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Outcome of End-to-End Anastomotic Urethroplasty in Patients having Stricture Urethra

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ABSTRACT

Objective: *To see the results of end-to-end anastomosis and stricture excision after spatulation in patients with blind urethral stricture.* ***Study Design:*** *A prospective study.* ***Place and Duration:*** *In the Department of Urology PAEC General Hospital, Islamabad for the 3-year duration from February 2016 to January 2019.* ***Methods:*** *Total 20 male patients over the age of 16 years having blind stricture of membranous or bulbar urethra ≤ 2 cm were selected for the study. We excluded patients with stricture greater than 2 cm, patients with neurogenic bladder stricture and patients with malignant strictures. About 2.5 years was the mean follow-up time and one year was the minimum follow-up time.* ***Results:*** *About 20 patients with stricture of the urethra with 20-44 years were managed. The results were good in 14 (70%) patients, moderate in 4 patients (20%) and urethroplasty failed in 2 (10%) patients. Overall 90% was the success rate.* ***Conclusion:*** *Anastomosis urethroplasty has better results in patients with blind stricture of the membranous or bulbar urethra.*

Keywords: End-to-end urethroplasty, Urethra, Stricture

INTRODUCTION

Urethral stricture is a urethral caliber narrowing resulting from the incidence of scar tissue as a result of infection or injury [1]. Since ancient times, urethral dilatation has been performed with metal or wooden dilators [1]. It has been the only treatment for centuries since 600 BC. At the completion of the 17th century, in France and India, "La Buttoniere" operation was designed to create a buttonhole in the proximal dilated urethra to the stricture [2]. In the 18th century, Otitis and Civiale initiated a blind internal urethrotomy with little outcome. In 1857, anesthesia with chloroform and 10 years later, the knowledge of aseptic and antiseptic measurements ensured the surgeon [3]. At the 19th century completion, removal of urethral stricture and end-to-end anastomosis was achieved, but often the technique was abandoned due to failure [4]. Subsequently, treatment was continued with blind internal urethrotomy, periodic urethral dilatation, suprapubic cystostomy, and perineal urethrostomy to guide urine. In the 2nd half of the 20th era, renowned British urethologist Richard Turner Warwick described urethroplasty with good results founded on the removal of stricture and primary urethral anastomosis was done [5]. In this study, we evaluated the results of urethroplasty in cases with blind urinary stricture of the membranous or bulbar urethra by stricture removal and anastomosis of normal urethral ends after spatulation.

MATERIALS AND METHODS

This prospective study was performed on 20 patients with stricture who cleaned the entire bar or membranous urethra in the Department of Urology PAEC General Hospital, Islamabad for the 3-year duration from February 2016 to January 2019. The study included male patients only older than 16 years. The subjects having 2 cm stricture were selected for the study. Patients with above 2 cm stricture, malignant stricture or neurogenic bladder stricture were omitted. We also excluded any case where endwise anastomosis cannot be performed without grafting. Total 20 subjects who

fulfill the criteria of inclusion during the analysis were assessed with stricture, detailed history, physical examination and previous treatments were given. Studies include routine urinalysis, complete blood count, serum creatinine, blood urea, viral markers and cross-match of blood group, X-ray chest, ECG, antegrade cystourethrogram and retrograde urethrogram. Under spinal or general anesthesia; surgery was performed. In an exaggerated lithotomy position; the patient was positioned after anesthesia. In the perineum midline; incision was given. To cut bulbocavernosus muscle and subcutaneous fat; incision was deepened in the midline to uncover the bulbar urethra. Through the urethra; a metal bougie was passed to the stricture to ease dissection. A dissected window was formed between the deeper structures and distally from the urethra, corpora cavernosa to the penoscrotal junction. Up to the stricture; proximal dissection was done and then towards the urethral normal part more proximally. At this point; bulbar stricture was excised. Spatulation of both ends was done and 4/0 interrupted polyglycolic acid sutures were applied over the 18 Fr Foley catheter. At the level of stricture; the urethra was resected. Through cystostomy opening; into the prostatic urethra, bougie was passed and adjusted in such a way that the bougie tip was expected into the perineum. At the bougie projecting tip; incision was given to make an opening into the proximal urethra.

RESULTS

Total 20 subjects with membranous or blind bulbar urethral stricture were selected for the analysis, 20-44 years was the age range, and 32 years was the mean age (Table 1 and Figure 1).

