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Research Article

### OUTCOMES OF DORSAL ONLY VERSUS VENTRAL ONLY BUCCAL MUCOSAL GRAFT URETHROPLASTY IN PATIENTS OF BULBAR URETHRAL STRICTURE

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#### Abstract:

*Urethral stricture is a chronic and common urological problem and difficult to manage fraught with high patient morbidity and stricture recurrence. Buccal mucosal graft (BMG) has become an ideal urethral substitute because of the ease of harvest and surgical handling characteristics. Because of these unique characteristics, buccal mucosa has gained popularity in the realm of reconstructive urology. BMGs can be placed dorsally or ventrally. There has been controversy over which surgical technique is the most appropriate for its application.*

*130 patients with a diagnosis of bulbar urethral stricture having stricture length more than 2cm were included in this study and divided into two groups for BMG urethroroplasty (Group 1: Ventral onlay technique and Group 2: Dorsal onlay technique). Post-procedural Uroflowmetry and post-void volume estimation were done after 3 months of surgery to determine the success rate. Chi-square test was used to compare the success rate in group 1 and group 2 patients. P-value  $\leq 0.05$  was taken as a significant difference.*

*The Mean age of patients was  $39.39 \pm 8.56$  years, body mass index of  $24.51 \pm 3.75$  kg/m<sup>2</sup>. And the length of the bulbar stricture was  $3.55 \pm 0.94$  cm. On a Comparison of success rate between the groups, the procedure was successful in 61 (93.8%) in the ventral onlay BMG group versus in 50 (76.9%) patients in dorsal onlay BMG group (p-value 0.006).*

*According to the present study results, ventral onlay buccal mucosal graft (BMG) urethroplasty has a higher success rate as compared to the dorsal onlay BMG urethroplasty. So ventral onlay BMG urethroplasty can be adopted as a preferred technique for the management of bulbar urethral stricture.*

**Keywords:** *Bulbar urethral stricture, buccal mucosal graft, urethroplasty.*

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**INTRODUCTION:**

Urethral stricture is a chronic and common urological problem and difficult to manage fraught with high patient morbidity and stricture recurrence. [1,2] Urethral strictures are fibrotic narrowing composed of dense collagen and fibroblasts. These narrowings restrict urine flow and cause dilation of proximal urethra and prostatic ducts. In today's world of high-velocity trauma, urethral stricture has become more common. [3]

Buccal mucosal graft (BMG) is the ideal urethral substitute because of ease of harvest, surgical handling characteristics, hairlessness, and compatibility in a wet environment and it is early in growth and graft survival; because of these unique characteristics, buccal mucosa has gained popularity in the realm of reconstructive urology. [4] BMGs can be placed dorsally (the entire urethra is mobilized and the graft placed on cavernosal bodies), or ventrally (a urethrotomy is made ventrally on the stenotic segment and graft placed on the urethrotomy defect). [5] There has been controversy over which surgical technique is the most appropriate for its application.

A study conducted by Pathak *et al.* found a higher success rate 89.0% using ventral only Urethroplasty as compared to dorsal only Urethroplasty (70.0%) and concluded that ventral only Urethroplasty has a higher success rate as compared to dorsal only Urethroplasty. [6] Another study by Vasudeva *et al.* reported a success rate of 90% using ventral only Urethroplasty and 92.5% using dorsal only Urethroplasty and concluded that both of these techniques are equally effective. [7]

The proposed study aims to compare the outcomes of ventral only Urethroplasty with dorsal only Urethroplasty using BMGs in patients having bulbar urethral stricture. The results of this study will help us to determine which technique of Urethroplasty is better in patients with bulbar urethral stricture. Because there is controversy regarding which technique has a higher success rate. So this study will help to generate local data and will help us to decide a better technique of Urethroplasty based on the results of this study.

**MATERIAL AND METHODS:**

The Randomized control trial was conducted at the department of urology Sindh institute of urology and transplantation between April 2019 to October 2019. A total of 130 patients were included with 65 patients in each group (ventral only vs dorsal only). Non-probability consecutive sampling was used to induct patients with a diagnosis of the bulbar stricture with

length more than 2 cm (irrespective of cause). Patients with a previous history of urethral surgery (endoscopic or open) were excluded from the study.

