ORIGINAL ARTICLE

Experience at a stricture clinic in a developing country

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Abstract

Objective: To evaluate the experience of 37 years regarding etiology, complications and evolving practice of the management of stricture urethra patients at the Sindh Institute of Urology and Transplantation, Karachi.

Methods: The retrospective descriptive study included 1600 cases of stricture urethra admitted to the Urology Section of the institute from 1972 to 2009. Files of all patients were reviewed; age, gender, site of stricture, etiology, diagnostic methods, clinical symptoms and management, as well trends and patterns were noted.

Results: There were 1600 patients of whom 1595 (99.4%) were males and 5 (0.4%) were females with age ranging from 14-80 years. Pelvic fracture urethral disfraction defects (n=655; 49.5%) and fall astride (n=123; 9.2%) were the commonest causes. Of the total, 92 percent presented with retention of urine. In the first decade, rail-road and dilatation was the mainstay of treatment. In the second decade, rail-road, dilatation and direct visual internal urethrectomy were the mainstay, but in the last 5 years, urethroplasty replaced the old methods.

Conclusion: Trauma is the main cause of stricture. Over the years, urethroplasty and direct visual internal urethrotomy are the mainstay of management. Stricture clinic plays an important role in the early diagnosis of complications of stricture urethra and in the rehabilitation of these patients.

Keywords: Stricture clinic, PFUDD, Fall astride. (JPMA 63: 234; 2013)

Introduction

Uretheral stricture disease is one of the oldest diseases known to medicine. Its first description is found in Sushruta Samhita, India, in the 6th century. In ancient Egypt, strictures were dilated using reeds. Internal urethrotomy has been practised for more than 150 years since the description by Maisonneve in 1855. Although urology is transforming itself to endourology from open surgery, but recent publications suggested that urethral stricture should be regarded as an open surgical disease.[1] The etiology of stricture was largely gonococal urethritis in the past which has now passed to modern age motor vehicle accidents and iatrogenic trauma.

Stricture clinic, the oldest clinic at the Sindh Institute of Urology and Transplantation (SIUT), was started in 1972 because at that time stricture disease was the most neglected disease in the country. Every stricture was thought to be caused by sexually transmitted infections, and patients were reluctant to discuss their problem at big, general urology clinics with their physicians. Moreover, the attitude of physicians towards these patients was disgusting. So just to give such patients privacy and confidence, a separate stricture clinic was started at the Urology ward, Civil Hospital, Karachi in 1972 by Prof. Rizvi. In the beginning the basis of diagnosis was clinical, rarely radiological and occasionally cystoscopy. Etiology was mainly infective in origin followed by trauma. The mainstay of managing these cases was urethral dilatation under local anaesthesia with metallic bougies.[2] This was once-a-week clinic where 10-15 patients came for regular dilatation as daycare cases. The clinic was mainly managed by registrars. This was a unique experience, and the first lesson in urology to learn was how to do a painless and gentle dilatation.

Patients used to go away if the doctor of their choice was not present at the clinic for dilatation on that particular day, and the patients guided their surgeons for the right passage of bougie to bypass the stricture. Dilatation with metallic bougie was associated with complications like bleeding, shivering, pain, trauma to urethra and occasionally sepsis.[3] There was almost 100% recurrence rate of stricture after dilatation, so repeated procedures were required; for example every week for 1 month, then twice a month and then every month for 1 year. Many patients of pelvic fracture urethral distraction defects (PFUDD) were managed initially by railroad catheterisation followed by intermittent dilatation at the stricture clinic.

Direct vision internal urethrotomy (DVIU) was introduced in 1990 at the institute as an alternative to dilatation for short strictures in bulbar and bulbomembranous part of urethra. Internal urethrotomy was followed by intermittent urethral dilatation at the stricture clinic in many cases, but,

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again, as the literature review shows, complications associated with this procedure were bleeding, extravasation, sepsis and recurrence.[4] To oppose the forces of wound contraction and to prevent the recurrence, DVIU was combined with urethral dilatation, but, as mentioned, dilatation was not an acceptable option for many young patients, so there was search for a better option. Urethroplasty was started in 1998 which has replaced the option of perineal urethrostomy and dilatation in many cases in our recent practice. More so, laser urethrotomy was introduced at the Institute in 2006 and up to now about 78 cases have been reported.[5] All these patients are regularly followed up in dedicated stricture clinic for symptoms, investigations and complications of urethral stricture disease. As very little data is available from Pakistan on epidemiology and management of stricture, this study will add new information on various aspects of the disease. The current study was planned to gather useful information about epidemiology, etiology and management of stricture urethra and to highlight the importance of stricture clinic in the rehabilitation of these patients.

