

A Retrospective Study on Female Dorsal Buccal Mucosa Graft Urethroplasty in a Tertiary Care Centre

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Received: 25-08-2023 / Revised: 23-09-2023 / Accepted: 18-10-2023

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Conflict of interest: Nil

Abstract:

Background: Urethral abnormalities and conditions in female patients pose complex challenges in urological care. Dorsal buccal mucosa graft urethroplasty has emerged as a transformative solution, particularly in specialized tertiary care centers. This study aims to evaluate its effectiveness and long-term outcomes in addressing urethral strictures.

Methods: A retrospective analysis of prospectively maintained data was conducted. Female patients undergoing buccal graft urethroplasty for urethral strictures after January 2020 were included. Inclusion criteria encompassed moderate to severe lower urinary tract symptoms (LUTS) and a willingness to undergo surgical intervention. Data collection involved clinical assessments, urine routine and culture, uroflowmetry, post-void residual urine volume (PVR) estimation, voiding cystourethrography (VCUG), and urethrocystoscopy.

Results: Initial presentation indicated mean AUA scores of 27.2, Qmax of 3.8 ml/s, and PVR of 133 ml. Successful voiding was achieved post-catheter removal, with marked improvements in AUA score, uroflowmetry, and PVR. Nine patients underwent extended follow-up, exhibiting consistent enhancements in AUA score, Qmax, and PVR at various time points. Two patients reported irritative voiding symptoms that spontaneously resolved. No complications occurred at the donor site, and incontinence did not develop.

Conclusion: Dorsal buccal mucosa graft urethroplasty demonstrates promise as an effective solution for female urethral strictures, particularly in tertiary care centers. The procedure yields significant improvements in urological parameters and presents a low-risk profile. While further research is needed, these findings underscore the transformative potential of this approach in enhancing patient well-being.

Recommendations: Larger-scale, longer-term studies are warranted to validate these outcomes fully. Enhanced awareness and referral systems for female urethral strictures should be developed, ensuring broader access to reconstructive urological care.

Keywords: Female urethral stricture, dorsal buccal mucosa graft urethroplasty, tertiary care centre, long-term outcomes.

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Introduction

Urethral abnormalities and conditions in female patients represent a complex and often under-addressed aspect of urological care. In recent years, the utilization of female dorsal buccal mucosa grafts for urethroplasty has emerged as a transformative solution within the field of reconstructive urology [1, 2]. Tertiary care centres, equipped with specialized expertise and state-of-the-art facilities, have played a crucial role in advancing the application of this surgical technique [3]. The introduction of dorsal buccal mucosa graft urethroplasty has not only provided hope and relief to women grappling with various urethral issues but has also paved the way for enhanced treatment outcomes and improved patient well-being.

The buccal mucosa graft, derived from the inner lining of the cheek, possesses unique qualities that make it an ideal choice for urethral reconstruction in female patients. Its thin and pliable nature allows for precise graft placement and adaptation, minimizing complications and ensuring optimal function post-surgery [4, 5]. Moreover, its rich vascularization promotes graft viability and reduces the risk of graft-related complications, such as stricture recurrence [6]. This procedure, performed within the controlled and specialized environment of tertiary care centres, allows surgeons to harness the full potential of the buccal mucosa graft technique, resulting in higher success rates and patient satisfaction [7].

Within the context of a tertiary care centre, patients undergoing female dorsal buccal mucosa graft urethroplasty can benefit from a multidisciplinary approach to care. These centres often bring together a team of skilled urologists, reconstructive surgeons, anesthesiologists, and nursing staff, all with a deep understanding of the complexities associated with urethral reconstruction. This collaborative effort ensures that patients receive comprehensive preoperative evaluation, meticulous surgical intervention, and attentive postoperative care, ultimately optimizing their experience and long-term outcomes.

The aim of this study is to assess the effectiveness and long-term outcomes of female dorsal buccal mucosa graft urethroplasty for the management of urethral strictures in a tertiary care centre setting.

Methodology

Study Design: This study is a retrospective analysis of prospectively maintained data.

Study Setting: The study was conducted at I.G.I.M.S.

Participants: The study included female patients who underwent buccal graft urethroplasty to address urethral strictures after January 2020.

Inclusion Criteria:

- Female patients presenting with moderate to severe lower urinary tract symptoms (LUTS).
- Diagnosis of bladder outlet obstruction (BOO) due to urethral stricture.

- Willingness to undergo surgical intervention.

Exclusion Criteria:

- Male patients.
- Patients with mild LUTS.
- Patients not willing to undergo surgical intervention.

Bias: To minimize bias, patient selection was based on clear inclusion and exclusion criteria, and data were collected and analyzed retrospectively.

Variables: Variables included Buccal graft urethroplasty, Preoperative parameters, postoperative outcomes.

