Reduction of length of hospital stay after transurethral resection of prostate by early catheter removal: A retrospective analysis

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ABSTRACT

The aim of this study was to determine whether early catheter removal after transurethral resection of prostate significantly reduces the length of hospital stay. Fifty two consecutive patients who underwent transurethral resection of prostate (TURP) for benign prostatic hyperplasia (BPH) were reviewed retrospectively. Patient's profile and all relevant data were noted from charts. The length of hospital stay was registered in days. These patients were divided into two group; Group I (n=20) includes patients whose catheter was removed within 2 days of operation and group II (n=32) includes beyond 2 days. Various parameters were analyzed in between the groups using statistical package for social sciences (SPSS) for Windows. The demographics of the patients, pre-operative morbidities and immediate post-operative complications in both groups were comparable. There was statistically significant difference noted in duration of resection, weight of resected prostatic tissue, catheter removal and length of hospital stay between group I and group II. Length of hospital stay strongly correlates with days on which catheter was removed. Further, correlation was found between the catheter removal and the weight of resected prostatic tissue; but not with duration of resection. In conclusion, early catheter removal significantly shortens the length of hospital stay, which not only helps the authorities for efficient bed management, but also saves cost. The weight of resected prostatic chips and duration of resection are few peri-operative factors which can guide for effective catheter management after TURP.

Key Words: Benign prostatic hyperplasia, catheter removal, length of hospital stay, transurethral resection of prostate.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is an endemic disease in the male population and its prevalence increases with age. Histological evidence of disease is present in more than 60.0% of men in their 60s, and over 40.0% of men beyond this age have lower urinary tract symptoms (LUTS).[1] BPH conveys its morbidity through LUTS and complications, such as acute urinary retention, obstructive uropathy, and urinary tract infections. Aging populations seek medical attention for those morbidities, and relief of symptoms and prevention of complications are the most frequent indications for intervention. Although the management of BPH has been dramatically modified during the past decade, transurethral resection of the prostate (TURP) is considered the reference standard in the management of symptomatic bladder out-let obstruction (BOO) secondary to BPH.[2] Indeed, it has been estimated that there is a 30.0% probability that an 80-year-old man will undergo TURP during his life time.[3]

The number of aging population is rising worldwide and proportion of the Nepalese population above 60 years is also rising significantly. Thus the absolute number of patients having symptoms related to BPH is rising as a result of increasing aging populations. This is directly imposing a pressure to our health care provision where the resources are already limited. Long waiting list for TURP and beds being occupied by post operative patients with urinary drainage are few difficulties that need to be addressed. Various studies have reported a mean duration of hospitalization after TURP of 2-7 days. Among the total cost for TURP, 29.0% - 33.0% represents accommodation charges; any methods to reduce the duration of stay would lead to enormous savings of healthcare resources.[4] In this present study, we tried to find out the variables that are responsible for early catheter removal; so that catheter can be removed earlier without increasing morbidity, reduces the length of hospital stay and finally save healthcare budget.

MATERIALS AND METHODS

This retrospective study was conducted in B.P Koirala Institute of Health Sciences, during a period of one year from January 2004 to January 2005. The charts of 52 consecutive patients who underwent transurethral resection of prostate (TURP) for benign prostatic hyperplasia (BPH) were reviewed. Those patients having past history of prostatic surgery, discharged with urethral catheter in situ, prostatic carcinoma and urethral stricture were excluded from this study. The patient's demographic profile and symptom severity, which was objectively scored using international prostate symptom score (IPSS), were noted in Performa. All the relevant investigations were also

noted. The charts were also reviewed for duration of surgery, weight of resected prostatic chips and any post-operative complications. The length of hospital stay was registered in days and included the day of admission and discharge. All the patients were divided into two group depending on the days in which catheter was removed. Group I (n=20) includes patients whose catheter was removed within 2 days of operation and group II (n=32) includes beyond 2 days. Various parameters were analyzed in between the groups to explore the feasibility of early catheter removal.

