

## EARLY VERSUS DELAYED FOLEY CATHETER REMOVAL AFTER TRANSURETHRAL RESECTION OF THE PROSTATE

Akpayak I.C. Shuaibu S.I. Onowa V.E. Agbo C.A.  
Urology Division, Surgery Department, Jos University Teaching, Jos, Nigeria.

### ABSTRACT

#### Background

Time of removal of the urethral catheter varies after the TURP. While some urologists remove the catheter on day 1 or 2 after TURP, most wait for 4-7 days before removing the catheter. The keeping of a urethral catheter for 4-7 day may require that the patient stays in the hospital for that duration of time to have the catheter removed before he goes home. The delayed catheter removal, therefore, may prolong hospital stay. There is no data from our environment on when to remove the catheter after TURP. This study seeks to compare early and delayed catheter removal after TURP for benign prostatic hyperplasia.

#### Patients and Method

This was a hospital-based prospective study carried out at a multi-specialty hospital in Jos, North-central Nigeria, comparing the outcomes of delayed (conventional) catheter removal with early removal of the catheter after TURP for BPH between December 2013 and January 2018. Patients with BPH who met the indications for TURP as well as consented to the study formed the subject of the study. Patients who had chronic retention prior to TURP and those who had significant perforation of the prostatic capsule and therefore required a longer catheterization were excluded from the study. The patients and surgeons were not blinded to the procedure. All the consenting patients who had the TURP for various indications were blocked randomized into the two groups: Group A: early catheter removal (postoperative day 2) Group B: delayed catheter removal (postoperative day 4). The intraoperative and postoperative parameters were compared using appropriate statistics

#### 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. In groups A and group B, the number of patients that had urinary retention were 2 (6.1%) and 2 (6.1%) respectively, and the difference was not statistically significant ( $p = 0.693$ ). The number of patients that had UTI in group A and group B were 1 (3.0%), and 4 (12.1%) and the difference was also not statistically significant ( $p = 0.178$ ). One (3.0%) patient developed urethral stricture in group A and 1 (3.0%) also in group B with no statistical difference ( $p = 0.734$ ). Three patients (9.1%) developed epididymorchitis in group B while none had this complication in group A ( $p = 0.119$ ). Stress incontinence was seen in 1 (3.0%) patient in group A and also in 1 (3.0%) in group B with no statistical difference ( $p = 0.734$ ) Bleeding complication was negligible in both groups after removal of the catheter.

#### Conclusion

Either early or delayed removal of the catheter after TURP does not add excessively to postoperative complications. Removal of a urethral catheter on postoperative day 2, favourably granted the reduced hospital stay and consequently reduced cost.

**Keywords:** TURP, early catheter removal, delayed catheter removal

NigerJmed 2020: 111-114  
© 2020, Nigerian Journal of Medicine

## INTRODUCTION

The modalities of treatment of benign prostatic hyperplasia (BPH) vary depending on the severity of symptoms as measured by the international prostate symptoms score (IPSS) and on the presence or absence of complications, e.g. acute or chronic urine retention and the size of the gland<sup>1</sup>. These modalities include; watchful waiting, medical management, minimally invasive methods, Transurethral resection of the prostate (TURP), open prostatectomy and more recently anatomical endoscopic enucleation of the prostate (AEEP).

#### Correspondence to:

Dr Idorenyin C. Akpayak  
Division of Urology, Surgery Department,  
Jos University Teaching Hospital,  
Jos, Nigeria.  
Tel: +2347032125825  
E-mail: akpayakuro@yahoo.com

Despite the perceived advantages<sup>2, 3</sup> and the intensive campaigns to popularize AEEP procedures particularly holmium laser enucleation of the prostate (HoLEP), the steep learning curve and expensive investment required have combined to limit its global spread<sup>4</sup>. Therefore TURP is still widely practised and remains the gold standard of surgical treatment of BPH<sup>5</sup>.

A 3 way Foley catheter is usually placed through the urethra into the bladder after TURP. The catheter allows monitoring of bleeding, bladder irrigation to prevent blood clot retention and drains urine. Also, when the catheter is placed under traction, the balloon of the catheter compresses the bladder neck and the prostatic fossa, thereby reducing bleeding. The urethral catheter also helps in monitoring urinary output, reduce symptoms of urethral irritation.

