DOI: https://doi.org/10.53350/pjmhs2023171385

ORIGINAL ARTICLE

Outcome of Urethral Stricture Managed by Different Surgical Techniques

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ABSTRCACT

Aim: To compare the outcome of urethral stricture managed by different surgical techniques.
Place and Duration: This Study was conducted at Lahore General Hospital, Lahore in the duration from May, 2022 to October, 2022.
Methods: This randomized controlled trial was conducted on 60 patients divided equally in two groups. Both groups were assessed for maximum urinary flow 6 months after surgery, cause of the stricture, site of the stricture and success rate was assessed between both variables. T-test and Chi Square test with P < 0.05 as statistically significant were used to assess various outcomes between both groups.
Results: The mean age in urethroplasty group was 44.43±10.618 years while in endoscopic urethrotomy group the mean age was 48.23±11.790. Urethroplasty was significantly successful in 80% patients whereas endoscopic urethrotomy was successful in 43.3% patients (P = 0.003).
Conclusion: Urethroplasty is a safe and effective technique for treatment of urethral stricture.
Keywords: Urethral stricture, Urethroplasty, Endoscopic urethrotomy, Efficacy

INTRODUCTION

When the urethra becomes narrowed, it can lead to obstruction and the symptoms known as a stricture. Injuries to the urethral mucosa and surrounding tissues are typically to blame [1]. There are numerous potential explanations for this condition, which can arise anywhere throughout the male urethra [2]. The majority (92.2%) of urethral strictures originate in the anterior portion of the urethra [2]. The bulbar urethra accounts for more than half of all strictures (46.9%), followed by the penile urethra (30.5%) or a combination bulbar and penile stricture (9.9%), and then the entire urethra (4.9%) [3].

Idiopathic and iatrogenic urethral strictures account for 33% of all cases, followed by traumatic factors, which account for 19%, and inflammatory causes, which account for 15% [4]. In order to determine the severity, extent, and location of a urethral stricture, uroflowmetry and serial voiding urethrography, or retrograde urethrography alone, are commonly employed to make the diagnosis. Assuming a stricture is indeed present, the next question is what kind of surgery should be performed [5, 6].

In the United States, the incidence of urethral strictures is approximately 200 per 100,000 males under the age of 65 and over 600 per 100,000 males over the age of 65. The annualized occurrence in the United States is predicted to be 0.9% [7]. There are 5,000 annual hospitalization and 1.5 million annual clinic visits due to urethral strictures in men [3]. Prevalence estimates in the UK are much lower, at 40/100,000 in men up to age 65 and 100/100,000 afterward [8]. Male urethral strictures are relatively common, with an estimated global frequency of 229-627/100,000 [9].

Many procedures have been documented for the treatment of the anterior urethra, such as dilations, urethrotomy, end-to-end urethroplasty, graft urethroplasty, flap urethroplasty, and two-stage urethroplasty, with differing success rates depending on the research and the method of treatment [10, 11]. The length of the stricture is often connected to the operative procedure of the posterior urethra. If the length is less than 1 cm, urethrotomy is recommended, but urethroplasty is needed if the length is higher than 1 cm [12, 13]. The success rate of urethroplasty is higher than that of endoscopic or open surgery alone, however this varies from series to series and depends on parameters like the location, size, and cause of the stricture [14, 15].

The purpose of this research was to compare the outcomes of different surgical approaches used to treat urethral stricture in male patients at our institution.

MATERIAL AND METHODS

We conducted this randomized controlled trail at This Study was conducted at Lahore General Hospital, Lahore in the duration from May, 2022 to October, 2022. Total 60 male patients presenting with urethral stricture from March 2022 to December 2022. After obtaining ethical clearance we assigned 30 patients to urethroplasty group while 30 patients were assigned to endoscopic urethrotomy group. Basic demographics were collected from all patients. All the surgeries were performed by two experienced surgeons having experience of more than 5 years. Maximum urinary flow 6 months after surgery, and functional results with serial voiding urethrography 6 months after surgery were all evaluated, along with the following variables: cause of the stricture, site of the stricture and success rate was assessed between both variables.

