

Urethral Stricture and Urethroplasty Practice in a Teaching Hospital in Anambra, South-Eastern Nigeria

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Abstract

Background: Management of urethral stricture disease remains a challenge in the field of urology. Though several options exist for its management, urethroplasty has proved to give the best outcome.

Methodology: This is a retrospective study of urethral strictures and urethroplasties for 5 years spanning from January 2015 to December 2019 at a tertiary teaching hospital in Anambra, South East Nigeria. Data was retrieved from the case notes of all the urethral strictures cases which presented to our facility in these 5 years and analysed using Microsoft Excel.

Results: A total of 186 patients were diagnosed with urethral stricture disease within the 5 years' period. However, only 28 (15.1%) of them had urethroplasty within the period, mostly due to lack of fund. Of those who had urethroplasty, their ages ranged from 4 – 64 years with a median of 29.50 years. Motor vehicular road traffic accident (RTA) was the most common (46.43%) aetiology. Excision and anastomosis was the most common type of urethroplasty performed (71.43%) and the most common complication was stricture recurrence (32.14%).

Conclusion: Though urethroplasty techniques have become more refined, accessibility of care continues to hamper treatment in Sub-Saharan Africa due to socioeconomic issues.

Keywords: Urethroplasty; Urethral Stricture; 2 Stage; South East; Nigeria.

Introduction

Urethral stricture has continued to remain a challenge to urologists. It is an abnormal narrowing and loss of distensibility of the urethral lumen due to fibrosis. The term “stricture” is limited to the anterior urethra while abnormal narrowing in the posterior urethra is referred to as stenosis or contracture.¹⁻³ Although the true world incidence of urethral stricture is unknown, it has been estimated at 200-1,200 cases per 100,000 individuals in the United States⁴ while a hospital prevalence of 4.2% has been documented in Burkina-Faso.⁵ The pathological changes associated with strictures occur in a spectrum and range from simple fibrosis which is best described as mucosal fold to

spongiofibrosis and extra-spongiofibrosis.^{2,3} Complex strictures are complicated by fistula or abscess.

Patients with urethral stricture usually present with varying degrees of lower urinary tract symptoms (LUTS) as well as complications. Common among the complications are recurrent urinary tract infections, urolithiasis, peri-urethral abscess formation, fistula formation, male infertility and, in

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severe cases, renal impairment.⁶ The diagnosis is usually confirmed with the aid of urethrogram, urethrosonography and urethrocystoscopy. As one of the oldest known urological illnesses, its treatment has evolved over time. The modalities of treatment include dilation, internal urethrotomy and urethroplasty.⁷

Urethral dilation is the oldest method of treatment of strictures and has been in use for thousands of years.⁶ There are several methods of dilation including dilation with a balloon, filiform and followers, urethral sounds, or self-dilation with catheters.³ Direct vision internal urethrotomy has been in use for several decades and involves making transurethral incisions on the stricture with a cold-knife, to release scar tissues.^{3,6} Both urethral dilation and urethrotomy are associated with high rate of recurrence. Urethroplasty offers the best results for urethral strictures and is offered to those patients in whom dilation or urethrotomy are inappropriate or have failed.⁶ Excision and anastomosis, use of grafts and flaps are the cornerstones upon which several techniques of urethroplasty have been described. We reviewed the urethroplasties done at a tertiary hospital in South-Eastern Nigeria.

Material and Method

This is a retrospective study of urethral strictures and urethroplasties for 5 years spanning from January 2015 to December 2019, done at a tertiary teaching hospital in Anambra State, South East Nigeria. Ethical approval was received from our institution's Ethical Committee Board. We accessed the records of all the urethral strictures which presented to our facility in these 5 years from the clinic, emergency department and theatre. From the folders and operation notes (for those who had surgery) we retrieved the biodata, stricture type, stricture length, method of diagnosis, duration of stricture, complications, aetiology of stricture, presence or absence of suprapubic cystostomy (SPC), acceptance of surgery, type of surgery, outcome of surgery, complications of surgery. These data were collected using Pro forma and were analysed by simple descriptive statistics using Microsoft Excel.

Results

A total of 186 patients were diagnosed with urethral

stricture disease within the 5 years' period. Thirty (30) of them had urethroplasty from our theatre records within the period, however, we could only retrieve 28(15.1%) of the folders. Two (2) folders were incomplete and could not be retrieved. Of those who had urethroplasty with retrievable folders, their ages ranged from 4 – 64 years, with a median age of 29.50 years and modal age group of 21 – 30 years (see Table 1). The modal occupation was trade (28.57%) and senior secondary education was the highest level of education attained by majority (39.29%) of the patients. Most (75%) of the patients were single (see Table 1).

