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Urethral Stricture; Etiology, Presentation, Complications, and Outcome of Management at Gezira State, Central Sudan

Mustafa Omran Mansour[1,2], Yassir Abdalla Bakheet Aboagla[1], Sami Mahjoub Taha[1,2] and Khalid Eltahir Khalid[3]

1- Department of Urology, Gezira Hospital for Renal Disease and Surgery, Medani, Sudan.
2- Department of Surgery, Faculty of Medicine, University of Gezira, Medani, Sudan
3- Department of Biochemistry and Nutrition, Faculty of Medicine, University of Gezira, Medani, Sudan.
Corresponding author: Mustafa Omran Mansour, MBBS, MD Urology. Associate Professor of Urology. Department of Surgery, Faculty of Medicine, University of Gezira, P.O: 20, Medani-Sudan. E-mail:omranmansour@hotmail.com**.**

Abstract:

Objectives: The objective is to evaluate urethral strictures in term of etiological factors, presentations and management at GHRDS, Gezira State, Central Sudan.

Patients and Methods: One hundred sixty patients, who were diagnosed as urethral stricture, were enrolled in this study. All patients were dealt with through a scientific stratum of a thorough work up and managed according to the EAU guidelines. The bio-data, etiological factors of strictures, presenting symptoms and signs, the pathological types and modalities of treatment were recorded and analyzed.

Results: The total number of patients was 160**,** only two females and the rest were males. The mean age was 46.2 ±2 years. The etiological factors were: post-surgical in 67 patients (41.9%), gonococcal urethritis in 48 patients (30%) followed by post traumatic stricture in 28 patients (17.5%). Concerning the sites 41 (25.6%) patients had bulbar urethral stricture and 24 (15%) with membranous urethra strictures. One hundred forty two (88.8%) patients were treated with visual internal urethrotomy (VIU) and the outcome of treatment was comparable to the literature

Conclusion: The commonest etiological factors for urethral strictures in GHRDS were post-surgery followed by gonococcal urethritis. The outcome of management was comparable.

Key words: Urethral stricture, GHRDS

Introduction:

Urethral stricture disease is one of the common conditions encountered in the day-to-day urological practice. It can present at any age and has a wide range of etiological factors. It usually manifests itself as lower urinary tract symptoms or urinary tract infections with significant impairment in the quality of life. (1)

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A urethral stricture is a narrowing of the urethra [2], generally caused by either injury-related trauma to the tract or by a viral or bacterial infection of the tract, often caused by certain sexually transmitted infections (STIs). [3]

Urethral stricture disease imposes a great burden on both health and quality of life in men. Previous studies of male urethral stricture disease have shown that nearly 90% of men present with complications [4]. The majority of men with a stricture suffer from obstructive and irritative voiding symptoms, and many experience hematuria, recurrent urinary tract infections, and the need for repeated procedures such as dilation or urethrotomy [5-7]. More severe complications, including acute urinary retention, urethral carcinoma, renal failure, Fournier's gangrene, and bladder atonia have been reported in a small minority of men with stricture disease [4].

Urethral dilation is both historically and currently a common method used to treat patients with urethral strictures; visual internal urethrotomy (VIU) and urethroplasty are known methods of treatments [8, 9]. Urethral strictures were known to have a great share as a causative factor of obstructive uropathy in Sudanese patients with a percentage of 12.3. [10]

The aims of this work are to evaluate urethral stricture in term of etiology, presentation and management at GHRDS, Gezira State, Central Sudan.

Patients and Methods:

This was a prospective cross–sectional, hospital based study conducted at Gezira Hospital for Renal Disease and Surgery (GHRDS) in the period from February 2005 to February 2008. One hundred sixty patients who were diagnosed, treated and followed up in GHRDS were included in this study. The excluded were patients who underwent any surgical intervention elsewhere, and those who did not show for follow up. All patients were subjected to a clinical work up including history, examinations and investigations that include urethrogram, the etiological factors of stricture, presenting symptoms and signs, the site of strictures and modalities of treatment were recorded and analyzed.

The treatment modalities were tailored in accordance with the EAU guidelines (2013) on surgical management for urethral strictures. Visual internal urethrotomy was done for short uncomplicated strictures (=1cm) and urethroplasty (resection and anastomotic, on lay, buccal mucosal graft and two stages urethroplasty were conducted for different lengths and or complicated strictures (> 1cm), although serial dilatation (after one month then every month for 6months) was done for certain cases with gonococcal urethritis but the outcome of these procedure was questioned. All surgical procedures were done as stated in the EAU guidelines (2013). Catheters were retained for 7-9days following VIUs and up to a 15 days in urethroplasty. Patients were followed regularly (after one week- after 1 moth- every 3month for the first year- every 6month for the second year) and assessed by clinical (voiding symptoms) and radiological evidences for success and\ or recurrence (normal urethrogram)

Recurrence of symptoms, failure to self-calibrate and the need for secondary procedures (dilatation or urethroplasty) were considered treatment failures.

Data was analyzed using computer statistical professional software package program (SPSS 17).

