TURKISH JOURNAL OF UROLOGY Turk J Urol 2016; 42(2): 80-3 • DOI: 10.5152/tud.2016.48921

GENERAL UROLOGY

Original Article

Early removal of urinary catheter after excision and primary anastomosis in anterior urethral stricture

Ön üretra darlığında eksizyon ve primer anastomozdan sonra üretral sondanın erkenden çekilmesi

Ankur Bansal, Satyanarayan Sankhwar, Ashok Gupta, Kawaljit Singh, Madhusudan Patodia, Ruchir Aeron

ABSTRACT

Objective: To investigate the feasibility of removing the urinary catheter 7 days after excision and primary anastomosis (EPA) performed with the indication of anterior urethral stricture disease.

Material and methods: Retrospective review of medical records of the patients who had undergone EPA between January 2005 and December 2010 was performed. These patients were divided into 2 groups: Group 1 (urethral catheter removed on or before 7. postoperative day) and Group 2 (urethral catheter removed on 8. postoperative day or later). We compared 2 groups as for the frequency of extravasation as detected on retrograde pericatheter urethrogram (PUG) and recurrence rate till the last follow-up.

Results: PUG was performed on an average day 7 and 14 in Groups 1 (n=102) and 2 (n=134), respectively followed by removal of the catheter. Extravasation on the first PUG was detected in 6.8% of the patients in Group 1, and in 4.5% of the cases in Group 2 had extravasation on the first PUG. Urethral catheter was left in situ in these patients and a repeat PUG after one week was performed which was normal in all cases. The incidence of extravasation and recurrence rate did not differ significantly whether catheter was removed on day 7 or 14 (6.8% vs. 4.5% and 4.9% vs. 5.2% respectively) (p>0.5).

Conclusion: We conclude that removal of the catheter on postoperative day 7 after EPA does not increase the rate of extravasation and recurrence during long-term follow-up. Urethral catheter restricts physical activity in the postoperative period which is bothersome to the patient. Hence early removal of a catheter should be offered to men after EPA.

Keywords: Catheter removal; early; excision and primary anastomosis; urethral stricture.

ÖZ

Amaç: Ön üretra darlığında eksizyon ve primer anastomoz (EPA) sonrası 7. günde üretral sonda çekilmesinin uygunluğunun araştırılması.

Gereç ve Yöntemler: Ocak 2015 ile Aralık 2010 tarihleri arasında EPA uygulanmış hastaların tıbbi kayıtları geriye dönük olarak gözden geçirilmiştir. Bu hastalar 2 gruba ayrılmıştır: Grup 1 (üretral sondası postoperatif 7. günde veya daha önce çekilenler) ve Grup 2 (üretral sondası postoperatif 8. gün veya daha sonra çekilenler). İki grubu son izlem tarihine kadar retrograt perikateter üretrogramda (PUG) oluşan ekstravazasyon ve nüks sıklığına göre karşılaştırdık.

Bulgular: Grup 1 (n=102) ve 2'de (n=134) sondanın çekilmesinden sırasıyla ortalama 7 ve 14 gün sonra PUG uygulanmış, ardından sonda çıkartılmıştır. İlk PUG'da Grup 1 ve 2'de hastaların sırasıyla %6,8 ve %4,5'inde ekstravazasyon meydana gelmiştir. Bu hastalarda üretral sonda yerinde bırakılmış ve bir hafta sonra PUG tekrarlanmış ve tüm olguların normal olduğu görülmüştür. Sondanın 7. veya 14. gün çıkartılması arasında ekstravazasyon ve nüksün görülme sıklığı açısından anlamlı bir fark yoktu (sırasıyla %6,8'e %4,5 ve %4,9'a %5,2) (p>0,5).

Sonuç: EPA sonrası postoperatif 7. günde sondanın çıkartılmasının uzun dönemde ekstravazasyon ve nüks oranını değiştirmediği sonucuna vardık. Üretral sonda postoperatif dönemde fiziksel aktiviteyi kısıtlamakta ve hastaya rahatsızlık vermektedir. Bu nedenle EPA'dan sonra erkeklere sondanın erkenden çıkartılması önerilmelidir.

Anahtar kelimeler: Sondanın çekilmesi; erken; eksizyon ve primer anastomoz; üretra darlığı.

