

# The Effect of Catheter Removal Time Following Transurethral Resection of the Prostate on Postoperative Urinary Retention



Coşkun Şahin, Mehmet Kalkan

Sema Hospital, Department of Urology,  
Istanbul, Turkey

Eur J Gen Med 2011;8(4):280-283

Received: 18.02.2011

Accepted: 29.10.2011

## ABSTRACT

**Aim:** This clinical study investigates the effect of catheter removal time on re-catheterisation following transurethral resection of the prostate.

**Method:** This study includes 66 surgical candidates diagnosed with benign prostate hyperplasia. Cases were randomised into three groups. The catheter was removed on the first post-operative (Group I), second post-operative (Group II) and third post-operative (Group III) day. A record was kept of re-catheterised cases.

**Result:** In Group I, we identified four cases of vesical globe and 1 case of active haemorrhaging between the 5th and 70th hour (av. 18 hours) following removal of the catheter that required re-catheterization. One case from Group II developed a need for re-catheterisation (vesical globe) in the sixth hour. There were no cases requiring re-catheterisation in Group III. Differences in age, prostate volume, resection time and amount of irrigation fluid in all three groups were statistically insignificant.

**Conclusion:** Although the number of cases is insufficient, this study identified a statistically significant relation between early catheter removal following transurethral resection of the prostate and development of urine retention.

**Key words:** Transurethral prostatectomy, catheter, urinary retention

**Correspondence:** Dr. Mehmet Kalkan  
Özel Sema Hastanesi, Sahil yolu sok.  
No:16 34844 Dragos-Maltepe - İstanbul  
Tel: +905322650917 Fax: 0902163528359  
E-mail: mkalkan@semasaglik.com

## Prostatın Transüretal Rezeksiyonunu İzleyen Postoperatif İdrar Retansiyonunda Kateter Çekme Zamanının Etkisi

**Amaç:** Bu klinik araştırmada; prostatın transüretal rezeksiyonu sonrası kateterin çekilme zamanının rekateterizasyon üzerine etkisi araştırıldı.

**Metod:** Bening prostat hiperplazisi tanısı ile operasyon endikasyonu konan 66 olgu çalışmaya dahil edildi. Olgular 3 gruba randomize edildi. Kateter; her bir grupta sırası ile operasyon sonrası birinci (Grup I), ikinci (Grup II) ve üçüncü (Grup III) günde çekildi. Rekateterize edilen olgular kayıt edildi.

**Bulgular:** Grup I'de; kateterin çekildiği saatten itibaren beşinci saat ile 70. saat (Ort. 18 saat) arasında 4 olguda globe vesika, bir olguda aktif kanama tesbit edilmesi üzerine yeniden sonda kondu. Grup II'de bir olguda altıncı saatte rekateterizasyon ihtiyacı (Globe vesika) oluştu. Grup III'de hiçbir olguda rekateterizasyon gerekmedi. Her üç grupta da olguların yaşları, prostat volümü, rezeksiyon süresi ve irrigasyon sıvısı miktarında istatistiksel anlamlı fark yoktu.

**Sonuç:** Olgu sayısı yetersiz olmakla birlikte, prostatın transüretal rezeksiyonu sonrası sonanın erken çekilmesi ile idrar retansiyonu gelişimi arasında istatistiksel olarak anlamlı bir ilişkinin olduğu saptandı.

**Anahtar kelimeler:** Transüretal prostatektomi, kateter, üriner retansiyon

### INTRODUCTION

The quest continues for the most effective method in the surgical treatment of prostate that can reduce haemorrhaging, shorten hospital stays and coherently shorten catheterisation periods (1). Advancements in technology and increased amounts of shared information have paved the way for patients to have more interactive communication with their physician. This has, in turn, kept the expectation of shorter catheterisation times and hospitalisation times at the top of the agenda when presenting the best surgical treatment techniques. Urologists unwilling to ignore patient expectations are pushed to find ways to shorten catheterization time following an operation. These efforts have led some to argue that a few hours of catheterization is sufficient while others argue that a suprapubic catheter be used instead of a foley catheter (1-3).

This retrospective randomised clinical study investigates the effect of foley catheter removal time on the ratio of re-catheterisation.

