

Buccal Mucosal Graft Usage in Anterior Stricture Urethra in Our Institution

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ABSTRACT

Introduction: Urethral strictures are difficult to manage. Some treatment modalities for urethral strictures are fraught with high patient morbidity and stricture recurrence rates; however, an extremely useful tool in the armamentarium of the Reconstructive Urologist is buccal mucosal urethroplasty. **Aim:** To analyze the outcome of surgical procedure for anterior urethral stricture and to analyze complication associated with buccal mucosal graft and its management.

Material and Methods: This prospective study was conducted in patients admitted in Department of Urology, Government Pudukottai Medical College Hospital, with clinical diagnosis of urethral stricture from January 2017. The mean length of stricture was 3.6 cm. Patients with bulbar, penile, or bulbopenile strictures received one-stage dorsal free graft urethroplasties.

Results: Mean follow-up was 15 mo. One-stage bulbar and penile urethroplasties without meatal involvement had an 81.8–100% success rate. Bulbo penile urethroplasties were successful in 60% of the cases, whereas one-stage urethral reconstructions in patients with meatal involvement were successful in 66.6%.

Conclusion: Buccal mucosa graft for urethral stricture reconstruction yield reproducibly excellent results with minimal morbidity and low complication rates. Longer followup will be required to confirm the durability of our results. Buccal mucosal graft for dorsal onlay or augmentation urethroplasty gives rewarding results in anterior urethral strictures.

Keywords: Buccal Mucosa, Graft, Urethral Strictures, Urethroplasty

INTRODUCTION

Management of intractable anterior urethral strictures poses a continuing urological challenge. Buccal mucosal graft (BMG) urethroplasty has been the gold standard in the past decade for substitution urethroplasty, and the medium-term results have been good.^{1,2} Traditionally, grafts have been placed on the ventral aspect of the urethra, because it allows easier access and better visualisation of the stricture, and ventrally placed grafts are likely to be associated with a higher rate of graft failure and diverticulae formation.^{3,4} Barbagli et al introduced dorsally placed grafts and postulated that dorsal placement is advantageous because the underlying corpora gives better mechanical support for the graft as well as blood supply.⁵

Asopa et al. described a ventral sagittal urethrotomy approach for dorsal free-graft urethroplasty and claimed that the procedure is easier to perform and better because

the urethra is not mobilised.⁶ Malone described a similar approach as a salvage procedure in the management of meatal and urethral stenosis following hypospadias repair.⁷ We report our ongoing experience with the Asopa technique for intractable anterior urethral strictures.

Study aimed to analyze the outcome of surgical procedure for anterior urethral stricture and to analyze complication associated with buccal mucosal graft and its management.

MATERIAL AND METHODS

This prospective observational study was conducted in patients admitted in Department of Urology, Government Pudukottai Medical College Hospital, with clinical diagnosis of urethral stricture. Inclusion criteria: age group less than 50 years, inflammatory strictures on SPC, long strictures, BXO.

Exclusion criteria: post traumatic strictures, complex urethral strictures, complicated stricture cases. 12 cases of anterior urethral stricture were included in the study. Age, Etiology, clinical features, AUG, Opposing Urethrogram, Surgery, pre and post operative uroflowmetry, pericatheter study, Follow up AUG, and Cystoscopy. Detailed history, physical examination, investigations –complete hemogram, urine analysis, renal function test, plain x-ray kubu, AUG, USG KUB, MCU, opposing urethrogram, uroflow pre and postoperative period were collected.

RESULTS

12 cases of anterior urethral stricture were included in the study. Majority of the patients are below 35 years. Almost all strictures for which a cause can be identified are acquired. The largest group is iatrogenic and result from urethral manipulations (traumatic indwelling catheter, transurethral interventions, correction of hypospadias, prostatectomy, brachytherapy). Around 30% of urethral strictures are idiopathic. Bulbar strictures are most common (around 50%), followed by penile strictures (around 30%) and strictures of the navicular fossa (around 20%). Strictures in the posterior urethra are rare and result either from traumatic urethral

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Clinical Features	Number of Cases
Thin Stream	8
Strain to Void	10
Slow Void	10
Incomplete Void	7
Acute Urinary Retention	5
Increased frequency	12
BXO changes	4
Supra pubic cystostomy	12
AUG and opposing urethrogram	12

Table-1: Distribution of clinical features

rupture or from radiotherapy for prostate cancer. In our cases 8 patients are present in our hospital without any cause and BXO changes present in 4 cases.

