ORIGINAL ARTICLE

TRANSURETHRAL RESECTION OF PROSTATE: EARLY VERSUS DELAYED REMOVAL OF CATHETER

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Background: Transurethral resection of prostate is the gold standard operation for bladder outflow obstruction due to benign prostatic enlargement. However, catheter removal day is variable. The objective of this study was to compare early and delayed catheter removal groups in terms of length of hospital stay, weight of resected prostate, duration of resection, peri-operative blood transfusion, and postoperative complications. **Methods:** This randomized controlled trial was carried out in Urology Unit-B, Institute of Kidney Diseases Peshawar from 1st September 2009 to 31st July 2011. Patients were selected by simple random sampling technique after taking informed consent and divided into two groups: Group A-standard catheter removal group and Group B-early catheter removal group. The study excluded patients with large post-void urine volume, simultaneous internal urethrotomy and transurethral resection of prostate, co-morbidity and intra-operative complications. Patients were discharged after removal of catheter if they voided successfully. In Group-A the catheters were kept for more than one day according to the standard protocol of our ward. The data were analysed using SPSS-17. **Results**: The study included 320 patients, 163 in Group-A and 157 in Group-B. Mean weight of resected tissue in Group-A was 46.67±9.133 grams; it was 45.22±7.532 grams in group B. Mean catheter removal day was 4.13±1.65days in Group-A; and 1.23±0.933 days in Group-B. Mean length of hospital stay was 3.57 days±1.028 in Group-A and 1.29 days±1.030 in Group-B (p-value<0.05). Length of hospital stay strongly correlated with the day of catheter removal. There was no significant difference between the two groups in terms of postoperative complications. **Conclusion:** Removal of catheter on first postoperative day after transurethral prostatectomy does not increase the postoperative complications and results in shorter hospital stay.

Keywords: Transurethral resection of prostate, urinary catheterization, postoperative complications

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INTRODUCTION

Lower urinary tract symptoms due to benign prostatic enlargement are very common in the elderly patients. The treatment options for benign prostatic enlargement range from watchful waiting, medical treatment, minimally invasive surgery, transurethral resection of prostate to open prostatectomy.[1] Each option has its merits and demerits. Transurethral Resection of Prostate (TURP) is considered as a reference standard treatment for patients with bladder outflow obstruction due to benign prostatic enlargement.[2] However, in contrast to minimally invasive techniques, an important drawback of TURP is that it usually requires stay in the hospital.[3] Time of removal of urethral catheter after TURP is variable and ranges from the night of operation to 5 days.[2–5] Many authors report that early catheter removal shortens postoperative stay in hospital and is more cost effective than delayed removal of catheter; patients return to work earlier.[3–6] However, some studies report higher re-catheterization rate and clot retention after early removal of catheter.[2,7,8]

The objectives of this study were to compare early catheter removal and delayed catheter removal groups in terms of age, hospital stay, weight of resected prostate, duration of resection, peri-operative blood transfusion, urinary retention after catheter removal and postoperative complications.

MATERIAL AND METHODS

It was a randomized controlled trial (RCT) carried out in the Urology and Transplant unit-B of Institute of Kidney Diseases, Peshawar from 1st September 2009 to 31st July 2011. The study included 320 patients with bladder outflow obstruction due to benign prostatic enlargement undergoing TURP. Written informed consent was taken from all the patients before including them in the study. The study excluded patients with large post-void urine volume, urethral stricture, patients undergoing simultaneous internal urethrotomy and TURP, co-morbidity like uncontrolled diabetes mellitus, spinal cord problem, cerebro-vascular accident or any condition that might result in neurogenic urinary bladder, intra-operative complications like capsular or bladder perforation, severe haemorrhage during or immediately after surgery. Patients were divided into the two groups by randomly selecting from a pile of sealed opaque envelopes containing assignment as A or B group as the patients came and were included in the study. Sealed opaque envelopes were kept in a box in equal