Department of Urology, King George Medical University, Lucknow, U.p, India

Submitted: 18.12.2015

Accepted: 16.02.2016

Correspondence: Ankur Bansal
E-mail: ankurbansaldmc@gmail.com

©Copyright 2016 by Turkish Association of Urology

Available online at www.turkishjournalofurology.com

Introduction

Urethroplasty is one of the commonest surgery performed by urologists worldwide. There is a common consensus about the details of surgery, however still there is controversy on patient care after urethroplasty. There are variable opinions about the time to remove

urethral catheter postoperatively after urethroplasty. The time for removal of the urethral catheter after excision and primary anastomosis (EPA) performed for anterior urethral stricture disease varies in literature from 3 to 21 days.[1-9] However, there is disparity regarding the earliest feasible time of catheter removal after EPA and this decision usually depends upon surgeon's opinion. Early removal of the urethral catheter has been studied in radical retropubic prostatectomy and has proved to improve patient mobility and comfort.[10]

This study aimed to investigate the feasibility of early removal of the urinary catheter after EPA in anterior urethral stricture disease. Early catheter removal after urethroplasty has many advantages. Firstly, it promotes earlier mobilization, reduces the discomfort to the patient and shortens duration of convalescence. This makes EPA comparable to optical internal urethrotomy in terms of the surgical impact. Secondly, the urethral catheter can be harmful to just completed anastomotic site as all type of catheters can induce some degree inflammatory reaction.[11]

Material and methods

We performed a retrospective review of prospectively collected medical records of patients who had undergone urethroplasty for urethral stricture disease at our institution between January 2005 and December 2010. Informed consent was taken from all patients. The patients were evaluated preoperatively by uroflowmetry and retrograde urethrogram with micturating cystourethrogram (RUG/MCU) and postoperatively by retrograde pericatheter urethrogram (PUG) before removal of the urethral catheter. Patients who had undergone excision and primary anastomosis for anterior urethral stricture were included in this study. Patients with a history of failed previous repair, radiotherapy, renal failure, uncontrolled diabetes mellitus and those in whom PUG was not done postoperatively were excluded from the study.

Approval of the study was obtained from ethics committee board of King George's Medical University, Lucknow, India. These patients were divided into 2 groups:

- Group 1: Urethral catheter removed on or before postoperative 7. day.
- Group 2: Urethral catheter removed on postoperative 8. day or later.

We compared 2 groups in terms of frequency of extravasation as detected on PUG and the recurrence rate till the last follow-up. Patients in whom extravasation was present on the first PUG, the catheter was left in situ which was followed by the second PUG after 7 days. Patients were followed up regularly at 3 month- intervals and evaluated symptomatically with a history of difficulty during voiding or dribbling, and objectively by urinary flow studies. In suspect cases with recurrent stricture (recurrent obstructive symptoms, poor flow rates) a retrograde urethrogram (RUG) and micturating cystourethrogram (MCU) were performed. The eventual surgical success was defined as asymptomatic voiding without any clinical evidence of residual stricture (good flow rate and no residual urine) till the last follow-up. Data on age, duration of symptoms, etiology of stricture, preoperative maximal urinary flow rate, the length of stricture, PUG finding, the timing of catheter removal and recurrence rate were collected.

Statistical analysis

Unpaired T-test was used to compare continuous data and Fisher's exact test was used to analyze categorical data. Student paired T- test was used to assess improvement in parameters compared to baseline. Statistical analysis was performed using Statistical Package for the Social Sciences, version 16 (SPSS Inc; Chicago, IL, USA). The level of statistical significance ws accepted as $p<0.05$.

Results

During the 6-year time period, 310 male patients underwent excision and primary anastomosis for anterior urethral strictures. Seventy-four patients were excluded from the study [patients having a history of failed repair (n=8), radiotherapy (n=3), renal failure (n=6), uncontrolled diabetes mellitus (n=2) and those in whom PUG was not done postoperatively (n=55)].

Patients were divided into 2 groups. In Group 1 (n=102), we performed an PUG on average day 7 after surgery. In the delayed catheter removal group (n=134), we performed PUG on 8-21 days (mean 14 days) after surgery. Preoperative parameters including age, duration of symptoms, etiology of stricture, preoperative maximal urinary flow rate and length of stricture showed no significant difference between the two groups (Table 1).

In Group 1, 6.8% (n=7/102) of patients had extravasation as detected on the first PUG (Figure 1). The remaining 95 patients (93.2%) had a normal PUG, and the urethral catheter was removed on the same day (Figure 2). A urethral catheter was left in situ for another 7 days in patients with extravasation. Repeat PUG after one week was normal in all 7 cases. In Group 2, 4.5% (n=6/134) of the patients had extravasation as revealed on the first RPU and 128 patients (95.5%) had a normal PUG. Repeat PUG obtained after one week in all 6 patients was within normal limits. The incidence of extravasation between two groups was not significant (p=0.56). There were 5 recurrences (4.9%) in Group 1 after a mean follow-up of 47.5 months (range 18-63 months) and 7 recurrences (5.2%) in Group 2 after a mean follow-up of 51.2 months (range 21-65). The incidence of recurrence between 2 groups was not significant (p=1.0). Two patients both in Groups 1, and 2 had extravasation as detected on the first PUG. The overall success rate of EPA was 95% (n=224/236).