IBM SPSS 20 was used for assessing the data. Frequency and percentages were used for categorical variables and Mean SD was calculated for numerical variables. Chi Square test and T-test were used to assess the outcome variables between groups. P < 0.05 was considered significant.

RESULTS

This study was conducted on 60 patients. Patients were divided in two groups equally. The mean age in urethroplasty group was 44.43±10.618 years while in endoscopic urethrotomy group the mean age was 48.23±11.790. The mean postoperative Qmax flow was significantly higher in Urethroplasty group 14.60±4.32 ml/s than in endoscopic urethrotomy group 10.53±2.99 (P = 0.0001).

Regarding the success rate between both groups, urethroplasty was successful in 80% patients whereas endoscopic urethrotomy was successful in 43.3% patients. The difference was statistically significant (P = 0.003).

Table 1: Baseline characteristics

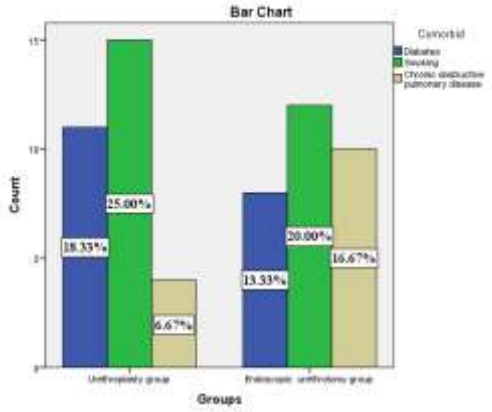
Baseline characteristics	Urethroplasty group	Endoscopic Urethrotomy groups
Age (years)	44.43±10.618	48.23±11.790
BMI (Kg/m^2)	27.11±2.66	25.95±.3.00
Postoperative Qmax flow (ml/s)	14.60±4.32	10.53±2.99

Regarding comorbid, diabetes was found in 18.33% patients in Urethroplasty group while 13.33% patients in endoscopic urethrotomy group. The frequency of smoking was 25% in Urethroplasty group while 20% in endoscopic urethrotomy group. Chronic obstructive pulmonary disease was seen in 6.67% patients

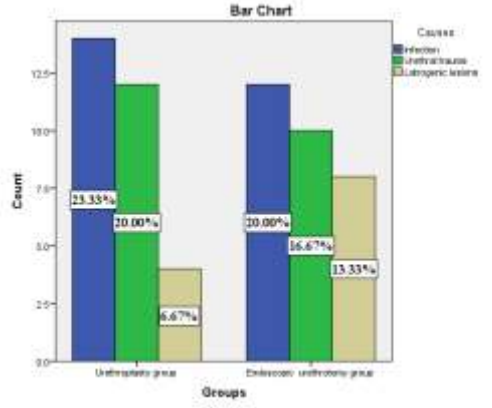
in Urethroplasty group while 16.67% in endoscopic urethrotomy group.

Table 2: Comparison of success rate between both groups

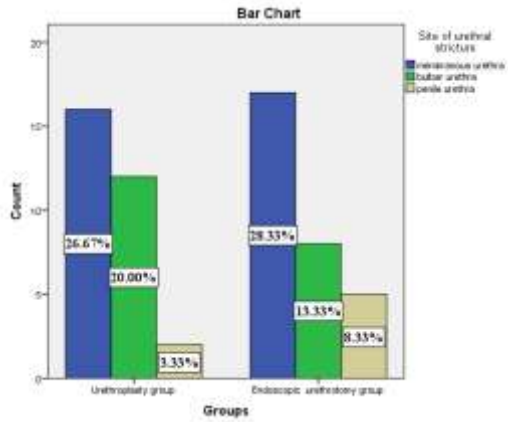
		Success rate		Total	P value
		Successful	Not successful		
Groups	Urethroplasty group	24	6	30	0.003
		80.0%	20.0%	100.0%	
	Endoscopic urethrotomy group	13	17	30	
		43.3%	56.7%	100.0%	
Total		37	23	60	
		61.7%	38.3%	100.0%	



