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OPTICAL INTERNAL URETHROTOMY FOR THE TREATMENT OF URETHRAL STRICTURES



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ABSTRACT ... abidbashir@hotmail.com, drabid68@yahoo.com **Aims and Objectives:** To study the outcome of optical internal urethrotomy in the treatment of urethral strictures. **Study Design:** Prospective. **Setting:** Allied Hospital, Faisalabad . **Period:** April 1996 to Dec. 1998. **Patients and Methods:** A total of 70 consecutive male patients ranging from 5-80 years treated with optical internal urethrotomy for stricture urethra were included in the study. Follow up ranged from 12 to 30 months. **Results:** Trauma was the most common cause of urethral stricture. Fracture pelvis alone was responsible for 43% of the strictures while straddle injury accounted for another 23%. The incidence of iatrogenic and infective stricture was found to be 26% and 8% respectively. The results of optical internal urethrotomy were excellent in 61% patients who were treated with single internal urethrotomy. Internal urethrotomy was to be repeated in 21% patients and urethroplasty was performed in 9% patients. Clean Intermittent Self Catheterization and active urethral dilatation was applied as adjuvant treatment to prevent the recurrence of stricture. **Conclusions:** Internal Urethrotomy is safe and reliable procedure for simple urethral strictures while urethroplasty should be considered for complex strictures. Active urethral dilatation at repeated intervals still has a role in preventing recurrence of stricture after initial treatment with internal urethrotomy or urethroplasty.

Keywords: Stricture Urethra, Internal urethrotomy, Urethral Dilatation.

INTRODUCTION

Stricture urethra is one of the common ailments seen in the urological and surgical practice. The etiological classification of stricture includes congenital, traumatic, iatrogenic, infective and miscellaneous varieties.

Congenital strictures are mostly located in the proximal bulbar urethra and are thought to be due to

the incomplete disappearance of cloacal membrane at its junction with the urogenital sinus¹.

Traumatic strictures can either be due to direct trauma or indirect violence. Strictures of the anterior urethra usually results from direct trauma that may be either blunt (straddle injuries 70-80%), penetrating (due to gun shot or ice pick) or due to intraluminal manipulations (self inflicted or iatrogenic)². Indirect

violence due to fracture pelvis is the main cause in the pathogenesis of posterior urethral strictures. Though the incidence of fracture pelvis is rising due to increasing road traffic accidents, fortunately the urethra is ruptured in only about 10% of these^{3,4}. The usual location of urethral rupture and subsequent stricture in the adults is within 2 cm of sphincter-active sub-prostatic urethra.

Iatrogenic urethral strictures may result from the manipulation of urethra, inadvertent use of catheters or mismanagement of urethral injuries in the emergency department³. With the introduction of silicon catheters, the incidence of post catheterization urethral strictures is on the decline⁵. Incidence of stricture urethra following transurethral resections ranges from 9 to 15%. Most of these are located in the penile urethra.^{6,7}

Infective strictures due to gonococcal infections and poor hygiene are still a common entity in tropical Africa⁸. Among rare causes of urethral stricture, cancerous strictures have to be considered⁹. Urethral lymphangioma has also been reported as rare cause of urethral stricture¹⁰.

Long term management of stricture urethra is also a nuisance not only for the patient but for the attending physician as well. Many treatment options have been tried but none is completely satisfactory⁵.

Various treatment modalities used to treat urethral stricture includes urethral dilatation^{11,12}, self intermittent clean catheterization¹³, internal urethrotomy, stent implants, laser and various forms of urethroplasty. In some cases more than one treatment modality has to be applied.

AIMS & OBJECTIVES

To study the outcome of optical internal urethrotomy in the treatment of urethral strictures at Allied Hospital, PMC Faisalabad.

PATIENTS & METHODS

A total of 90 consecutive male patients with the

diagnosis of stricture urethra were admitted in Surgical Unit-II of Allied Hospital, Faisalabad during the study period. Urethroplasty was performed as first line treatment in twenty patients because of blind long (>3 cm) strictures. They were excluded from the study.

The protocol included complete clinical history and thorough physical examination. Baseline investigations included urinalysis, hemoglobin, total and differential leukocyte count, blood sugar, serum creatinine, urea and ultrasound KUB. Retrograde urethrography was performed in all cases while antegrade micturating cystourethrography was performed in patients with blind urethral strictures.

The operative findings and procedure were recorded in each case. The follow up ranged from 12 to 30 months.