Discussion

There is no consensus on the time of removal of the urethral catheter in patients after urethroplasty and most urologists remove catheter according to their opinion and experience. Period of postoperative catheterization after excision and primary anastomosis varies in literature from 3-21 days with a success rate

Turk J Urol 2016; 42(2): 80-3
DOI:10.5152/tud.2016.48921

Table 1. Comparison between preoperative data of the patients

Parameters	Group1	Group 2	p
Total number of patients	102	134	
Mean age (yrs) Mean±SD	33.8±22.4	35.7±21.9	0.51
Duration of symptoms (months) Mean±SD	12.7±4.3	11.9±5.2	0.20
Radiological stricture length (cm) Mean±SD	1.2±0.8	1.31±0.7	0.26
Q max* (mL/sec) Mean±SD	4.1+1.8	3.7±2.1	0.12
Etiology of the stricture (n)			
Inflammatory	30	37	
Traumatic	20	27	0.99
Iatrogenic	28	38	
Idiopathic	24	32	

*who are able to void. SD: standard deviation



Figure 1. Extravasation seen on retrograde pericatheter urethrogram

of 90-98%.[1-9] However, only a few authors have reported their extravasation rates before removal of catheter (Table 2). Some authors prefer voiding cystourethrogram (VCUG) to see extravasation but we routinely perform PUG as it avoids unnecessary urethral manipulations such as removing and then reinserting the catheter Indeed if extravasation is present, these urethral manipulations ,even unintentionally, may cause an injury to the anastomosis and should be avoided. This problem usually occurs when VCUG is done to see the integrity of urethral healing.

Jakse et al.[1] did VCUG on post-operative day 10 in 105 patients and reported an extravasation rate of 10% and a success rate of 93%. However, this series included patients who had undergone



Figure 2. Normal retrograde pericatheter urethrogram with no extravasation

anterior or posterior urethroplasty. Santucci et al reported that out of 168 patients undergoing anastomotic urethroplasty for bulbar urethral stricture, only 1% had extravasation following catheter removal on day 14 with 95% success rate.[2] Al-Qudah et al.[4] reported 17% (n=2/12) extravasation rate on VCUG done on postoperative day 3 after anastomotic urethroplasty; as compared to absence of extravasation (n=0/7) in whom VCUG was done 8 days after surgery. The recurrence rate of stricture was comparable between 2 groups i.e 8% (n=1/12) in the early group vs 14% (n=1/7) in the late group. We assume that probable reason of high extravasation in early group was too early removal of urethral catheter and before completion of urethral re-epithelisation. Solanki et al.[8] did PUG after anastomotic urethroplasty in 28 patients on post-operative day 14, and reported a 64.2% (n=18/28) extravasation rate. We observed an extravasation rate of 6.8% (n=7/102) when the catheter was kept *in situ* for 7 days. Our study also proves that extravasation and recurrence rate do not differ significantly whether the catheter was removed on day 7 or 14 (6.8% vs. 4.5% and 4.9% vs. 5.2% respectively). In Group 1, 93, and 7% of the patients had their catheters removed on day 7 and 14 , respectively Early catheter removal enhances patient's quality of life as it avoids care of the catheter. It also shortens the postoperative convalescence period.

Most patients reported that prolonged catheterisation was the most troublesome part of their postoperative care.[10,12] Early removal of the catheter provides more comfort, decreases irritative lower urinary tract symptoms and reduces the overall negative impact of surgery. Thus, it is more convenient for the patient and acceptable to the surgeon. Prolonged catheterization may interrupt release of urethral secretions and ejaculation which can act as a source of infection. Hence, early catheter removal after urethroplasty is appealing, but there is limited data on a small cohort of patients with short-term results. This is the first study done on a relatively large number of patients with long-term results. A major limitation of this study was retrospective study design.

