



Endoscopic management of stricture urethra and their outcome. A study of 80 cases at rural medical college hospital

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Abstract:

Aims and Objectives: To study the outcome of endoscopic management of urethral strictures. **Study Design:** Prospective. **Setting:** Dhiraj hospital, Piparia, Vadodara. **Period:** May 2009 to Sept 2010. **Materials and Methods:** 80 male patients afflicted with stricture urethra and who underwent visual internal urethrotomy (VIU) were selected. After VIU these patients underwent regular dilatations as per the study protocol. Follow-up was done for 6 months. **Results:** Urethral stricture is common in the young population with trauma being the most common cause. The results of VIU were excellent in 75% patients who were treated with single internal urethrotomy. Internal urethrotomy was to be repeated in 12.5% patients and urethroplasty was performed in 7.5% patients. 4 patients (5%) were lost to follow-up. Follow-up urethral dilatations were done in order to prevent recurrences. **Conclusions:** Visual Internal Urethrotomy is a safe and reliable procedure for simple urethral strictures. Urethral dilatations as a follow-up tool has a role in preventing stricture recurrence after initial treatment with internal urethrotomy.

Key words: Catheterisation; Stricture Urethra; Urethral Dilatation; Urethroplasty; Visual Internal Urethrotomy

Introduction

Urethral stricture disease is as old as the history of mankind and has been described in Greek and Egyptian literature. This disease has remained the source of painful sufferings, alteration in family and social life and even a cause of life threatening conditions like Fourniers' gangrene, renal failure, bladder failure, urethral carcinoma and even death [1]. The exact incidence of stricture is unknown but it can be as high as 0.6% in some susceptible populations. Historically gonococcal urethritis was the common cause [2] but with early treatment of infection and the change of life style, now it is external trauma, use of various endoscopic instruments and indwelling catheters which has become the etiology of stricture urethra. Other causes include hypospadias surgery, balanitis xerotica obliterans (BXO).

Effective and safe management of urethral stricture disease has long been the dream of urologic surgeons and their patients. The earliest recorded attempts to treat urethral strictures dated back to the sixth century B.C. when metal dilators were described in Ayurveda [3]. Since then, there was very little change for nearly 2400 years. Then came the blind internal urethrotome by Civiale and Otitis in 18th century but failed to gain much popularity because of their complications and poor result. After the introduction of endoscopic optical system by Hopkins 1960 and later Sachse 1970 much improvement was found in recurrence rate [4].

Urethral stricture is still unsolved problem because of its recurrence. The corpus spongiosum which encircle the anterior urethra leads to extensive fibrosis (corpus spongiosum fibrosis) after a trivial injury and cause recurrent stricture (Figure 1) [5].

Dilatation, Visual Internal Urethrotomy (VIU) by cold knife and urethroplasty are the modalities used to restore the continuity of the urethra. In some cases more than one treatment modality has to be applied. Endoscopic management of urethral strictures and distractions are being carried out since the last 2 decades by internal urethrotomy. Visual Internal Urethrotomy is a full thickness incision through the scar performed at 12 O'clock position using an optical direct vision urethrotome (Figure 2). A 12 o'clock urethrotomy avoids damage to the cavernous nerves which are at 5 and 7 o'clock to the prostatic urethra, 3 and 9 o'clock to the membranous and 11 and 1 o'clock to the bulbar urethra [6]. The penile urethra is not related to cavernous nerves. Following adequate urethrotomy the urethra should admit size 24

Frcatheter easily. In 1988 McAninch & Colleagues reported the curative success rate to be 20% while Pansadoro & Emiliozzi (1996) reported the rate to be 35%.

Aims and Objectives

We had undertaken this study to determine the outcome of visual internal urethrotomy in the treatment of urethral strictures at Dhiraj Hospital, SBKS Medical Institute and Research Centre, Piparia, Vadodara.