proportion and patients were asked to select one sealed envelope. Fifty envelopes with 25 for each group, A and B, were kept in the box initially and when 10 would remain, another 50 with the same proportions would be added. The box was kept locked all the time and under the supervision of the principal investigator. There were 163 patients in the conventional or delayed catheter removal group (Group-A) and 157 patients in early catheter removal group (Group-B). All the patients for TURP were admitted in the hospital one day before the surgery. Detailed history including International Prostate Symptom Severity Score (IPSS) scoring and thorough physical examinations were carried out. Investigations included: Full Blood Count, serum Creatinine, serum Electrolytes, Hepatitis B and C screen, serum PSA, Urinalysis, ECG, Chest X-ray and Echocardiography in selected cases. Abdomino-pelvic ultrasound and uroflowmetry were done on out patient basis before admission. The prostatic volume was calculated by trans-abdominal ultrasonography.

Anti-platelet drugs were stopped 7 days before surgery. Standard TURP was carried out under spinal anaesthesia by two senior urologists. Third generation Cephalosporin 1gm was administered intravenously at the time of induction of anaesthesia. TURP was performed using continuous irrigation resectoscope (Karl Storz®, 26 Fr), tungsten cutting loop and roller ball (Karl Storz®) were used. Glycine solution was used during resection. Three way 22 Fr haematuria catheter was inserted at the end of the procedure and continuous bladder irrigation was started with normal saline. Traction was not applied in any case. Bladder irrigation was continued until the effluent was light pink in colour. The operative time was noted from the time of insertion of resecto-scope to the insertion of catheter.

Catheters were removed on the first postoperative day in Group-B (early catheter removal group) and patients were discharged the same day if they could void urine normally. Catheters were removed if the patients were stable with clear bladder wash and no clot retention. In Group-A the catheters were kept for more than one day; according to the protocol of our ward. Patients were discharged after removal of catheter if they could void successfully. If prolonged catheterization was required then the patients were discharged with catheter and asked to come for catheter removal after a few days.

Important variables of study were: catheter removal day, length of hospital stay, weight of resected prostatic tissue, duration of resection, peri-operative blood transfusion, acute retention of urine after removal of catheter, need for re-catheterization, re-admission in emergency, need for second operation, and post-operative complications within 6 weeks of surgery.

Patients were asked to come after 2, 4 and then at 6 weeks after surgery for assessment. History, IPSS score, physical examination, renal function test, urinalysis, urine culture-sensitivity (in selected cases) and uroflowmetry were carried out. A doctor who did not know the actual grouping of patients collected all the data. The data was entered on a *pro forma* and analysed on SPSS-17. Mean, standard deviations were used for the description of quantitative data; and frequencies and proportions for categorical or dichotomous data. Tests of significance included independent sample *t*-test for quantitative outcome data and Chi-square test for categorical outcome data. 95% confidence interval was used. *p*-value of less than 0.05 was considered significant.

RESULTS

The study included 320 patients. There were 163 patients in Group-A (standard/conventional catheter removal group) and 157 patients in Group-B (early catheter removal group). Mean age was 71.32±5.94 years.

Mean weight of resected prostate tissue in Group-A was 46.67±9.133 grams; it was 45.22±7.532 grams in Group-B. Mean duration of resection was 53.05±10.057 minutes. Blood transfusion was required in 20 (6.2%) cases in the peri-operative period. Out of these 13 (4.06%) cases required transfusion in the preoperative period, they had preoperative haemoglobin of less than 10 gm/dl. Seven (2.1%) patients had bleeding in the immediate postoperative period requiring transfusion.

Mean catheter removal day was 4.13±1.65 days in standard catheter removal group (A); it was 1.23±0.933 days in early catheter removal group. In Group-B catheter was not removed on first postoperative day in 6 (3.8%) because they did not meet the early catheter removal criteria. Mean length of hospital stay in group A was 3.57±1.028 days and in group B it was 1.29±1.03 days. In Group-B, 12 (7.6%) cases were not discharged on first postoperative day. In group A, 15 (9.2%) cases were discharged with catheter and asked to come for catheter removal after few days. There was no significant difference between the two groups in terms of postoperative complications. (Table-1) Trial without catheter failed in 15 (9.2%) cases in Group-A and in 10 (6.4%) cases in Group-B. These patients required catheterization.