The patients were admitted one day prior to surgery for preoperative evaluation and preparation. All patients except three were given spinal anesthesia. They were placed in lithotomy position and a standard TURP carried out by a consultant surgeon using a continuous-flow resectoscope in a video-assisted endourological system. Bladder irrigation was continued till next morning and stopped if the drainage was clear. In case of blood-tinged drainage, irrigation was continued further till satisfactory effluent was observed. The decision of catheter removal was taken by operating surgeon and patients were discharged after 2 or 3 successful voiding.

Data from filled Performa was entered and analyzed using the statistical package for social sciences (SPSS) for Windows. One-way ANOVA was used to compare the means between two groups. The level of significance for all tests was set at $P<0.05$.

RESULTS

The mean age of patients in this study was 67.3±8.2 years and there was no significant difference between group I and group II ($p=0.743$). The mean duration of symptoms and prostatic volume were 20.3±15.2 months and 44.3±13.8 cm^3 respectively. Most of the patients had severe symptom with average IPSS of 23.3±2.5 and poor quality of life scoring 5.2±0.6. The other parameters in these patients are listed in Table-1. Among those patients; 7 (13.5%) had already received medical treatment for BPH, 33 (63.5%) had one or more episodes of acute urinary retention and 35 (67.5%) were on indwelling urethral catheter till the time of surgery. Table-2 summarizes the pre-operative morbidities and immediate post- operative complications; 2 (3.8%) patients required blood transfusion after surgery and both were from group II. There was no statistically difference observed in between those two groups whose catheter was removed within 2 days (group I) or beyond (group II) except for COPD ($p=0.046$).

The mean duration of resection for group I was 52.5±11.6 min which was significantly less as compared to group II ($p=0.009$). The average weight of resected prostatic chips in group I and group II were 13.9±4.7 gm and 18.7±3.6 gm respectively and the difference was statistically significant ($p<0.001$). Catheter was removed after 1.9±0.2 days in group I and after 3.3±0.5 days in group II ($p<0.001$). Those patients whose catheter was removed earlier (group I) were also discharged from hospital earlier with average stay of 4.3±0.5 days, while patients from group II stayed for 5.6±0.8 days. This difference of length of hospital stay is also statistically significant ($p<0.001$).

Early catheter removal had a dramatic impact on reducing the length of hospital stay and both of them strongly correlates with each other ($r=0.765$; $p<0.001$) [Fig.1]. Further, correlation was found between the catheter removal and the weight of resected prostatic tissue($r=0.368$; $p=0.007$) [Fig.2]; but not with duration of resection ($r=0.223$; $p=0.111$) [Fig.3]. Similarly it had no correlation with other parameters that being studied [Table 3].

DISCUSSION

The safe and superior efficacy of TURP always argue strongly for maintaining it as the primary mode of therapy for patients with symptomatic BPH. About one third of the total cost of TURP is represented by accommodation charges.[4] Any methods that reduce the length of hospital stay significantly alter the economic output.

The length of hospital stay for TURP decreased significantly between 1987 and 1995 from 10.6 to 6.1 days.[5] The decreasing trend may be explained by advancement in surgical and anesthetic technique, better peri-operative care and efficient bed management; but the strongest predictor is aggressive catheter management. Similarly, in this study, length of hospital stay was found to be strongly related to the days on which catheter was successfully removed. Many clinical trials have emphasized on early catheter removal after TURP; [6-14] which not only helps the authorities for efficient bed management and saves cost, but also reduced the long waiting list for TURP.