The patients had varying degrees of lower urinary tract symptoms (LUTS) in various combinations with the most common being storage phase symptoms (60.71%) and poor urinary stream (60.71%) as shown on Table 2.

Table 1: Socio-demographic characteristics of the patients

CHARACTERISTICS	LEVELS	FREQUENCY	PERCENTAGE
Age Range (Years)	1-10	3	10.71
	11-20	2	7.14
	21-30	11	39.29
	31-40	8	28.57
	41-50	1	3.57
	51-60	2	7.14
	61-70	1	3.57
Occupation	Job Applicant	1	3.57
	Pensioner	1	3.57
	Teacher	1	3.57
	Apprentice	1	3.57
	Student	6	21.43
	Trader	8	28.57
	Artisan	4	14.29
	Security Personnel	2	7.14
	Commercial Bus Driver	4	14.29
	Highest Level of Education	No Education	2
Primary		9	32.14
Junior Secondary		3	10.71
Senior Secondary		11	39.29
Tertiary		3	10.71
Marital Status	Single	21	75.00
	Married	6	21.43
	Divorced	1	3.57

Table 2: Lower Urinary Tract Symptoms

LOWER URINARY TRACT SYMPTOMS	FREQUENCY	PERCENTAGE
Storage Phase Symptoms	17	60.71%
Hesitancy	16	57.14%
Intermittency	16	57.14%
Poor Stream	17	60.71%
Straining	15	53.57%
Terminal Dribbling	14	50%
Incomplete Emptying	16	57.14%
Post-micturition Dribbling	8	28.57%

Other urinary symptoms that were noted included acute urinary retention (AUR) (71.43%), chronic urinary retention (25%), acute-on-chronic urinary retention (3.57%), dysuria (21.43%) and haematuria (3.57%). The duration of symptoms before presentation ranged from 0.04-94 months with median of 5 months. Motor vehicular road traffic accident (RTA) was the most common (46.43%) aetiology as shown on Table 3. Complications of urethral stricture were observed in 9 (32.14%) patients as shown in Figure 1.

Table 3: Aetiology of Stricture

	FREQUENCY	PERCENTAGE
Motor Vehicular RTA	13	46.43%
Motorcycle RTA	1	3.57%
Infection	1	3.57%
.....	1	3.57%
Injury from a Falling Object	1	3.57%
External Trauma	3	10.71%
Catheter-induced	6	21.43%
Penile Fracture	1	3.57%
Unknown	1	3.57%

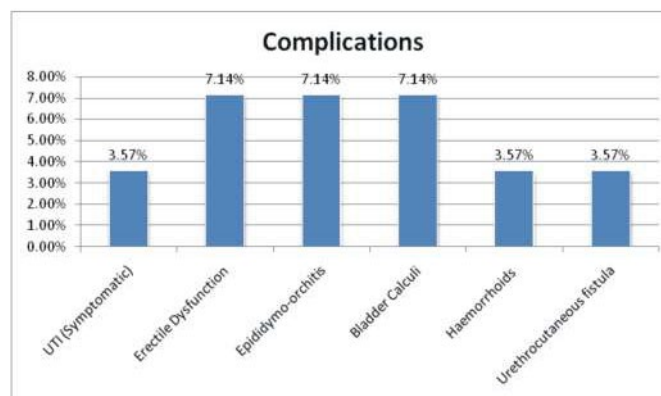


Figure 1: Complications of Urethral Stricture

The most common co-morbidity among the patients was pelvic fracture which was seen in 4 (14.29%) patients. Two (7.14%) patients had hypertension while cerebrovascular accident (CVA), closed tibiofibular fracture, non-united femoral fracture and thigh ulcer was seen in 1 (3.57%) patient each. One of the patients with hypertension also had CVA. Fifteen (53.57%) patients already had a supra pubic cystostomy (SPC), in a peripheral hospital, before presentation.

The predominant bacterial organism cultured from the urinary tract of the patients was *Escherichia coli* (50%). Others included *Klebsiella* spp (21.43%), *Staphylococcus aureus* (7.14%), *Pseudomonas aeruginosa* (3.57%), *Proteus* spp (3.57%). Three (10.71%) patients' urine culture yielded no growth while 1 (3.57%) patient's result could not be traced. All the patients had urethrogram.

