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Etiology and outcome of primary anastomotic urethroplasty for bulbous urethral stricture

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Abstract

Urethral stricture is among the common urological conditions which can have significant impact on one's quality of life. If managed properly it is completely curable. Selections of the method with respect to the type of the stricture have much effect on the outcome. The aim of the study was to determine the outcome in patients who had bulbous urethral stricture and underwent anastomotic urethroplasty. This was a hospital based descriptive retrospective cohort study, patients who had bulbous urethral stricture and underwent anastomotic urethroplasty from year 2016 to 2019. Data were analyzed using statistical package for social science (SPSS) version 16.0 and summarized in tables and figures. One hundred and fifteen patients were included in the study; the mean age was 46.96 (SD ±19.17 years), the commonest site for stricture was proximal bulbous with 56 (48.7%), majority of patients 67(58.3%) presented with stricture ≤2cm. Forty five patients (39.1%) had history of perineal trauma. The overall success rate for anastomotic urethroplasty to bulbous urethral stricture found to be 82.6%.

These results suggest that Anastomotic urethroplasty remain the best options in bulbar urethral strictures <2 cm.

Keywords: Urethroplasty; Bulbous urethra; Urethral stricture; Excision and Primary Anastomosis (EPA)

1. Introduction

The male urethra is a narrow fibromuscular tube that conducts urine and semen to the exterior of the body. The term urethral stricture refers to anterior urethral disease, or a scarring process involving the spongy erectile tissue of the corpus spongiosum[1]. Before the 21st century the majority of anterior urethral strictures resulted from gonococci infections [2]. The pattern of etiologies in Tanzania shows urethral trauma is the leading causes of stricture[3].

Patients with a urethral stricture mostly complain about obstructive voiding symptoms[4]. The most apparent symptom is weakening of the urinary stream. Urethrogram has been the gold standard for urethral stricture diagnosis.[5]

Anastomotic urethroplasty is the most reliable management and it is deal for bulbar strictures < 2cm(6). It has four elements or steps: excision, mobilisation, spatulation and anastomosis.

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From our theatre registry about 130 to 150 patients with urethral stricture are being operated every year, average of 40 are undergoing anastomotic urethroplasty, both the outcome and patient factors that influence the outcome has not been documented recently.

This study aimed on retrospectively reviewing the outcome of anastomotic urethroplasty done to bulbous urethral stricture in the four years period 2016-2019 at KCMC.

Having recent data has enabled us on creation of evidence based protocol on the management of this predominant subtype of urethral stricture.

2. Material and methods

A retrospective hospital based cohort study was conducted between January 2016 to December 2019 at KCMC, which is a zonal, referral and teaching hospital of KCMUCo in Northern zone of Tanzania. All patients who were diagnosed to have bladder outlet obstruction secondary to bulbous urethral stricture and also underwent anastomotic urethroplasty at KCMC were involved in the study. Patients who did not show up monthly for 3 months follow-up post-surgery were excluded as per protocol at Urology department KCMC. Structured data extraction sheet, note books and theatre registry books were used where data necessary for this study were extracted from their respective files and these included age, sex, area of residence, occupation, clinical presentation, investigations done, clinical stage, surgical option, surgical complication, histopathological pattern and survival length. These data were analyzed by SPSS and summarized using frequency tables, cross tabulation, charts and histograms.

3. Results

Table 1 Characteristics of men who underwent EPA following Bulbous Urethral Stricture (N=115)

Variable	n	%
Age (in years)		
0-39	46	40
40-60	40	34.8
>60	32	25.2
Site of Stricture		
Distal bulbous	30	26.1
Mid bulbous	29	25.2
Proximal bulbous	56	48.7
Length of Stricture		
≤2cm	67	58.3
>2cm	48	41.7
Voiding without catheter (LUTS) (n=29)		
≤6 months	18	62.1
>6 months	11	37.9
Voiding with suprapubic catheter (n=86)		
≤6 months	61	70.9
>6 months	25	29.1

A total of 140 files with the diagnosis of Bulbous Urethral Stricture were reviewed. Among these 115 met the inclusion criteria giving the response rate of 82.1%. Age ranged from 5 years to 86 years with the mean age of 46.96 (SD ±19.17

years). Fifty six patients (48.7%) were having stricture at proximal bulbous. Other characteristics of participants are displayed in Table 1.