Materials and Methods

80 male patients admitted at Dhiraj hospital from May, 2009 to Sept, 2010 who were afflicted with urethral strictures and in whom Visual Internal Urethrotomy was undertaken were selected for the study. The procedure, eventual outcome and expected complications were explained to the patient and a consent form was filled by the patient to participate in the study. The female patients with retention of urine are a more complicated problem and it has been regarded as a mass delusion to consider urethral stricture as a cause [7]. They were excluded from the present study. Likewise male patients treated with other modalities of treatment for urethral strictures were excluded. The protocol included complete clinical history and thorough physical examination. Clinical evaluation included a general physical examination, examination of meatal opening and palpation of fibrotic strictures and examination of both testes to exclude epididymo-orchitis.

Base line investigations included urinalysis, hemoglobin, total and differential leukocyte count, blood sugar, serum creatinine and blood urea. Radiological evaluation was the mainstay of examinations. It included retrograde urethrography which was performed in all cases and an additional micturating cystourethrography performed in patients with blind urethral strictures in order to determine the length of the strictures. Ultrasonography was performed to assess the upper tracts and local sonography done to assess the depth of the strictures. The operative findings and procedure were recorded in each case. Patients were advised regular dilatations as per our protocol i.e. every 2 weeks for 3 months, then every monthly for 3 months, then every 3 monthly for 1 year. Regular follow-up was done for 6 months.

Micturating cystourethrogram and retrograde urethrogram was done at the end of 6 months and the

results tabulated. The study did not require any extra funding and there are no conflicts of interests.



Figure: 1

Figure: 2

Results

Patients ranged from the age of 11 yrs to 84 yrs, however majority of the patients (30%) were from the 21-30 yrs group. Regarding the etiology, the stricture was a consequence of trauma in 52 (65%) patients. Post surgical (instrumentation) history of strictures was given by 10 (12.5%) patients. Among these, in six patients strictures followed trans-urethral resections (5- TURP & 1- TURBT) and in four patients it followed urethroplasty wherein these patients developed strictures at the sites of urethroplasty. Urethral catheterization following non-urological procedure was found to be responsible for the stricture formation in thirteen (16.25%) patients. There were five (6.25%) 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 located in the membranous urethra in thirty one (38.75%) patients in the bulbous urethra in fifteen (18.75%) patients, in the penile part in thirteen (16.25%) patients and six (7.5%) patients had stricture of the prostatic urethra. Multiple strictures were seen in eleven (13.75%) patients and strictures of the anastomotic segment were seen in four (5%) patients who had undergone urethroplasty. Length of the stricture (Table – 1) varied from <2 cms in thirty nine (48.75%) patients to <4 cms in thirty two (40%) patients. Only in nine (11.5%) patients did the stricture length exceed 4cms.

Postoperative complications (Table – 2) were encountered in 19 (23.75%) patients with recurrence of stricture accounting for 20% (16 patients) of it. Bleeding was seen in 2 (2.5%) patients while 1 (1.25%) patient suffered from epididymoorchitis postoperatively. Visual Internal urethrotomy was performed in all patients.

A single internal urethrotomy was sufficient in 60 (75%) patients while 10 (12.5%) patients needed two or more sessions of internal urethrotomy. In 6 (7.5%) patients, after multiple attempts with internal urethrotomy, urethroplasty was performed. Four (5%) patients were lost during the follow up period of 6 months (Table - 3).

