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Comparative Study to Evaluate Surgical Outcome and Donor Site Morbidity of Buccal Versus Lingual Mucosa Graft in Anterior Urethroplasty

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Abstract **Original Research Article**

Background: Stricture urethra is a frequent urological problem and substitution urethroplasty is the standard treatment for longer (>2 cm) urerthral strictures, multiple urethral strictures and recurrent strictures. Currently, buccal mucosa graft (BMG) is the preferred donor site for substitution urethroplasty which is associated with donor site morbidities. The mucosa covering the lateral and undersurface of the tongue is identical to the rest of the lining of oral cavity and seems to be associated with less risk of donor site complications. The aim of the study was to compare the surgical outcome and donor site morbidity of buccal versus lingual mucosa graft in anterior urethroplasty. ***Methods:*** A prospective experimental study was done in the department of Urology Dhaka Medical College Hospital during the period of April 2017 to September 2018. Total 54 Patients were included by purposive sampling for the study as per inclusion and exclusion Criteria. Patients were than allocated into two groups. Group A consisted of 27 patients where Lingual mucosa graft (LMG) urethroplasty done and group B also consisted of 27 patients where Buccal mucosa graft (BMG) urethroplasty done. ***Results:*** In the present study, the baseline characteristics of the patients in group A and Group B were almost similar having no statistically significant difference. The overall surgical outcome between two groups was in group A 92% and in group B 88%. The inter-group difference was not statistically significant. Donor site complications more frequently occurred in Group B. Pain in oral cavity at 3rd week in Group A was in 1(4%) patient and in group B was in 9(36%) patients, at 6th month follow up, eating and drinking problem (Group A 4% versus group B 32%), peri-numbness (Group A 4% versus Group B 28%), oral tightness (Group A 0% versus Group B 32%), salivary disturbance (Group A 0% versus Group B 28%) were significant statistically ($p<0.05$). ***Conclusion:*** We conclude that that lingual mucosa graft urothroplasty has similar outcome like that of buccal mucosa graft urethroplasty with less donor site morbidities.

Keywords: Buccal mucosa graft (BMG), Lingual Mucosa Graft, Urethroplasty, Multiple urethral strictures, recurrent strictures.

INTRODUCTION

Stricture urethra is a frequent urological problem in Indian subcontinent, posing a big challenge in managing its chronic and recurrent course. Urethral strictures are fibrotic narrowings composed of dense collagen and fibroblast. Fibrosis usually extends into the surrounding corpus spongiosum causing spongiofibrosis [1]. A patient with stricture urethra most often presents with obstructive voiding symptoms. Although irritative symptoms; including frequency, urgency & dysuria may also occur [2]. Urethral strictures restrict urine flow and cause dilatation of proximal urethra and prostatic ducts [1]. One consequence of obstruction is a predisposition to recurrent urinary tract infection and prostatitis and epididymitis are also common [3]. The bladder muscle may become hypertrophied and increased residual urine

may be noted. Severe and prolonged obstruction can result in incompetence of vesicoureteric junction, vesicoureteric reflux, hydronephrosis & renal failure. Periurethral abscess & urethral fistula commonly develop in association with chronic, severe urethral stricture [1]. Excision and primary urethral anastomosis remains the optimal technique for urethral reconstruction but is limited to relatively short strictures of the bulbous urethra. Longer strictures require substitution urethroplasty [4]. Oral mucosa graft can be harvested from the inside of the cheek (buccal mucosa), the lower side of the tongue (lingual mucosa) or the inside of the lip [5]. Currently, buccal mucosa graft (BMG) is the preferred donor site for substitution urethroplasty [6]. The use of buccal mucosa graft (BMG) for urethral reconstruction was first described by Humby in 1941 [7]. After having the sleeping beauty for more than 5 decades, buccal mucosa urethroplasty experienced its renaissance after Burger *et al.*, rediscovered this technique in the early 1990s [8]. The buccal mucosa graft is composed of thick epithelium, thin lamina propria and rich vascular supply facilitating early inosculation. The graft is resistant to infection, easy to harvest, no hair follicle and a hidden donor site [9]. However, its harvesting is associated with donor site morbidities like perioral numbness, difficulty in mouth opening and dry mouth [10]. The mucosa covering the lateral and undersurface of the tongue is identical to the rest of the lining of oral cavity. In 2006, preliminary experience with lingual mucosa graft (LMG) for reconstruction of urethra reported with promising results. The use of lingual graft is effective and well tolerated in patients with urethral stricture [11]. Harvesting the graft from the lateral mucosal surface of the tongue, because the lateral aspect of tongue mucosa has no particular functional features [12]. To obtain a wider graft, preferred site of harvesting the graft is the ventral surface of the tongue according to suggestions of the oral surgeon [11]. Lingual mucosa graft seems to be associated with less postoperative pain and less risk of donor site complications [12]. The donor site complications are minimal in lingual mucosa harvesting [13]. There is no difference in morbidity at the donor site when LMG is harvested by an oral surgeon or a urologist [11]. Many studies have been reported in different part of the world to compare the outcomes and morbidities of LMG and BMG. Less published study has been found in the perspective of our country. So, keeping in mind the above scenario, I have decided to conduct a study to compare the surgical outcome and donor site morbidity of buccal versus lingual mucosa graft in anterior urethroplasty.