3.1. Causes/etiologies of Bulbous Urethral Stricture

Among 115 patients who underwent excision and primary anastomosis (EPA); Majority 45 (39.1%) had history of Perennial Trauma, 29 (25.2%) had history of Sexual Transmitted Infections (STIs), 19(16.5%) had a history of traumatic Catheterization, 11.3% had history of endoscopic procedure and 9 (7.8%) were due to unknown cause, refer to figure 1

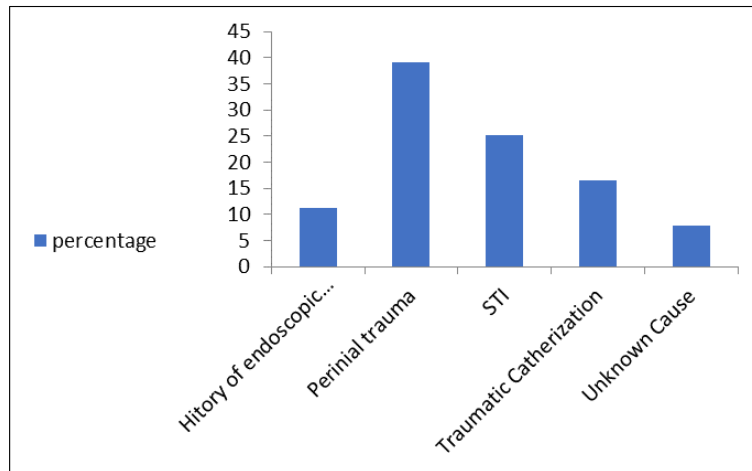


Figure 1 Etiologies of Bulbous Urethral Stricture

3.2. Outcome

Among 115 cases, that underwent EPA at KCMC in years 2016-2019, 93 (80.9%) had successful results during 3 months of follow-up other details are shown on figure 2.

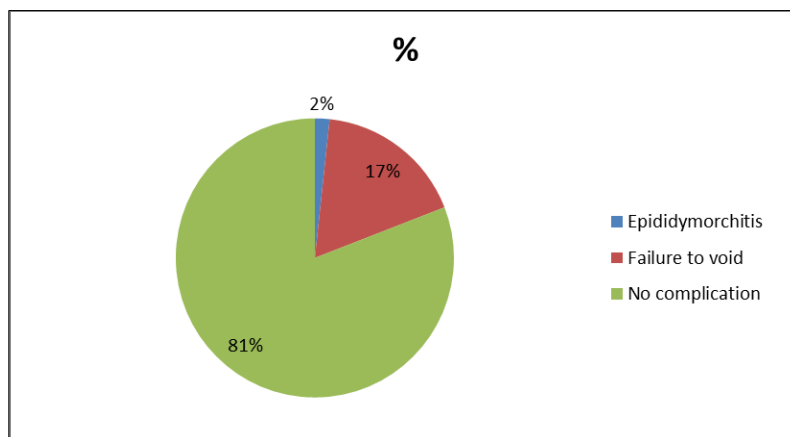


Figure 2 Outcomes of patients with Bulbous Urethral Stricture repaired by EPA at KCMC in 2016-2019, during 3 months of follow-up (N=115)

3.3. Possible factors associated with failure.

Among 115 patients who underwent EPA, 20 (17%) experienced lower urinary tract symptoms after 3 months of follow-up and thus need re-treatment. It was found that the longer the length of a stricture, the higher the odds of ending in failure, patients whose stricture were more than 2 cm had 3.04 times more odds of ending in failure as compared to those whose stricture were shorter (significant at P-value 0.02), whereas strictures located at proximal bulbous were 51% more likely to end in failure compared to those at the distal bulbous (however, these were not statistically significant) and age of the patient was found not to influence outcome of anastomotic urethroplasty. Other factors are shown on the table 2.