- The mean stricture length in these 12 patients (range: 2–7.5 cm).
- Bladder-Normal Mucosa, capacity.
- Barbagli Urethroplasty With Dorsal Onlay – 9 Cases
- Augmented Urethroplasty – 3 Cases.

Under GA, through midline perineal incision, corpus

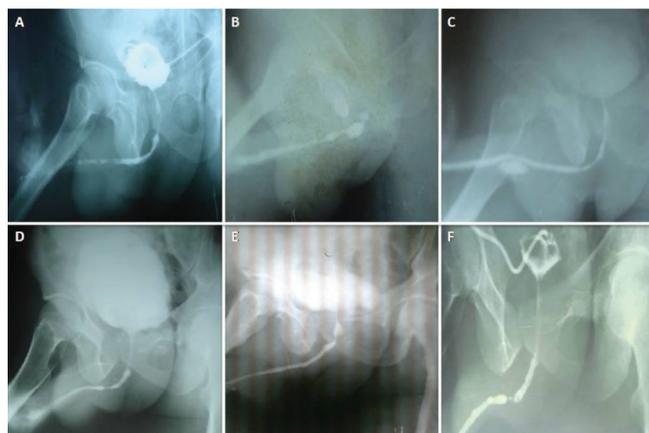


Figure-1: PRE OP ASCENDING URETHROGRAM STUDY (A. Long anterior stricture, B. Stricture at bulbomembranous region with extra vasation C. Long anterior stricture with extravasation in the penile urethra D& E. both anterior and posterior urethra stricture F. Stricture at bulbar urethra)

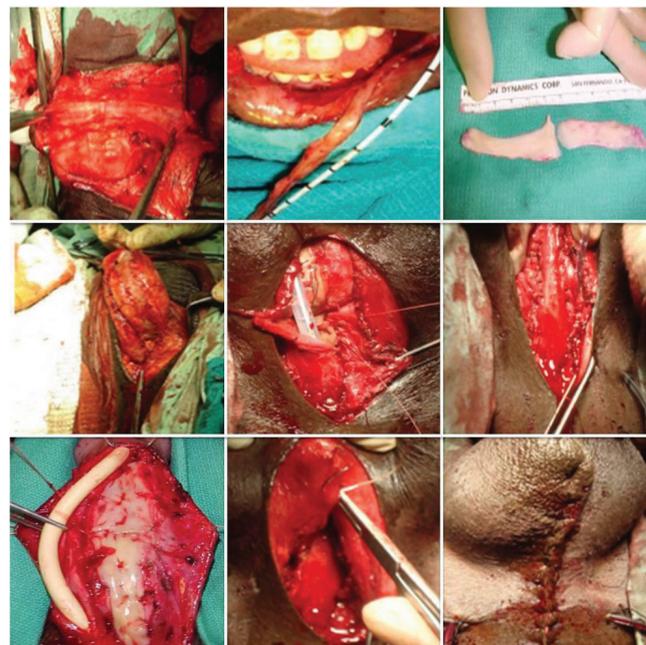


Figure-3: A. Strictered tract of urethra opened B. Buccal mucosa c. Buccal mucosal graft from both side of cheek D. Proximal mucosal edge is spatulated and splayed over the corpora cavernosa E. Graft is sutured over the corporal bed F. The strictered urethral mucosa sutured with the buccal mucosal graft G and H. Silastic catheter (16FR) inserted I. Wound closed in layers