Time of removal of the urethral catheter varies after the TURP. While some urologists remove the catheter on day 1 or 2, most wait for 4-7 days before removing the catheter<sup>6,7</sup>. The keeping of urethral catheter for 4-7 days is a significant drawback for TURP patient because that usually requires

additional days of hospital stay. Moreso, urinary catheter leads to a significant increase in the rate of urinary tract infection (UTI) and epididymorchitis<sup>8</sup>. Again, urinary catheter constitutes significant anxiety for men after prostatectomy, and patients usually appreciate its early removal after surgery. But its removal should not negatively affect the surgical outcome.

There is no data from our environment on when to remove the catheter after TURP. Our practice is to remove the urethral catheter on day 4-5 after TURP. This study seeks to compare early and delayed catheter removal after TURP for benign prostatic hyperplasia with respect to postoperative complications including urinary retention, bleeding, epididymorchitis, stress urinary incontinence and urethral stricture in our patients.

## PATIENTS AND METHODS

This was a hospital-based prospective study carried out at a multi-speciality hospital in Jos, North-central Nigeria, comparing the outcomes of delayed (conventional) catheter removal with early removal of the catheter after TURP for BPH. The study duration was between December 2013 and January 2018.

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 and who met the indications for TURP as well as consented to the study were the subject of the study. Patients who had chronic retention before TURP and those who had a significant perforation of the prostatic capsule and therefore required a longer catheterization were excluded from the study. Also, those in group B who wanted to be discharged home earlier and prefer to come back for catheter removal were excluded from the study.

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

All the consenting patients who had the TURP for various indications were blocked randomized preoperatively into the two groups:

Group A: early catheter removal (postoperative day 2)

Group B: delayed catheter removal (postoperative day 4)

Patients were thoroughly evaluated and had full blood count, urinalysis, urine microscopy, culture and sensitivity (urine MCS), fasting blood sugar (FBS), 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 to rule out prostate cancer.

All the patients were admitted a day before surgery. The surgical protocol followed the standard technique, and satisfactory hemostasis was achieved. A 3-way silicone Foley catheter was inserted after each procedure to allow continuous bladder irrigation commenced with normal saline. Traction of the catheter was not applied in any of the cases. The intraoperative time was recorded. The irrigation was continued until the effluent was clear or light pink.

The Foley catheter was removed on a postoperative day 4 in patients in group A and postoperative day 2 in patients in group B. The patients were allowed to void and were discharged home the following day if there were no complications. All patients were seen at 2<sup>nd</sup> week postoperative and reevaluated for UTI and subsequently asked to come back if they developed lower urinary tract symptoms (LUTS).

The mean and t-test were carried out for a numeric variable. Categorical variables were analysed using Fisher's exact test. 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 66 patients underwent the monopolar TURP for BPH during the period under review. The main indications were for severe LUTS, failed medical therapy, and for haematuria. In both groups, there was no statistical difference in the mean patients' age, prostate size, prostatic specific antigen (PSA), operative time, the volume of irrigation fluid used for the operation, and weight of resected prostatic tissues. (Table1).

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

|                                             | Group A | Group B | p     |
|---------------------------------------------|---------|---------|-------|
| Mean age (years)                            | 68.09   | 67.45   | 0.374 |
| Mean prostate volume (ml)                   | 67.32   | 64.34   | 0.819 |
| Mean PSA (mg/dl)                            | 5.20    | 4.98    | 0.172 |
| Mean operation time (mins)                  | 68.96   | 68.38   | 0.248 |
| Mean intraoperative Irrigation fluid volume | 27.80   | 27.36   | 0.721 |
| Mean weight of prostatic chips              | 50.6    | 53.2    | 0.519 |

All the patients had spinal anaesthesia and perioperative prophylactic antibiotics. Prophylactic antibiotics were continued postoperatively. Those that required re-catheterization for urine retention after removal of the catheter had their prophylactic antibiotic extended till trial without catheter (TWOC) was carried out. Overall, 3 (4.54%) out of the 66 patients had a blood transfusion. Of this, 2 (3.03%) patients were from group A while 1 (1.51%) patient belonged to group B.

