URETHRAL DILATION EFFECT ON RECURRENCE URETHRAL STRICTURE AFTER INTERNAL URETHROTOMY

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ABSTRACT

Objective: *The aim is to evaluate the effect of urethral dilation on anterior urethral stricture recurrences after direct vision internal urethrotomy (DVIU).* ***Material & Method:*** *Patients were classified into 2 groups after internal urethrotomy for urethral dilation or observation. All strictures included were anterior, single, and causing partial obstruction. Urethral dilation was performed using a metal sound. This procedure was performed every 1 or 2 weeks in the first and second month after operation and then once a month for 1 year or in case of voiding complaints or low flow rate (< 10 mL/s). Follow up at least until 1 year after DVIU.* ***Results:*** *A total of 32 cases could be reviewed, of which are 21 had urethral dilation and 11 observation only. In the urethral dilation group, we found 4 recurrences (19%) with mean time to recurrence 10,52 months. In the observation group, we found 7 recurrent cases (63,63%) with a mean time to recurrence of 8,09 months. P value is 0,02 which means urethral dilation significantly decreased the chance of stricture recurrence. By Kaplan Meier survival analysis, urethral dilation had a better and longer time to recurrence.* ***Conclusion:*** *In this study, regular meatal dilation is proven to prolong the time to recurrence of an anterior urethral stricture after DVIU.*

Keywords: *Urethral dilation, anterior urethral stricture, stricture recurrence.*

ABSTRAK

Tujuan Penelitian: *Tujuan dari penelitian ini adalah untuk mengevaluasi peranan dilatasi uretra pada striktur uretra anterior setelah dilakukan direct vision internal urethrotomy (DVIU).* ***Bahan & Cara:*** *Pasien diklasifikasikan menjadi dua grup, yaitu grup dilatasi uretra dan observasi. Semua striktur terletak di anterior uretra, hanya terdapat satu striktur dan obstruksi parsial. Dilatasi uretra dilakukan mengunakan busi metal. Prosedur ini dilakukan setiap 1 atau 2 minggu pada bulan pertama dan kedua, kemudian sekali sebulan selama 1 tahun, atau bila terdapat keluhan menurunnya pancaran urine, atau bila Qmax uroflow dibawah 10 ml/detik. Kami melakukan follow up selama 1 tahun setelah DVIU.* ***Hasil Penelitian:*** *Sebanyak 32 kasus dapat dikumpulkan, 21 dengan dilatasi uretra dan 11 dengan observasi. Pada grup dilatasi uretra, kami menemukan 4 kasus rekuren (19,04%) dengan rerata waktu rekurensi 10,52 bulan, pada grup observasi ditemukan 7 kasus rekuren (63,63%) dengan rerata waktu rekurensi 8,09 bulan, p = 0,02, yang artinya bahwa dilatasi uretra secara signifikan menurunkan rekurensi striktur. Dengan menggunakan analisa Kaplan Meier, didapatkan hasil bahwa dilatasi uretra lebih baik dan mempunyai rerata waktu rekurensi lebih lama.* ***Simpulan:*** *Pada studi ini didapatkan bahwa dilatasi uretra berkala terbukti memperpanjang waktu terjadinya rekurensi pada striktur uretra anterior pasca DVIU.*

Kata Kunci: *Dilatasi uretra, striktur uretra anterior, rekurensi.*

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INTRODUCTION

Urethral strictures arise from various causes, and a patient can be asymptomatic or present with severe discomfort secondary to urinary retention. Urethral stricture disease has been cited in ancient Greek writings that report establishing bladder drainage with the passage of various catheters.[1]

There is a concept known as the reconstructive ladder was used as a treatment guideline for urethral strictures. This concept was based on the

principle that the simplest procedure should always be attempted first, and repeated after failure, before changed to more complex approaches.[2] The management of urethral stricture disease has undergone significant change in the last 4 decades from periodic dilation and blind internal urethrotomy to optical urethrotomy and open urethroplasty as the procedure of choice.[3]

Direct vision internal urethrotomy (DVIU) was still the most common procedure in the USA and UK.[4] DVIU and dilation are best used as the initial treatment for 2 cm or less stricture.[5] Open surgical repair should be the first choice with longer strictures or strictures that have failed conservative treatment.[6] The most common complication of internal urethrotomy is a recurrence of stricture. Success rate for DVIU was reported between 20 – 35%.[2] Because of this dismal success rate, several techniques have been used to prevent the process of wound contraction and stricture recurrence, including indwelling Foley catheter, home self-catheterisation (CIC), urethral stents, Mitomycin C, Botulinum Toxin (Botox) and corticosteroid injection.[7,8] Last three agents have higher cost compared to other procedures.[9]

Our institutes have a protocol to performed urethral dilation by metal dilator post definitive urethral surgery to maintain urethral caliber.