Patients and Methods

The retrospective descriptive study comprised data spanning 37 years on stricture urethra at the Sindh Institute of Urology and Transplantation (SIUT) in Karachi, Pakistan. Only those cases were included whose files were available in the record room with necessary information. The old files were manually reviewed. This cohort of the patients included all the anterior and posterior urethral strictures due to any cause. The age, gender, etiology, complications, diagnostic methods, management and followup of the stricture urethra patients were noted. Complications of stricture urethra were defined as renal failure, urinary tract infection (UTI), orchitis, water care perineum, fournier's gangrene, periurethral abscess and bladder failure. Diagnostic methods included clinical, urethrogram and urethro-cystoscopy. Management variables included dilatation, DVIU, laser urethrotomy, excision and primary anastomosis (EPA) urethroplasty, and perineal urethrostomy. Children under the age of 14 years were excluded as there is a separate dedicated Paediatric Urology Unit at the Institute.

Diagnosis methods used ranged from clinical and bougineage during 1972-1980. Later on, X-ray, retrograde urethrogram (RUG) and rigid cystoscopy was introduced between 1981-92, while in the beginning of 2000, dynamic RUG and voiding cystourethrogram (VCUG) combined with flexible cystoscopy was started in the evaluation workup. Recently, ultrasound urethra magnetic resonance imaging (MRI), uroflowmetry are also part of evaluation strategy.

Stricture urethra was defined as a scarring, narrowing or complete avulsion injury of the anterior and posterior urethra. All patients with PFUDD leading to stricture formation were also included in the study.

For the repair of penile urethral stricture, genital skin or buccal mucosal graft (BMG) was used. Also, for longer bulbar strictures (> 5cm) ventral onlay BMG urethroplasty was done. BMG was harvested from the lower lip or inner cheek.

All these patients were called for followup at the stricture clinic, where regular urethral dilatation is done, pre- and post-procedure uroflometery and urine culture is performed, and patients are interviewed for quality of life, erectile dysfunction, infertility and results after the intervention. The database included all these factors.

Results were tabulated in the form of tables. Frequencies with percentages were calculated by using the calculator. Trends in the etiology and management were also noted over the decades.

Results

This study comprised of 1600 patients with urethral stricture disease. Of them, 1595 (99.6%) were males and 5 (0.4%) females.

The age of the patients ranged from 14 to 80 years, with peak age of 41-50 years, involving 378 (22.1%) patients with a mean age of 45.5±19.8 years (Table-1). The majority of the patients (n=1168; 73%) belonged to urban areas.

Etiology of the stricture urethra was found in 1323

Table-1: Data on Stricture Urethra (n=1600).

Patients Demography		
Year	**No**	**%**
1972 - 1982	117	7.3
1983 - 1993	151	9.4
1994 - 2004	682	42.6
2005 - 2009	650	40.6
Male	1595	99.6
Female	5	0.4
Age in years	**No**	**%**
< 20 years	217	13.5
21 - 30	269	168
31 - 40	244	15.2
41 - 50	378	23.6
51 - 60	270	16.8
> 60	222	13.8

Mean SD (45.5±19.8).

(82.68%) patients. Out of these, 655 (49.5%) were due to PFUDD, 123 (9.2%) due to fall astride injury, fall from wall or ceilings, and other causes (Table-2).

The clinical presentation of the patients was majority (n=1472; 92%) with retention of urine at the first presentation with or without suprapubic catheter, but 125 (7.8%) presented with lower urinary tract symptoms (LUTS) and thin stream or double stream. However, 36 (2.1%) presented with complications of stricture urethra like Fournier's gangrene in 3 (0.18%), epididymoorchitis in 10 (0.6%), testicular abscess or periurethral abscess in 4 (0.25%) and renal failure in 11 (0.6%) cases.

