Original Article

CLEAN SELF DILATATION (CSD): ITS ROLE IN PREVENTION OF REOCCURRENCE OF STRICTURE URETHRA

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ABSTRACT

Background:
Stricture Urethra is a highly reoccurrent disease. Various treatment modalities were used to prevent its reoccurrence with variable success. Clean Self Dilatation (CSD) is one of the modalities being employed to prevent its reoccurrence.

Objectives:
To assess the acceptability and compliance for the CSD and its outcome.

Study Design:
Observational study.

Setting:
Department of Urology, Madina Teaching Hospital, University Medical & Dental College, Faisalabad.

Methods:
Study was conducted between 01-08-2008 to 30-06-2010. All patients with Stricture Urethra were included irrespective of their age. Retrograde Urethrogram was performed in all patients. Patients were treated with Optical Internal Urethrotomy (OIU), Anastomotic and Substitutional Urethro-Plasties. Patients were advised to perform CSD for 06 months with prescribed schedule and follow up was done for another 06 months. Success of procedure was measured as relief from symptoms.

Results:
Total numbers of patients were 55 with age range of 09-65 years. Forty Nine (89%) patients were compliant to the procedure. Direct trauma and instrumentation were the most common etiologies (58%), and 49% patients presented with urinary retention followed by lower urinary tract symptoms (20%). Thirty three (60%) patients were treated with OIU and length of stricture was < 1cm in 36.36% patients. Reoccurrence of stricture was 100% in those who did not accept the procedure and 50% in those who partially complied. Twenty nine out of 34 (86%) patients were disease free who compiled the procedure for 06 months. Urinary tract infection (25%) and bleeding per urethra (9%) were the complications.

Conclusion:
Clean Self Dilatation is a safe, cost effective and easy to perform procedure for the prevention of urethral stricture with good acceptability, compliance, better outcome and with few complications.

Keywords: Stricture Urethra, Clean Self Dilatation (CSD), clean intermittent self catheterization (CISC), Prevention of urethral strictures.

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INTRODUCTION

Causes of urethral strictures are trauma, infections, iatrogenic insult and malignancy.[1] Urethral stricture is highly reoccurent disease. An old saying 'once stricture there is always stricture' was used to be true.[2]

In the pathogenesis of urethral stricture like other body tissues, fibrosis along with collagen deposition leads to various phases of contraction, scar maturation, remodeling. This process of healing by fibrosis and maturation requires a period of about six months to one year from the date of injury and start of repair. Important factor in this healing process is the amount of fibrosis and collagen.[3,4,5] Process will be less severe in cases of little fibrosis and collagen.

Local steroids, radiations, Mitomycin-C, somatostatin have been tried in prevention of fibrosis in urethral stricture with very little success.[6,7,8,9]

Dilatation by bougies has been reported to be the oldest method of treating and preventing the urethral strictures. Periodic urethral dilatation is usually performed under surface anesthesia to prevent the reoccurrence of urethral stricture. Even in best hands it is very painful procedure and may lead to urethral perforation and formation of false passage in addition to bleeding.[10,11,12]

On the contrary clean periodic self dilatation (CSD) is a safe procedure requiring no expertise except patient's training.[13,14,15] Patient is trained to perform self dilatation by nelaton catheter according to prescribed schedule. It can be performed at home or at his work place requiring no theatre. Due to its softness it causes less pain, less bleeding episodes and no false passages.

A study was planned to assess the compliance and usefulness of clean self Dilatation in the prevention of urethral strictures.

Objectives of study were:

1. Assess the effectiveness of the procedure in prevention of urethral stricture.
2. Complications of the procedure.
3. Assess the compliance of the procedure.
4. Assess the acceptance of the procedure by the patient.

MATERIAL AND METHODS

Study was conducted at the Department of Urology, Madina Teaching Hospital Faisalabad, from 01-08-2008 to 30-06-2010. All males irrespective of age with the diagnosis of Urethral Stricture were included in this study.

Inclusion criteria

All males irrespective of age treated by Optical Internal Urethrotomy/Anastomotic or Substitutional urethroplasty were included.

Exclusion criteria

Females, Patients of Hypospadias, Epispadias or Neurogenic Bladder.