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Results:

One hundred Sixty patients with urethral stricture were followed during these 3 years. One hundred fifty eight (98.8 %) patients were males and 2 (1.2 %) were females. Their ages ranged from 10 to 84 (46.2 ± 2) years. Forty-three (26.9%) patients were over 70 years.

The aetiology of urethral stricture was post-surgical in 67 patients (42%) included open prostatectomy in 26.9%, transurethral resections of the prostate in 8.8%, urethral stone retrieval 2.5%and perineal abscess drainage in 1.3%. Gonococcal urethritis accounted for 30% followed by post traumatic stricture in 28 (17.5%); this included pelvis fractures (10.6%) and perineal trauma in (6.9%) patients. Post urethral catheterization in 6.3%. The etiological factor was not reported in 7 patients on the other hand, 17 (10.5%) of the patients with post traumatic stricture were suffering from complications of fracture pelvis and 11 (6.9%) from perineal trauma including the females in repairing of urethra vaginal trauma (Table 1).

Concerning the presenting symptoms, seventy three (45.6%) patients presented with acute urinary retention followed by weak stream in 69 (43.1%) of the study subjects. Other modes of presentation were chronic urine retention (CUR), interrupted stream, incontinence, uremic symptoms, incomplete evacuation, straining, haematuria, and burning micturition (Table2).

Local signs were identified, but not significant. Yet 26 patients (16.3%) had induration while the rest had meatal stenosis in 4 patients, perineal fistula in 3 patients, vetiligo in 3 patients and extravasation in one patient.

Most of the strictures were bulbar in 41 patients (25.6%), 24 patients (15%) had membranous urethra, 14.4% (n=23) had prostatic and 7.5% (n= 12) had penile strictures. Sixty (37.5%) patients presented with multiple strictures (Table 3).

One hundred forty two (88.8%) patients were treated with visual internal urethrotomy (VIU), 10 patients (6.3%) with urethroplasty, and 8 patients (5%) with serial dilatations. Complications of surgery occurred in 23.7% (n=38) of all surgical procedures. Complications included extravasation in 13 (8.1%) patients followed by false passage in 10 (6.3%) patients and bleeding in 3.1%. Complications of urethroplasty operations occurred in 7 patients which included wound infection in 4 patients, urethra -cutaneous fistula in 2 patients and death due to septic shock in one case (Table 4).

The recurrence of symptoms occurred in 10 patients after the first month, the number increased to 22 patients after 6 months, and the recurrence of the stricture was reported in 33 patients after 24 months.

Discussion:

Urethral stricture is a narrowing of the urethra due to scar tissue, which leads to obstructive voiding dysfunction with potentially serious consequences for the entire urinary tract. Its prevalence among men in industrial countries is estimated at 0.9 %. [(11)]

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Our study demonstrated that the commonest cause of urethral stricture was post surgical 41.9% (n=67), of them prostate surgery was the commonest which was done in 35.6% (n= 57), a considerable number of these operations were done by general surgeons. It was proved by several studies that recurrence of urethral stricture is very high (40.0%-50.0%) irrespective to cause, site and severity of stricture whatever procedure is conducted to manage the stricture. [6-8]

Table 1: The etiological factors Urethral stricture in GHRDS (2005-2008)

Presenting cause	Type	No	%
Post surgical	TVP	43	26.9
	TUR	14	8.8
	UB (vesicolithotomy)	4	2.5
	Urethra stone retrieval	4	2.5
	Perineum abscess drainage	2	1.3
Total		**67**	**42.0**
Gonococcal urethritis		48	30
Trauma	Pelvic fracture	17	10.6
	Perineal trauma	11	6.9
Total		**28**	17.5
Post catheterization		10	6.3
Unknown etiology		7	4.2
Total		**160**	**100**

TVP = transvesical prostatectomy
TUR = Trans urethral resection of the prostate
UB = urinary bladder

Table 2: The presenting symptoms in patients with urethral stricture

Symptoms	No	% of total
AUR	73	45.6
Weak stream	69	43.1
CUR	4	2.5
Interrupted stream	3	1.9
Incontinence	3	1.9
Uraemic symptoms	3	1.9
Incomplete evacuation	2	1.3
Straining	2	1.3
Haematuria	2	1.3

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Burning micturition	2	1.3

AUR = acute urine retention
CUR = chronic urine retention

Table 3: Urethral stricture locations in GHRDS (2005-2008)

Stricture Site	No	%
Multiple	60	37.5
Bulbar	41	25.6
Membranous	24	15
Prostatic	23	14.4
Penile	12	7.5
Total	**160**	**100**

Table 4: Types of surgical management and their complications in patients with urethral stricture in GHRDS (2005-2008)