OBJECTIVE

General Objective

The general objective of this study was to compare the outcome and donor site morbidities of buccal mucosa graft and lingual mucosa graft urthroplasty for the treatment of anterior urethral stricture.

Specific Objectives

- To compare the pre and post-operative urine flow rate (maximum) in both graft urethroplasty).
- To compare complications at donor site such as post-operative pain, eating and drinking problem, speech impairment, peri-oral numbness, oral tightness, salivary disturbance in both group.

METHODOLOGY

This was a Quasi experimental study by using Purposive sampling method, conducted on the April 2017 to September 2018. A total number of 50 patients were Included. For group A 25 patients and for group B 25 patients. The patients who were admitted in the Department of Urology, Dhaka Medical College Hospital (DMCH) Dhaka, Bangladesh for the management of anterior urethral stricture were recruited as study population.

Inclusion Criteria

- Patients having anterior urethral stricture.
- Length of stricture > 2 cm to 6 cm.

Exclusion Criteria

- Complex stricture requiring multistage urethroplasty.
- Patient with history of urethral and urinary bladder malignancy.
- Active urinary infection.
- Patient with leukoplakia, submucosal fibrosis or malignancy of oral cavity, previous oral surgery, oral neuropathies.
- Patient with chronic retention of urine.

Study Procedure

This hospital based, quasi experimental study was conducted in the department of Urology, Dhaka Medical College Hospital from April 2017 to September 2018 to evaluate the outcome of lingual mucosal graft and buccal mucosal graft urethroplasty in anterior urethral stricture and compare donor site morbidities between the two. 50 patients with long segment anterior urethral stricture were managed with single stage free oral mucosal graft substitution urethroplasty with 6 months of follow up. All the patients were evaluated with a detailed history, physical examination and necessary imaging study. The oral cavity was also examined during the initial evaluation. All admitted patients were allocated into two groups according to every alternate sequence. In group A, patients were treated with lingual mucosa graft urethroplasty and group B patients were treated with buccal mucosa graft urethroplasty.

Data Analysis

All the collected data were compiled. Percentages were calculated to find out proportion of the findings. Further statistical analyses of the results were obtained by using computer on statistical software (SPSS) version 25.0. The results were presented in tables. Quantitative data were expressed as mean and standard deviation and compared by Student "t" test. Qualitative data were expressed as frequency and percentage, compared by chi-square (X^2) test and Fisher's exact test. A probability value (*p*) of less than 0.05 was considered to indicate statistical significance. The summarized findings were then presented in the form of tables.

Ethical Consideration

The study was approved by Ethical Clearance Committee of Dhaka Medical College.

RESULTS

A total of 50 patients with anterior urethral stricture were included in this study according to selection criteria. Patients were divided into two groups, 25 patients in group A: lingual mucosa graft and 25 patients group B: buccal mucosa graft.

Table I: Distribution of the patients according to age. (N=50)

Range of Age (year)	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
20-29 yrs.	5	20.0	4	16.0	0.881
30-39 yrs.	10	40.0	13	52.0	0.954
40-49 yrs.	7	28.0	6	24.0	0.225
50-59 yrs.	3	12.0	2	8.0	0.296
Mean ±SD	37.32 ± 8.88		37.64 ± 8.87		0.889

Table I showed the age distribution of group A mean age 37.32±8.88 years and in group B mean age 37.64±8.87. No significant difference was observed between the two groups in relation to age (p>0.05).

