



ANALYSIS OF FUNCTIONAL OUTCOME OF BUCCAL MUCOSAL GRAFT URETHROPLASTY- A PROSPECTIVE STUDY FROM TERTIARY CARE CENTRE IN NORTH INDIA

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ABSTRACT

Introduction-Buccal mucosal graft urethroplasty (BMGU) is most commonly performed surgery for urethral stricture disease. Postoperatively alterations in urinary and sexual function have an impact on the patient's satisfaction. This study mainly focuses on functional outcomes of urethroplasty and its impact on the patient's satisfaction with the procedure. **Methods**-42 patients operated at Government Medical College, Kota with BMGU between December 2019 and November 2021 were included. Functional outcome assessment of urinary and sexual function was done using validated questionnaires (IPSS, IIEF-5 and USS-PROM) pre and 6 months postoperatively. **Results**-Out of 42 patients, median age was 55 years, median stricture length was 5cm and stricture locations were bulbar, penile and pan urethral in 76.8%, 11.9% and 11.9% respectively. Three patients suffered recurrence. The preoperative and 6 month postoperative mean Qmax was 5.83 mL/s and 24.92 mL/s ($p < 0.001$); mean IPSS were 24 and 6 ($p < 0.001$); mean IIEF-5 scores were 15 and 12 ($p = 0.11$) respectively. Based on USS PROM, postoperative improvement of QoL and satisfaction with BMGU was found in 85.7% and 90.4% patients respectively. **Conclusion**-BMGU causes significant improvement in urinary flow, IPSS and quality of life with slightly decreased erectile function. Functional outcome should be assessed when urethroplasty is performed.

KEYWORDS :

INTRODUCTION

Urethral stricture disease causes obstructive and irritative voiding symptoms that have a major impact on the patient's quality of life. The different techniques of urethroplasty in the management of urethral stricture disease are well described in literature (1-3).

Among various procedures, autologous buccal mucosa currently remains the most commonly used graft for substitution urethroplasty, due to its favourable availability, simple processing and durable integration in the urethra [4].

The primary outcome parameter of studies assessing different techniques of urethroplasty has been stricture recurrence. The need for further instrumentation or reoperation is considered a stricture recurrence by the majority of urologists. Erectile dysfunction, persistent postoperative pain and postvoid dribbling can also be there.

All these possible alterations in urinary and sexual function might have an impact on the patient's satisfaction with the procedure. It has previously been reported that patient's satisfaction is not always the same as what the surgeon defines as success (5).

This study mainly focuses on functional outcome of urethroplasty and its impact on the patient's satisfaction with the procedure.

MATERIAL AND METHODS

Forty two patients who underwent BMGU for urethral stricture disease at Government Medical College, Kota (India) from December 2019 to November 2021 and giving written informed consent were included. Patient's refusal to participate in the study was an exclusion criterion.

Preoperative evaluation included history taking, physical

examination, uroflowmetry and urethrography. BMGU has previously been described extensively [6, 7]. In brief, based on the location and length of the urethral stricture, single-stage or two-stage BMGU was performed.

The urinary catheter was removed after 3 weeks when a voiding pericatheter urethrography showed absence of extravasation. Follow-up in this study was done after 6 months with history taking and uroflowmetry. In case of clinical symptoms and/or a maximum urinary flow (Qmax) < 15 mL/s, an urethrography was performed.

Stricture recurrence was defined as the need for any further instrumentation or reoperation. The functional outcome on urinary and sexual function was assessed using validated questionnaires that were offered to the patient before operation and at 6 months follow-up visits. These questionnaires were:

The International Prostate Symptom Score (IPSS) assesses the patient's lower urinary tract symptoms. This score is mainly used for the evaluation of symptoms in patients with benign prostatic hyperplasia. Seven questions with 6 possible answers are asked leading to a score from 0 (no symptoms) to 35 (very severe symptoms) [8].