Complications of surgery	Surgical management			Total
	VIU	Dilatation	Urethroplasty	
None	112 (70.0%)	7 (4.4%)	3 (1.9%)	**122 (76.3%)**
Bleeding	4 (2.5%)	1 (0.6%)	0 (0.0%)	**5 (3.1%)**
Extravasation	13 (8.1%)	0 (0.0%)	0 (0.0%)	**13 (8.1%)**
Infections	0 (0.0%)	0 (0.0%)	4 (2.5%)	**4 (2.5%)**
False passage	10 (6.3%)	0 (0.0%)	0 (0.0%)	**10 (6.3%)**
Fistula	0 (0.0%)	0 (0.0%)	2 (1.3%)	**2 (1.3%)**
Failure of VIU	2 (1.3%)	0 (0.0%)	0 (0.0%)	**2 (1.3%)**
Death	1 (0.6%)	0 (0.0%)	1 (0.6%)	**2 (1.3%)**
Total	**142 (88.8%)**	**8 (5.0%)**	**10 (6.3%0**	**160 (100.0%)**

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Gonorrhea was found to be a cause in 48 cases (30%) comparable to the low rates in other series in the developed world (9-13). About 17.5% of the cases had strictures of traumatic etiology. Traumatic strictures in our study 10.6% were caused by fractured pelvis from road traffic accidents. The largest group (45%) was iatrogenic and resulted from urethral manipulations (traumatic indwelling catheter, transurethral interventions, correction of hypospadias, prostatectomy and brachytherapy). [18-19]

The main symptoms of urethral stricture are those of obstructed and irritated micturition, with increased urination time and a feeling of incomplete bladder emptying, combined with increased micturition frequency and urgency. **(15)**

Most of our patients in this study presented with acute urinary retention; 45.6% followed by weak stream in 69 (43.1%) of the studied subjects. In the past, patients frequently presented for the first time with the complications of urethral strictures [(1)]. This pattern of presentation also appears to be changing as 76.9% of the patients in this series had no identifiable clinical signs resulting from complication of urethra stricture.

The most frequently encountered clinical sign was mostly acute urinary retention with or without overflow incontinence.

Investigating patients with stricture should include urethrography as yet we did cysto urethroscopy for certain cases .Urethroscopy can show where the stricture is located, but if the stricture cannot be passed by the cystoscopies, no information can be obtained about the length of the lesion or about any additional, more proximal strictures that may be present. For this reason, urethroscopy does not have a major role in the diagnostic work-up of urethral stricture. [(11)]

Our analysis revealed that most of the strictures were solitary 62.5% (n=100), and the site was bulbar in 41 patients (25.6%), 24patients (15%) were having membranous urethra strictures, 14.4% (n=23) prostatic and 7.5% (n= 12) were penile strictures. Sixty (37.5%) patients presented with multiple stricture sites. This was found to be comparable to data reported by Ahmed and Kalayi, **(17)** where they found bulbar urethral stricture in 38%, prostatic in 15.1%, membranous in 17%, and penile strictures in 7.2% of patients with urinary stricture.

When the patient first presents, the primary question is whether urinary retention or upper tract obstruction is present, which would necessitate urinary diversion and treatment of any accompanying urinary tract infection. [(11)]

Several methods of treatment were used including bougienage which can only ever have a temporary effect on the obstruction, and as a rule the stricture may be expected to recur after 4 to 6 weeks [(16)]. This procedure should therefore be employed only in patients who refuse surgical treatment or who are unsuited for surgery for other (e.g., anesthesiological) reasons.

In this study the commonest operation done for urethral stricture was the VIU in 82.5% (n=123), which had been chosen for the patients preoperatively depending on the site and length of the stricture and it was

successful with no acute complication in 104 (78.8%) patient. The complications registered after this procedure occurred in 30 patients, extravasation of irrigation fluids in 13 cases whom were observed after the operation closely, bleeding occurred in 4 cases, two of them were managed conservatively by catheter tamponade, the other 2 patients needed cautery by endoscopy and no one needed blood transfusion. False passages occurred in 10 cases and the operation discovered and delayed intervention was done. The procedure failed in 2 cases that were booked for urethroplasty. The comparisons between these varieties of mode of treatment were addressed by several authors. [18-22]

Urethroplasty was done in 6.2% (n=10), all of them were open urethroplasty using pedicled genital skin flaps , buccal mucosa in one case and \or excision and anastomosis. These procedures were preserved for long strictures and \or after failure of VIU. The complications registered after this procedure occurred in 7 patients. Wound infection occurred in 4 is the most prevalent one. The first death was a case of ESRD due to post TURP stricture, VIU was done twice then the patient underwent renal transplantation but the stricture recurred shortly after that during taking chemo suppressive drugs. One stage repair urethroplasty was done, on the third post-operative day the patient developed anuria and wound infection then he died because of a cardiac problem.

Urethral dilatation was done in 8 cases by using urethral sounds, and no stents used or post VIU self intermittent catheterization. Our study concluded that VIU is the common management of urethral stricture and the outcome of surgical management in the theme of complications is quite acceptable as a mainstay of management procedure.

This study reflected the situation in Sudan, where GHRDS was establishing to serve Central Sudan, and Sudan as whole. It added good data regarding the etiology, presentation and management of urethral stricture. Further studies are highly recommended.

Conclusion:

The commonest etiological factors for urethral strictures in GHRDS were post-surgery followed by gonococcal urethritis. The outcome of management was comparable.

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