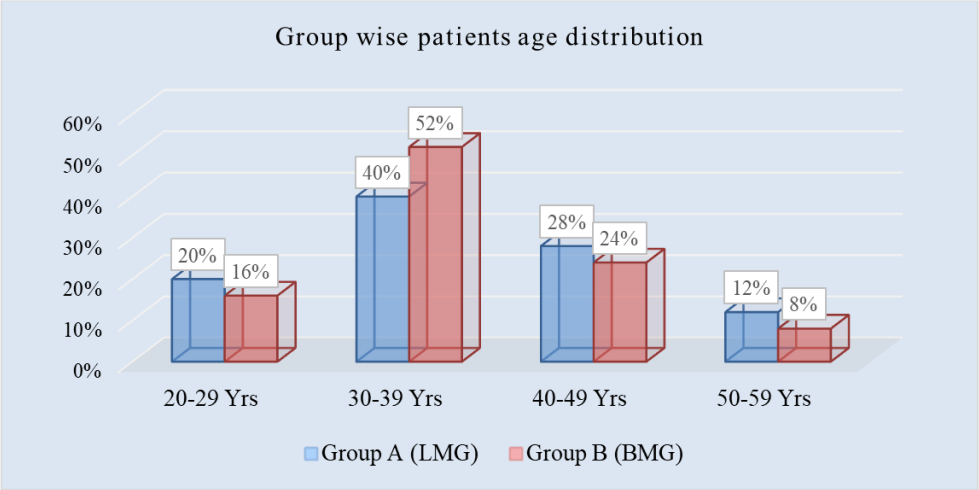


Figure 1: Bar chart showed group wise patients age distribution (N=50)

Table II: Distribution of the patients according to length of stricture (N=50)

Length (mm)	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
20-29 yrs.	2	8.0	2	8.0	0.807
30-39 yrs.	4	16.0	3	12.0	0.643
40-49 yrs.	16	64.0	14	56.0	0.926
50-59 yrs.	3	12.0	6	24.0	0.423
Mean ±SD	43.48 ± 8.05		44.88 ± 8.16		0.544

Table II showed the mean length of the stricture group A 43.48±8.05 mm and in group B 44.88±8.16 mm. Inter-group difference was not statistically significant.

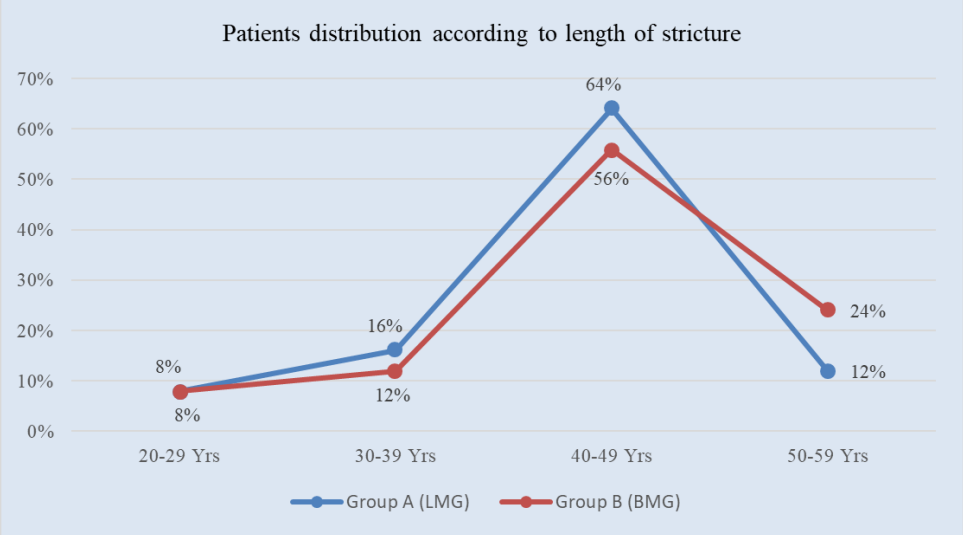


Figure 2: Line chart showed distribution of the patients group according to length of stricture (N=50)

Table III: Distribution of the patients according to site of stricture (N=50)

Location	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
Bulbar	13	52.0	15	60.0	0.818
Penile	9	36.0	8	32.0	
Bulbar and penile	3	12.0	2	8.0	

Table III showed maximum number of strictures 13(52%) were located in the bulbar part in group A and 15(60%) in group B. Penile urethral strictures were 9(36%) in group A and 8(32%) in group B. In 3(12%) in group A and 2(8%) in group B patients involved both bulbar and penile part. This was not a statistically significant difference between two groups (p value 0.818).