### MATERIALS AND METHODS

66 surgical candidates diagnosed with benign prostate hyperplasia (BPH) between February 2006 and January 2008 were included in the study. Patient age ranged from 48 to 77 (avg. 62) years. In addition to systemic and rectal examination all cases were subject to full urine analysis, routine biochemical tests, urinary system ultrasound, Prostate Specific Antigen, residual urine, uroflowmetry and international prostate symptom score (IPSS). Cases with more than 50 cc of residual urine, central and peripheric nervous system illnesses or dia-

betes were excluded from the study. Prostate weight varied between 35 and 100 (avg. 55). grams All surgery was performed with spinal anaesthesia. The same surgeon operated on all cases using a 24 F resectoscope sheet. We recorded the surgical duration, the amount of resected tissue and the amount of used irrigation fluid in all groups. A 22F three-way foley catheter was used for all cases. Cases were randomised into three groups. The catheter was removed on the first post-operative (Group 1), second post-operative (Group 2) and third post-operative (Group 3) day. A record was kept of re-catheterised cases. We determined criteria for re-catheterisation to be development of vesical globe, complaints of excessive irritation and the obstruction of urinary flow due to clotted or non-clotted bleeding.

### RESULTS

Five cases in Group 1 required re-catheterisation in the period following catheter removal (due to vesical globe in four cases and active haemorrhage in one case). While only one case from Group 2 developed a need for re-catheterisation due to vesical globe, there were no cases requiring re-catheterisation in Group 3. Although there was a statistically significant difference between Group 1, Group 2 and Group 3 ( $p < 0.032$ ), the difference between Group 2 and Group 3 was statistically insignificant ( $p > 0.05$ ). Differences in terms of age, prostate volume, symptom scores, resection time and amount of irrigation fluid between the three groups was statistically insignificant (Table 1,  $p > 0.05$ ).

**Table 1.** The Characteristics of Group 1, Group 2 and Group 3

	Group 1	Group 2	Group 3
Patient Age (years)	62.5	61.5	62
Prostate weight (grams)	53	57	56
Symptom Score	23	21	22.5
Resection duration (minutes)	35	33	35
Irrigation fluids (litres)	15	13	14
Catheter removal time (hours)	19	43	68

## DISCUSSION

The traditional surgical treatment method for benign prostate enlargement is transurethral resection (TUR-P). There is no doubt that a urinary catheter must be used in this procedure. Although there is nearly 100% consensus amongst urologists on the necessity of using a foley catheter, we are not unanimous in identifying when the catheter should be removed. The most important parameters in determining the time of catheter removal are patient expectations, the drive to reduce hospital costs and the surgeon's experience and preference (4). The purpose of using a foley catheter following TUR-P operations is to prevent haemorrhage, monitor urine, to prevent complaints of excessive irritation and to ease urination.

In this retrospective randomised clinical study, catheter removal criteria were defined as having clear or pinkish urine colour and the absence of haemorrhage. Two cases from Group 1 and one case from Group 2 did not meet these criteria; hence their catheters were not removed on the designated day. Five cases in Group 1 required re-catheterisation following the initial removal of the catheter. The reasons for re-catheterisation were severe urgency in four cases and haemorrhage in one case. A single case in Group 2 required re-catheterisation due to urine retention. None of the cases in Group 3 required re-catheterisation. Although the statistical differences between Group 1 and II and between Group 1 and 3 was significant in terms of re-catheterisation rate, we could not identify a significant difference between Group 2 and 3. The statistical difference among the three groups was insignificant in terms of age, surgery duration, type of anaesthesia, resected prostate tissue quantity and pre-operative complications. Evaluating patients developing urine retention, we observed that the majority of these individuals presented complaints of severe tenes-

mus that started with complaints of painful urination and ended with vesical globe. Only one of the patients demanded re-catheterisation due to haemorrhage. Even though there was no pre-operative neurogenic bladder or use of alpha-blockers and there was no sign of significant residual urine prior to the operation, this condition was explained by the fact that early catheter removal increased tenesmus complaints and invited the development of urine retention.

In a review of available literature, there were several articles describing and recommending early stage removal of catheter in the postoperative stage (5, 6). Some articles indicate removal times as early as 6-7 hours after the operation (2). We observed that this was a selective choice and that the prostate volumes were between 17 and 50 ml. The average prostate size in our cases was 55 grams. Another argument for early removal of catheter relates to an effort to minimise hospital expenses. Starkman et al. indicated that removing the catheter a day earlier results in savings of 1,200 US\$ per patient (6). However, the concern of increased costs related to an additional day of hospitalisation is invalid for Turkey, at least for our hospital where more importance is given to patient comfort and mental health. We believe that the anxiety and panic experienced by patients due to re-catheterisation as an outcome of removing the initial catheter a day earlier and the worries of a patient discharged for home rest with the catheter in place is of greater significance. As a matter of fact, we directed the following question to the re-catheterised patients included in the scope of this study: Would you have preferred to keep the catheter for an extra day if you were given the option of removing the catheter a day earlier with a heightened chance of re-catheterisation? All patients participating in the study indicated that they would have preferred to be catheterised for an extra day. Previously, our routine practice following TUR-P was to remove foley catheter two days after the operation and we observed that this approach did not present serious complications. Experience shows that catheters could be removed earlier in patients with a small prostate size whose urine turned clear in the first hours after the operation. Available literature supports our opinion (2).