The management trends at the stricture clinic were noted and divided into decades. During 1972-82 period, a total of 117 (7.3%) stricture patients were admitted in the Urology Ward; 91 (77.7%) were treated by intermittent urethral dilatation, 12 (10.2%) were managed by initial railroad catheterisation followed by intermittent dilatation, and 14 (11.9%) patients were treated by perineal urethrostomy. During the period of 1983-93, a total of 151 (9.4%) stricture urethra patients were admitted; 96 (63.5%) were treated by intermittent dilatation, 25 (16.5%) with DVIU, 11 (7.2%) patients with railroad, catheterisation followed by intermittent dilatation; 7 (4.6%) with EPA urethroplasty and 12 (7.9%) with perineal urethrostomy. During 1994-2004, there was a sharp rise in the number of stricture patients to 682 (42.6%). Although the majority of the patients (n=247; 36.2%) were treated by DVIU and (n=210; 30.7%) intermittent dilatation, but there was overall rise in urethral reconstructive surgery like EPA was done in 151 (22.1%) cases and BMG urethroplasty in anterior urethral stricture repair in 9 (1.3%) cases. In the last 5 years of the study period (2005-2009), laser urethrotomy was added and 96 cases were treated with holmium laser and, similarly, there was a rise in EPA and BMG urethroplasty cases (Table-3).

Table-2: Etiology of stricture urethra (n=1323).

	No	%
PFUDD	655	49.5
Fall astride / fall from ceiling / wall	123	9.2
Infection	95	5.9
Post Catheterization & instrumentation	111	6.9
Post open prostectomy / TURP	64	4.8
BXO	13	0.9
Post Hypospadias failure	16	11.0
Unknown	237	14.8
Earthquake injury	05	0.3
Fire arm injury	04	0.25
Total	1323	

PFUDD: Pelvic fracture urethral distraction defect. TURP: Transurethral resection of prostate. BXO: Balantis xerotica obliterans.

Discussion

With 1600 stricture urethra patients, this study, to our knowledge, presents the largest number of patients ever reported from Pakistan. The actual number of patients was even more, and with the introduction of newer modalities of treatment, the number of patients treated has increased tremendously in recent years. There were 99.6% males and 0.4% females in this series, which shows the rarity of stricture in females because of anatomic protection of the female urethra from trauma and severity of accident cases in females.

The exact frequency of stricture urethra among urologic patients is unknown, but in our recent practice (2009) it was estimated to be 4% of all urologic indoor patients. Similarly, the exact incidence and prevalence of disease in the community is unknown in Pakistan, but reported incidence from the West is approximately 8-10 cases/million.[6]

Although all age groups can be involved in this disease, but because of start of separate Paediatric urology unit at the Institute, we only covered patients more than 14 years of age (range 14-80 years). Peak age group 41-50 years shows the shift towards the older age group, although trauma is more common in the younger age group.[7]

The increasing frequency of the disease in older

Table-3: Management of stricture urethra over the decades (n=1600).

Year	Rail-Road catheterisation	Dilatation	DVIU	Laser urethrotomy	Urethroplasty (Excision & Primary anastomosis)	Perineal urethrostomy	Penile Skin Patch + B.M.G.
1972 - 1982 n=117	12	91	-	-	-	14	-
1983 - 1993 n=151	11	96	25	-	7	12	-
1994 - 2004 n=682	14	210	247	-	151	51	2+7=9
2005 - 2009	2	131	356	96	123	10	3+17=20
Total = 1600	39 (2.4%)	523 (32.6%)	641 (40%)	96 (6%)	281 (17.5%)	87 (5.4%)	29 (1.8%)

population more than 60 years shows more cases of trauma due to prostate surgery (transurethral resection of the prostate, or open surgery) as a cause of stricture urethra.[8]

Etiology results were available in 1323 cases only which showed that road traffic accident (RTA) leading to PFUDD was the commonest cause seen in 655 (49.8%) patients. This shows the increasing incidence of trauma in this country which is in contradiction with reports from Western literature which shows iatrogenic/instrumental trauma as the commonest cause seen in 32-79% of cases.[9,10] Fall astride, fall from wall or occupational trauma was the second most common cause constituting 123 (9.2%) patients, which shows trauma as commonest cause of stricture in this series. Though reported incidence of posterior urethral injuries after pelvic fracture is only 10%,[7] this again shows that a high number of people sustain pelvic fracture in this country. A recent study from Belgium[9] showed pelvic fracture urethral distraction defects in 11.2% of cases, which is much lower than our study. However, another study from India showed the prevalence of traumatic stricture to be quite high which is similar to our study.[11]