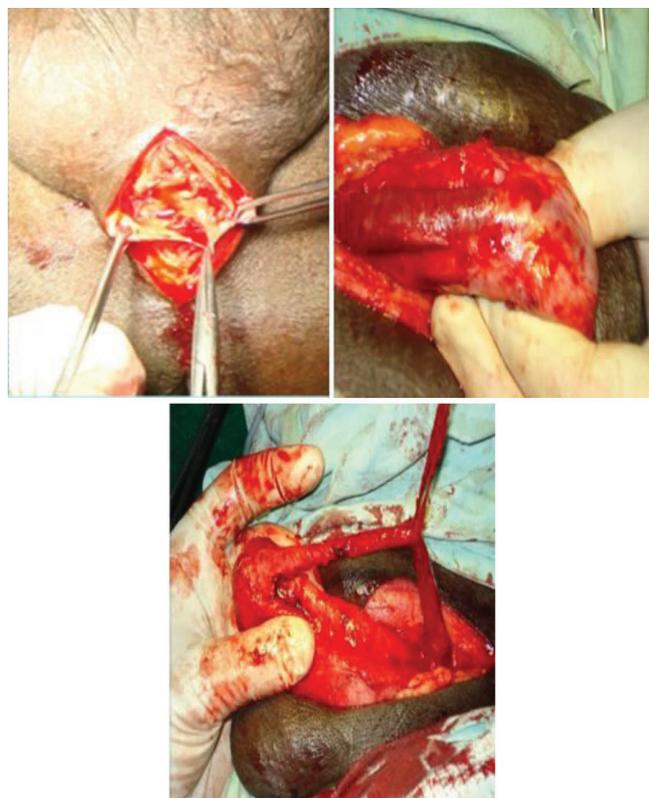


Figure-2: A. Midline perineal incision B. Corpus spongiosum separated from glans penis up to bulbar urethra C. Bulbar urethra is completely mobilized

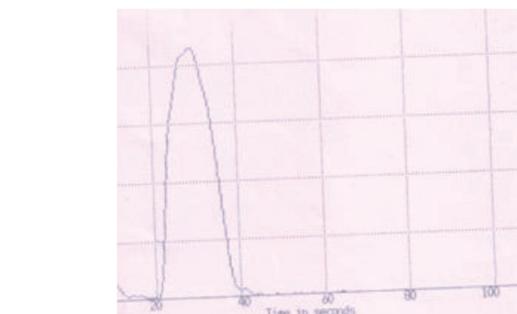


Figure-4: A. Post operative cystoscopy B. Ascending urethrogram

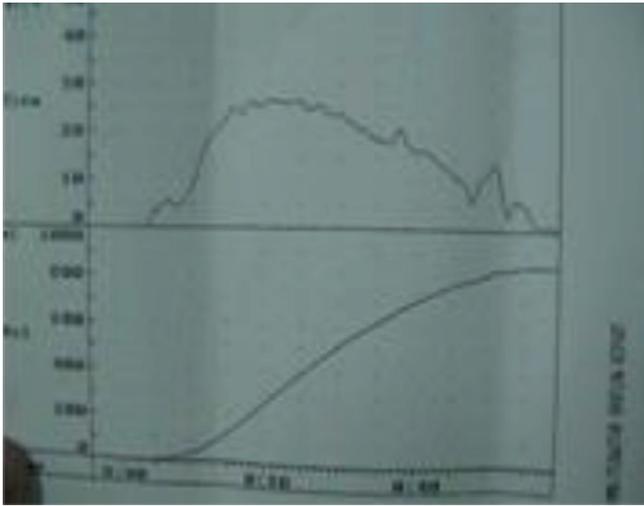


Figure-5: Post operative uroflow

spongiosum separated from glans penis upto bulbar urethra done. The bulbar urethra is completely mobilized from corpora cavernosa. The strictured tract of urethra opened along its dorsal surface (Figure 1).

The buccal mucosa taken from the oral cavity. The proximal mucosal edge is spatulated and splayed over the corpora cavernosa. The graft is sutured over the corporal bed. The strictured urethral mucosa sutured with the buccal mucosal graft. The Silastic catheter (16FR) inserted and urethral mucosa closed over the catheter along with the graft. Wound closed in layers with drain (Figure 2).

Pericatheter study done after 2weeks for all twelve cases. Uroflowmetry done in all cases show, Peak flow rate about 14- 27 ml/sec, and post void residual is insignificant in all cases. Post operative cystoscopy done in all cases. Follow-up Ascending Urethrogram done in all cases. (Figure 3- 5)

Post operative check cystoscopy done in all cases after catheter removal with 17 Fr sheath with 30° cystoscope. Dilatation done 1- 2 times for 5 patients. All other patients does not need dilatation.