Available literature also reports the potential of the energy source used during TUR-P to prolong its effect during the process of catheter removal. Atalay et al. found that the average period of catheterisation for the

patient group undergoing TUR-P to be 2.8 and the group receiving plasma-kinetic tissue treatment to be 2.3 days resulting in a statistically significant difference (7). Starkman et al. reported shorter catheterisation times with the use of the Gyrus system resulting in savings of 1,200 US\$ per day per patient (6). Mottola et al.'s routine practice removing foley catheters between three and five days was included in a clinical study. Their report indicates the absence of significant complications in the first 24 hours after the removal (8). Mueller et al. performed TUR-P operation on 119 cases and retrospectively compared the results of early catheter removal with previous results and found complication ratios to be 5% and 6.6% respectively. Parallel to patient age they reported a savings of between 829 US\$ and 1,406 US\$ per patient (4).

Chander et al. conducted a more ambitious study in India. The authors' publication indicates catheter removal at an average of 7.5 hours in 92% of patients and within the first ten hours in the remaining 7%. None of the patients in their study reported the need for re-catheterisation due to clotting retention or failure to urinate (2). Nakagawa et al. conducted a broader series study in Japan including 431 patients. Besides adequate urination, absence of clots and clear urine colour they considered catheter removal criteria to be normal vital findings. Catheters were removed the following day in 93.6% of patients meeting these criteria and they concluded that this approach was not only safe but also cost effective, without resulting in morbidity (9). A general assessment of available literature suggests that urologists endeavour to remove catheters in the earliest possible time. This tendency can be explained by high hospital costs in Western countries, easy access to medical attention that results in surgery for obstructive patients with smaller prostate sizes. Certainly removing patients from the hospital environment as quickly as possible reduces the chance of hospital infections and catheter-related complications. However, we cannot overlook the unnecessary pain of failing to urinate as well as the anxiety and worry of re-catheterisation due to early catheter removal.

With consideration to domestic conditions in Turkey, clinical experience and completed clinical studies investigating the extent of anxiety experienced by patients due to re-catheterisation, we conclude that two days is more appropriate as the earliest catheter removal time following a TUR-P operation.

#### REFERENCES

1. Daly P, Connolly S, Rogers E, Sweeney P. Management outcome of acute urinary retention: model of prediction. *Urol Int* 2009; 83(1):39-43. Epub 2009 July
2. Chander J, Vanitha V, Lal P, Ramteke VK. Transurethral resection of the prostate as catheter-free day-care surgery. *BJU Int* 2003;92(4):422-5.
3. Djaladat H, Mehraei A, Saraji A, Moosavi S, Djaladat Y, Pourmand G. Suprapubic prostatectomy with a novel catheter. *J Urol* 2006;175(6):2083-6.
4. Mueller EJ, Zeidman EJ, Desmond PM, Thompson IM, Optenberg SA, Wasson J. Reduction of length of stay and cost of transurethral resection of the prostate by early catheter removal. *Br J Urol* 1996;78(6):893-6.
5. Perera ND, Nandasena AC. Early catheter removal after transurethral resection of the prostate. *Ceylon Med J* 2002;47(1):11-2.
6. 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(1):69-71.
7. Atalay A, Küçükpolat S, Toktaş G, Ünlüer E, Koçan H, Coşkun E. Benin prostat hiperplazili hastalarda plasmakinetik doku tedavi sistemi kullanılarak yapılan transüretal rezeksiyon (TURP) ve transüretal plazma vaporezasyon (TUVAP) sonuçlarının karşılaştırılması. *Türk Üroloji Dergisi* 2007;33(3):308-16.
8. Mottola A, Daniele G, Caselli B, Palminteri V. Early catheter removal after transurethral resection of the prostate. *Minerva Urol Nefrol* 1999;51(2):103-4.
9. Nakagawa T, Toguri AG. Early catheter removal following transurethral prostatectomy: a study of 431 patients. *Med Princ Pract* 2006;15(2):126-30.