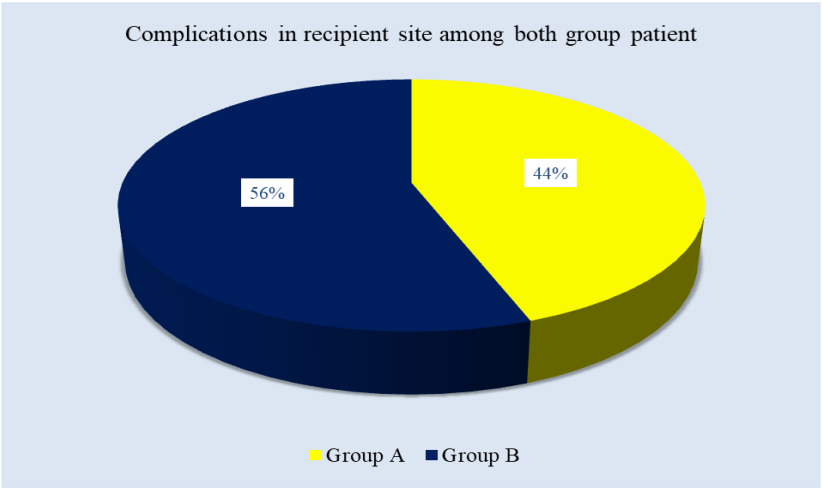


Figure 3: Pie chart showed postoperative complication at recipient site of each group Patients

Table IV: Distribution of the patients by Comparison of pain in oral cavity on 3rd postoperative day (N=50)

Pain in oral cavity	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
No pain	22	88.0	6	24.0	<.0001
Mild Pain	2	8.0	13	52.0	
Moderate pain	1	4.0	5	20.0	
Severe Pain	0	0.0	1	4.0	

Table IV showed in group A pain was mild and moderate in 2(8%) patients and 1(4%) patient respectively. In group B, pain was mild in 13(52%), moderate in 5(20%) and severe in 1(4%) patients. There was significant difference of pain at donor site on 3rd postoperative day between two groups (p value < 0.0001).

Table V: Distribution of the patients by comparison of pain in oral cavity on 7th postoperative day (N=50)

Pain in oral cavity	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
No pain	23	92.0	12	48.0	<0.0015
Mild pain	1	4.0	8	32.0	
Moderate pain	1	4.0	4	16.0	
Severe pain	0	0.0	1	4.0	

Table V showed in group A pain was mild and moderate in 1(4%) patient and 1(4%) patient respectively. In group B, pain was mild in 8(32%), moderate in 4(16%) and severe in 1(4%) patients. There was significant difference of pain at donor site on 7th postoperative day between two groups (p value <0.0015).

Table VI: Distribution of the patients by pain in oral cavity at 3rd week (N=50)

Pain in oral cavity	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
No pain	24	96.0	16	64.0	<0.010
Mild pain	1	4.0	8	32.0	
Moderate pain	0	0.0	1	4.0	

Table VI showed in group A pain in oral cavity at 3rd week was mild and moderate in 1(4%) patient. In group B, pain was mild in 8(32%), moderate in 1(4%) patients. There was significant difference of pain at donor site at 3rd week between two groups (p value <0.010).

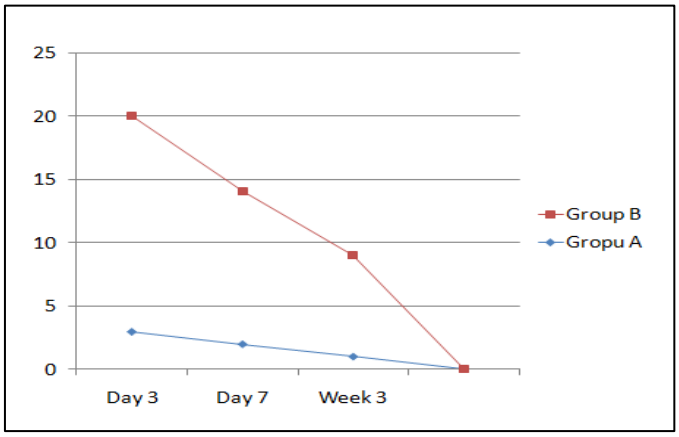


Figure 4: Line chart showed are showing pain among two groups

Table VII: Distribution of the patients by numbness on oral cavity (N=50)

Follow up for numbness	Group				p value
	Group A (LMG) (n=25		Group B (BMG) (n=25)		
	n	%	n	%	
At 7th postoperative day	3	12.0	21	84.0	<0.0001
At 3rd week	3	12.0	15	60.0	0.0009
At 3rd month	2	8.0	10	40.0	0.018
At 6th month*	1	4.0	7	28.0	0.048

Table VII showed in group A, follow up at 7th postoperative day and 3rd week numbness was present in 3(12%) patients but at 3rd month and 6th month follow up, numbness present in 2(8%) and 1(4%) patient, respectively. In group B, follow up at 7th postoperative day at 3rd week, at 3rd month and 6th month numbness was present in 21(84%), 15(60%), 10(40%) and 7(28%) respectively. Results between the two groups were

compared and found significant at 7th postoperative day and 3rd week, at 3rd month and 6th month.