Five patients developed mild dilutional hyponatremia, three in Group-A and two in Group-B. They recovered with treatment. However, their discharge from hospital was delayed. Emergency readmission was seen in 5 cases in Group-A and 2 in

cases in Group-B. Secondary bleeding with clot retention and urinary tract infection were the main causes of re-admission. These patients required re-catheterization, continuous bladder irrigation, intravenous antibiotics. Blood transfusion was required in cases of readmission. Re-operation, clot evacuation and diathermy of bleeding/oozing points were required in 3 (0.9%) case in Group-A and one 0.3% in Group-B. There was no mortality in this study.

Table-1: Postoperative Complications

Postoperative Complications	Group A		Group B		*p*
	N	%	n	%	
Failed TWOC	15	4.7	10	3.1	>0.05
Re-catheterization	15	4.7	10	3.1	>0.05
Clot retention	14	4.4	8	2.5	>0.05
Urinary tract infection	6	1.9	3	0.9	>0.05
Dilutional hyponatremia	3	0.9	2	0.6	>0.05
Epididymoorchitis	2	0.6	1	0.3	>0.05
Haemorrhage	9	2.8	7	2.2	>0.05
Atrial fibrillation and CCF	0	0	1	0.3	>0.05
Re-admission	5	1.6	2	0.6	>0.05
Re-operation	3	0.9	1	0.3	>0.05

Group A=Conventional catheter removal group, Group B=Early catheter removal group, TWOC=Trial without Catheter

DISCUSSION

The time of removal of catheter after TURP varies considerably. In our ward, it is a standard practice to remove the catheter on 4th or 5th postoperative day. Most of our patients belong to far-flung areas where proper health care facilities are not available; nearest hospitals are at 12–24 hrs distance so the patients usually do not want to be discharged early. However many studies report that early catheter removal is not only safe but also cost effective.[3–5,9] Some authors even carry out TURP as day case surgery.[10] A study by Mueller *et al* reported that the mean cost saving of early catheter removal after TURP was $829 and $1406 for patients aged <70 and >70 years, respectively.[9]

Aslan *et al* reported that in 79.6% patients catheter was removed on first postoperative day and mean hospital stay was 1.4 days in these patients.[11] Nakagawa *et al* reported that in 96.3% patients catheter was removed on first postoperative day, 80% of these patients were discharged on the same day. The author suggested that the difference in the percentage of catheter free patients on first postoperative day between their study and other studies might be due to improvement in anaesthesia technique and more meticulous hemostatsis.[3]

In our study, catheter was removed in 96% of cases in early catheter removal group. Strong correlation was seen between the time of catheter removal and discharge from hospital. Length of hospital stay was significantly reduced in the early catheter removal group. Several risk factors have been identified as predictors of delayed catheter removal and hence delayed discharge from hospital. A study by Nakagawa *et al* suggested that age, postoperative bleeding and comorbidities predicted delayed catheter removal.[3]

Weight of resected prostate tissue and duration of resection have also been reported by many studies as important risk factors for delayed catheter removal.[6,12] In a study by Kirollos MM, mean weight of resected prostatic tissue was 31.6±22.9grams and it strongly correlated with length of hospital stay.[12] In our study, mean weight of resected tissue was higher than in most of western studies. This difference in the weight may be due to late presentation of our patients. Most of the patients delay the hospital visit and surgery because of poor socioeconomic condition or lack of awareness. Mean weight of resected tissue is similar to that of studies from Romania, Eastern Europe and other local studies.[2,13–17]

Retention after catheter removal was not significantly different between the two groups. Under contractility of the aged detrusor, caused by axonal and muscular degeneration or persistent urethral obstruction after TURP, are believed to be responsible for postoperative retention.[2,18]

In short, early catheter removal shortens the length of hospital stay, which reduces the burden on health care system. This is especially beneficial in our setup as there is shortage of beds in the hospitals. Short hospital stay is also advantageous for patients as most patients belong to villages, are underprivileged and cannot afford long leave from work. Short follow up and small sample sizes were the major limitations of our study.

CONCLUSION

Removal of catheter on first postoperative day after transurethral prostatectomy in selected patients does not increase the postoperative complications and results in shorter hospital stay.

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