RESULTS

Among 70 patients, age range was 5 - 80 years. The number of patients was almost same in all age groups except, at the extremes of ages. (Table I)

Regarding the etiology, the stricture was a consequence of rupture of urethra due to fracture pelvis in 30 (42%) patients. In 16 (23%) patients, history of direct urethral trauma (straddle injury) was present. There were 6 (9%) patients with infective strictures. All these patients gave past history of gross pyuria. The history of extramarital sexual contact was present in two of these patients.

The stricture was found to be due to the iatrogenic causes in 18 (26%) patients. Among these, in four patients strictures followed trans-urethral resections (3- TURP & 1-TURBT), in six patients it followed trans-vesical prostatectomy while urethral catheterization following non-urological procedure was found to be responsible for the stricture formation in seven patients.

One patient had acid burns causing meatal and anterior urethral stricture formation following acid application to glands and dilatation of urethra with

wooden pieces (foreign body) by a non qualified person. (Table II).

The stricture was located in bulbar urethra in 19 (27%) cases, in membranous urethra in 16 (23%), in penile part in 12 (17%), and in the prostatic part in 3 (4%) patients, while 20 (29%) patients had long strictures involving more than one part of urethra (Table III).

Age	No of pts	%age
0-9	5	7%
10-19	5	7%
20-29	11	16%
30-39	08	11%
40-49	10	14%
50-59	09	13%
60-69	16	23%
>70	6	9%

Etiology	No of pts	%Age
Fracture pelvic	30	42%
Straddle injury	16	23%
Infective	6	9%
Iatrogenic	18	26%
TVP	6	9%
TURP/TURBT	4	6%
Catheterization	7	10%
Acid burns	1	1%

Internal urethrotomy was performed in all patients. In patients with blind urethral strictures, duplex approach was adopted. A single internal urethrotomy was sufficient in 43 (61%) patients while 15 (21%) patients needed two or more sessions of internal

urethrotomy.

Site	No of pts	%age
Penile Urethra	12	17%
Bulbar Urethra	19	27%
Membranous Urethra	16	23%
Prostatic Urethra	3	4%
Bulbo-Membranous/Prostato-Membranous Urethra	20	29%

In six patients, after multiple attempts with internal urethrotomy, urethroplasty was performed. Six patients were lost during follow up which ranged from 12 to 30 months (Table IV).

Out come	No of pts	%age
Treated with single internal urethrotomy	43	61%
Required two sessions of internal urethrotomy	8	11%
Required more than two sessions of internal urethrotomy	7	10%
Urethroplasty was to be performed	6	9%
Lost during followup	6	9%

Clean Intermittent Self Catheterization with 12 Fr. Nelaton tube and frequent active urethral dilatations were performed as adjuvant treatment in patients with complex and recurrent strictures. Unfortunately, the outcome of intermittent clean self catheterization was not good due to patients' non-compliance. Active urethral dilatation with Lister Bougies at increasing intervals was found to be a better alternative in these patients.

DISCUSSION

Blind urethrotomy for stricture of male urethra has been used for over a century, but it was only after the introduction of visual technique that it gained an acceptable clinical status¹⁴. Keitzer et al. first introduced the blade fitted to a resectoscope for direct vision incision of bladder neck contractures¹⁵. Sacshe in 1974, developed the first urethrotome with a fine movable scalpel to incise urethral stricture under direct vision. Since then, internal urethrotomy has gained much popularity among urological surgeons as a treatment of first choice for urethral strictures¹⁶⁻²⁰.

Various modifications have also been suggested for the treatment of recurrent and complex strictures. Guillemin technique is advocated for the treatment of recurrent urethral stricture. In this procedure, incision is made with a cold-knife at 11 o'clock and 1 o'clock position instead of conventional 12 o'clock position. This is followed by transurethral resection of all the scar tissue at 12 o'clock position at a second operation after two to three weeks.²¹ Koherman et al. has recommended cut to the light procedure for blind and impassable strictures of bulbar and membranous urethra²².

The use of trans-rectal ultrasound has also been recommended for more accurate assessment of urethra during duplex internal urethrotomy²³. Suprapubic bougie and per rectal finger has also been advocated for urethral alignment specially if transrectal ultrasound is not available²⁴. Mahesh et al. has described "core-through" technique of internal urethrotomy for blind posterior urethral strictures under C-arm fluoroscopic guidance²⁵. Despite all the improvements and modifications, recurrence of stricture is still very common^{26,27}.