OBJECTIVE

The aim of this study is to evaluate the effect of urethral dilation on anterior urethral stricture recurrence after internal urethrotomy.

MATERIAL & METHOD

We retrospectively collected data of DVIU for stricture treatment. Data were collected from Cipto Mangunkusumo Hospital and Sardjito Hospital in 2004 – 2006 period. We classified into 2 groups which are urethral dilation group and observation group. All strictures was anterior, single, and partial obstruction.

DVIU for the stricture was performed as an identical procedure in all patients as originally described by Sachse. Using a ureteral catheter as a guide, the urethral stricture was incised under vision at the 12-o'clock position. Incision of the stricture was carried out until healthy, bleeding tissue was reached. The incision was considered adequate and the procedure terminated when the urethroscope was easily passed into the bladder. The urethral catheter was left in place for 48 hours. Urethral dilation performed using a metal sound urethral dilation. This procedure was performed every 1 or 2 weeks for first and second month and once a month for 1 year or if there is any voiding complaints or if there is any voiding complaints or maximal urine flow rate <10mL/s. We follow up at least 1 year after DVIU.

During follow-up, the criteria for recurrence of urethral stricture indicating the need for urethroscopy, as well as DVIU or open surgery. Relative frequency of stricture recurrence was compared between the two groups by chi square analysis. The Student t test was used to compare age.

RESULTS

A total of 32 male patients that could be followed up for 1 year. This was only 46,4% (n = 69

Table 1. Overall patient characteristic

	Urethral dilation	Observation	p
Number of patients	21	11	
Mean age	50,62 ± 19,75	41,54 ± 17,97	
Etiology			
1. Trauma			
Accident	3 (14,3%)	5 (45,5%)	
Catheterization	4 (19%)	0	
Post endoscopy	2 (9,5%)	1 (0,9%)	
Post trauma operation	2 (9,5%)	0	0,204*
Passing stone	1 (4,8%)	1 (0,9%)	
Post open prostatectomy	1 (4,8%)	0	
2. Infection	4 (19%)	3 (27,3%)	
3. No data	4 (19%)	1 (0,9%)	

*p was calculated in comparison of trauma and infection group.

Table 2. Time to recurrence.

Post operative procedure	Recurrence incidence	p	Time to recurrence (month/mean range)
Urethral dilation	4 (19,04%)	0,02*	10,52 (9-12)
Observation	7 (63 63%)		8 09 (5-11)

*p was calculated in comparison of recurrence and dilation/observation group.

patients) from anterior urethra stricture patients. In table 1 & 2, there is patient characters and recurrence incidence.

We compared between age and stricture recurrence in both groups and found no significant correlation between them (p = 0,796). Then we evaluated and compare urethral stricture recurrence and time by Kaplan Meier (Fig. 1).

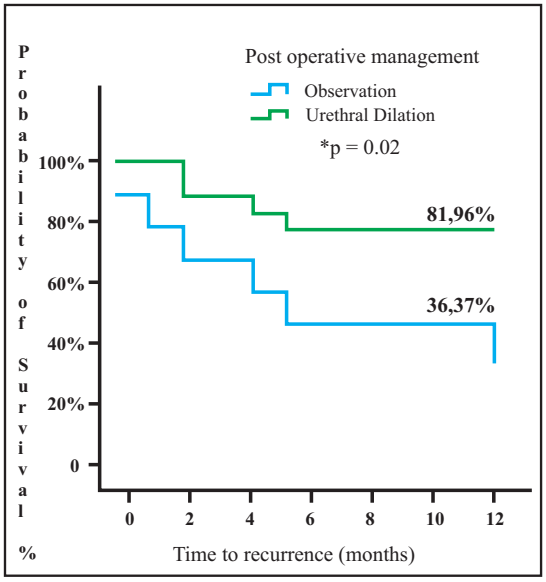

Figure 1. Kaplan-Meier curve for time to recurrence in urethral dilation group (green line) vs observation group (blue line).

DISCUSSION

Internal urethrotomy has been considered as standard therapy for anterior urethral stricture. Many reports showed a high recurrence rate after urethrotomy. Gibod and Le Portz et al (1982) noted the success rate of optical urethrotomy was only 25%.[10] But Pansandoro and Emilliozi et al (1996) noted that the recurrence rate after urethrotomy was 68%.[11] This high recurrence rate urged physicians and urologists to find management to prevent it.

There are many modalities for preventing anterior urethral stricture recurrence. Procedures that based on dilation principle such are CIC, indwelling catheter and urethral stent. Other developed techniques have been tested are: Botox injection, Mitomycin C injection and corticosteroid injection. Those last techniques are not suitable for our patients due to economic problem. Therefore, the most suitable procedure is dilation with metal dilator in our center.