These patients were divided into two groups using the lottery method. All procedures were carried out by consultant urologists having a minimum of 3 years' post-fellowship experience. Post-procedural Uroflowmetry and post-void estimation were done after 3 months of surgery to determine the success rate according to the criteria given in the operational definitions. Data regarding the patient's age, body mass index, and length of stricture was also collected.

Data analysis was carried out using SPSS v20.0. Mean and standard deviations were calculated for quantitative variables like age, height, weight, BMI, and length of the bulbar stricture. Categorical variables like the success rate of Urethroplasty were presented as frequency and percentage. Chi-square test was used to compare the success rate in group 1 and group 2 patients. P-value  $\leq 0.05$  was taken as a significant difference. Effect modifiers such as age, BMI, and length of bulbar stricture were controlled by stratification. To determine the effect of effect modifiers, the Post-stratification chi-square test was applied to the success rate of both of these procedures. P-value  $\leq 0.05$  was taken as a significant difference.

**RESULTS:**

The mean age of patients included in this study was  $39.39 \pm 8.56$  years, body mass index was  $24.51 \pm 3.75$  kg/m<sup>2</sup> and the length of the bulbar stricture was  $3.55 \pm 0.94$  cm. The overall success of the procedure as defined by Qmax >15 and post-void volume < 100 ml at 3 months was seen in 111 (85.38%) patients while it was unsuccessful in 19 (14.62%).

Comparison of success rate between the groups, the procedure was successful in 61 (93.8%) in the ventral only BMG group versus in 50 (76.9%) patients in the dorsal only BMG group. This difference was statistically significant with a p-value of 0.006.

The stratification of success rate with age and BMI showed no significant difference. However, stratification of the length of bulbar stricture in patients having stricture length 2.00-3.50 cm, procedural success was found in 28 patients in the ventral only BMG group and in 24 patients in dorsal only BMG group with insignificant p-value 0.389. Conversely, in patients having stricture length 3.51 to 5.50, procedural success was found in 33 patients in the ventral only BMG group and in 26 patients in the dorsal only BMG group with a significant p-

value of (0.004), indicating better results of ventral onlay technique is longer strictures.

	Mean	SD	Min	Max
Age	39.39	± 8.56	21	64
Height	166.91	± 8.26	143	182
Weight	67.95	± 10.26	47	90
BMI (kg/m <sup>2</sup> )	24.51	± 3.75	18.1	39.10
Lentgh of stricture (cm)	3.55	± 0.94	2.00	5.5

Procedural success	Overall	Ventral Onlay BMG	Dorsal Onlay BMG	P-value
Yes	111 (85.38%)	61 (93.8%)	50 (76.9%)	0.006
No	19 (14.62%)	04 (6.15%)	15 (23.10%)	

Procedural success	Ventral Onlay BMG	Dorsal Onlay BMG	P-value
Yes	33	26	0.004
No	01	10	

### DISCUSSION:

Male urethral stricture disease has an incidence of 0.6% in some susceptible populations.[8] The majority of the studies which investigated the etiology and distribution of strictures are single institutional studies. Thus few data have been derived from multi-institutional studies and even considerably lesser data have been gathered from developing countries. Anterior urethral stricture accounts for 92% of all urethral strictures, and 47% of these cases are solely bulbar urethra strictures. [9]

Urethral stricture is a great source of morbidity among men who can present with obstructive voiding patterns to frank urinary retention. The cause of urethral stricture can be infectious, post-intervention, and trauma, though in many cases the cause cannot be ascertained. Non-traumatic bulbar urethral stricture can be iatrogenic, secondary to lichen sclerosis, or post-infection. Ischemia has been proposed to be responsible for spongio-fibrosis with the result being urethral stricture. A multi-geographic study to understand the demography of

urethral stricture concluded that Lichen sclerosis and trauma were responsible for strictures in developing countries compared to the developed countries where iatrogenic injury in particular failed hypospadias repair is more frequently seen. [10] The treatment modality mainly comprises of three strategies, 1) Visual internal urethrotomy (VIU). 2) Endoscopic dilation. 3) Urethroplasty (anastomotic or augmentation).