Table 1 Age of the patients at the time of presentation

Age (Years)	Quantity	Percentage
20-29	10	50%
30-39	4	20%
40-44	6	30%

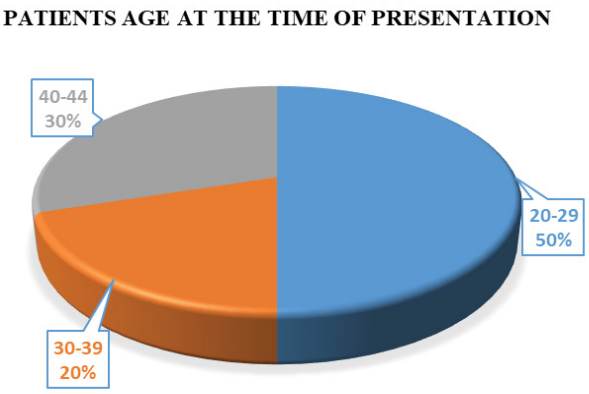

Figure 1 Age of the patients at the time of presentation

The trauma was the most common cause of stricture. About 11 (55%) subjects had fall astride history and a direct impact on the perineum, and 6 (30%) had a pelvic fracture and lesions in the posterior urethra and had a traffic accident. About 2 patients (10%) had an infectious stricture and 1 (5%) had no source of the stricture (Table 2 and Figure 2).

Table 2 Etiology

Etiology	Quantity	Percentage
Fall astride	11	55%
Road traffic accident	6	30%
Infective	2	10%
Unknown	1	0.05

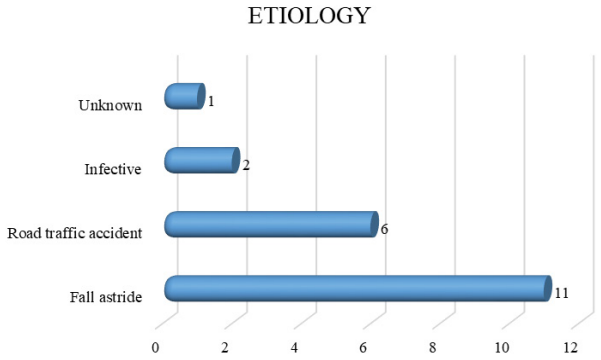

Figure 2 Etiology

In 14 (70%) cases bulbar urethra is affected by the urethra and membranous urethra affected in 6 (30%) of the patients (Table 3 and Figure 3).

Table 3 Location of stricture

Location	Quantity	Percentage
Bulbar Urethra	14	70%
Membranous Urethra	6	30%

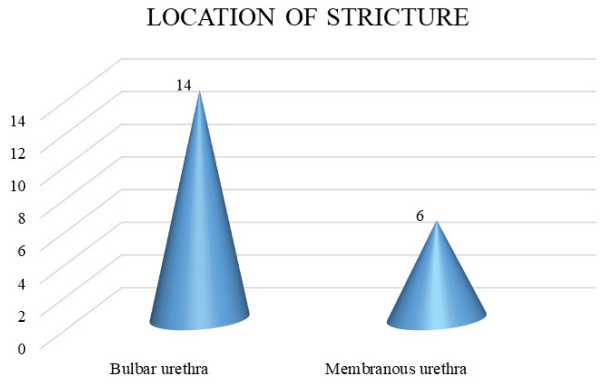

Figure 3 Location of stricture

All subjects had a stricture treatment history. The internal urethrotomy was done in 16 (80%) patients. Urethroplasty was done in 2 (10%) patients. Urethral dilatation history was positive for all patients (Table 4 and Figure 4).

Table 4 Previous history of treatment for stricture

History of treatment	Quantity	Percentage
Urethral dilation	20	100%
Urethroplasty	2	10%
Optical internal urethrotomy	16	80%

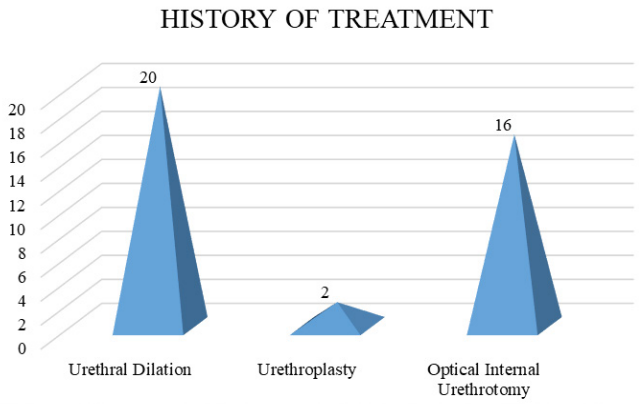

Figure 4 Previous history of treatment for stricture

In all patients, stricture was excised and with good spatulation the urethral end-to-end anastomosis was done. In 6 (30%) patients, blood transfusion was required. In 2 (10%) patients, wound infection occurs which was managed successfully. One year was the minimum follow-up time. The mean follow-up time was 2.5 years, and 4 (20%) patients established anastomosis stricture.

By optical internal urethrotomy, the cases were managed and two were placed in the CISC. Preoperatively, and impotence developed in 1 (5.3%) of the remaining 19 cases (Table 5 and Figure 5).