Table – 1. Length of the Stricture

Length of stricture	No. of Patients	Percentage
<2 cms	39	48.75%
2-4 cms	32	40%
>4 cms	9	11.25%
TOTAL	80	

Table – 2. Post operative complications

Complication	No of Patients	Percentage
Bleeding	2	2.50%
Haematoma	.	
Extravasation	.	
Septicaemia	.	
Recurrence	16	20%
Epididymoorchitis	1	1.25%
Fistula	.	
Incontinence	.	
Impotence	.	
False passage	.	
Total	19	23.75%

Table – 3. Outcome of treatment

OUTCOME	No of Patients	Percentage
Required single session of VIU	60	75%
Required 2 sessions of VIU	7	8.75%
Required more than 2 sessions of VIU	3	3.75%
Required Urethroplasty	6	7.5%
Lost during follow-up	4	5%
Total	80	

Discussion

During the first half of the 19th century, blind internal urethrotomy with a cold knife was mainly used, while during the latter half of the 19th century, the development of urethroscopy made it possible to incise a urethral stricture under direct vision. It was only after the introduction of visual technique that urethrotomy gained an acceptable clinical status [8]. Keitzer et al. first introduced the blade fitted to a resectoscope for direct vision incision of bladder neck contractures [9]. 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 strictures [10-13].

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 [14] Koherman et al. has recommended cut to the light procedure for blind and impassable strictures of bulbar and membranous urethra.

The use of trans-rectal ultrasound has also been recommended for more accurate assessment of urethra during duplex internal urethrotomy [15]. Suprapubic bougie and per rectal finger has also been advocated for urethral alignment specially if transrectal ultrasound is not available [16]. Mahesh et al. has described "core-through" technique of internal urethrotomy for blind posterior urethral strictures under C-arm fluoroscopic guidance [17]. Despite all the improvements and modifications, recurrence of stricture is still very common [18,19]

In our series, the highest incidence is noted in the (21-30) age group, probably because they are more exposed to outdoor work and the increased incidence of vehicular accidents in this age group. The older age group also has a higher incidence owing to the popularity of transurethral procedures. Most of the strictures were traumatic (52 out of 80 patients). 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. Rail road catheterization was the treatment of choice for urethral disruption some

years ago. However it is not recommended any more and only suprapubic diversion is advocated [20].

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 retro pubic space had not been explored earlier.

Post surgical (instrumentation) history of strictures was given by 10 (12.5%) patients. Among these, in six patients strictures followed trans-urethral resections (5- TURP & 1-TURBT) and in four patients it followed urethroplasty wherein these patients developed strictures at the sites of urethroplasty. Urethral catheterization following non-urological procedure was found to be responsible for the stricture formation in thirteen (16.25%) patients. Urethral stricture is one of the common complications of trans-urethral resections [21]. Similarly, the use of urethral catheter is also a well documented cause of urethral stricture [23,24]

The incidence of infective urethral strictures is still very high in certain parts of the world [18,25]. In our study, there were only five patients (6.25%) with infective strictures. The history of extramarital sexual contact was positive in two of them. Good personal hygiene and awareness of healthy practices along with better diagnostics and effective antibiotics may be the reasons of low incidence of infective strictures in our country.

The results of visual internal urethrotomy were excellent in 60 (75%) patients who did not require any other treatment. Internal urethrotomy has excellent results with low recurrence rate in patients with short strictures. Ten patients required two or more sessions of internal urethrotomy due to recurrence of strictures. Urethroplasty was done in 6 (7.5%) patients. Most of these patients had recurrent strictures despite repeated internal urethrotomy.

Urethroplasty has been recommended in patients with recurrent strictures after internal Urethrotomy [26,27].

Clean intermittent self catheterization is not a good option amongst our patients due to non compliance hence we devised an active urethral dilatation protocol wherein patients were advised regular urethral dilatations every 2 weeks for 3 months, then every monthly for 3 months, then every 3 monthly for 1 year. It was our observation that

strict adherence to this protocol helped in preventing 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 [28-30].

Conclusion

Advances in endoscopic instrumentation and techniques have expanded our armamentarium for safe and effective treatment of urethral strictures. Endoscopic treatment should be considered the first line procedure in the management of all types of urethral strictures. Visual Internal Urethrotomy has an excellent success rate with durable long term results in most patients with the added advantages of safety and reliability. Urethral dilatation as a follow up therapeutic tool helps preventing recurrence of stricture after the initial treatment with internal urethrotomy.

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