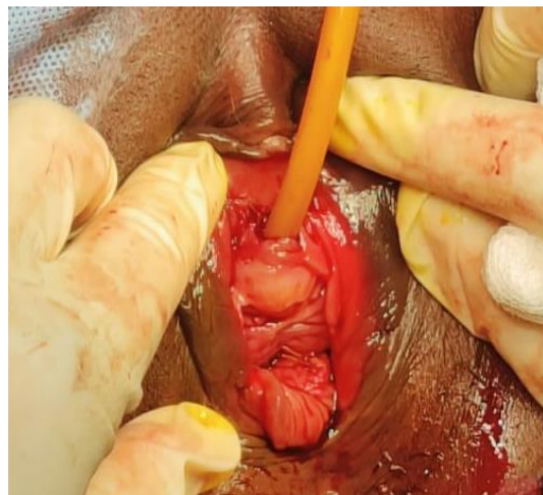
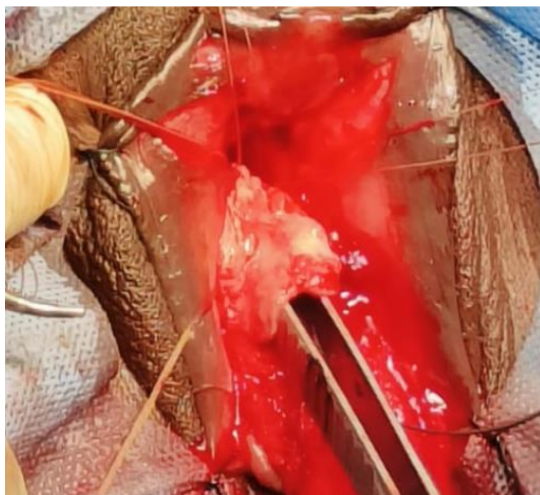
Data Collection:

Data were collected prospectively and included:

- Clinical assessment.
- Urine routine and culture results.
- Uroflowmetry measurements.
- -Post-void residual urine volume (PVR) estimations.
- Voiding cystourethrography (VCUG) findings.
- Urethrocystoscopy results and calibration of the urethra.

Methodology

Buccal graft urethroplasty was performed on eligible patients. Follow-up assessments included voiding trials, 3, 6, 12, and 18-month evaluations of AUASS, uroflowmetry, and PVR, as well as VCUG examinations when recurrence was suspected.



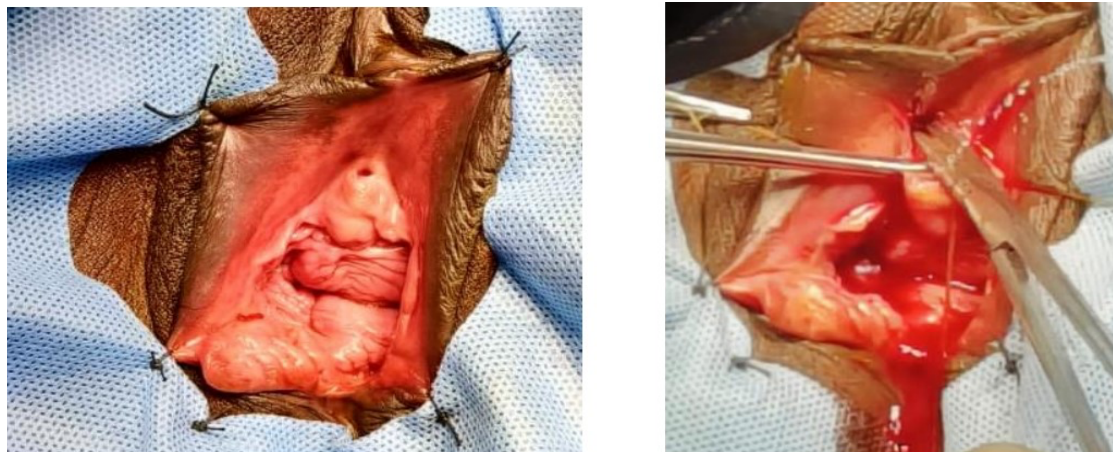


Figure 1: Operative techniques

Preoperative Parameters:

The following preoperative parameters were recorded for each patient:

| PT NO. | AGE (yr) | AUASS | MAXM FLOW (ml/s) | VCUG | PVR (ml) |
|--------|----------|-------|------------------|------|------------|
| 1 | 45 | 20 | 4 | US | 100 |
| 2 | 52 | 24 | 3 | US | 120 |
| 3 | 48 | 28 | 2 | US | 110 |
| 4 | 45 | 26 | 6 | US | 140 |
| 5 | 46 | 30 | 4 | US | 260 |
| 6 | 50 | 28 | 5 | US | 150 |
| 7 | 34 | 26 | 3 | NON | DIAGNOSTIC |
| 8 | 46 | 28 | 7 | US | 90 |
| 9 | 48 | 30 | 4 | US | 80 |
| 10 | 40 | 32 | 4 | NON | DIAGNOSTIC |

Statistical Analysis: Descriptive statistics were used to summarize preoperative parameters. Continuous variables were presented as means \pm standard deviations. Categorical variables were presented as frequencies and percentages.

Ethical Considerations: This study was conducted following ethical guidelines and with approval from the Ethics Committee. Patient data were anonymized to ensure confidentiality and compliance with privacy regulations.