Table 2 Factors associated with failure of Anastomotic Urethroplasty at KCMC, (N=115)

Variable	Total (N=115)	Failed EPA, n (%)	OR	95% CI	P-Value
Age (in years)					
0-39	46	8(17.4)	1.00		
40-60	40	7(17.5)	1.01	0.330 - 3.077	0.99
>60	32	7(24.1)	1.51	0.482 - 4.736	0.48
Site of Stricture					
distal bulbous	30	5(16.7)	1.00		
mid bulbous	29	4(13.8)	0.80	0.192 - 3.333	0.76
proximal bulbous	56	13(23.2)	1.51	0.482 - 4.741	0.48
Length of Stricture					
≤2	67	8(11.9)	1.00		
>2	48	14(29.2)	3.04	1.156 - 7.977	0.02
Voiding without catheter (LUTS) (n=29)					
>6 months	11	1(9.1)	1.00		
≤6 months	18	3(16.7)	2.00	0.181 - 22.056	0.57
Voiding with suprapubic catheter (n=86)					
≤6 months	61	9(14.8)	1.00		
>6 months	25	9(36.0)	3.25	1.103 - 9.576	0.03

4. Discussion

Male urethral stricture is one of the oldest urological pathologies known. There is a great interest in identifying the etiologies of urethral stricture disease because they strongly determine its clinical characteristics, the choice of therapeutic methods, and treatment outcomes[7], another study also revealed that to identify all aspects of the stricture anatomy, preoperative assessment, including urethrography, cystoscopy and sometimes uroflowmetry is important so as to choose mode of management[8]. The common etiologies include trauma, iatrogenic, infectious, congenital causes and sometimes the cause is unknown. In this study majority of the stricture found to be located at the proximal bulbous 56 (48.7%) and they were short less than 2 cm in length 67 (58%). This results are similar to the study done in German where majority of stricture were short and located at proximal bulbous[9].

Out of 115 of patients who were analyzed, perineal trauma was identified as the leading cause of stricture to 45 (39.1%) patients, 29 (25.2%) had history of Sexual Transmitted Infections (STIs), 19(16.5%) had a history of traumatic catheterization, 11.3% had history of endoscopic procedure and 9 (7.8%) the cause was not identified. These findings are similar to the study done by Igenge and Mteta in Tanzania where majority of the stricture were caused by perineal trauma followed by iatrogenic causes and infections. It is contrary to the study done in Senegal where majority (63%) of patients was found to be due to infectious causes(3,7) .Early diagnosis, treatment of STI and having protective sex is possible explanation for the decrease in stricture caused by STI in Tanzania.

In this study among 115 patients who underwent anastomotic urethroplasty, 95 (82.6%) had successful results during 3 months of follow-up, this is nearly the same as study done in Tanzania where the overall success rate for urethroplasty was 88.4%. And the specific success rates were 87.3% for anastomotic type. It was also found that strictures located at proximal bulbous were 51% more likely to end in failure, being high stricture and difficulties in mobilization is the possible explanation to failure. Factors like age of the patient, results of urine cultures and whether the stricture is complete or incomplete were found not to influence the outcome; this is the same as the study done in USA where it was found that Urethroplasty success may be affected by co morbidities but not age [10].

5. Conclusion

Male urethral stricture is one of the commonest urological conditions at KCMC, the commonest etiology being perineal trauma and bulbous site being the predominant. Patient selection specifically on the length of the stricture should be considered for the successful anastomotic urethroplasty and minimal complication. Stricture excision and primary anastomosis remain the first and best options in dealing with short bulbar urethral strictures (<2 cm) with excellent results. The overall success rate in anastomotic urethroplasty of 83% at KCMC Urology department is nearly the internationally noted range of all urethroplasty which is 87% to 92%.

Compliance with ethical standards

Acknowledgments

All authors listed have made a substantial and intellectual contribution to the work and approved it for publication.

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

Approval for this study was obtained from Kilimanjaro Christian Medical College Research Ethics Committee with reference number 2309 and permission to extract data from files was thought from Executive director of Kilimanjaro Christian Medical Centre

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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