In our series, most of the strictures were traumatic (46 out of 70 patients). In 30 patients (43%), the stricture was a consequence of rupture of urethra following fracture of pelvis in various accidents. This is an unfortunate price of modernization. With increasing mechanization and fast moving traffic, the incidence of fracture pelvis is also on the rise. Luckily, urethra is injured in only about 10% of

these^{3,4}.

In 16 patients (19%), the history of blunt perineal trauma (straddle injury) was present. Fifteen patients had classical short bulbar strictures while one patient had long (> 2 cm) strictures. He had longer stricture involving bulbo-membrano-prostatic urethra. He got straddle injury fifteen years ago and gave history of rail road catheterization and multiple urethral dilatations. The badly stenosed and distorted urethra may be attributed to these blind procedures. Rail road catheterization was the treatment of choice for urethral disruption some years ago. Now it is not recommended and only suprapubic diversion is advocated^{28,29}. Some of these urethral injuries are only partial injuries and may heal spontaneously. Moreover, rail road catheterization is a blind procedure without any knowledge of whether the true urethra has been cannulated or a false passage is created. Morehouse and Mackinnon, while managing posterior urethral strictures with Johnson's urethroplasty noted that the amount of scarring at the site of urethral reconstruction was minimal if the retropubic space had not been explored earlier³⁰.

The stricture was found to be due to iatrogenic causes in 18 (26%) patients. Four strictures followed transurethral resections (3 TURP & 1 TURBT), six followed trans-vesical prostatectomy. Urethral catheterization was the cause of stricture formation in seven patients. The urethral stricture is one of the common complications of trans-urethral resections^{31,32}. Similarly, the use of urethral catheter is also a well documented cause of urethral stricture^{3,5,33}.

One of our patients had a unique history. He was an old man of about 75 years. He developed symptoms of bladder outflow obstruction due to the enlarging prostate and went to a non qualified person for treatment. The quack applied acid to the glans penis and inserted straws (taken from the dusting broom) into the urethra in order to relieve obstruction and caused acid burns to the glans and the external urethral meatus. Moreover, the dirty straws caused urethritis and subsequent stricture of the penile urethra. These dirty straws were still present in the external urethral meatus when he presented to us in

the emergency department. He developed meatal stenosis and penile urethral stricture. Such an example is hard to find in the international literature and it is very unfortunate that at the verge of 21st century, such type of quackery is still a common practice in our country.

The incidence of infective urethral strictures is still very high in certain parts of the world^{18,26}. In our study, there were only six patients (8%) with infective strictures. The history of extramarital sexual contact was positive in two of them. Good personal hygiene specially adequate toilet after micturition and the practice of neonatal circumcision may be one of the causes of low incidence of infective strictures in our country. Similarly, relatively low incidence of extramarital sexual relationship may be another cause.

Internal urethrotomy was performed in all patients. The results were excellent in 43 (61%) patients who did not require any other treatment. In patients with blind urethral strictures, duplex approach was adopted. A single internal urethrotomy was sufficient in 28 of these patients. Internal urethrotomy has excellent results with low recurrence rate in patients with short strictures.

Fifteen patients required two or more sessions of internal urethrotomy due to recurrence of strictures. In fourteen of these patients, the stricture was caused by rupture of urethra due to fracture pelvis while one patient presented with history of straddle injury and rail road catheterization as discussed earlier. These results are comparable with most of other studies¹⁶⁻²⁰.

Urethroplasty was done in 6 (9%) patients. Most of these patients had recurrent strictures despite repeated internal urethrotomy. Urethroplasty has been recommended in patients with recurrent strictures after internal urethrotomy^{34,35}.

Clean intermittent self catheterization and active urethral dilatation were used as an adjuvant to internal urethrotomy. Unfortunately, results of clean intermittent self catheterization were not good in our patients due to non compliance. Then we started

doing active urethral dilatations at increasing intervals to prevent the recurrence of stricture formation. The use of urethral dilatation is being recommended in recent studies as an adjuvant treatment to stabilize the urethral lumen^{11,12,36}.

CONCLUSIONS

Internal Urethrotomy is safe and reliable procedure for simple urethral strictures while urethroplasty should be considered for complex strictures. Active urethral dilatation at repeated intervals still has a role in preventing recurrence of stricture after initial treatment with internal urethrotomy and/or urethroplasty.

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