Each patient with the provisional diagnosis of urethral stricture was subjected to retrograde urethrogram AP and Oblique view. Optical Internal Urethrotomy (OIU), Anastomotic/ Substitutional urethroplasty was performed depending upon length of stricture and grade of stricture. Indwelling catheter was removed after two days following OIU and after two weeks following urethroplasty. After three weeks patient was trained to perform Clean Self Dilatation (CSD) with nelaton catheter. All patients greater than 16 years of age were advised to perform CSD with nelaton catheter of 18 Ch. In younger patients nelaton was of 10-14 Ch depending upon the diameter of urethra. Each patient was advised to perform the CSD once a day for initial one month and on alternate day for another 15 days. Interval of one day between successive CSD was added after every 15 days till the completion of six months. Patients were advised to wash nelaton catheter, hands and genitalia before and after each CSD with antiseptic soap or lotion. They were advised to change the nelaton catheter after each 10 days. Patients were followed up for next six months on monthly basis and advised to consult early in case of any complication like haematuria, pyuria, epidydmoorchitis or fever and in case of failure to perform CSD. Patients were followed up for next six months for reoccurrence of Lower Urinary Tract Symptoms (LUTS). Success of treatment was absence of symptoms (LUTS/retention). Compliance, success, failure and any complication of treatment modality were recorded. Data was collected and analyzed.

RESULTS

Total number of patients was 55. Majority of patients (41.81%) belonged to 31-50 years of age with age range of 09-65 years (Table 1). Direct trauma and instrumentation were the most common causes, being more common in patients below 30 years and above 50 years respectively (Table 1). Urinary retention was presenting complaint in majority of patients and more common in those having direct trauma (Table 2). Bulbar urethra is the site most commonly involved (72.72%) (Table 3). Optical internal urethrotomy was performed in

Table 1. Etiology according to age groups

Age	Causes				Total
	Direct Trauma	Indirect Trauma	Instrumentation	Nonspecific/Miscellaneous cases	
Upto 30 yrs.	8	2	1	5	**16**
31 to 50 yrs.	6	3	3	11	**23**
51 and Above	2	-	11	2	**16**
Total	**16**	**5**	**16**	**18**	**55**

Table 2. Etiology and symptoms

Symptoms	Causes				Total
	Direct Trauma	Indirect Trauma	Instrumentation	Miscellaneous	
LUTS	1	-	10	-	11
Urinary Retention	15	4	6	2	27
Pyuria + Urinary Retention	-	-	-	9	9
LUTS + Pyuria	-	-	-	7	7
Non Specific	-	1	-	-	1
Total	**16**	**5**	**16**	**18**	55

Table 3. Etiology and site of stricture

Sites	Causes				Total
	Direct Trauma	Indirect Trauma	Instrumentation	Miscellaneous	
Penile	-	-	-	1	1
Bulbar	13	-	13	14	40
Membranous	-	-	1	-	1
Penile + Bulbar	-	-	2	3	5
Bulbar + Membranous	3	5	-	-	8
Total	**16**	**5**	**16**	**18**	**55**

Table 4. Site of stricture and procedure performed

Sites	Procedure				Total
	OIU	Anastomotic Urethroplasty	Substitutional Urethroplasty with Penile Skin	Substitution with Buccal Mucosa	
Penile	1	-	-	-	1
Bulbar	33	6	1	-	40
Membranous	1	-	-	-	1
Penile + Bulbar	5	-	-	-	5
Bulbar + Membranous	1	5	1	-	8
Total	**41**	**11**	**2**	**1**	**55**

33 patients (60%) followed by anastomotic urethroplasty (Table 4) and length of stricture was <1cm in 20 patients (Table 5). Forty nine patients (89%) accepted the procedure and were compliant (Table 6 and 6-1). Reoccurrence of stricture occurred in 21 (38%) patients and is more common in those having stricture length of 1-2cm (Table 7 and 7-1). Reoccurrence of stricture was 100% in non compliant patients and 14.70% in fully compliant (Table 8). Second procedure was performed in 21 patients (Fig.-1). Microscopic pyuria/urinary tract infections and bleeding per urethra were main complications (Fig. 2). Patients were followed for 6 months. One patient expired during this period due to myocardial infarction.

Table 5. Length of stricture and procedure

Length of strictures	Procedure				Total
	OIU	Anastomotic Urethroplasty	Substitutional Urethroplasty with Penile Skin	Substitution with Buccal Mucosa	
< 1cm	19	-	-	1	1
1-2 cm	16	-	13	14	40
> 2cm	2	-	1	-	1
Multiple	4	-	2	3	5
Total	**41**	**11**	**2**	**1**	**55**

Table 6. Compliance and site of stricture

Compliance	Site of Stricture					Total
	Penile	Bulbar	Membranous	Penile+Bulbar	Bulbar + Membranous	
Yes	1	36	1	4	7	49
No	-	4	-	1	1	6
Total	**1**	**40**	**1**	**5**	**8**	**55**

Table 6-1. Compliance and Etiology

Compliance	Etiology				Total
	Direct Trauma	Indirect Trauma	Instrumentation	Membranous	
Yes	14	5	15	15	**49**
No	2	-	1	3	**6**
Total	**16**	**5**	**16**	**18**	**55**