Local infection should be prevented by irrigating the wound with antibiotic solution before closure. The donor site healed well in all patients by primary closure. No long-term morbidity was observed. However, persistent postoperative discomfort, neurosensory deficits, and salivary flow changes were reported in men whose grafts were harvested from the lower lip.No post operative complications seen in our cases. Patients need further follow up.

DISCUSSION

Reconstruction of the urethra poses continuing challenges to the urologist. Although several tissues and substitutes have been used in urethral reconstruction, the buccal mucosa has become the favoured tissue for use as the urethral substitute in the past decade.^{8,9}

There are several variables, including length, site, number of stricture, amount of spongiofibrosis, and the presence of BXO, on which the results of urethroplasty depend. New strictures occurred despite the stricture incision being carried out on either side into the normal urethra during urethroplasty.

It is possible that there was an underlying process of spongiofibrosis already going on, despite the apparently “normal” appearance of the tissues at urethroplasty. Both of these patients responded well to OU and self-dilatation.

The overall success rate was 87% in our patients. Others using the Asopa technique have reported similar results. None of our patients with skin changes over the genitalia suggestive of BXO had lichen sclerosis (LS) histologically. The biopsy of the prepuce or glandular mucosa only showed chronic fibrosis with inflammatory cell infiltration. LS often involves the urethra in men and results in extensive anterior urethral stricture disease. BXO/LS-related strictures are complex and generally managed by two-stage urethroplasty.¹⁰⁻¹³

Two-stage urethroplasty has been advocated for complex and extremely narrow panurethral strictures in which the urethral plate cannot be salvaged. However, Joseph et al. suggested that stricture recurrence may be inherent in multistage procedures because of local factors, including poor tissue quality and a compromised vascular supply. Dubey et al. reported excellent intermediate-term results in BXO-related strictures with a viable urethral plate one-stage dorsal onlay buccal mucosal urethroplasty.¹³ We managed three panurethral strictures by sequential progressive continuous dilatation (SPCD); after reaching an adequate lumen size (from 6F/8F to 14F/16F) in 10 d, BMG urethroplasty was undertaken by the one-stage ventral sagittal urethrotomy approach. Although the strictures recurred, they responded well to self-dilatation and OU, which was preferable to a prolonged multistaged repair in a resource-poor setting like ours. The SPCD technique enabled us to preserve the urethral plate and facilitated BMG urethroplasty in this setting.

The success of any urethroplasty in this setting, as in others, depends on a good vascular supply. The mobilisation of the urethra compromises critical supply from the circumferential arteries. As the urethra was not mobilized in this technique, the blood supply (circumferential artery) of the diseased and ischemic urethra was not further compromised by dissection, thereby improving the chances of a good outcome, as described by Asopa et al.⁶ However, long-term follow-up and randomized studies are necessary to buttress these presumptions.

The other distinct advantage of this technique is that it is simpler and easier than the dorsal urethrotomy technique, as there is no mobilization and rotation of urethra. Moreover, the stricture site is directly seen, and the BMG can be tailored to the dorsal urethrotomy defect; in the dorsal urethrotomy approach, visualization is rendered difficult by the rotation necessary for urethral incision dorsally. This technique may also be more suitable when the urethra is adherent to underlying corpora cavernosa as a consequence of repeated OUs and in obese patients where a dorsal approach may be particularly difficult.¹⁴ The bleeding from the edges of the spongy urethra from the ventral urethrotomy site is more than in the dorsal urethrotomy technique but can usually be controlled effectively with diathermy or sutures. The elliptical dorsal urethrotomy defect can be as wide as 1.2–1.7 cm in the penile urethra and 2 cm in the bulbar area, yielding

an adequate urethral lumen at the end of the surgery.

CONCLUSION

Buccal mucosa graft for urethral stricture reconstruction yield reproducibly excellent results with minimal morbidity and low complication rates. Longer followup will be required to confirm the durability of our results. Buccal mucosal graft for dorsal onlay or augmentation urethroplasty gives rewarding results in anterior urethral strictures.

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