

Original Article **Visual Internal Urethrotomy in the Management of Anterior Urethral Stricture**

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ABSTRACT

Objective: Urethral stricture disease is common in our environment. The aim of this study is to report our experience with visual internal urethrotomy (VIU) in the management of this disease.

Patients and Methods: Seventy male patients with a mean age of 30.6 years were treated for anterior urethral stricture by VIU at the Jos University Teaching Hospital between May 2002 and April 2006. To evaluate the treatment results, we studied the following parameters: stricture etiology, outcome of urethrotomy and complications. All patients were treated as day cases.

Results: The main cause of urethral stricture found in 43 (61.4%) patients was infection followed by trauma which was found in 11 (15.7%) patients. Twenty five (35.7%) patients had been subjected to previous treatment, notably urethral dilatation. The strictures were bulbar in 62 (88.6%), non-obliterative in 66 (94.3%), single in 28 (40%) and <1cm long in 10 (14.3%) patients. Fifty-six (80%) patients had a satisfactory outcome after a single or second urethrotomy, 10 (14.3%) showed an improvement of symptoms after a third urethrotomy, while in 4 (5.7%) patients urethrotomy failed after four sessions. There was a recurrence rate of 32.9% (n=23), including those who had a good outcome after repeated sessions. Other complications included bleeding in 5 (7.1%), and extravasation in 6 (8.6%) patients. Six (8.6%) patients were admitted for observation because of complications. No mortality was encountered.

Conclusion: VIU is effective and relatively safe for the short-term management of selected patients with anterior urethral strictures. Patients who do not respond favorably to this modality of treatment should be offered urethroplasty, the outcome of which is not affected by previous internal urethrotomy.

Keywords : Urethrotomy, urethral stricture, visual internal urethrotomy (VIU)

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INTRODUCTION

Many procedures are available for the treatment of urethral strictures; internal urethrotomy is one of the oldest¹. The use of direct vision urethrotomy in the management of urethral strictures has steadily increased since its introduction by Sachse in 1974^{2,3}. This technique aims to keep urethral trauma to a minimum, to modify the inevitable inflammatory response and to prevent scarring, thereby reducing the indications for anastomotic or substitution urethroplasty⁴.

The advent of visual internal urethrotomy (VIU) has enabled precision endoscopic surgery to be performed on a wide variety of urethral strictures, to the extent that many urologists make it the procedure of first choice in the management of urethral strictures^{6,7}. However, this procedure, regarded by many as the standard treatment modality, is not without complications, notably new scar formation with stricture recurrence⁸. This has led to the search for alternative techniques,

Table 1: Etiology of urethral strictures

Cause of stricture	No. of Patients	%
Infective	43	61.4
Traumatic	11	15.7
Unknown	10	14.3
Post prostatectomy	2	2.9
Post catheterization	4	5.7
Total	70	100.0

Table 2: Previous treatment

Previous treatment	No. of Patients	%
Urethral dilatation	20	28.6
Urethroplasty	3	4.3
Urethrotomy	2	2.9
No previous treatment	45	64.3
Total	70	100.0

which would avoid or ameliorate recurrence. These approaches include balloon dilatation, laser urethrotomy, endoscopic urethroplasty, "cut to the light" procedures and urethral stents⁹⁻¹⁴, which are not readily available in many centers, particularly in sub-Saharan Africa. We report our experience with VIU in the management of urethral strictures at a Nigerian health center.

PATIENTS AND METHODS

Between May 2002 and April 2006, 70 male patients aged between 20 and 89 years (mean 30.6 years) were selected to have elective VIU for the treatment of their anterior urethral strictures at the Jos University Teaching Hospital, Jos, Nigeria. They were subjected to a full clinical evaluation, urine culture and anterior urethroscopy. Retrograde urethrography was done in one patient only, due to financial constraints. All pediatric patients, and also adult patients with obliterative strictures, were excluded. Four adult patients with obliterative but short-segment (<1cm) strictures were pre-selected for urethrotomy.

VIU was performed under local urethral anesthesia, with or without sedation, and all patients received a single parenteral injection of Gentamicin (280 mg) at the time of anesthesia.