Table 7. Reoccurrence of stricture and length of stricture

Reoccurence	Length				Total
	< 1cm	1-2 cm	>2 cm	Multiple	
Yes	4	14	2	1	**21**
No	16	12	3	3	**34**
Total	**20**	**26**	**5**	**4**	**55**

Table 7-1. Reoccurrence of stricture and site of stricture

Reoccurrence	Site					Total
	Penile	Bulbar	Membranous	Penile+Bulbar	Bulbar+Membranous	
Yes	-	14	1	2	4	**21**
No	1	26	-	3	4	**34**
Total	**1**	**26**	**5**	**5**	8	**55**

Table 8. Reoccurrence of stricture according to acceptability and compliance

Compliance	Reoccurrence		
	No. of patients	Reoccurrence	%age
No. of compliance	6	6	100%
< 1 month	3	2	100%
1-3 months	3	3	100%
2-5 months	10	5	50%
>6 months	34	5	14%
Total	55	21	-

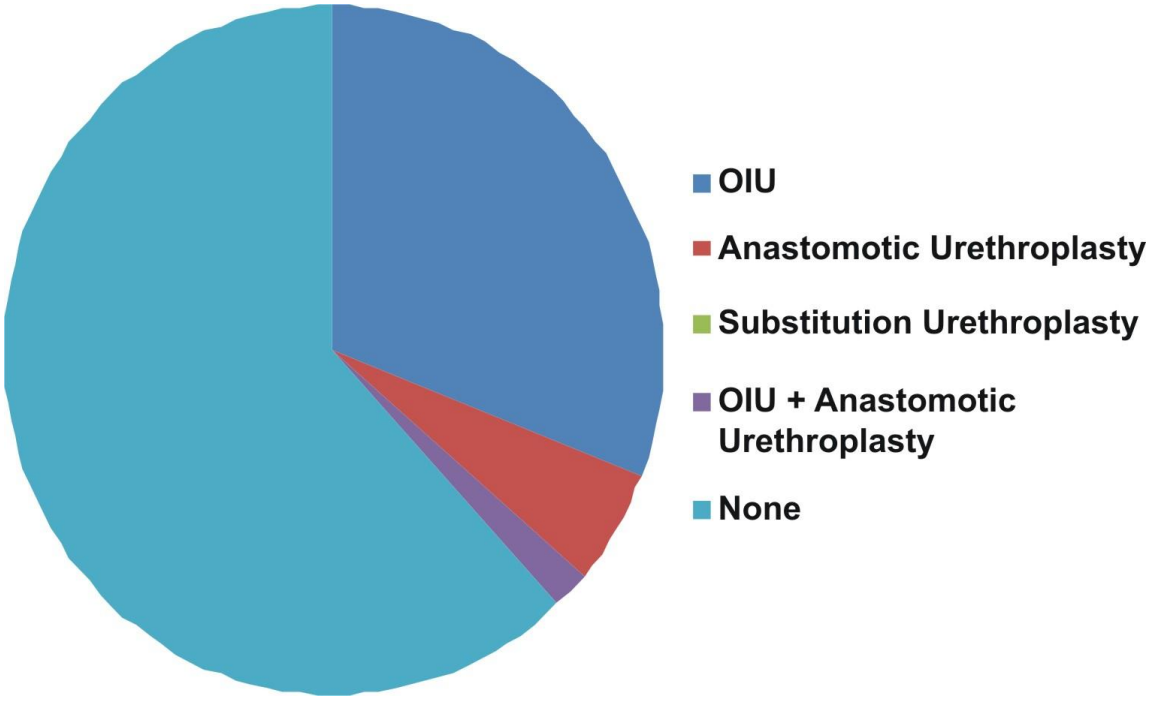

Figure I. Second procedure in reoccurrent cases

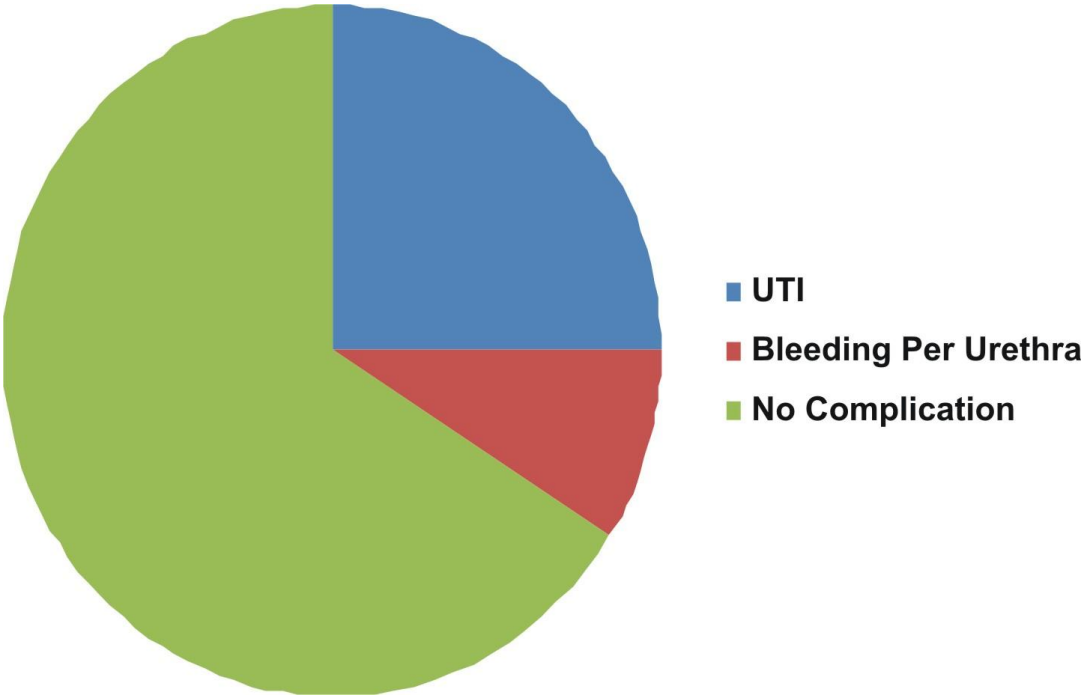

Figure 2. Complications

DISCUSSION

Urethral stricture disease is notorious for reoccurrence. The old saying "once stricture, always stricture" however does not hold true in this modern era of minimally invasive procedure.

Urethral mucosa and surrounding tissue is replaced by fibrotic tissue causing the stricture formation. Fibrosis tissue having the property of contraction leads to narrowing of the lumen. To keep the urethra open various methods of dilatations were devised using metallic and plastic bougies or dilators.[10,11,12] Initially these dilators were blind. However endoscopic placement of guide wire and serial dilatation over it definitely decreased the chance of perforation and bleeding but required endoscope for its placement. Another very important aspect of passive dilatation was repeated exposure of private parts and visits of patient to the clinician and this causes a lot of psychological trauma in addition to actual pain which he suffers during and after dilatation.

Prevention of stricture reoccurrence have been tried with steroids gellies, wall stents urolomes with little success and heavy cost.[6,18]

Nd-yag laser, diode laser have been used in reoccurrent strictures with satisfactory success rates but at very high cost and probably due to this reason use of laser in urethral stricture disease and its role in reoccurrence prevention is not very well advocated.[19,20]

Clean Self Dilatation by nelaton catheter is reliable and safe procedure, having good compliance and very less morbidity. Various studies reported in the literature have proved[13,14,15,16] its success in the management of reoccurrence, however protocol is different in those series. Some adopted weekly self dilatation for a year, others for two years and some reported it to be enough for two months. In our series, we adopted the protocol based on the pathophysiology of fibrosis and its maturation, over a period of six months and if unprovokated usually stabilizes after this period.

