

Single Stage Combined Ventral and Dorsolateral Buccal Mucosa Onlay Urethroplasty for Panurethral Stricture. Our Experience with this Novel Technique

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ABSTRACT

Introduction: Panurethral strictures have always been a difficult disease to treat. Buccal Mucosa Graft (BMG) augmentation urethroplasty remains the mainstay of treatment for single stage procedure. Inlay, dorsal onlay and dorso-lateral onlay with unilateral mobilization are all different methods. So the present study aimed to assess the outcomes of combined ventral bulbar onlay with dorsolateral penile onlay buccal mucosa graft (BMG) urethroplasty for panurethral strictures and to compare it with our previous series of dorsolateral BMG augmentation urethroplasty for pan urethral stricture.

Material and methods: A single institution retrospective study was done from 2009 to 2014 and all cases (n=19) undergoing combined BMG onlay urethroplasty for pan anterior urethral stricture were studied. This study was compared with our previous series of 8 patients who underwent complete dorsolateral onlay BMG urethroplasty with unilateral mobilisation of urethra from 2005 to 2008 for panurethral stricture.

Results: Mean patient age was 41 years. The etiologies were catheterisation (15.8%), lichen sclerosis (31.6%), infection (15.8%) and idiopathic (36.8%). Mean stricture length was 11.3 cm (7.5cm-14.cm). Mean follow-up period was 46 months (15-62 months). The success rate of combined approach described here was 89% which is comparable to the success rate 87.5% for complete dorsolateral approach in our previous series.

Conclusion: Ventral onlay repair for the bulbar part of panurethral stricture provides better access to proximal anastomotic site specially when proximal bulbar urethra is diseased and also damages the vascularity to the least extent. Hence, combined ventral onlay and dorsolateral onlay BMG urethroplasty can be a good alternative to complete dorsolateral onlay BMG urethroplasty for panurethral stricture. Short term results are comparable and encouraging.

Keywords: Panurethral stricture, Urethroplasty, Dorsolateral onlay, Ventral onlay. Augmentation urethroplasty

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MATERIAL AND METHODS

A single institutional retrospective study was performed on 19 cases of pan urethral stricture in Nair Hospital, Mumbai comprising of anterior urethra that underwent BMG augmentation. Patients undergoing combined ventral onlay (for bulbar urethra part) and dorsolateral onlay (for penile urethra part) for pan urethral stricture were included in the study group. As it was a retrospective observational study and involved analyses of data from records and did not involve disclosure of patient profile consent was not sought, however ethical committee clearance was taken for same. The study period was from 2009 to 2014. Patients were followed up for a minimum period of 12 months and the range of follow up was 15 months to 62 months. Only patients with a minimum follow up of > 12 months were included and 19 patients qualified for same. Outcome of surgery was successful if maximum flow rate >15ml/sec with normal retrograde urethrogram and /or urethroscopy and absence of voiding symptoms. Failure was defined as maximum flow rate <15ml/sec or voiding symptoms with stricture diagnosed on retrograde urethrogram and/or stricture seen on urethroscopy which required any intervention either endoscopic, self-dilatation or urethroplasty.

The results obtained were compared with a similar series of ours that we had published in 2009 consisting of 8 cases of pan urethral stricture treated with dorsolateral onlay urethroplasty.³

STATISTICAL ANALYSIS

Standard two variant statistical analyses comprising of comparison of the means, success percentage/ratio of the present study and the previous published series was undertaken.

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INTRODUCTION

Urethral stricture is a sequel to any process that would injure the urethral epithelium beyond the point of healing wherein the normal pseudostratified epithelium is replaced by squamous metaplasia followed by urinary extravasation leading to inflammation with fibrosis and stricture formation being the end result.^{1,2} Stricture involving both penile and bulbar urethra is referred to as panurethral stricture disease. The disease is rare compared to bulbar urethral stricture and its management is also complex. Presently single stage dorsal or dorsolateral BMG augmentation urethroplasty is the gold standard for treatment of panurethral stricture. Here we discuss our experience with use of combined approach i.e. ventral onlay for bulbar part and dorsolateral onlay for the penile part of the pan anterior urethral

	Success Ratio/percent	Pre-op Qmax Range/mean	Post-op Qmax Range/mean	Change in Qmax
Combined Approach	17/19 89.4%	0 – 6.7 ml/sec 5 ml/sec	9.5 – 28.4 ml/sec 19.5ml/sec	14.5 ml/sec
Dorsolateral approach ³	7/8 87.5%	3.8 – 8.7 ml/sec 6.4 ml/sec	10.2–21.2 ml/sec 16.1 ml/sec	9.7 ml/sec

Table-1:

RESULTS

The mean stricture length was 11.3 cm (7.5cm - 14.cm) and the mean follow up period was 46 months (15 - 62 months). In our study lichen sclerosis accounted for 32% (n=6) while catheterization and infection accounted for 16% (n=3) each and in 37% (n=7) no cause could be identified.

The pre-op Qmax and post-op Qmax and its comparison with our previous study is shown in Table-1.

Out of the total cases (n=19) that underwent combined onlay repair, 17 cases (89%) were successful and 2 cases (11%) failed which is comparable to our previous study comprising of 8 patients who underwent dorsolateral approach wherein 7 cases (87.5%) were successful while 1 case (12.5%) failed.