Table VIII: Distribution of the patients by salivary disturbance (N=50)

Follow up for salivary disturbance	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
At 7th postoperative day	0	0.0	21	84.0	<0.0001
At 3rd week	0	0.0	16	64.0	<0.0001
At 3rd month	0	0.0	10	40.0	0.001
At 6th month*	0	0.0	7	28.0	0.014

Table VIII showed in group A, follow up at 7th postoperative day, at 3rd week, at 3rd month and at 6th month no salivary disturbance was present in any patient. In group B, salivary disturbance was present at 7th postoperative day, at 3rd week, at 3rd month and at 6th month in 21(84%), 16(64%), 10(40%) and 7(28%) patients respectively. Results between two groups were found significant.

Table XI: Distribution of the patients by uroflowmetry (N=50)

Follow up with uroflowmetry	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
At 3rd month					
Success	24	96.0	23	92.0	.551
Failure	1	4.0	2	8.0	
At 6th month					
Success	23	92.0	22	88.0	.673
Failure	2	8.0	3	12.0	

Table XI showed in group A, follow up at 3rd month and at 6th month success rate was 24(96%) and 23(92%) respectively. In group B, success rate was 23(92%) and 22(88%) respectively. Results between two groups were found not significant at 3rd month, and at 6th month.

Table X: Distribution of the patients with RGU & MCU (N=50)

Follow up with RGU & MCU	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
At 3rd month					
Success	24	96.0	23	92.0	0.551
Failure	1	4.0	2	8.0	
At 6th month					
Success	23	92.0	22	88.0	0.673
Failure	2	8.0	3	12.0	

Table X showed RGU & MCU done at 3rd month and at 6th month in both groups. In group A, at 3rd month and at 6th month stricture was found in 24(96%) and 23(92%) respectively. In Group B, at 3rd month and at 6th month stricture was found in 23(92%) and 22(88%) respectively. Results between two groups were found not significant at 3rd month, and at 6th month.

Table XI: Distribution of the patients with urethrocystoscopy (N=50)

Follow up with urethrocystoscopy	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
At 3rd month					
Success	24	96.0	23	92.0	0.551
Failure	1	4.0	2	8.0	
At 6th month					
Success	23	92.0	22	88.0	0.673
Failure	2	8.0	3	12.0	

Table XI showed urethrocystoscopy done at 3rd month and at 6th month in both groups. In group A, at 3rd month and at 6th month normal calibre urethra was found in 24(96%) and 23(92%)) respectively and stricture was found in 1(4%) and 2(8%) respectively. In group B, at 3rd month and at 6th month normal calibre urethra was found in 23(92%) and 22(88%) respectively and stricture was found in 2(8%) and 3(12%) respectively. Results between two groups were found not significant at 3rd month (p value >0.05), and at 6th month (p value >0.05).

Table XII: Distribution of the patients by overall outcome at 6th month follows up at recipient site

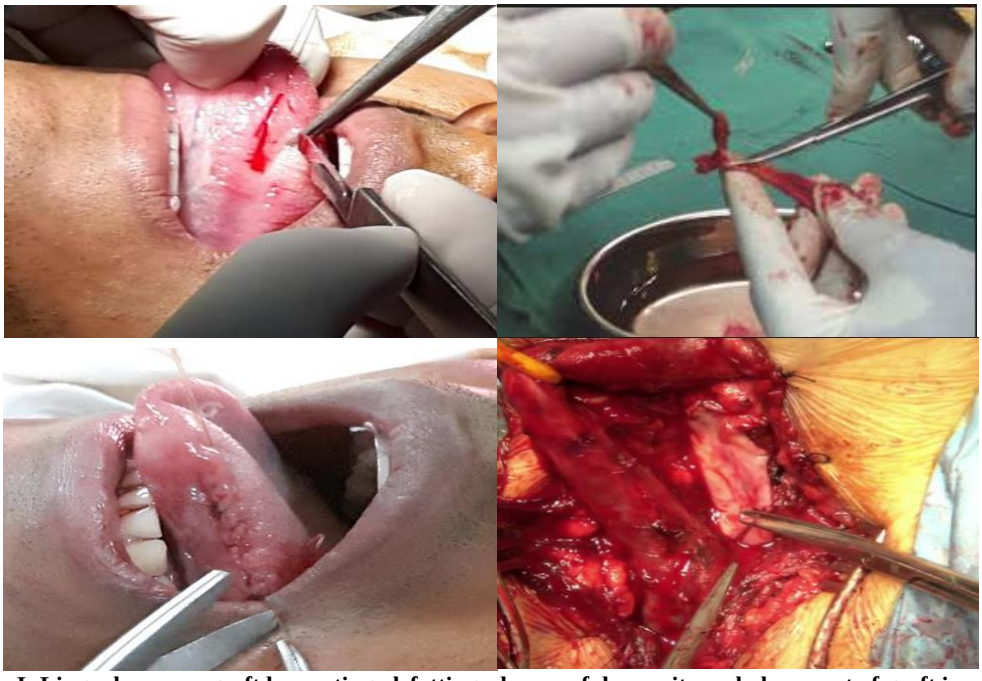
Outcome	Group				p value
	Group A (LMG) (n=25)		Group B (BMG) (n=25)		
	n	%	n	%	
Success	23	92.0	22	88.0	0.673
Failure	2	8.0	3	12.0	