The duration of bladder drainage after TURP depends to a great extent on the surgeon, with a frequent empirical orientation.[15] Major factors that influence its removal can be divided into three categories: intrinsic patient factors, such as co-morbidities, preoperative urinary retention and gross haematuria; procedure-specific factors such as resected prostatic specimen weight and peri-operative morbidities; and intrinsic hospital factors relating to capacity and resources.[5,8] Although, we were unable to link the duration with all the factor mention above; it was found to be strongly related to weight of the resected prostatic chips. The patient without pre-operative co-morbidities and complications, short resection time with limited amount of resected prostatic tissue and with no added peri-operative morbidities is the candidate whom catheter can be removed safely without increasing morbidity and thus significantly reduces the length of hospital stay.

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Table-1: Descriptive statistics

	TOTAL (n=52)		GROUP I (n=20)		GROUP II (n=32)		p value
	Mean (Range)	SD	Mean (Range)	SD	Mean (Range)	SD	
Age (years)	67.3 (48-85)	8.2	67.8 (54-85)	7.9	67.1 (48-82)	8.6	0.743
Duration of Symptoms (month)	20.3 (4-84)	15.2	24.5 (4-84)	19.3	17.6 (6-60)	11.6	0.114
Prostate Volume (cm^3)	44.3 (22-88)	13.8	44.4 (22-77)	14.5	44.3 (24-88)	13.6	0.991
Pre-operative IPSS	23.3 (16-28)	2.5	23.2 (16-27)	3.0	23.3 (18-28)	2.3	0.933
Quality of Life (QOL) Score	5.2 (4-6)	0.6	5.3 (4-6)	0.6	5.1 (4-6)	0.5	0.526
Hemoglobin (gm/dl)	12.6 (6-15)	2.0	12.4 (6-14)	2.6	12.8 (10-15)	1.5	0.510
Blood Urea (mg/dl)	24.8 (10-94)	13.2	25.2 (12-37)	8.2	24.6 (10-94)	15.6	0.870
Serum Creatinine (mg/dl)	0.9 (0.3-1.6)	0.3	0.9 (0.3-1.4)	0.3	0.8 (0.3-1.6)	0.2	0.698
Duration of resection (min)	57.3 (35-75)	10.6	52.5 (35-75)	11.6	60.3 (40-75)	8.9	0.009*
Resected Prostatic weight (gm)	16.9 (5-26)	4.7	13.9 (5-22)	4.7	18.7 (12-26)	3.6	<0.001*
Catheter removed (days)	2.8 (1-5)	0.8	1.9 (1-2)	0.2	3.3 (3-5)	0.5	<0.001*
Length of hospital stay (days)	5.1 (4-8)	1.0	4.3 (4-6)	0.5	5.6 (5-8)	0.8	<0.001*

* p Value <0.05 (Significant)

Table-2: Pre-operative status and post-operative complications

	TOTAL (n=52)		GROUP I (n=20)		GROUP II (n=32)		p value
	n	%	n	%	n	%	
Received medical treatment	7	13.5	2	10.0	5	15.6	0.572
Episode of acute urinary retention	33	63.5	13	65.0	20	62.5	0.859
Urethral catheterization	35	67.3	14	70.0	21	65.6	0.749
Supra pubic cystostomy	1	1.9	0	0.0	1	3.1	0.435
Urinary tract infection	25	48.1	9	45.0	16	50.0	0.732
Diabetes mellitus	2	3.8	0	0.0	2	6.3	0.263
Hypertension	11	21.2	5	25.0	6	18.8	0.600
Chronic obstructive airway disease(COPD)	5	9.6	1	5.0	4	12.5	0.046*
Post-operative haematuria	6	11.5	1	5.0	5	15.6	0.252
Clot retention	5	9.6	1	5.0	4	12.5	0.382
Blood transfusion	2	3.8	0	0.0	2	6.3	0.263

* p Value <0.05 (Significant)

Table-3: Pearson's correlation coefficient for catheter removable (days)