The International Index of Erectile Function- 5 (IIEF-5) assesses the patient's erectile function. Five questions were asked with 5 possible answers leading to a score from 5 (severe erectile dysfunction) to 25 (normal erectile function) [9]. Only patients that were sexually active were asked to complete this questionnaire

At 6 month follow-up visit the patients were also asked to score their satisfaction with the urethroplasty using USS-PROM addressing voiding symptoms, patients' satisfaction and health related quality of life (HRQoL) [10]

Statistical Analysis

Erectile function, voiding symptoms, and HRQoL were assessed by questionnaires. Patients' satisfaction with BMGU was assessed with the question "Are you satisfied with the outcome of BMGU?" with the following answering possibilities: "very satisfied", "satisfied", "undecided", "dissatisfied" and "very dissatisfied". Only patients answering "very satisfied" or "satisfied" were classified as satisfied with BMGU.

The software program SPSS (version 25, SPSS Incorporated, Chicago, Illinois, USA) was used for statistical analysis. Frequency and percentages were used to summarize categorical variables. Mean and standard deviation were computed for numerical variables. Paired 't' test was applied for comparing IPSS and IIEF scores pre and postoperatively and 'p' value of <0.05 was taken as significant.

RESULTS

Out of 42, median patient's age was 55 years (range: 17-65 years), median stricture length was 5 cm (range: 1-12 cm) and stricture locations were bulbar in 76.8%, penile and pan urethral in 11.9% each. Etiologically strictures were idiopathic, iatrogenic, inflammatory and lichen sclerosis in respectively 24, 13, 4 and 1 patient. 25 patients had previous interventions which were intermittent dilations, one or more internal urethrotomies and urethroplasty in respectively 6, 15 and 4 patients. (Table 1)

Table 1 Clinical Characteristics Of 83 Patients With Urethral Stricture Disease Treated With BMGU

Age years [median (range)]	55 (17; 65)
Location of the stricture patients (%)	
Bulbar urethra	32 (76.8)
Penile urethra	5 (11.9)
Panurethral	5 (11.9)
Length of the stricture cm [median (range)]	5 (1; 12)
Procedure patients (%)	
Single-stage	40 (95.4)
Two-stage	2 (4.6)
Previous surgical urethral interventions patients (%)	25 (59.5)
Direct visual internal urethrotomy	15 (35.7)
Urethroplasty	4 (9.5)
Dilatation	6 (14.2)

Three patients suffered recurrence during the study period. The preoperative mean Qmax was 5.83 mL/s (range: 0-7 mL/s) which rose to 24.92 mL/s (range: 7-48.9 mL/s) 6 months postoperative. This amelioration was statistically significant (p < 0.001).

Table 2 IPSS And IIEF-5 scores

	Preoperative	Postoperative (6 months)	p-value
IPSS score Mean (+/-SD) (Range 0-35)	24 (+/-6.1)	6 (+/- 4.2)	(< 0.001)
IIEF-5 score Mean (+/-SD) (Range 25-5)	15 (+/-4.8)	12 (+/-4)	0.11 (not significant)

The mean IPSS preoperative and 6 months postoperative were respectively 24 and 6 which was significantly better compared to the preoperative score. (Table2) Comparing the 3 patients with a recurrence versus the other patients, there was a higher 6 months (15 vs 6) IPSS in the patients with a recurrence.

Thirty five patients were sexually active and filled in the IIEF-5 questionnaire. The mean IIEF-5 scores preoperative and 6 months postoperative were respectively 15 and 12. There was

worsening in IIEF-5 scores preoperative versus 6 months postoperative but it didn't reach statistical significance. Twenty patients (60.3%) had erections with normal or slightly reduced rigidity. Eighteen patients (51.8%) had a normal or slightly reduced ejaculate volume and 4 patients (10.8%) had painful sensations during ejaculation. In total, 2 patients (8.4%) described a strong impairment of sexuality. Severe penile shortening, penile curvature and hypoesthesia of the glans or scrotum were reported by 1 patient (2.4%).

