Original Article

Experience with Cold Knife Optical Internal Urethrotomy

Arif Pervez, Hidayatulla Mandokhel, Sultan Tareen, Ammar Arif

ABSTRACT

Objective: To evaluate the outcome and efficacy of cold knife optical internal urethrotomy. **Study Design:** A retrospective analysis of 300 cases. **Place and Duration of Study**: The study was carried out over a period of 3 years (January 2005 to December 2007) in the Department of Urology, Bolan Medical College and Salim Medical Complex, Quetta. **Subjects and Methods:** Three hundred male patients with urethral strictures were treated with cold knife optical urethrotomy over a period of 3 years. An analysis was carried out of the long-term results of optical internal urethrotomy to determine the outcome and efficacy of the procedure. The mean age was 25 years (range from 15-60 years). **Results:** The follow-up period on treated patients ranged from 3 months to 1 year. The results showed that early morbidity was 15.6 % with no mortality. The recurrence rate was 6% (18 out of 300). The results are consistent with other studies and confirm this as the preferred initial procedure in urethral strictures of bulbar, membranous and proximal penile urethra. **Conclusion:** Optical internal urethrotomy is safe and effective in the management of un-complicated urethral stricture. Urethroplasty should be considered in failed optical urethrotomy and recurrent stricture disease. **Key Words:** Urethral stricture, Urologic diseases, Urinary retention, Surgery, Therapy,

INTRODUCTION

The natural history of urethral stricture begins with a lesion of the urethral mucosa and infection followed by a fibrotic scar. The normally compliant urethral lumen becomes inelastic. Biochemical analysis of urethral scar tissue reveals increase in ratio of collagen type 1 and 111 when compared to normal distensible urethral spongiosum.[1] Trauma (direct and indirect) infection (gonococcal and non-gonococcal) and iatrogenic injuries remains a major cause of urethral stricture. Subgroups of patients do not give a history of trauma or infection and are labelled as idiopathic strictures. Large urethral catheters and endoscopic instruments are more likely than the small ones to cause ischaemia and internal trauma leading to urethral strictures [2]. In contrast to well-known pathogenesis of the disease, the indications for various treatments are not well defined due to lack of studies on long-term results of different operations. The most common method used at present in this part of the country is blind urethral dilatation for all kinds of strictures as the initial treatment. This study aims to encourage the physicians to chalk out a protocol of the treatment and follow-up of patients with urethral stricture disease.

PATIENTS AND METHODS

Three hundred male patients were treated between January 2005 to December 2007 with variable duration of the disease ranging from one month to twelve months. The mean age was 25 years (range from 15-60 years). The presenting symptoms were from poor ,thin urinary stream to urinary retention. One hundred ninety patients presented with poor urinary stream, 60 with urinary retention having suprapubic catheters in place, 12 had periurethral fistulas and epididymo-orchitis as well. Hundred and ten patients had recurrent urinary tract infection. Twenty patients had chronic retention with renal failure and twenty two patients had bladder calculi.

All patients with diagnosed strictures of membranous, bulbar and proximal penile urethra by urethrogram were included in the study.

ETIOLOGY

The etiology of these cases revealed external trauma, being the most common cause (180 patients). The second most common cause (44 patients) was iatrogenic injury to the urethra from a variety of urological procedures, like cystoscopy, urethral catheterization, open prostatectomy and transurethral resection of prostate or bladder tumors. All patients had urine examination, blood complete examination, urea, sugar, renal tract ultrasound, and retrograde urethrogram. Antegrade urethrogram was carried out in those with suprapubic catheters in place. Sonourethrography was performed in every patient to see the current status of urinary tract as other workers have found it to be a useful diagnostic method [3].

PROCEDURE

The procedure used was as described by Sachse in 1974. [4] Two hundred procedures were done under general anesthesia and 100 were carried in local anaesthesia with pseudo-analgesia. Antibiotic prophylaxis was routinely provided. A 4 Fr.flexibe ureteric catheter was first passed through the stricture to guide the blade for accurate cutting right across the stricture. In nine cases the guide wire negotiation was not passable. The bladder was filled with methylene blue through already placed suprapubic catheters. Pressure was applied to the suprapubic area, dye was expressed antegradely through the stricture into distal urethra and a direct cut was given at the stained area with the successful completion of the procedure.

The urethrotome used was of 21 fr. outer diameter and 0 degree telescope (Karl Storz, Germany). It gave a good forward view of the urethra and an examination of the bladder after the completion of the procedure. A clean cut was given at twelve o'clock position throughout the stricture length until the normal urethra was seen. The urethra was calibrated up to 24 fr. An 18-20 fr. Candell folley's catheter was passed for one to three weeks in different patients according to membranous to fibrous strictures. Those cases with vesical stones were followed with litholapaxy and open cystolithotomy.