All the patients had urethroplasty for their strictures. The median time of surgery from presentation was 7.0 months (Range of 1.0 month – 40.0 months). The most common reason for the delay in having surgery was financial constraint (57.14%). Other reasons were co-morbidities (10.71%), hospital logistics (7.14%), and persistent urethrocutaneous fistula (3.57%). A patient had no documented reason for delay in having surgery. The site of stricture was, predominantly, bulbomembranous (see Figure 2). The length of the strictures ranged from 1.0 cm to 12.0 cm with a mean length of 3.80 ± 3.81 cm. The patients had different forms of urethroplasty as shown on Table 4.

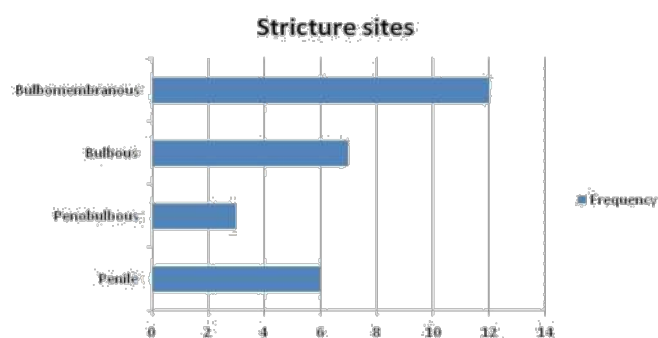


Figure 2: Site of stricture

The most common complication of urethroplasty was recurrence which was seen in 9 (32.14%) patients. Other complications noted were erectile dysfunction (10.71%), weak ejaculation (3.57%), perineal abscess (3.57%), recurrent epididymo-orchitis (3.57%), and persistent vesicocutaneous fistula (3.57%). Two of the three patients with erectile dysfunction already developed it prior to urethroplasty.

Table 4: Urethroplasty Techniques

URETHROPLASTY	FREQUENCY	PERCENTAGE (%)
Excision and Anastomosis	20	71.43
Buccal Mucosal Graft	1	3.57
Longitudinal penile flap (Orandi)	2	7.14
Distal circumferential penile flap (McAninch)	1	3.57
Two-stage urethroplasty (Johanson)	4	14.29

The median follow-up period was 6.0 months (Range of 1.0 month – 48 months). There were successful outcomes in 19 (67.86%) patients while failure was seen in 9 (32.14%) patients. Eight of the nine patients with failed urethroplasty had excision and anastomosis for bulbomembranous strictures while one patient had buccal mucosal graft urethroplasty for penobulbar stricture. Three of the eight patients with failed excision and anastomosis eventually had a repeat urethroplasty which was successful in two patients and failed again in one. Erectile function after urethroplasty was good in 9 (32.14%), poor in 3 (10.71%), and was not documented in 16 (57.14%) patients. Two of the three patients with poor erectile function already had it prior to the urethroplasty.

Discussion

Management of urethral stricture disease remains a major problem in the developing world. Though the treatment has undergone several refinements with a range of options including direct visual internal urethrotomy, excision and anastomotic urethroplasty, various types of penile flap repairs, substitution with buccal mucosal grafts and skin grafts; poor health-seeking behaviour, lack of finance (poverty), scarcity of skilled manpower as well as inadequate facilities continue to hamper treatment in Sub-Saharan Africa. This is in spite of the fact that urethral stricture disease constitutes a huge disease burden in the region.⁸ A total of 186 patients had urethral stricture out of which only 28(15.1%) patients had urethroplasty in this 5-year period. The cause of this is primarily lack of funds by the patients, while other contributing factors include frequent industrial actions by healthcare workers, limited number of urologists with

reconstructive skills, limited operating theatre space and hospital logistics.⁹

The age range of those who had surgery was between 4 to 64years with a median age of 29.50years. This correlates with previous studies by Dakum et al.¹⁰, and Singh et al.¹¹ This trend is expected as most of strictures resulted from road traffic accidents which are more common among the young people who are more mobile and adventurous.

The modal occupation was trade (28.57%) and senior secondary education was the highest level of education attained by majority (39.29%) of the patients. Most (75%) of the patients were single while the rest were either married (21.43%) or separated (3.57%). The predominant occupation of most of the patients is trading and most travel a lot by means of motor vehicles and motorcycles. The fact that most were petty traders also impacted on financial capacity to access treatment.