Our results showed metal dilation was the only differentiating factor in decreased and prolonged recurrence rate. Metal dilation will stretch the urethral lumen without producing more scarring and keep adequate luminal size. This stretching is assumed to increase blood flow, oxygenation, and also decrease cytokines. This will prevent fibrin tissue formation and contraction at the site of urethrotomy.[12] It will kept the urethral lumen in size and prevent it from contracted. This periodical dilation also give an advantage for reducing a psychological problem associated with self catheterization.[13] Beside that, we can have regular and long term follow up data due to regular dilation.

But the weakness of this procedure is the probability of trauma, especially if performed by unskilled physician.[14] So in our center, this procedure will be performed by a physician who can already performed endoscopic procedures. They are expected to know urethral anatomy better and will perform urethral dilation more gently.

The urethral wall is normally thin, smooth, elastic and easily distensible. However, fibrosis of the urethral wall makes it thick, irregular and nondistensible. The extent of spongiofibrosis is a critical determinant of appropriate therapy and prognosis. Sonourethrography has been used to measure the spongiofibrosis and its grade by comparing the luminal diameter at the stricture site with the normal urethral diameter during maximal retrograde distention.[15] It is proven to show greater

sensitivity in assesing the severity, length and spongiofibrosis in strictures.[16] We do not have the appropriate equipment and experience in using sonography to measure the degree of spongiofibrosis. Therefore, the degree of spongiofibrosis can not be evaluated as a predictive factor for recurrence.

CONCLUSION

In this study, we found regular metal dilation was proven to prolong the time or recurrence of anterior urethral stricture compared to the observation group.

REFERENCES

1. Goose AE, Caruso DJ, Santucci RA, Broghammer JA, Possey JT. Male urethral stricture. c2009 [cited 2009 July 28]. Available on http://emedicine.medscape.com/article/450903-overview.
2. Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA. Surgery of the penis and urethra: Urethral stricture disease. Campbell-Walsh Urology. 9th ed. 2007: 33; 1054-75.
3. Bullock TL, Brandes SB. Adult anterior urethral strictures: A national practice patterns survey of board certified urologists in the United States. J Urol. 2007; 177: 685-90.
4. Wright J, Wessells H, Nathens A, Hollingworth W. What is the most cost-effective treatment for 1 to 2 cm bulbar urethral strictures: Societal approach using decision analysis. Urology. 2006; 67(5): 889-93.
5. Steenkamp JW, Heyns CF, de Kock MLS. Internal urethrotomy versus dilation as treatment for male urethral strictures: A prospective, randomized comparison. 1997; 157: 98-101.
6. MacDonald MF, Santucci RA. Review and treatment algorithm of open surgical techniques for management of urethral strictures. Urology. 2006; 65(1): 9-15.
7. Mazdak H, Meshki I, Ghassami F. Effect of mitomycin C on anterior urethral stricture recurrence after internal urethrotomy. Eur Urol. 2007; 51(4): 1089-92.
8. Khera M, Boone T, Smith C. Botulinum toxin type A: A novel approach to the treatment of recurrent urethral strictures. J Urol. 2004; 172(2): 574-5.
9. Cost of botox injections. C2008 [cited 2009 September 1]. Available on www.docshop.com /education/dermatology/injectables/botox/cost/
10. Gibod LB, Le Portz, B. Endoscopic urethrotomy: Does it live up to its promises? J Urol. 1982; 127: 433.
11. Pansadoro V, Emiliozzi P. Internal urethrotomy in the management of anterior urethral strictures: Long-term follow-up. Clinical Urology. 1996; 156: 73-5.
12. Tunc M, Tefekli A, Kadioglu A, Esen T, Uluocak N, Aras N. A prospective randomized protocol to examine the efficacy of post internal urethrotomy dilations for recurrent bulbomembranous urethral strictures. Urology. 2002; 60: 239-44.
13. Shaw C, Logan K, Webber I, Broome L, Samuel S. Effect of clean intermittent self-catheterization on quality of life: A qualitative study. Journal of Advanced Nursing. 2008; 61: 641-50.
14. Fenton AS, Allen F, Ricardo A, Garcia C. Anterior urethral strictures: Ethiology and characteristics. Urology. 2005; 65: 1055-8.
15. Mandhani A, Chaudhury H, Kapoor R, Srivastava A, Dubey D, Kumar A. Can outcome of internal urethrotomy for short segment bulbar urethral stricture be predicted? J Urol. 2008; 173: 1595-97.
16. Coudhary S, Singh P, Sundar E, Kumar S, Sahai A. A comparison of sonourethrography and retrograde urethrography in evaluation of anterior urethral strictures. Clinical Radiology. 2004; 59: 736-42.