Table XII showed at 6th month overall outcome between two groups were observed. In group A, success rate was 92% and in group B, success rate was 88%. Results between two groups were found not significant.

OPERATIVE PROCEDURE

Harvesting and preparation of Lingual Mucosa Graft

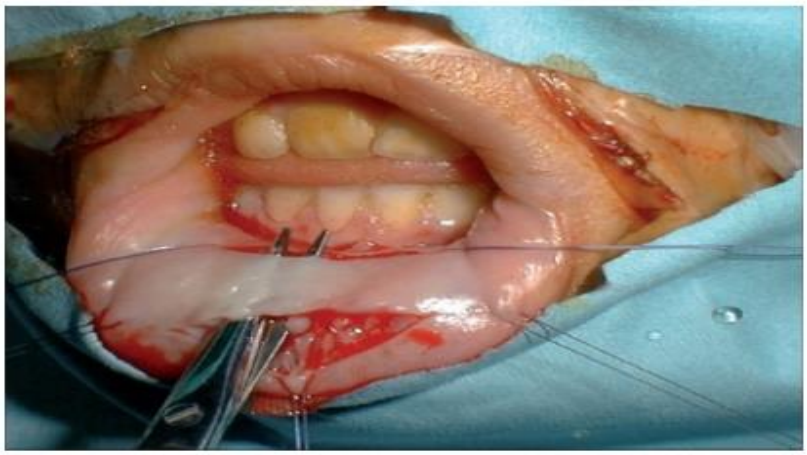
The apex of the tongue was passed through via a stich for traction outside of the mouth to expose the ventrolateral surface of the tongue. The required graft was measured and harvested from the ventral to lateral mucosal lining of the tongue. The graft was harvested unilaterally from the tongue, if large graft required, then harvested bilaterally from the tongue. The harvested graft site was infiltrated with a mixed solution of 1% lignocaine with 1:100000 adrenalines. Using a sharp knife beginning at the anterior landmark of the graft, the graft edges were incised and a full thickness mucosal graft was harvested. The donor site was carefully examined for bleeding and the donor site was closed using 4-0 polygalactin running sutures. All underlying fibrovascular tissue was completely removed until graft defatting was performed until.



Photograph- I: Lingual mucosa graft harvesting, defatting, closure of donor site and placement of graft in recipient site

Harvesting and Preparation of Buccal Mucosa Graft

For harvesting buccal mucosa graft, the length and width of uerthral gap was measured. A mouth opener was placed and equivalent area of buccal mucosa marked with marker pen on the inner aspect of cheek. A solution of 1% lignocaine with 1:100000 adrenalines were injected submucosally at proposed site for harvest. This helped as hydro- dissection of mucosa and for haemostasis. A full thickness mucosal graft was procured using a knife and sharp scissors keeping a minimum of 5 mm distance from the gingivibuccal sulcus below and parotid duct above.



Photograph- II: Harvesting buccal mucosa graft

Care was taken to avoid injury to parotid duct, underlying buccinators muscle and neurovascular bundle. The subcutaneous tissue and fat removed. Donor site was closed with a running suture or left open if large. The graft was kept in normal saline after harvesting. The area where graft was placed was checked properly that all bleeding points were controlled.