The stricture was incised at the 12 o'clock position using an Olympus urethrotome (cold knife) with a size 21F cystoscope sheath and a 12° telescope. A second incision was made at the 6 o'clock position in a few patients. The primary incision extended both proximally and distally into macroscopically normal urethral tissue⁴, and bleeding points were left undiathermized. Following urethrotomy, a size 16G or 18G self-retaining rubber urethral catheter was inserted through an insertion sleeve and left in situ for 7 or 14 days. Patients, who did not have suprapubic cystostomy drainage before urethrotomy, had their urethral catheters spigotted immediately after the procedure and removed after 7 days. Those patients who had suprapubic cystostomy drainage prior to urethrotomy were left on continuous bladder drainage for the first 7 days following the procedure. The catheter was then spigotted for another 7 days and finally removed. All patients were treated as day cases.

Table 3: Stricture characteristics and number of urethrotomies in 70 patients

Location	No. Patients (%)	No. of urethrotomies			
		1	2	3	4
Penile	8 (11.4)	4	-	4	-
Bulbar	62 (88.6)	43	9	6	4
Nature					
Non-obliterative	66 (94.3)	45	8	10	3
Obliterative	4 (5.7)	2	1	-	1
Number					
Single	28 (40)	20	4	2	2
Multiple	42 (60)	27	5	8	2
Length					
<1cm	10 (14.3)	5	-	3	2
1 – 3cm	48 (68.6)	34	7	6	1
> 3cm	12 (17.1)	8	2	1	1

Complications occurring during and after the procedure were recorded. The patients were followed up in the outpatient clinic by a subjective assessment of their symptoms. We did not measure pre- and post-operative urine flow rates because of lack of facilities. A subjective response was satisfactory, improved or unsatisfactory if a patient had a good urine flow, improvement in urine flow or poor flow necessitating urethroplasty, respectively. Recurrence was defined as the need for a repeat procedure or urethroplasty. Follow-up was for three to 48 months (mean 28.6 months) after urethrotomy.

RESULTS

As shown in Table 1, the main causes of stricture were infection in 43 (61.4%) and trauma in 11 (15.7 %) patients. Twenty-five patients (35.7%) had received one form of treatment previously (Table 2). Table 3 shows the stricture characteristics and number of urethrotomies performed.

Subjective assessment revealed that 56 patients were satisfied with the result after a

first and/or second urethrotomy (80%). Ten patients reported an improvement of their symptoms after a third urethrotomy (14.3%), while 4 had unsatisfactory results after 4 urethrotomies (5.7%) (Table 4). In these four patients urethroplasty was performed.

In total, 23 patients needed a repeat urethrotomy within 48 months of follow-up (recurrence rate of 32.9%). Intra- and early post-operative complications occurred in 15 (21.4%) patients (Table 5). There were 6 conversions of day-care to inpatient admission post-operatively because of complications: two each due to bleeding, extravasation and post-obstructive diuresis. All were discharged within 72 hours of observation and conservative management only. No mortality was encountered.

DISCUSSION

Subjective assessment revealed that 80% of the patients were satisfied after a first or second urethrotomy. This compares favorably with the 70% to 80% success rates reported

Table 4: Outcome of 111 urethrotomies in 70 patients

No. of Urethrotomies	No. of Patients	%	Total Urethrotomies	Subjective Outcome
1	47	67.1%	47	satisfied
2	9	12.9%	18	satisfied
3	10	14.3%	30	improved
4	4	5.7%	16	not satisfied
Total	70	100%	111	

by other authors^{4,5,15-17}. Furthermore, there was a subjective improvement in symptoms after a third urethrotomy in another 14% of patients for whom further treatment was deemed not necessary except hydraulic self-dilatation.