Graph 1: Distribution of Comorbid between both groups



Graph 2: Distribution of causes of urethral stricture between both groups



Graph 3: Distribution of site of urethral stricture between both groups

DISCUSSION

Most medical professionals agree that urethroplasty is the best option for treating urethral stricture, but there is some debate on whether or not this is the best course of action to take. 14 Many medical professionals advocate for the use of internal urethrotomy and even urethral dilations as effective methods of care. In light of these findings, studies propose urethroplasty as the first line of treatment for strictures of 1.5 cm or longer, and in any situations where internal urethrotomy is not appropriate and treatment failure occurs[15, 16]. However, it is important to note that urethrotomy has historically had poorer outcomes than urethroplasty. When deciding between internal urethrotomy and urethroplasty for the treatment of urethral stricture, we take into account not only clinical factors but also economic and geographical ones.[17]

As long as the length of the stricture is less than 2 centimetres, internal urethrotomy is preferable to urethroplasty from a financial and cost-effectiveness standpoint. Because of this, patients who fit this description should be candidates for internal urethrotomy rather than urethroplasty. The prevalence of urethroplasty appears to vary widely from state to state within the United States, ranging from zero percent in Alaska and Hawaii to seventeen percent in Alaska and Hawaii. About once for every seventeen urethrotomies or dilations is a urethroplasty procedure.[18] More urethroplasties are performed in states with more residents in their centres or by younger urologists.[17]

Sixty male patients were included in the current investigation. Urethroplasty group consisted of 30 patients who underwent urethroplasty, whereas Endoscopic urethrotomy group was comprised of those who underwent endoscopic urethrotomy. Patients' average ages were 44.43±10.61 years in urethroplasty group 48.23±11.79 years in endoscopic urethrotomy group. We observed that the most common causes of urethral stricture were infection followed by urethral trauma and latrogenic lesions in both groups. Our findings are in agreement with a study[18] which reported the same findings. The most common site of urethral stricture in our study in both groups was membranous urethra followed by bulbar urethra and penile urethra was reported the least in both groups.

The mean Qmax flow in Urethroplasty group was 14.60±4.32 ml/s while in endoscopic urethrotomy group the mean postoperative Qmax flow was 10.53±2.99 ml/s, the difference was statistically significant. In various studies it has been reported that the Q-max flow was significantly higher in urethroplasty group as compared to endoscopic urethrotomy.[18, 19]

According to the success rate of both treatments we observed that urethroplasty had a significant higher success rate than endoscopic urethrotomy. Similar findings have been reported by multiple studies[18, 19]. Similar to our findings, previous studies have shown that urethroplasty performed via end-to-end anastomosis, graft placement, or flap placement has an overall success rate of 85–95%[20, 21]. When a urethroplasty fails, it may be because the bladder catheter was removed too soon or there was too much scar tissue. In addition to its benefits over endoscopic urethrotomy, performing a urethroplasty to treat urethral stricture also allows for the introduction of different techniques and variations, which are not possible with urethrotomy (although different techniques of urethrotomy can be used with different types of materials, like laser, cold cut, or electric cut). In addition, urethroplasty has aided in the current application of tissue engineering with inorganic matrices for surgical procedures, as well as organic matrices that are loaded with cells of varying origins.[22]

CONCLUSION

From our study we conclude that the success rate was significantly higher in urethroplasty group as compared to endoscopic urethrotomy. We can safely assume that urethroplasty is safe and effective procedure for treatment of urethral stricture.