Infection (urethritis) as a possible cause was seen in 95 (5.9%) cases. Historically, gonococal urethritis used to be a common cause in the past,[9] but with the advent of newer antibiotics, the incidence of gonococcus has decreased as a cause of stricture urethra. The role of non-gonococcal urethritis and trachomonas is not proven. Another study reported urethritis as a cause of stricture in more than 50% cases.[10] Preventive campaigns and widespread use of condoms can protect not only against human immunodeficiency virus (HIV) but gonococcal urethritis as well. Large number of unknown cases (n=237; 14.8%) showed the pitfalls of retrospective analysis and also posed a problem in defining the exact etiology of stricture and analysis of success according to etiology.[12]

Initial management of acute trauma at the Institute is by suprapubic cystostomy and is followed by delayed repair. After suprapubic cystostomy, antigrade and retrograde urethrogram is done under local or general anaesthesia which is also accompanied by rigid or flexible urethro cystoscopy from above and below to see the site, length of stricture and associated abnormalities of bladder, but many cases in this series were referred from all over the country with previous history of railroad catheterisation, DVIU, dilatation and failed urethroplasty.

The management of stricture urethra has changed over the last 3 decades in all urological centres of the world. The same pattern was applicable to this centre as well. In the first decade (1972-1982) the mainstay of management was intermittent urethral dilatation with metallic bougie, while in fractured pelvis urethral distraction defects, railroad catheterisation was the initial management followed by dilatation, or perineal urethrostomy which also followed dilatation. This method of treatment was painful and the end result was false passages, episodes of bleeding and occasionally sepsis after repeated dilatation. Overall, patient satisfaction was not good.[3] The method of dilatation has also changed with time at the Institute; old blind method of dilatation with metallic bougie is largely being replaced by endoscopic placement of guide wire and dilatation with co-axial. Amplatz dilators[13] or by nelaton catheters are used to avoid trauma. The search for better treatment continued and if we see the management trends in the 2nd decade (1983-1993), there was a trend towards DVIU and at the same time there was the beginning of EPA urethroplasty. However, urethral dilatation, perineal urethrostomy and railroad catheterisation for traumatic posterior urethral stricture continued. This dissatisfaction with dilatation and DVIU was mainly because of complications and high recurrence rate.[3,14]

In the 3rd decade (1995-2004), there was an exponential rise in the number of stricture urethra patients coming to the clinic. During this period, DVIU was the commonest operation done for stricture urethra and also 151 patients underwent EPA urethroplasty, and also BMG was introduced during this period which replaced the option of perineal urethrostomy for anterior urethral stricture. BMG harvested from lower lip[15] gave better results than penile and scrotal skin flaps and grafts similar to our study[16] that is the reason behind the increase in the number of BMG urethroplasty in the later part of our experience (2005-2009). In the last 5 years i.e. (2005-2009), laser urethrotomy was introduced as a minimally invasive alternative to the DVIU, the results are reported elsewhere. Initial better results with laser urethrotomy could not be maintained in long-term (36 months) followup and 40% of the patients in the laser group had recurrence of stricture.[5]

DVIU again was the commonest operation done in 356 patients during this period; 11 out of these DVIU patients were done by antegrade and retrograde route for pelvic fracture urethral distraction defects, but, unfortunately, all of these had recurrence of stricture and were subjected to urethroplasty. Moreover, DVIU and laser had higher number of septic complications post-operatively than open urethroplasty.[5,8] By centralising referral of stricture urethra patients, the management over the years has improved, and close followup at clinic has allowed the

identification of complications like impotence, infertility, recurrence at an early stage. Rehabilitation of the patient regarding impotence was started easily with sildenafil or intracavernosal injection therapy with Trimax. Also in post-operative period, if the patient comes with complaint of infertility, semem analysis and testicular biopsy with vasography was offered to the patients and appropriate treatment was given. In some patients, colour Doppler index for internal pudendal arteries followed by angiography was done as a part of investigations related to impotence. This unique opportunity can only be provided to patients if there is a special dedicated clinic where there is a high volume of stricture urethral disease like the SIUT. Similar views have been shared in a recent editorial review.[17] The long-term problems of stricture urethra, specially with PFUDD can only be solved by establishing special stricture clinics in centres where there is a high volume of disease. The curative newer solutions of this older human disease can only be found if we develop a sub-specialty in Urology and through in-depth study of the subject.[18]

Since it was a simple retrospective descriptive study, etiology could be found in 1323 patients out of the total of 1600. Etiology and other information could not be found because of incomplete files.

Conclusion

The number of stricture urethra patients is quite high at the SIUT. Road traffic accident and fall astride is the commonest cause. Diagnostic methods have improved to stage the disease, and management has changed in favour of ureothroplasty with improved results. Stricture clinic plays an important role in early rehabilitation of these patients.

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