All our patients came with one form of urinary retention, the most common being acute urinary retention. This is understandable as most of these patients developed urethral distraction injury from a possible pelvic trauma with associated AUR. Presenting with chronic or acute-on chronic retention after a prior history of lower urinary tract symptoms may suggest late presentation of patients. This could be explained by poverty and ignorance among the patients, most of whom have an average level of education. This pattern of late presentation of patients with urethral stricture disease where they present with one form of complication or the other has been shown to be the rule as reported by some authors in the Sub-Saharan Africa subregion.^{12,13}

The most common aetiology of urethral stricture in our locality was trauma, particularly road traffic accidents. This finding contrasts with that of a study done at the same centre 15years ago where traumatic and infective causes were almost of same rate.¹³ Poor road network, common use of motorcycle as routine means of transport and increase in violence has contributed to this change of trend. Infective causes continue to be on a decrease due to increased availability of antibiotics as well as an improved and better health care awareness among the populace.

This also agrees with other recent studies in other urban parts of the country.¹³⁻¹⁵ This trend may however change in the near future as strictures from iatrogenic causes are expected to increase in the near future with the gradual increase in transurethral endoscopic procedures in the region.^{16,17}

The predominant site of stricture in our patients is the bulbomembranous urethra, followed by the bulbous urethra. This is similar to what was reported by Van denHeever et al¹⁸ and Igenge et al.¹⁹ These are sites of urethra commonly traumatised in road traffic accidents with associated pelvic fractures and in fall astride injuries, which ranked high in the aetiology of our patient cohort. The rest occurred at the penile and penobulbous urethra and represent mostly those from urethral catheterisation, penile fracture and other external trauma.

Most of the patients came with suprapubic cystostomy (SPC) done at peripheral centres while those that came in AUR had SPC done for them. However, the median duration from stricture diagnosis to definitive surgery was 7 months and the major cause of delay remains financial constraint. Many of the patients though young, had to endure the psychosocial trauma of carrying a suprapubic catheter for such long period before they could raise the funds for surgery which was about \$800 equivalent. Widespread prevalence of poverty coupled with poor health insurance scheme means out-of-pocket expenditure is the only means of finance and this makes the cost expensive for these patients. A similar observation was made by Olajide et al.¹⁹ Many of the other patients, who could not raise the fee, had to settle for a life of routine change of suprapubic catheter.

Though several options are available for the management of urethral stricture, urethroplasty remains the gold standard of care that gives best curative outcome.²⁰ The technique of urethroplasty depends on the site and length of the stricture, as well as the expertise of the surgeon. Most of the patients had excision and anastomotic urethroplasty as most of the strictures occurred at the bulbous and membranous urethra, while penile flaps and buccal mucosal graft were used in the others. Most of these were done in a one stage procedure as has also being reported by other workers.²¹

Following urethroplasty, about 68% had a good outcome. This was judged by visual assessment of urine flow by both patients and surgeons, retrograde urethrogram and by ultrasound assessment of post void residual urine volume. The most common complication was recurrence which occurred in 32.14% of patients and these were addressed by repeat urethroplasties. This is also the trend in similar studies.^{19,22} Erectile dysfunction was another common complication and this could result from posterior urethral distraction during the traumatic cause or from the urethroplasty technique. Preoperative penile Doppler ultrasound scan was not done for these patients due to lack of the equipment though two out of the three patients that developed erectile dysfunction had it prior to the procedure. Other complications noted were perineal abscess and recurrent epididymo-orchitis.

There is an increasing incidence of idiopathic catheter induced stricture as noted in this work (6 cases) which in most cases cause long and dense complete pan penile and distal bulbar strictures. They followed catheterisation with poor quality silicon coated latex Foley catheter. Those who had total obliteration of penile urethral lumen (4 in number) did well with the 2 stage urethroplasty. The first stage was to lay the stricture open and the second stage was to fold and include some penile skin to form a new tube.

Conclusion

Though urethral stricture disease remains fairly common in our environment, only a few are able to access definitive surgical treatment due to financial constraint. This results in many patients being managed with routine suprapubic catheter change. Another consequence is the challenge of training of the upcoming young urologists who get less hands-on training in urethroplasty due to the few number of reconstructive urethral surgeries done for these patients. While some work has been done to improve definitive care of urethral stricture disease in the region, it is clear that more is needed to make the care universally available and affordable and there may be need for advocacy for endowment/intervention fund for the treatment of urethral stricture, as well as setting up of specialized urethroplasty centres with skilled and well-experienced staff and complete equipment. This will

go a long way in helping the management of urethral stricture disease as well as the training of the next generation of urologists in the skill of urethral reconstructive surgery.

We advocate the use of 100% silicon catheters to reduce the incidence of catheter induced urethral stricture with its attendant dense complete and long stricture.

Conflict of Interest

The authors declare no conflict of interests.

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