REFERENCES

1. Mathur R, Aggarwal G, Satsangi B, Khan F, Odiya S. Comprehensive analysis of etiology on the prognosis of urethral strictures. Int Braz J Urol. 2011 ;37(3):362-69.
2. Hampson LA, McAninch JW, Breyer BN. Male urethral strictures and their management. Nat Rev Urol. 2014;11(1):43-50.
3. Hampson LA, McAninch JW, Breyer BN. Male urethral strictures and their management. Nat Rev Urol. 2014;11(1):43-50.
4. Fenton AS, Morey AF, Aviles R, Garcia CR. Anterior urethral strictures: etiology and characteristics. Urology. 2005;65(6):1055-58.
5. Verla W, Oosterlinck W, Spinoit AF, Waterloos M. A Comprehensive Review Emphasizing Anatomy, Etiology, Diagnosis, and Treatment of Male Urethral Stricture Disease. Biomed Res Int. 2019.
6. Lambert E, Denys MA, Poelaert F, Everaert K, Lumen N. Validated uroflowmetry-based predictive model for the primary diagnosis of urethral stricture disease in men. Int J Urol. 2018;25(9):792-98.
7. Smith TG. Current management of urethral stricture disease. Indian J Urol. 2016;32(1):27-33.
8. Mundy AR, Andrich DE. Urethral strictures. BJU Int. 2011;107(1):6-26.
9. Liaw A, Rickborn L, McClung C. Incidence of Urethral Stricture in Patients with Adult Acquired Buried Penis. Adv Urol. 2017.
10. Singh O, Gupta SS, Arvind NK. Anterior urethral strictures: a brief review of the current surgical treatment. Urol Int. 2011;86(1):1-0.
11. Barbagli G, Sansalone S, Djinovic R, Romano G, Lazzeri M. Current controversies in reconstructive surgery of the anterior urethra: a clinical overview. Int Braz J Urol. 2012;38:307-16.
12. Hosseini SJ, Kaviani A, Vazirnia AR. Internal urethrotomy combined with antegrade flexible cystoscopy for management of obliterative urethral stricture. Urol J. 2008;5(3):184-87.
13. Santucci RA, Mario LA, Aninch JW. Anastomotic urethroplasty for bulbar urethral stricture: analysis of 168 patients. J Urol. 2002;167(4):1715-19.
14. Santucci RA, Mario LA, Rajpurkar A, Chopra AK, Miller KS, Armenakas NA, et al. Urethroplasty in patients older than 65 years: indications, results, outcomes and suggested treatment modifications. J Urol. 2004;172(1):201-3.
15. Veeratterapillay R, Pickard RS. Long-term effect of urethral dilatation and internal urethrotomy for urethral strictures. Curr Opin Urol. 2012;22(6):467-73.
16. Jackson MJ, Sciberras J, Mangera A, et al. Defining a patientreported outcome measure for urethral stricture surgery. Eur Urol. 2011;60:60–8.
17. Meeks JJ, Erickson BA, Granieri MA, Gonzalez CM. Stricture recurrence after urethroplasty: a systematic review. J Urol. 2009;182:1266–70.
18. Wessells H, Angermeier KW, Elliott S, et al. Male urethral stricture: American urological association guideline. J Urol. 2017;197:182–90
19. Khan N, Khan A, Rashidullah M, Rahman SU. Outcomes of Uretheral Strictures Treated with Endoscopic Urethrotomy and Urethroplasty. PJMHS. 2022;16(03):1171-.
20. Tinaut-Ranera J, Arrabal-Polo MÁ, Merino-Salas S, Nogueras-Ocaña M, López-León VM, Palao-Yago F, et al. Outcome of urethral strictures treated by endoscopic urethrotomy and urethroplasty. Can Urol Assoc J. 2014 Jan-Feb;8(1-2):E16-9.
21. Lumen N, Hoebeke P, Oosterlinck W. Urethroplasty for urethral strictures: Quality assessment of an in home algorithm. Int J Urol 2010;17:167-74.
22. Micheli E, Ranieri A, Peracchia G, et al. End-to-end urethroplasty: Long-term results. BJU Int 2002;90:68- 71.