The success rate of DVIU and urethral dilation is relatively low with only half of the patients remain stricture free at 48 months and the results are even much worse with the second or third repetition of the procedure. [11] The results are worst for long-segment (>2 cm) strictures. [12] So the option is urethroplasty! But it remains to be underutilized with few institutes offering the present standard of care. Urethroplasty across many centers regularly performing the procedure offers a cure rate of 80% to 90% which is far superior to their competitors. For long-segment nontraumatic bulbar urethral stricture,

BMG augmentation urethroplasty is the standard of care. [13,14]

The use of BM in urethral surgery was first described in 1941 but not reported again until the late 1980s. [15] Since then, it has proved to be a versatile graft material well suited to repair the urethra because it is a wet epithelium, which is easily harvested and amenable to surgical manipulation, has a privileged immunity rendering it less prone to infection, and is more resistant to stricture recurrence than skin particularly in the presence of lichen sclerosis, previously known as balanitis xerotica obliterans. [16,17] In this study, we experienced 10% (7 patients) stricture recurrence and the three had perineal wound infections. BM also has a dense submucosa with a dense capillary network that facilitates the early imbibition of nutrients from the wound bed as well as early inosculation of neovasculature. [18] The graft is harvested either from the inner aspect of one or both cheeks, from the posterior lower lip, or in cases where extensive substitution is necessary, from all three sites. Several papers have looked at the morbidity associated with harvesting the BM graft, and all conclude that morbidity is lower with inner cheek harvest than the lower lip, because these patients tend to have a lesser degree of discomfort and a lower rate of paraesthesia (secondary to mental or lingual nerve injury) postoperatively. [19] We however technically preferred the lower lip approach and had no adverse events.

The site of placement of graft remains to be a controversial issue. Barbagli *et al.* found that all three sites were associated with similar outcomes.<sup>20</sup> On review of literature, it was found that both dorsal and ventral BMG augmentation urethroplasty were associated with similar outcomes. [21] Proponents of dorsal placement of graft argue that there is a decreased chance of diverticula formation and a better chance of neovascularisation with the graft lying on cavernosal bodies which would not be seen if the graft is placed ventrally. The proponents of ventral placement in bulbar urethra argue that it offers better access to the proximal site of stricture, less mobilization of urethra preserving its vascularity in addition to the fact that the bulbocavernosus muscle prevents diverticula formation. However, a technique that involves unilateral mobilization of the urethra with the dorsolateral placement of the graft which has evolved is a compromise between these two approaches with fairly good results. [21] This method is nearly similar to the lateral placement of graft with the difference that it involves mobilization

of the urethra from the ventral midline to the beyond of dorsal midline. [22]

In the present study, the procedure was successful in 61 (93.8%) in the ventral only BMG group versus 50 (76.9%) patients in the dorsal only BMG group. A study conducted by Pathak *et al.* also reported a higher success rate in the dorsal only group; the authors found an 89% success rate in the dorsal only group versus in 79% patients in ventral only group. [6] While a study conducted by Kaggwa *et al.* did not find any significant difference between the success rate of the dorsal and ventral BMG group. they reported a success rate of 80.0% in dorsal only BMG group versus in 84.0% patients in ventral only BMG group. [2] Both dorsal and ventral only buccal mucosal graft urethroplasty have comparable efficacy for the treatment of bulbar urethral strictures. In the present study, we found a higher success rate in patients who underwent ventral only BMG as compared to the dorsal only BMG group.

#### CONCLUSION:

According to the present study results, ventral only buccal mucosal graft (BMG) urethroplasty has a higher success rate as compared to the dorsal only BMG urethroplasty. So ventral only BMG urethroplasty can be adopted as a preferred technique for the management of bulbar urethral stricture.

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