There was no perioperative mortality in either group. The early postoperative complications recorded were minor and included UTI, epididymorchitis, stress urinary incontinence and urinary retention. The only postoperative complication noted at 6 months was urethral

stricture. No case of TURP syndrome was recorded in either group. There was no statistically significant difference in the complication rate between the two groups (Table 2).

Patients who had re-catheterization were discharged home with the catheter the same day after re-passing the catheter as came back for TWOC after one week.

One patient in group A and one patient also in group B, in the current study had urethral stricture at four months and five months, respectively. They both had direct visual internal urethrotomy (DVIU) with satisfactory urine flow afterwards.

**Table 2 showing the postoperative complications recorded in each group:**

|                                             | Group A<br>(n= 33) ,n(%) | Group B<br>(n=33), n(%) | p     |
|---------------------------------------------|--------------------------|-------------------------|-------|
| Bleeding after removal of urethral catheter | 0                        | 0                       | -     |
| Urinary retention                           | 2(6.1)                   | 2(6.1)                  | 0.693 |
| Urinary tract infection                     | 1(3.0)                   | 4(12.1)                 | 0.178 |
| Urethral stricture                          | 1(3.0)                   | 1(3.0)                  | 0.734 |
| Epididymorchitis                            | 0                        | 3(9.1)                  | 0.119 |
| Stress urinary incontinence                 | 1(3.0)                   | 1(3.0)                  | 0.734 |

## DISCUSSION

With various technical improvements over the past decades, TURP though not without complications is a safer and more acceptable surgery for BPH. Urethral catheters placement after TURP facilitates bladder irrigation to prevent clot retention. It is also believed to reduce burning sensation and ease the irritation of the prostatic fossa. The keeping of urethral catheter for 4-7 days is a significant drawback for TURP patient because that usually requires additional days of hospital stay and therefore added cost to the patient.

Our study revealed that more patients who had their catheter removed on day 4 had epididymorchitis and UTI compared to those who had their catheter removed on day 2. This finding was not statistically significant for both rates of epididymorchitis (p = 0.119) and UTI (0.178) compared to that of delayed catheter removal. Durrani<sup>9</sup> and colleagues made a similar observation in their evaluation of 320 patients comparing early and delayed removal of catheter found no statistically significant difference in the rate of epididymorchitis and UTI.

We also found that bleeding was negligible after catheter removal in both groups. Some authors have reported that early catheter removal leads to higher re-catheterization rate and bleeding/clot retention compared to delayed

catheter removal<sup>10,11,12</sup>. One variable that can predispose to perioperative bleeding is UTI<sup>13</sup>. We made sure all patients who had UTI preoperatively where treated before surgery. We also gave all our patients intraoperative prophylactic antibiotic and continued it postoperatively. Chander<sup>6</sup> and colleagues also did not find significant bleeding or clot retention following early removal of the catheter in their patients. They reported early removal of the catheter in 7.5hours in 92% of their patients and within 10hours in the remaining 8% of their patients. None of their patients required re-catheterization due to bleeding or clot retention.

There was no difference in the number of patients who developed urinary retention. Urinary retention requiring re-catheterization after TURP occurs in 3- 9 % of patients, and this is majorly attributed to primary detrusor failure than incomplete resection<sup>14</sup>. Nakagawa<sup>15</sup> and colleagues removed catheter in 24hours in 93.6% of 431 patients. All the patients did not develop urinary retention. They concluded that early catheter removal is safe. Other authors also did not find any difference in both the early and delayed catheter removal<sup>16,17</sup>.

Urethral stricture is a major late complication of TURP. Rassweiler<sup>5</sup> and colleagues in their review of complications of TURP recorded that the rate of urethral stricture was 2-

9%. We encountered urethral stricture in one patient in each group ( $p=0.734$ ). So delayed catheter removal after TURP for BPH is an unlikely contributor to post-TURP urethral stricture. In both patients, the stricture was amenable to DVIU.