	Pearson's Correlation Coefficient (r)	p value
Age	-0.037	0.793
Duration of Symptoms	-0.174	0.218
Prostate Volume	0.048	0.734
Pre-operative IPSS	-0.100	0.481
Quality of Life (QOL) Score	-0.057	0.690
Acute urinary retention	-0.148	0.296
Indwelling catheter	-0.130	0.357
Pre-operative hemoglobin	0.117	0.410
Blood Urea	0.075	0.598
Serum Creatinin	0.116	0.412
Duration of resection	0.223	0.111
Resected Prostatic weight	0.368	0.007*
Length of hospital stay	0.765	<0.001*

* p Value <0.05 (Significant)

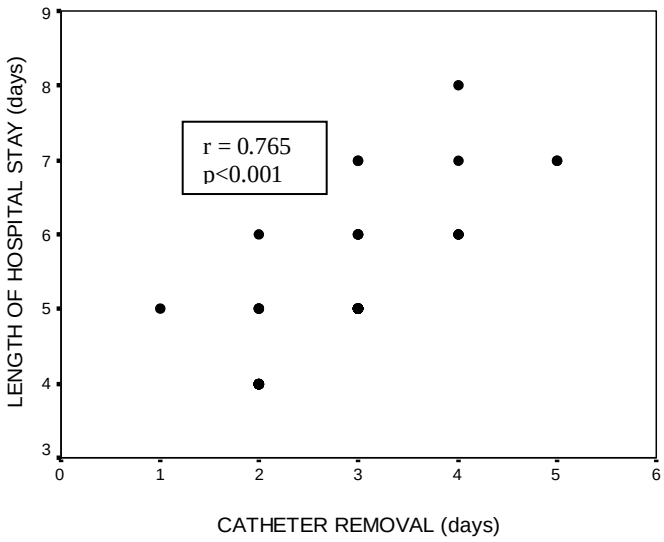

Fig. 1. The relationship between catheter removal and length of hospital stay

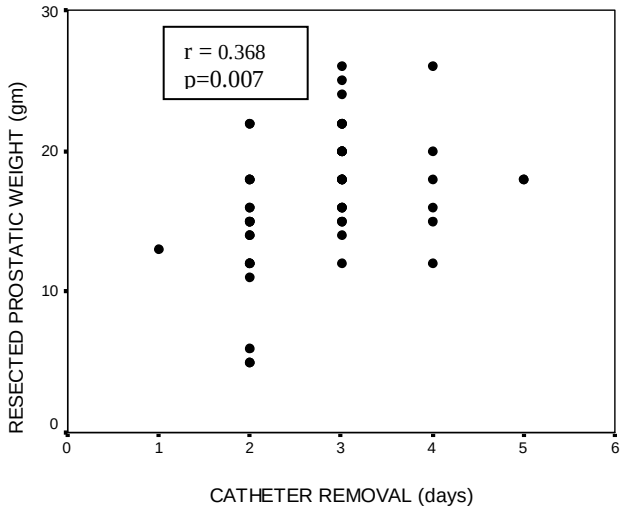

Fig. 2. The relationship between catheter removal and resected prostatic weight

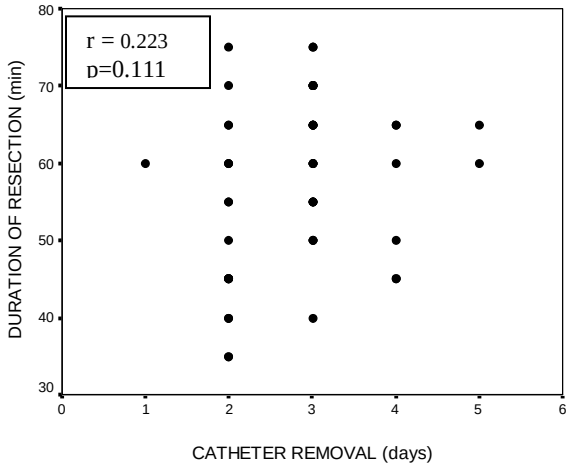

Fig. 3. The relationship between catheter removal and duration of resection