Table 2. Timing of urethral catheter removal and frequency of extravasation after EPA in various studies

Authors (year)	n	Stricture length (cm)	Catheter removal time (days)	VCUG leak rate (%)	Success rate (%)
Jakse et al.[1]**	105	1-4	10	10 (10/105)	93
Santucci et al.[2]	168	1.7 (0.1-4.5)	14	1.1 (2/168)	95
Micheli et al.[3]	74	0.5-3.0	07	-	93
Al-Qudah et al.[4]	19	1.2 (0.5-3.0)	3 (n=12) 8 (n=7)	17 (2/12) 0	89.5
Barbagli et al.[5]	153	1-5	14	-	90.8
Eltahaway et al.[6]	260	1.9 (0.5-4.5)	21	-	98.8
Suh et al.[7]	33	1.5 (0.8-2.3)	16.5 (13-24)	-	87.9
Solanki et al.[8]**	28	<2	14	64.2 (18/28)*	-
Choudhary et al.[9]	45	<2	21	-	86.6

*VCUG leak documented on RPU, **including anterior and posterior urethroplasty. EPA: excision and primary anastomosis

We conclude that removal of the catheter on postoperative day 7 after EPA does not increase the rate of extravasation and recurrence during long-term follow up. Urethral catheter restricts physical activity during the postoperative period and it is bothersome to the patient. Hence early removal of a catheter should be offered to men after EPA.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of King George's Medical University.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - A.B., S.S., A.G., K.S.; Design - A.B., S.S., A.G., K.S.; Supervision - A.B., S.S., M.P., R.A.; Resources - A.B., S.S., A.G., K.S.; Materials - A.B., S.S., M.P., R.A.; Data Collection and/or Processing - A.G., K.S., M.P., R.A.; Analysis and/or Interpretation - A.B., K.S., A.G., M.P.; Literature Search - M.P., R.A.; Writing Manuscript - A.B., S.S.; Critical Review - A.B., S.S.; Other - A.B., S.S.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı King George's Tıp Üniversitesi'nden alınmıştır.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - A.B., S.S., A.G., K.S.; Tasarım - A.B., S.S., A.G., K.S.; Denetleme - A.B., S.S., M.P., R.A.; Kaynaklar - A.B., S.S., A.G., K.S.; Malzemeler - A.B., S.S., M.P., R.A.; Veri Toplanması ve/veya İşlemesi - A.G., K.S., M.P., R.A.; Analiz ve/veya Yorum - A.B., K.S., A.G., M.P.; Literatür Taraması - M.P., R.A.; Yazıyı Yazan - A.B., S.S.; Eleştirel İnceleme - A.B., S.S.; Diğer - A.B., S.S.
Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

References

1. Jakse G, Marberger H. Excisional repair of urethral stricture. Follow-up of 90 patients. Urology 1986;27:233-6. [CrossRef]
2. Santucci RA, Mario LA, McAninch JW. Anastomotic urethroplasty for bulbar urethral stricture: analysis of 168 patients. J Urol 2002;167:1715-9. [CrossRef]
3. Micheli E, Ranieri A, Peracchia G, Lembo A. End-to-end urethroplasty: long-term results. BJU Int 2002;90:68-71. [CrossRef]
4. Al-Qudah HS, Cavalcanti AG, Santucci RA. Early catheter removal after anterior anastomotic (3 days) and ventral buccal mucosal onlay (7 days) urethroplasty. International Braz J Urol 2005;31:459-64. [CrossRef]
5. Barbagli G, De Angelis M, Romano G, Lazzeri M. Long-term follow-up of bulbar end-to-end anastomosis: a retrospective analysis of 153 patients in a single center experience. J Urol 2007;178:2470-3. [CrossRef]
6. Eltahawy EA, Virasoro R, Schlossberg SM, McCammon KA, Jordan GH. Long-term followup for excision and primary anastomosis for anterior urethral strictures. J Urol 2007;177:1803-6. [CrossRef]
7. Suh JG, Choi WS, Paick JS, Kim SW. Surgical outcome of excision and end-to-end anastomosis for bulbar urethral stricture. Korean J Urol 2013;54:442-7. [CrossRef]
8. Solanki S, Hussain S, Sharma DB, Solanki FS, Sharma D. Evaluation of healing at urethral anastomotic site by pericatheter retrograde urethrogram in patients with urethral stricture. Urol Ann 2014;6:325-7. [CrossRef]
9. Choudhary AK, Jha NK. Is anastomotic urethroplasty is really superior than BMG augmented dorsal onlay urethroplasty in terms of outcomes and patient satisfaction: Our 4-year experience. Can Urol Assoc J 2015;9:E22-6.
10. Lepor H, Nieder AM, Fraiman MC. Early removal of urinary catheter after radical retropubic prostatectomy is both feasible and desirable. Urology 2001;58:425-9. [CrossRef]
11. Ruutu ML, Talja MT, Andersson LC, Alfthan OS. Biocompatibility of urinary catheters-present status. Scand J Urol Nephrol Suppl 1991;138:235-8.
12. DeMarco RT, Bihrle R, Foster RS. Early catheter removal following radical retropubic prostatectomy. Semin Urol Oncol 2000;18:57-9.