Table 5 Frequency of complications

Complications	Quantity	Percentage
Deep Venous Thrombosis	0	0.0%
Incontinence	0	0.0%
Wound infection	2	10.0%
Re-stricture	2	10.0%
Impotence	1	5.3%

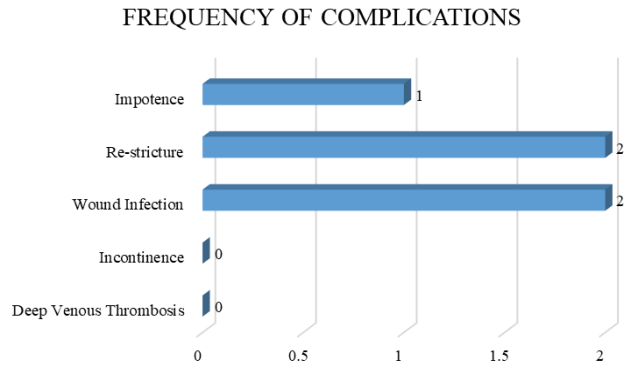

Figure 5 Frequency of complications

The results were good in 14 (70%) patients, moderate in 4 patients (20%) and urethroplasty failed in 2 (10%) patients. Overall 90% was the success rate (Table 6 and Figure 6).

Table 6 Location of stricture

Result	Quantity	Percentage
Poor	2	10%
Fair	4	20%
Good	14	70%

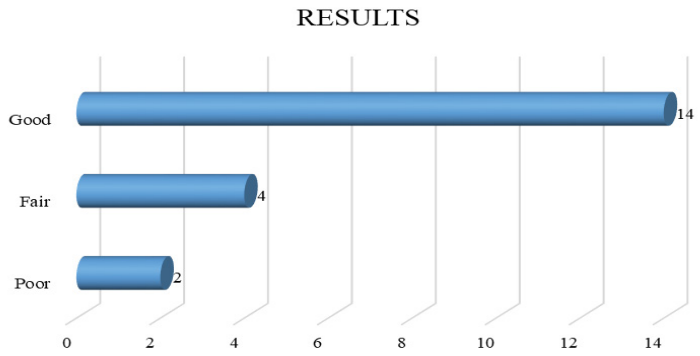

Figure 6 Location of stricture

DISCUSSION

Urethral stricture is a challenging surgical issue for males with a known clinical history. For centuries, in any of the etiology, urethral stricture was not changed. Currently, various management selections include periodic urethral dilatation with or without grafts, internal optic urethrotomy and urethroplasty [6]. After Hopkins introduced the optical system, an internal optical urethrotomy was extensively performed. It has a low complication rate and was easy to use. This has led to a constant discussion about the finest way to manage urethral stricture, particularly when urologists want the least invasive and simplest solution [7]. Though, the outcomes of the various series have elevated doubts about the effectiveness of this technique and reported an increased rate of recurrence approximately 80% over 5 years [8]. Internal optical urethrotomy improves stenosis (<1 cm) only without significant spongiofibrosis. It is only a palliative treatment for all other stenosis. In addition, its role in the treatment of blind urethral strictures is very limited [9]. For membranous and bulbar urethra, the standard management is anastomosis and stricture removal [10,11]. For better outcomes, the fibrosis segment was completely removed. At 2 anatomical points; anastomosis urethroplasty was done. First, 2 cm to 4 cm, the bulbar urethra is extended to overwhelmed a deficiency and provide anastomosis of the spatula superimposed on a spatula, and second, the bulbar urethra natural course of is almost semi-circular, i.e., the curve is flat, natural [12]. Longer defects may be recorded. The duration of stenosis is the main limitation of this analysis. Even with recent developments in the urethral stricture surgical treatment since the 2nd half of the last era, there is no definitive treatment for all these patients with prolonged stenosis. Perhaps in this century, the urethra can be reconstructed with better results using bio-engineering use with bovine collagen compounds in combination with culture or artificial tissue and embryonic cells [13]. In our study, 20 patients with bulbar or membranous stenosis underwent end-to-end anastomosis and resection after urethral spatulation. The patient's age range was 20-44 years and 32 years was the mean age, most of the patients were 20-39 years old. In the other series, a high incidence of traumatic stenosis was reported in the 3rd and 4th years. The median follow-up age was 2.5 years. End-to-end urethroplasty complications include erectile dysfunction and restriction. The restriction is usually due to ischemia-induced spongiofibrosis, and by lesions in the deep penile artery; impotence mainly occurs during trauma. The neural injury results in impotence in most of the cases. About 7.1% was the incidence of erectile dysfunction in one analysis and 5.6% in the other. In our study, 19 patients were sexually effective before the operation [14]. One patient (5.3%) developed erectile dysfunction comparable to other studies. The results were good in 14 (70%) patients, moderate in 4 patients (20%) and urethroplasty failed in 2 (10%) patients. Overall 90% was the success rate. In most studies, the 90% cure rate is noted; our results are analogous to other series.

CONCLUSION

The end-to-end anastomosis and stricture excision is a simple and direct procedure with better outcomes in patients with membranous or blind bulbar urethra stricture below 2 cm.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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