RESULTS

The catheter was left in for 7 to 21 days, keeping in view the length and duration of the stricture, to allow sufficient time for epithelialization of the urethra. However, at least another study has shown good results with less than seven days of catheterization [5]. One hundred and ninety patients with short simple strictures were followed with no further procedure. Rest of the cases was instructed to have regular dilatations in the form of intermittent self-dilatation or as an outpatient procedure. Good results were obtained regardless of the etiology and length of the stricture. As uroflowmetry is not available to us at present, a subjective assessment of a good stream and a complete emptying of the bladder was considered as a good result. Furthermore, the unobstructed passage of a 20-24 fr. Bougie at follow-up dilatation was considered as a success. Twenty of 190 cases, in which no further dilatation was carried out, had recurrence of the strictures in about three months and the procedure was repeated. Thirty patients were lost to follow-up. Out of 75 patients, who were on regular dilatations, five recurred in about 6-12 months time, four had a repeat urethrotomy, and one had urethroplasty. Most of the patients were advised to have regular dilatation at one to three months intervals.Eight patients had bacteremia soon after the procedure. Ten patients had bleeding, needing to postponed the procedure. Two patients had extravasation of irrigation fluid. One patient developed priapism, lasting for three hours. Urethrotome blade broke down in two cases, and a biopsy forcep was used to retrieve the broken segments of the blade. Urinary tract infection occurred in five cases, impotency in two cases, persistent penile pain on erection in four cases. Total morbidity was 16.6%.

The details of the presenting symptoms of patients, etiology of the strictures, location of the stricture and postoperative complications are given in tables I, II, III and IV respectively.

Table 1:
Presenting Symptoms

Symptom	No. of patients	%
Poor urinary stream	80	66.66
Acute urinary retention	20	16.66
Recurrent U.T.I.	8	6.66
Chronic retention with renal failure	6	5
Urethral fistula and orchitis	4	3.33
Vesical stones	2	1.66

Table 2:
Etiology of Urethral Stricture

Etiology	**No.**	**%**
Trauma:	80	66.6
Direct injury	60	-
Indirect injury	15	-
Bullet injury	3	-
Stab wound	2	-
Iatrogenic:	22	8.33
TVP	6	-
TURP	5	-
TURBT	3	-
Cystoscopy	5	-
Open urethrotomy	3	-
Infection	15	12.5
Spontaneous passage of stone	3	2.5

Table 3:
Site of Urethral Stricture

Site	**No.**	**%**
Bulbar urethra	85	70.8
Membranous urethra	15	12.5
Penile urethra	10	8.33
Prostatic urethra	6	5
Multiple strictures	4	3.33

Table 4:
Complications

Complications	No.
Urinary tract infection	5
Bacteremia	4
Bleeding	2
Priapism	1
Penile pain	4
Instrument failure	2
Impotence	2
Total	20

DISCUSSION

Management of urethral strictures has always been a difficult task. The advent of optical urethrotomy has restored the confidence of many urologists who would otherwise have had reservations about the prospects regarding the management of urethral strictures. Optical internal urethrotomy is now an established procedure of choice. Blind dilatation has been associated with the dreaded complications of rupture, bleeding, false passages and sepsis [6]. Recurrent strictures after blind dilatation are usually worse than the original one because of intense reactive fibrosis [2].All these complications led to the enthusiasm for dealing with these lesions with endoscopic means. These studies have shown excellent short-term results [6-9], but in one series the recurrence rate at long-term was very high.

The recurrence rate in this study of 7% (8 out of 120) is quite low in the short-term, because other studies have shown a very high recurrence rate (26.5%-50%) in the long term[5]. Rabade RJ et al., have analyzed 76 cases, with a follow-up from 6 months to 5 years, with a recurrence rate reported at 46% to 50%.10 Similarly, Benchekroun et al. have shown a recurrence rate of 46%.11 Optical urethrotomy can now be performed with cold knife and hot knife with electrocautery. Even laser energy can be used to divide the stricture. Additionally, good results have been reported with Guillemin's technique in urethral strictures, whereby a double urethrotomy is carried out at eleven and one o'clock positions, followed by transurethral resection of all scar tissue [12]. Urethral stents can be placed permanently after urethrotomy with variable success[13]. Optical urethrotomy is safe with minimum serious complications. The procedure can be repeated without any increase in the morbidity rate, and it does not influence the outcome of any future urethroplasty if deemed necessary. Now a days endourethrotomy with the holmium:YAG laser is also in practice [14].

Our excellent results may be attributed to strict follow-up and regular dilatation, which may be considered an over-treatment in many cases. The policey of regular dilatation was adopted only to reduce the recurrence rate, because most of these patients were secondary referrals with long-standing strictures.

CONCLUSION

Internal urethrotomy is a safe first-line treatment for urethral strictures, independent of etiology and location of stricture, with an overall success rate of 80%. A repeat internal urethrotomy will cure another 50-70% of primary failures. Generally, it is advisable to avoid more than 3 internal urethrotomies and a surgical repair should be performed instead. Clean intermittent self-dilatation will reduce the chances of recurrence. All cases of stricture of the urethra must be dealt with on a scientific basis and a thorough and careful evaluation. Optical internal urethrotomy should be carried out by surgeons having experience in endo-urology.

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