

Resection Urethroplasty for Urethral Stricture: Preliminary Findings from a Tertiary Care Hospital of Central Nepal

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ABSTRACT

Background: Urethral stricture is relatively common problem that we encounter in urological practice. As urethral stricture causes progressive narrowing of the urethral lumen, signs and symptoms of urinary obstruction arise. These patients experience obstructive symptoms like poor stream, straining to urinate, incomplete voiding, end dribbling, urinary retention and recurrent urinary tract infections. **Methods:** A prospective cohort study was carried out in College of Medical Sciences, Chitwan, Nepal. All the patients who were operated with end to end anastomosis for urethral stricture with stricture length not more than 2.5cm from January 2015 to June 2016 was included in this study. These patients were followed up for two year period for recurrence of the stricture and complications. **Results:** Mean age of patient in this study was 50.55 years, average length of stricture was 1.3 cm. 66.67% (12 patients) had complete success with no recurrence of the stricture. 33.33 % (6 patients) had recurrence of stricture. Out of those 6 patients, 3 had undergone DVIU with no further recurrence of the stricture until the follow up period, one patient was treated with dilatation, two had complete failure and needed re-procedure. **Conclusions:** End to end anastomosis for short segment stricture had a fairly satisfactory result.

Keywords: DVIU; end to end urethroplasty; urethral stricture.

INTRODUCTION

Urethral stricture is a relatively common problem in men, which could result in a debilitating condition. As urethral stricture causes progressive narrowing of the urethral lumen, signs and symptoms of urinary obstruction arises. These patients experience obstructive symptoms like poor stream, straining to urinate, incomplete voiding, end dribbling, urinary retention and recurrent urinary tract infections. In general, the incidence of infection related to urethral stricture has decreased, especially in the developed world.¹

One of the significant etiological factors for urethral stricture disease is trauma. Different types of trauma leading to urethral stricture are straddle injury, pelvic fracture - related urethral injury (PFUI) and iatrogenic. Straddle injury is the most common and typically occurs due to physical activities.² From the studies, the average length of stricture of urethral stricture is 4.1cm with most common site being the bulbar urethral (52%), Lichen Sclerosis was reported as inflammatory strictures and the third leading cause of stricture disease (26.6%), following idiopathic (31.9%) and

iatrogenic (31.9%).³ In Brazil and Nigeria infection was responsible for urethral stricture in 15.2% and 66.5% of the cases respectively and 85% of times these were multi-location strictures.^{4,5} In urethral stricture, there is spongiofibrosis and with repeated urethral manipulations like urethral dilatation and DVIU, the length and density of spongiofibrosis increases.⁶ In the United States, direct-vision internal urethrotomy (DVIU) is the most commonly performed procedure for strictures less than 2 cm. Nevertheless, the recurrence rate is much higher with this procedure. Resection urethroplasty has good outcome and is also cost effective compared to DVIU.⁷⁻⁹

From the management point of view, we take into consideration the length of the stricture, site and etiology of urethral stricture. For strictures of short segment, <2cm excision and an end to end anastomosis (resection urethroplasty) has been the ideal procedure which provides a good long-term results.^{10,11} The aim of this study is to evaluate the operative outcome of end-to-end urethroplasty in short segment stricture.

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METHODS

A prospective cohort study was carried out in College of Medical Sciences, Chitwan, Nepal from January 2015 to June 2016. A total of 60 patients who were treated for urethral stricture in 18 months. After selecting the patient which fulfilled the requirement of our inclusion and exclusion criteria, we had a total of 18 patients who under resection urethroplasty. Patients were evaluated with detail history, physical examination, urine analysis with urine culture. The retrograde urethrogram and micturating cystourethrogram were performed in every patients for diagnosis and treatment. Resection urethroplasty was performed under regional block (spinal and epidural anaesthesia). Inclusion criteria for end-to-end anastomosis were patients with urethral stricture, strictures less than 2.5 cm, cases operated by single surgeon. Patients with long segment strictures of more than 2.5 cm and those who have undergone combined procedures like augmented anastomotic urethroplasty and re-do surgeries were not included in this study.

Resection urethroplasty was performed following the standard surgical protocols. Patients were placed in lithotomy position, complete mobilization of bulbar urethra and complete excision of strictured (fibrosed) segment was carried out. Then healthy urethral segments were speculated after which end-to-end anastomosis was performed. Anastomosis was done in single layer using 5-0 polyglactin sutures in interrupted fashion. Following completion of dorsal suturing 14-Fr silicon catheter was placed and then ventral part was sutured. Peri neoscrotal area was sutured in layers with 3-0 polyglactin. Patients were hospitalized for about 3-5 days. Intravenous antibiotics (Ceftriaxone and Metronidazole) and analgesics were given. Wound dressing was done on 3rd post-operative day. After 5th POD, patients were discharged with catheter which was later removed in 14th post-operative day. In follow-ups, all the patient were evaluated with Uroflowmetry performed on 3rd, 6th and 12th month then annually thereafter. Retrograde urethrography and cystourethroscopy was done if patients developed voiding symptoms. Successful treatment was defined as no recurrence of stricture and good flow of urine in uroflowmetry. Treatment failure was defined as the need for any postoperative intervention including urethral dilation or DVIU. Fisher exact test was used to assess the significance of categorical risk factors for surgical failure and Student t-test was used to assess significance in continuous factors, e.g., age or operation time. Statistical significance was

considered at $p < 0.05$. Data were entered in MS-Excel and were imported to EZR software Version 3.4.1 for analysis

RESULTS

A total of 18 patients who fulfilled the inclusion criteria underwent resection urethroplasty. Out of which 11 patients(61.11%) had no recurrence of the stricture and had good surgical outcome. In six patients recurrence of the stricture was found, among which two patients presented with retention of urine (one in six months and other in 12 months). Foley’s catheter could not be negotiated per urethra so retention was relieved with suprapubic catheterization. In the remaining four patients, diagnostic cystogram and cystoscopic findings were suggestive of short segment stricture which was less than 0.5 cm. These patients were managed with DVIU (direct visual internal urethrotomy) among which three were managed successfully, remaining 1 patient did not improve with DVIU. The patient has been managed with monthly dilation and is having satisfactory flow rate and volume. In the total follow up period of 24 months one patient was lost in the follow up period after 12 months. There was no evidence of recurrence of the stricture therefore the patient is categorized as a success.