Stress, urge, and total incontinence may occur in up to 30-40% of patients after TURP. However, late iatrogenic stress incontinence is very rare<sup>5</sup>. Our patients had only transient stress urinary incontinence and there was no difference in the rate of occurrence within the early and delayed catheter removal groups. Srinivasan<sup>18</sup> and colleague did not also find any statistical difference in the rate of urge incontinence in their study.

#### Conclusion

Either early or delayed removal of the catheter after TURP does not add excessively to postoperative complications. Removal of the urethral catheter on postoperative day 2 favourably granted the reduced hospital stay and consequently reduced cost.

#### REFERENCES

1. Starkman JS, Santucci RA. Comparison of bipolar transurethral resection of the prostate with standard transurethral prostatectomy: shorter stay, earlier catheter removal and fewer complications. *BJU Int.* 2005; 95: 69 – 71.
2. Gilling PJ, William AK. Holmium laser enucleation of the prostate is the single best treatment for benign prostate hyperplasia refractory to medication. *Journal of Endourology.* 2008; 22: 2113 – 2115.
3. Vincent MW, Gilling PJ. HoLEP has come of age. *World J Urol.* 2015; 33: 487 – 493.
4. Robert G, Cornu JN, Fourmarier M, Descazeaud A, Azzouzi AR et al. Multicentre prospective evaluation of learning curve of holmium laser enucleation of the prostate (HoLEP) *BJU* 2016; 117: 495 – 499.
5. Rasswweiler J, Teber D, Kuntz R, Hofmann R. Complications of transurethral resection of the prostate (TURP) – incidence, management, and prevention. *Eur Urol.* 2006; 50: 969 – 979.
6. Chander J, Vanitha V, Lal P, Ramteke VK. Transurethral resection of the prostate as catheter-free day-case surgery. *BJU Int.* 2003; 92: 422 – 425.
7. Djaladat H, Meshrai A, Saraji A, Moosavi S, Djaladat Y, Pourmand G. Sprapubic prostatectomy with a novel catheter. *J Urol.* 2006; 175: 2083 – 2086.
8. Kunin M, McCormack RC. Prevention of catheter-induced urinary tract infections by sterile closed drainage. *N Engl J Med.* 1966; 274: 1155 – 1161.
9. Durrani SN, Khan S, Rehman A. transurethral resection of prostate: early versus delayed removal of catheter. *J Ayub Med Coll Abbottabad.* 2014; 26: 38 – 41.
10. Das BS, Mahmud SM, Khalid S. Is it necessary to remove Foleys catheter late after transurethral prostatectomy in patients who presented with urinary retention secondary to benign prostatic hyperplasia? *J Pak Med Assoc.* 2010; 60: 739 – 740.
11. Agarwal SK, Kumar AS. Early catheter removal of catheter following transurethral resection of the prostate. *Br J Urol.* 1993; 72: 928 - 929.
12. Mamo GJ, Cohen SP. Early catheter removal vs conventional practice in patients undergoing transurethral resection of prostate. *Urology.* 1991; 37: 519 – 522.
13. Shrestha BM, Prasopshanti K, Matanhelia SS, Peeling WB. Blood loss during and after transurethral resection of prostate: A prospective study. *Kathmandu university Medical Journal.* 2008; 6: 329 – 334.
14. Marzalek M, Ponholzer A, Pusman M, Berger I, Madersbacher S. Transurethral resection of the prostate. *European Urology Supplements.* 2009; 8: 504 – 512.
15. Nakagawa T, toguri AG. Early catheter removal following transurethral prostatectomy: A study of 431 patients. *Med Princ Pract.* 2006; 15: 126 – 130.
16. Sahin C, Kalkan M. The effect of catheter removal time following transurethral resection of the prostate on postoperative urinary retention. *Eur J Gen Med.* 2011; 8: 280 – 283.
17. Chalise PR, Agrawal CS, Pandit RK. Reduction of length of hospital stay after transurethral resection of the prostate by early catheter removal: A retrospective analysis. *Nepal Med Coll J.* 2007; 9: 84 – 87.
18. Srinivasan BK, Radhakrishnan R. prospective study on removal of urethral catheter on posop day2 vs conventional day4 after TURP. *IOSR Journal of Dental and Medical Sciences.* 2015; 5: 30 – 32.