Recurrence in this series was defined as the need for further treatment either by repeat urethrotomy or urethroplasty. Twenty-three (32.9%) patients fell into this group. This recurrence rate is comparable to the 41% reported by Aagaard et al.¹⁸. Recurrence rates of up to 68% have been reported following single urethrotomies for anterior urethral strictures in a study conducted by Pansadoro and Emiliozzi¹⁹, but this rather high recurrence could be explained by the long-term follow-up period in this study (60-216 months). In our study, a second or third urethrotomy yielded satisfactory results or an improvement in 9 (12.9%) and 10 (14.3%) patients, respectively. This is in contrast to the report by Pansadoro and Emiliozzi¹⁹ who observed that multiple urethrotomies did not improve success rates, but only offered temporary improvement. This implies that long-term follow-up of our patients is necessary before any final conclusions can be drawn. Four (5.7%) patients had unsatisfactory results even after four sessions of urethrotomy. These were considered as "failed urethrotomy" and were subjected to urethroplasty. Urethrotomy offered advantages to this particular group of patients. First, there was symptomatic relief and improved quality of life, as they were rid of suprapubic cystostomy tubes, even though

for short periods. Secondly, and probably more important for the patient was the fact that urethrotomy allowed time to raise funds for a planned urethroplasty.

In terms of socioeconomic dynamics, multiple urethrotomies of up to four times cost less than a single urethroplasty per patient in our setting; partly because the procedures were done under local urethral anesthesia and on day-care basis. Greenwell et al.²⁰ believe that while a strategy of initial urethrotomy or dilatation followed by urethroplasty in patients with recurrent strictures is most cost-effective, repeat urethrotomy or dilatation is neither clinically effective nor cost-effective. In our study, repeated urethrotomy was not found to make subsequent urethroplasty more difficult, a fact confirmed by Shittu in another Nigerian study⁵. Stricture etiology, location, number or even previous treatment did not have any influence on the outcome of urethrotomy as previously reported^{3,19}.

In a recent nationwide survey to determine the methods and patterns of evaluation of and treatment for adult anterior urethral stricture disease by practising American urologists, Bullock et al.²¹ reported that minimally invasive procedures were used more frequently than any open urethroplasty technique (dilatation 92.8%, optical urethrotomy 85.6%, endourethral stent 23.4%). Seventy-four percent of respondents believe that urethroplasty should be performed after repeat failure of endoscopic methods. However, this does not apply to our setting where endoscopic procedures are

Table 5: Early complications of urethrotomy in 70 patients

Complication	No. of patients	%
Urethral bleeding	5	7.1
Extravasation	6	8.6
Epididymo-orchitis	1	1.4
Post-obstructive diuresis	2	2.9
Scrotal gangrene	1	1.4
Total	15	21.4

not commonly available, and therefore most urologists resort to urethroplasty.

Infection was the leading cause of stricture in our series, accounting for 61.4% in our patients. This is in agreement with studies from other developing countries where 80% of the strictures treated were post-infective^{5,22} contrary to Western societies, where trauma and iatrogenic injuries are the leading causes of stricture^{4,7,15}. This difference is not unrelated to the fact that urethritis (gonococcal and non-gonococcal) is still a health problem in poor societies, worsened by indiscriminate use of antibiotics by patients for the treatment or "prevention" of sexually transmitted infections.

Complications (excluding recurrence) were minimal: urethral bleeding, extravasation, epididymo-orchitis, post-obstructive diuresis and scrotal gangrene, with an overall complication rate of 21.4%. None of the cases of urethral bleeding required blood transfusion. Extravasation, epididymo-orchitis, and post-obstructive diuresis were all managed conservatively. The patient who developed scrotal gangrene finally had split thickness skin graft. The minimal and transient nature of complications following VIU has been reported by other authors^{4,23}. However, six of our patients were admitted for observation, giving a rate of 8.6% for conversion from day-care to inpatient hospitalization. The mortality rate was nil.

Since the natural history of urethral stricture is measured in decades, and not months or a few years, longer follow-up is

necessary to show whether our satisfactory results will prove durable. Nevertheless, we suggest that, where available, VIU should be offered to patients with suitable anterior urethral strictures, because it is safe and clinically effective in the short-term. Patients who do not respond to several sessions of this procedure should be offered urethroplasty. Moreover, if performed properly, VIU does not necessarily make subsequent urethroplasty more difficult.

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