury. But it requires availability

of ureteroscope.

Our technique does not require any additional instrumentation and does not carry risk of urethral injury or creation of false passage.

CONCLUSION

This simple technique of passing silicone Foley urethral catheter into a bladder filled with normal saline into the bladder after TURP is as effective as passing the catheter with the aid of introducer and guarantees no further injury to the urethra, does not require a special catheter the possibility of catheter undermining the bladder or creating false passages.

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