Table 3 HRQOL Scores

Health related quality of life	
ICIQ-MLUTSqol	35 (83.5)
Urinary symptoms interfere with life – a little or not at all [patients (%)]	
Surgical outcome	
USS PROM: improvement of quality of life [patients (%)]	36 (85.7)
USS PROM: satisfaction with surgical procedure [patients (%)]	38 (90.4)

Based on USS PROM, 36 patients (85.7%) and 38 patients (90.4%) reported improvement of HRQoL and satisfaction with the surgical procedure, respectively. 83.5% patients had no or little interference of urinary symptoms with life postoperatively.

DISCUSSION

Qmax and IPSS-

Reconstruction of a normal urethral diameter should lead to a normalisation of the urinary flow and a reduction of lower urinary tract symptoms. In this study, a significant improvement of Qmax was observed at 6 months after urethroplasty. Moreover, successful cases had a significantly better Qmax compared to the failures. These findings suggest that uroflowmetry is a useful examination in the follow-up of patients after urethroplasty. A significant positive correlation between Qmax and urethral diameter has been reported by Heyns and Marais [8]. Although IPSS was initially designed and validated for BPH but it can be used to evaluate other causes of lower urinary tract obstruction also. The drawback of the use of both maximum urinary flow and IPSS is the lack of specificity for recurrence of urethral stricture disease [11]. Other factors affecting the lower urinary tract such as BPH, dysfunctional voiding and neurogenic bladder can also explain a persistent low Qmax and high IPSS. Nevertheless, rapid deterioration of Qmax and IPSS, especially in young and otherwise healthy patients should be considered as a sign of stricture recurrence and justifies further and more invasive examinations (Two tier approach)[12]

IIEF-

The median IIEF-EF score showed mild erectile dysfunction, and a relevant proportion of patients reported erections with reduced rigidity. Other impairments of sexual function comprised reduced ejaculate volume, painful ejaculation, penile shortening and curvature as well as hypoesthesia of the glans or scrotum, which corresponds to previously reported findings [6,13,14]. However, more than 90% of patients did not report a strong deterioration of their sexuality. Other authors have previously shown variable impairment of sexual function and IIEF scores following BMGU [6,15-17]. These alterations in sexual function may have several explanations: in deep bulbar urethroplasty, dissection in the space between the cavernosal bodies just under the pubic arch can damage the cavernosal nerves at the site where they perforate the urogenital diaphragm. Moreover, extensive dissection of the corpus spongiosum can lead to penile shortening and chordee certainly if done beyond the level of the penoscrotal angle. Extensions of the perineal nerves to the frenular area are described and there damage can lead to an altered sensation of this normally highly sensitive frenular area.

Patient Satisfaction-

Mean patient satisfaction after urethroplasty in this series was high. The patient satisfaction is not the same as what the surgeon defines as success. Voiding symptoms including post-micturition dribbling and streaking the urethra were quite frequently reported in the present study but were not considered bothersome by patients. This discrepancy may indicate that patients do not consider these symptoms to be bothering. Based on ICIQ-MLUTSqol, more than 80% of patients reported that urinary symptoms did not interfere with life, which is comparable to the results of earlier studies [18]. Although PROM does not allow an objective assessment of surgical complications, it adds crucial information on patients' subjective morbidity, including voiding symptoms, erectile function, pain and health-related QoL following BMGU.

CONCLUSION

In patients with urethral stricture disease, BMGU offers excellent outcome, success and quality of life, independent of previous urethral interventions, patient's age and stricture length. However patients should be counselled on morbidity of BMGU, including voiding symptoms, pain and impairment of sexual and erectile function prior to surgery. Functional outcome should be assessed after urethroplasty. Studies with more patients and a longer follow-up are needed to assess the long-term functional outcome.

Abbreviations-

BMGU: Buccal mucosal graft urethroplasty, ICIQ-MLUTSqol: LUTS-specific QoL Questionnaire, Question of Incontinence Questionnaire, Male Lower Urinary Tract Symptoms Module; IIEF: International Index of Erectile Function; PROM: Patient Reported Outcome Measure; QoL: Quality of life

Conflict Of Interest- None declared.

Informed Consent- Informed consent was obtained from all individual participants included in the study.

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