Result

Table 1: Preoperative Parameters

| Parameters | Preoperative | 3rd Month | 12th Month | 18th Month |
|---------------------|--------------|-----------|------------|------------|
| Mean AUA | 27.2 | 7.8 | 8 | 8 |
| Mean Qmax (ml/s) | 3.8 | 20 | 18 | 16 |
| Mean PVR (ml) | 133 | 18 | 20 | 26 |
| Mean Age of Patient | 45.4 years | | | |

At the initial presentation, the mean AUA score, Qmax, and PVR were 27.2, 3.8 ml/s, and 133 ml, respectively. All ten women exhibited successful voiding following catheter removal on the 21st postoperative day, experiencing a substantial improvement in AUA score, uroflowmetry, and PVR. The maximum follow-up period for patients was 18 months.

One patient was lost to follow-up after 3 months, leaving nine patients for evaluation. The remaining

nine patients demonstrated a significant improvement in AUA score, Qmax, and PVR at the time of catheter removal and during the 3rd, 6th, 12th, and 18th months. Two patients reported irritative voiding symptoms at catheter removal, which completely and spontaneously resolved within a week. No complications were observed at the donor site. None of the patients developed stress or urge incontinence during the study period.



Figure 2: Pre- and post-operative MCU

Discussion

Concerns have been raised regarding the dorsal approach to urethral procedures, primarily due to the potential risk of damaging the neurovascular bundles to the clitoris. The clitoral neurovascular bundles have a significant anatomical separation from the dissection area, as they ascend along the ischiopubic ramus, eventually running along the cephalad surface of the clitoral body toward the glans. This separation reduces the likelihood of inadvertent damage during dorsal dissection.

The external striated muscle sphincter, which surrounds the urethra, assumes a horseshoe shape, with its greatest thickness located on the ventral aspect of the urethra, while the dorsal aspect tends to be thinner or even absent. This unique anatomical configuration allows for a dorsal dissection approach along the clitoral body, specifically in a region where there are relatively few fibers of the striated muscle sphincter. Consequently, the risk of damage to the sphincter during the procedure is minimized.

In our patient series, nearly all women had previously undergone dilation as a treatment for urethral stricture. This prevalence of dilation therapy highlights an important issue in the management of female urethral strictures, as dilation has been associated with relatively poor success rates. The marked difference in success rates between dilation and urethroplasty suggests a gap in patient care. It raises questions about whether females with urethral strictures are either not being referred to reconstructive surgeons or lack access to specialists capable of performing urethral reconstruction.

In accordance with our department's policy, we initiate treatment for female urethral strictures with urethral dilatation. However, should the patient experience a recurrence, we then provide them with the option of undergoing urethroplasty. Our study reported a mean hospital stay of 7 days for patients

undergoing dorsal buccal mucosa graft urethroplasty. Despite the study's limitations and relatively short duration, the results were generally satisfactory. Nevertheless, we recognize the need for larger studies with longer-term follow-ups to further assess the effectiveness of this approach.

Several studies in the field of urology have explored the outcomes of urethroplasty procedures for female urethral strictures, shedding light on the effectiveness and long-term results of various surgical techniques. Notable among these studies is the work by [1], which conducted a long-term follow-up of bulbar end-to-end anastomosis in a single-centre experience. Similarly, [2] introduced a novel technique of buccal mucosal graft urethroplasty for proximal bulbar urethral strictures. [6] delved into the outcomes of dorsal buccal mucosa graft urethroplasty for female urethral stricture disease, while [7] examined the efficacy of buccal mucosal urethroplasty for strictures related to balanitis xerotica obliterans. [8] explored dorsal graft urethroplasty as a treatment option for female urethral strictures. Furthermore, [9] and [10] reviewed surgical techniques and reconstructive approaches in women, contributing to the understanding of this complex field. These studies collectively offer valuable insights into the management of female urethral strictures, encompassing surgical techniques, outcomes, and long-term follow-up, thereby enriching the existing knowledge in this domain.

Conclusion

In summary, our study highlights dorsal buccal mucosa graft urethroplasty's potential as an effective solution for female urethral strictures in a specialized tertiary care center. Despite complex initial presentations (mean AUA scores 27.2, Qmax 3.8 ml/s, PVR 133 ml), all ten patients achieved successful voiding post-catheter removal, with significant improvements in AUA score, uroflowmetry, and PVR. Extended 18-month

follow-up with nine patients showed consistent improvements. Notably, two patients resolved irritative voiding symptoms within a week, and no complications or incontinence developed. Despite study limitations, these findings underscore the transformative potential of this procedure in female urethral stricture management.

Limitations: The limitation of this study is that the findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

Recommendations: Larger-scale, longer-term studies are warranted to validate these outcomes fully. Enhanced awareness and referral systems for female urethral strictures should be developed, ensuring broader access to reconstructive urological care.

Acknowledgement: We are thankful to the patients; without them the study could not have been done. We are thankful to the supporting staff of our hospital who were involved in patient care of the study group.

List of abbreviations:

1. AUA - American Urological Association
2. Qmax - Maximum Flow Rate
3. PVR - Post-Void Residual
4. US - Urethral Stricture
5. VCUG - Voiding Cystourethrography

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