DISCUSSION

Urethral stricture is relatively common and is acquired from infection or injury. Blunt trauma to perineum causes injury to bulbar urethra. Peterson and Webster (2004) found that urological instrumentation also causes strictures anywhere in the urethra [14]. The present study was designed to compare the effectiveness of urethroplasty and donor site complications with lingual mucosa graft and buccal mucosa graft for long segment anterior utrethral stricture. 50 patients were included in this study. Thus 50 patients were analysed, 25 patients underwent lingual mucosa graft urethroplasty (group A) and 25 patients underwent buccal mucosa graft urethroplasty (group B) for anterior urethral stricture. The findings derived from data analysis leave some scope for discussion to conclude. Before comparing the outcome of interest, a statistical rigor demands that the groups should be comparable with respect to demographic and baseline characteristics that might influence the outcome. The demographic and baseline characteristics included in this study were almost identical between two groups. Age distribution of Group A was 21-57 years and group B was 21-58 years. The mean age of group A and group B were 37.32±8.88 and 37.64±8.87 years respectively. Age distribution of this study was similar with that of different international study like Asaduzzaman *et al.,* (2012) [15] showed mean age of 46, 41 and 36.6 years respectively. In this study the length of stricture was determined by retrograde urethrogram (RGU) and micturiting cystourethrogram (MCU). Mean stricture length of group A was 4.34 cm (2.6-5.9 cm) and group B was 4.45 cm (2.5-5.8 cm). Different international series of substitution urethroplasty for anterior urethral stricture, patient was selected with a stricture length of > 2 cm at bulbar part and penile part; Peterson, A.C., Webster, G.D., 2004. Wood *et al.,* (2004) showed mean stricture length >4 cm for buccal mucosa. [10, 14] Kumar *et al.,* (2008) showed mean stricture length 4.5 cm (4-6 cm) and 4.2 cm (3-10 cm) for lingual mucosa, respectively which were similar to this study. [16] Pain in the oral cavity was the predominant complaint in early postoperative period. In lingual mucosal graft urethroplasty on the 3rd postoperative day, mild and moderate pain was present in 2(8%) and 01(04%) paitents, respectively at donor site and on the 7th postoperative day, mild and moderate pain was present in 1(4%), 1(4%) patient, respectively at donor site. On follow up at 3rd week, 24(96%) patients were pain free and only 1(4%) patient had mild pain. Kumar *et al.,* (2008) showed no patient reported pain at donor site on the 7th postoperative day and Simonato *et al.,* (2006) showed just mild discomfort within the 3rd postoperative day which was different from the result of the study [12, 16]. In buccal mucosa graft urethroplasty on the 3rd postoperative day, mild and moderate pain was present in 13(52%), 6(24%) paitents, respectively at donor site and on the 7th postoperative day, mild and moderate pain was present in 8(32%), 4(8%) paitents, respectively at donor site. On follow up at 3rd week, 16(64%) patients were pain free and 8(32%) patients had mild pain and 1(4%) patients had moderate pain, respectively. At 3rd month and 6th month follow up, no patient had oral pain in both groups. This might be due to mixed closure and nonclosure of donor site, subjective variation in pain perception and inadequate analgesia. However, we only closed when this could be done without tension. Wood *et al.,* (2004) showed pain at buccal mucosa donor site in 73% (37 out of 49) patients in short term follow up (< 3 months) [10]. In lingual mucosa graft urethroplasty, follow up at 7th postoperative day and 3rd week eating problem in the form of pain in chewing were present in 4(16%) patients and persisted at 3rd month and 6th month follow up in 1(4%) patient. In buccal mucosa graft urethroplasty, follow up at 7th