In our community like other Muslim communities of the world "urine" is considered to be a "Napak" (very filthy thing) and person has to wash his hands, feet, body and clothes if it touches to these, to keep oneself "PAK" (absolutely clean). Due to this reason, we had to face difficulties initially in training the patients to perform "CSD", however acceptability and compliance of the patients was excellent (89%).

Majority of stricture patients were less than 50 years and etiology of stricture formation in these patients was trauma (38%), instrumentation (29%), followed by infections and miscellaneous causes (32.72%), compareable to other series.[12,13] Main bulk of patients with stricture was treated by OIU as this is a minimal invasive procedure with less complications and morbidity.

Urinary tract infection was the main complication of the procedure, although mild bleeding occurred in the initial days of procedure which gradually resolved. Causes of this mild initial bleeding were probably friction injury at operated site during initial days of the procedure. Infective complication is due to the lack of aseptic measures which cannot be taken during this procedure. Only the cleanliness of the hands, nelaton and genitalia can decrease the rate of this complication.

Compliance and success rate of CSD was excellent in our series like other series with initial difficulties of training.[13,14,15,16] Patients were reassured that urine was a clean and clear secretion of their own body. They were made more compliant by telling them about the recurrence rate of stricture formation, its infective and uraemic complications, and repeated surgical manipulations.

Besides safety and easy administration, CSD is cost effective. As we are living in a 3rd world developing country, cost of treatment plays very important role in the management of highly recurrent diseases. Patients and the whole nation can be de-loaded from heavy burden of repeated visits to hospitals, admissions and surgical procedures by this simple procedure and millions can be saved.[17]

CONCLUSION

Stricture urethra is a common disease of human being and notorious for reoccurrence. CSD is relatively safe, cost effective, acceptable and easy to perform procedure with good compliance and very little complications and high success rate in prevention of urethral stricture.

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