Mean operative time was 131.66 ± 21.69 mins ranging from 90 to 180 minutes. Mean excision length was 1.38 ± 0.39 ranging from 0.8 to 2.2cm. Length of stricture 1 cm and below was found in 5 patients, 1.1 to 1.5 cm in 9 patients and greater than 1.5 cm in 4 patients. Potential risk factor for the development of recurrence of the stricture was analyzed as shown in Table 1. There was no such risk factor identified in this study. p value was calculated using student t-test between success and failure group comparing the age and operative

Factors	Success (n=12)	Failure (n=6)	p-value
Age (years)	48.75000± 20.83758	54.16667± 19.57975	0.604
Operative time (min)	129.1667± 25.834555	136.6667± 9.309493	0.506
Etiology			
Traumatic	6	2	0.638
Non traumatic	6	4	
Operative findings			
Anterior urethral stricture	1	0	1
Bulbar urethral stricture	9	5	
Bulbomembranous urethral stricture	2	1	

Table 2. Comparison of q max in follow up period.

Uroflow Q max	After 3 months	After 6 months	After 12 months	After 24 months
Good	17 (94.44%)	15 (83.33%)	11 (61.11%)	11 (61.11%)
Bad	1(5.56%)	3 (16.67%)	6(33.33%)	6 (33.33%)
Lost to follow up	-	-	1(5.56%)	1(5.56%)

time which showed no statistical significance which was 0.604 and 0.506 respectively. Fisher exact test was used to compare etiology and site of stricture which also showed no statistical significance.

In early post-operative period three patients, experienced minor complication such as catheter, induced urinary tract infection and was managed with antibiotics. One patient had scrotal

Table 3. Causes of urethral strictures in patients who underwent end-to-end anastomosis.

Etiology	Number	Percentage
Trauma	8	(44.44%)
Iatrogenic	6	(33.33%)
Idiopathic	3	(16.67%)
Infection	1	(5.56%)

Catheterization = 4
TURP = 2

hematoma which was managed conservatively. A total of six patients complained of pain in the scrotal area which was managed with analgesics. Two patients complained of decrease in the force of ejaculation and volume. One patient had erectile dysfunction and was managed with sildenafil citrate. No patient complained of penile shortening or curvature.

Table 4. Different site stricture.

Operative Findings	Number	Percentage
Anterior urethral stricture	1	5.56%
Bulbar urethral stricture	14	77.78%
Bulbomembranous urethral stricture	3	16.67%

DISCUSSION

Surgical outcome can be influenced by many variables like length, severity and location of stricture. The surgical technique should be selected mainly according to stricture length, but we must also consider different factors like etiology and density of the spongiofibrosis.¹² DVIU or end-to-end urethroplasty is commonly accepted procedure for the treatment of short segment bulbar urethral stricture(<2 cm).⁹DVIU is recommended as the first choice of treatment when stricture is limited in a focal area. Stricture more than 1 cm in length, single setting of DVIU followed by end-to-end urethroplasty is commonly performed procedure.^{6,8,13} For a longer stricture (>2cm),

ventral or dorsal onlay urethroplasty using a buccal mucosa graft is currently recommended, where the urethral lumen is relatively well preserved and the spongiofibrosis around the lumen is limited to 1 mm.^{14,15} Augmented anastomotic urethroplasty, with complete excision of the worst stricture segment, is currently recommended for strictures that cover a particularly dense and narrow area of 1 to 2 cm in length. Both ventral and dorsal onlay free grafts survive well with equal success rates.^{16,17}

Short bulbar strictures are generally amenable to complete excision with primary anastomosis via a perineal incision, affording a high success rate of 95%, as reported by Santucci et al.¹⁰ Eltahawy et al.¹⁸ published their series of 260 patients with bulbar stricture who underwent end-to-end anastomosis with a mean follow-up of 50.2 months. The stricture length ranged from 0.5 to 4.5 cm (mean 1.9 cm) and the authors reported a success rate of 98.8%. Recently, Barbagli et al. described a success rate of 90.8% in 153 patients who underwent Bulbar end-to-end anastomosis with a mean follow-up of 68 months.¹¹ Jezior and Schlossberg summarized the surgical outcomes of excision and primary anastomosis for bulbar stricture on the basis of major series reported in the literature. These series showed a success rate of 93% in 443 patients with a range of 65% to 100% between series.¹⁹ Jun-Gyo Suh in 2013 studied 33 patients with bulbar stricture, end-to-end anastomosis had a success rate of 87.9% with a mean follow-up of 42.6 months.²⁰

In this study, we studied a total of 18 patients with success rate (66.67%) which is lower compared to other studies, probably because of early experience of the surgeon in the field of urethroplasty. Those patient who were categorized as a failure group did improve after a single setting of DVIU and dilatation. Two patients had complete failure as these patients presented with retention of urine and needed re-procedure.

Limitation of this study is small number of sample size, single surgeon and institutional study.

CONCLUSIONS

End-to-end anastomosis for short segment stricture is the procedure of choice and has better outcome.

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Conflict of Interest: None

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