postoperative day 20(80%) patients had some sorts of problem in eating and drinking. Most patients (17) complaint of pain in chewing and swallowing and food retention, whereas 6 patients had dripping of water. At 3rd week, at 3rd month and 6th month eating and drinking problem were present in 17 (68%), 10(40%) and 8(32%) respectively which is a significant difference though out entire follow up period (6 months). In lingual mucosa graft urethroplasty 12% (3 out of 25) patients complained of perioral numbness at 7th postoperative day and at 3rd week, but follow up at 3rd month and 6th month only 2(8%) and 1(4%) patient, respectively complaint of perioral numbness. Kumar *et al.,* (2007) showed 2 (6.6%) patients reported perioral numbness in first follow up after 1 month and subsided by the second [17]. In buccal mucosa graft urethroplasty, follow up at 7th postoperative day, 3rd week, 3rd month and 6th month numbness was present in 84%,60%,40% and 28%, respectively. Dublin and Stewart (2004) showed numbness in 26 % (15 out of 49) and 16% (5 out of 30) patients in long term follow up (≥ 6 months) [18]. Perioral numbness was related to a reduction in sensation in the site of graft harvest and was an unavoidable consequence of excision of mucosa. In lingual mucosa graft urethroplasty, no patient had complaint of oral tightness. Kumar *et al.,* (2007) revealed similar results. In buccal mucosa graft urethroplasty, oral tightness was present more frequently at 7th postoperative day, at 3rd week, 3rd month and 6th month in 88% (22 out of 25), 64% (16 out of 25), 44%(11 out of 25) and 32% (8 out of 25) patients, respectively [17]. This is logical as the buccinator muscle is involved in mouth opening where the lingual muscle is not. Moreover, the mouth opening and width varies according to age and from person to person. Our observation is in line with other studies like Wood *et al.,* (2004) [10] showed 67% (38 out of 49) patients in short term follow up (<3 months) and Dublin and Stewart (2004) [18] revealed oral tightness in 32% patients even after mean follow up of 20.9 months. Speech impairment between two groups was not statistically significant. In lingual mucosa graft urethroplasty, no patient had complaint of salivary disturbance. Lumen *et al.,* (2016) [20] showed salivary disturbance in 17.2% (5 out of 29) patients in short term follow up (< 3 months) which were lower than my study results. This dissimilarity might be due to environmental influences, subjective variation of salivation. Uroflowmetry showed Q max varied from 4.2 to 8 ml/sec in this series preoperatively. Follow up at 3rd month and 6th month, success rate (≥ 15 ml/sec) in lingual mucosa graft was 96% (24 out of 25) and 92% (23 out of 25), respectively. Follow up at 3rd month and 6th month, success rate (≥ 15 ml/sec) in buccal mucosa graft was 92% (23 out of 25) and 88% (22 out of 25), respectively. Success rate of my study were quite similar to other studies. In lingual mucosa graft urethroplasty, Simonato *et al.,* (2006) [12] showed urinary flow rate improved from 6% (4 to 8.9) ml/sec to 34.3% (19.1 to 44.2) ml/sec by uroflowmetry and success rate 87.5% (7 out of 8) at 3rd month follow up. Barbagli *et al.,* (2008) [11] showed 90% (9 out of 10) success rate of lingual mucosa graft on average follow up of 5 months (3 to 12 months). In this series during RGU and MCU and urethrocystoscopy at 3rd month and at 6th month, stricture noted in 1 (4%) patient and 2 (8%) patients respectively in lingual mucosa graft. In buccal mucosa graft, at 3rd month and at 6th month RGU and MCU and urethrocystoscopy revealed 2 (8%) and 3(12%) patients, respectively. Simonato *et al.,* (2006) [12], Das *et al.,* (2009) [21] showed 12.5% and 16.7 % recurrent stricture in lingual mucosal graft urethroplasty which is comparable to this study. In the present study, the overall success rate of lingual mucosa graft urethroplasty was 92% and buccal mucosa graft urethroplasty was 88%. Overall success of buccal mucosal graft urehtroplasty was similar in other studies, Xu *et al.,* (2009) [13] success rate of buccal mucosal graft urethroplasty were 86.6% and 92% respectively. The overall outcome of lingual mucosa graft urehtroplasty was also similar in other study, Das *et al.,* (2009) also reported success rate of 87.5%, 83.3% and 90% respectively [21]. We also observed bleeding from buccal mucosa graft site only in one patient which needed revision and coagulation with bipolar diathermy and wound infection occurred in perineal wound in 4 patients in lingual mucosa graft urehtroplasty and in 5 patients in buccal mucosal graft urethroplasty. All patients were treated conservatively and improved. In the present study, we harvested mucosa from lower lip in 3 cases and one of the patients developed inversion of lip vermilion by secondary healing (non- closure). In this study, it was observed that the mucosa of the tongue, which is identical to the mucosa of the rest of the oral cavity, is a safe and effective graft material in urethral reconstruction with potential minor risks of donor site complications.

CONCLUSION

This study was aimed to evaluate the outcome and donor site morbidities of buccal mucosa graft and lingual mucosa graft urthroplasty for the treatment of anterior urethral stricture. We conclude that lingual mucosa graft urothroplasty has similar outcome like that of buccal mucosa graft urethroplasty with less donor site morbidities. Therefore, lingual mucosa graft urethroplasty should be preferred to buccal mucosa in the management of anterior urethral stricture.

Limitations of the Study

It was a single centre study with small sample size. The Heterogeneity of surgeons.

RECOMMENDATION

Preliminary results with lingual mucosa graft urethroplasty for treatment of anterior urethral stricture are encouraging. A large multicentre study is required for further evaluation of this graft source against buccal mucosa.

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