DISCUSSION

Male urethral stricture is a common disease worldwide and has been so for centuries. The first known description of urethral dilatation is credited to Shusruta more than 600 years BC.⁴ Male urethral stricture disease has an incidence of 0.6% in some susceptible populations.⁵ Though may not seem significant but the total cost of urethral stricture diseases in 2000 was almost \$200 million, not including medication cost in United states⁴ and though the incidence is decreasing, the burden still remains significant

Stricture urethra as a disease has always posed a challenge to the urologist. There has been a gradual paradigm shift from endoscopic management of stricture to open reconstruction urethroplasty in view of the superior results offered by urethroplasty.^{6,7}

Among the nontraumatic anterior urethral stricture disease, bulbar urethral involvement is the commonest.⁸ Panurethral stricture involving majority of the anterior urethra (penile and bulbar) is relatively rare occurrence and presents a challenge to a urologist. The etiology of panurethral stricture can be secondary to iatrogenic trauma, lichen sclerosis or post infection. However central to the theme in the pathogenesis of stricture urethra is damage to the epithelium and ischemia of the spongiosum secondary to the inciting factor with the end result being squamous metaplasia and spongiofibrosis respectively.¹ Though in a developed country iatrogenic injury in the form of catheterization, post TURP and failed hypospadias repair predominate, in our scenario lichen sclerosis also called as balanitis xerotica obliterans predominated at 31.6% followed by infection and catheterization comprising 15.8 % while in 36.8% of patients no cause could have been identified.

While planning the management of panurethral stricture, decision to whether contemplate a single or staged repair needs to be taken. Factors favoring staged repair include significant narrowing of urethral plate, abscess, fistula and multiple previous failed attempts. For patients being planned for single stage repair, adequate thought must be given to length

of stricture and the availability and feasibility of graft to be taken for same. Though various grafts have been mentioned in literature with various successes, at our institution we have been using BMG.^{9,10}

Since the stricture length in pan urethral disease is long (mean= 11.3cm in our study) even bilateral buccal mucosa may not be enough. In such cases we have used labial mucosa of both upper and lower lips while in some cases even lingual mucosa (undersurface of tongue) has been used with minimal morbidity.

Surgical steps of combined (ventral and dorsolateral) approach.

The patient is placed in lithotomy position and a midline incision on perineum is taken. The bulbocavernous muscle is sharply cut in the midline exposing the bulbospongium. If the stricture involves the penile urethra the penis is evaginated and brought out from the perineal wound. For the stricture involving the bulbar urethra a ventral incision on the spongiosum is made and the strictured bulbar urethral plate exposed. The graft (BMG) is sutured to the urethral plate and the spongiosum closed over it. For the penile part of the stricture, the urethra is mobilized unilaterally from the cavernosa till dorsal midpoint is reached, dorsal urethrotomy extending all along the penile stricture and the graft (BMG) is sutured to the penile urethral plate.

In the bulbar part of the stricture the spongiosum is closed over the plate forming the bed of the graft providing vascularity and support. While for the penile part standard quilting onto the corpora is done as done in dorsolateral BMG onlay urethroplasty.³

This method of graft placement was compared to the standard technique of dorsolateral graft placement by unilateral mobilization of the entire urethra and results obtained from both the methods under evaluation were comparable.³

Advantages of Combined Approach

Minimal dissection of bulbar urethra - As only a ventral urethrotomy was performed in the bulbar part of the urethra and no dissection or mobilization of spongiosum from corporal bodies was done, minimal vascular damage is expected.

Least erectile Dysfunction – There is better preservation of bulbocavernous muscle and also the vascularity is least affected. Though there are studies arguing pooling of ejaculate in patients undergoing ventral onlay repair the same was not observed in our study.¹¹ This can be attributed to the fact that we have provided adequate spongiosum cover to our graft in all cases thereby preventing sacculations or diverticula formation.

Ease of access of proximal anastomotic site – It is the consensus of the authors that the proximal anastomotic site remains the most challenging part of the surgery especially when the proximal site of stricture is high up. Hence a wide spatulation of the proximal site is prevented on account of the hesitancy of the operating surgeon in view of limited access to it rendered

by dorsal and dorsolateral approach. Hence though the previous two advantages are debatable we strongly recommend using combined approach for pan urethral stricture involving proximal bulbar urethra.

Disadvantages of combined approach

There might be difficulty encountered while graft placement at the point of intersection of ventral onlay and dorsolateral onlay i.e. at the junction of bulbar and penile urethral stricture, However the same did not result in any complication in our study.

Theoretically there is increased risk of diverticula, sacculations, and fistula formation with ventral onlay however no such complication was encountered in our study which we attribute to the good spongiosa cover which is available in bulbar urethra.

CONCLUSION

For panurethral stricture of anterior urethra, single stage BMG onlay urethroplasty remains the gold standard. Though dorsolateral urethroplasty is most widely performed procedure, our experience with combined approach i.e. ventral and dorsolateral provided excellent comparable results with the added advantage of the ease of performing the repair when stricture segment also involved proximal bulbar urethra. However, the paucity of numbers renders this approach to be scrutinized by further large multi institutional randomized control trial.

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