

**Outcomes of double-face augmentation urethroplasty
using buccal mucosal graft for near-obliterative
bulbar urethral stricture.**

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Introduction

Urethral stricture is a pathology that is often complex and difficult to manage. Various techniques have been developed to treat it, ranging from primary anastomosis to tissue flaps and grafts. Currently, the preferred tissue for grafts is the oral mucosa due to its excellent physical characteristics and because harvesting is simple, with low rates of morbidity.(1)

Traditionally, short segment obliterative traumatic bulbar urethral strictures (<2 cm) are managed by excision and end-to-end anastomotic urethroplasty (EEA). However, non-traumatic bulbar urethral strictures (>2 cm) that are not amenable to EEA can be managed by augmentation urethroplasty. The current trend in the management of bulbar urethral strictures is non-transection, minimal urethral mobilization, and augmentation of the urethra. Augmentation bulbar urethroplasty can be performed using a dorsal or ventral approach, depending on the length, extent, and caliber of the stricture. Various techniques for bulbar urethral reconstruction with favorable outcomes have been described in the available literature.(2)

Combined dorsal and ventral onlay augmentation urethroplasty technique was described by Palminteri et al.(3) for bulbar urethral reconstruction.

Nontraumatic near-obliterative bulbar urethral strictures (BUS) of <2 cm in length can be managed with non-transecting anastomotic bulbar urethroplasty or augmented anastomotic urethroplasty. However, if the obliterative stricture segment is >2 cm and the urethral caliber is <6F, augmentation with a single graft may not be sufficient. In these cases, double-face augmentation urethroplasty (DFAU) is indicated. DFAU can be performed using either a dorsal (dorsal onlay and ventral inlay) or ventral (ventral onlay and dorsal inlay) approach. (4)

In dorsal approach, the urethra was mobilized on the left side. Dorsal urethrotomy was performed at the level of the stricture. A free graft was harvested and fixed to the apex of the proximal urethral margin using interrupted sutures (sutured to the medial urethral margin and the underlying corpora cavernosa). Ventral inlay augmentation with a free graft was at the level of the narrowed urethral plate (<6 mm) and the urethra was closed over a 16F catheter.(5)

Aim of the study

We present our initial experience with the double-face augmentation urethroplasty technique using buccal mucosal graft for near-obliterative bulbar urethral strictures through ventral or one-sided dorsal perineal approach and the analysis of the short-term outcomes of this technique.

Patients and Methods:

Study type: a prospective non-controlled interventional study.

Sampling: hospital-based sample.

Masking: open label.

Intervention Model: all patients with long segment more than 2 cm near-obliterative bulbar urethral stricture underwent the double-face augmentation urethroplasty technique through one-sided dorsal perineal approach.

Sample size: all candidates patients for the next 2 years.

Study Location: El-Hussein, Sayed Galal, Al-Azhar University Hospitals, Cairo, and Menoufia university hospital, Cairo, Egypt.

Study Population

Inclusion criteria

- The study will include patients with long segment bulbar urethral stricture (>2 cm).
- Urethral lumen size less than 6 Fr.

Exclusion criteria

- Urethro-cutaneous fistula, urethral abscess or diverticulum.
- A scarred and unsalvageable urethral plate or scarred perineum.
- Lichen sclerosis (Balanitis xerotica obliterans).
- Unhealthy/unavailable buccal mucosa.

Pre-operative evaluation:

- ✚ Medical and surgical history including age, cause of stricture, presence of medical diseases like diabetes mellitus, and history of previous urethral procedures.
- ✚ The following questionnaires will be used for assessment of LUTS, sexual function and satisfaction, and oral health:
 - IPSS (international prostate symptom score).(7)
 - IIEF-5 Score (international index of erectile function).(8)
 - MSHQEJD (male sexual health and ejaculatory dysfunction questionnaire).(9)
 - BMG questionnaire for brief oral health status examination (BOHSE).(10)

✚ Physical examination including BMI, oral, abdominal and penile examination and presence of supra-pubic catheter.

✚ Laboratory investigations (urine analysis, urine culture and sensitivity, complete blood count, bleeding profile and serum creatinine levels).

✚ Uroflowmetry (UFM).

✚ Radiologic investigations:

Retrograde urethrography (RGU) and micturating cystourethrography (MCU).

Renal and bladder ultrasound with estimation of pre and post voiding residual urine.

An informed consent will be signed by each patient.

surgical technique:

The patient will be put in lithotomy position then a midline perineal incision will be made & buccal mucosal graft will be harvested.

Buccal graft harvest Using a marking pen, the graft will be outlined 2.5 cm wide and as long as is required. Bupivacaine 0.5% with epinephrine will be injected underneath the graft for good analgesia and intraoperative hemostasis. The graft will be then incised and dissected of the buccinator muscle, while avoiding Stensen's duct. The defect will be left open to close by secondary intention, as it is less painful. The graft

will be pinned out and defatted/thinned on the back table. It will be kept in saline until the time of implantation.(11)

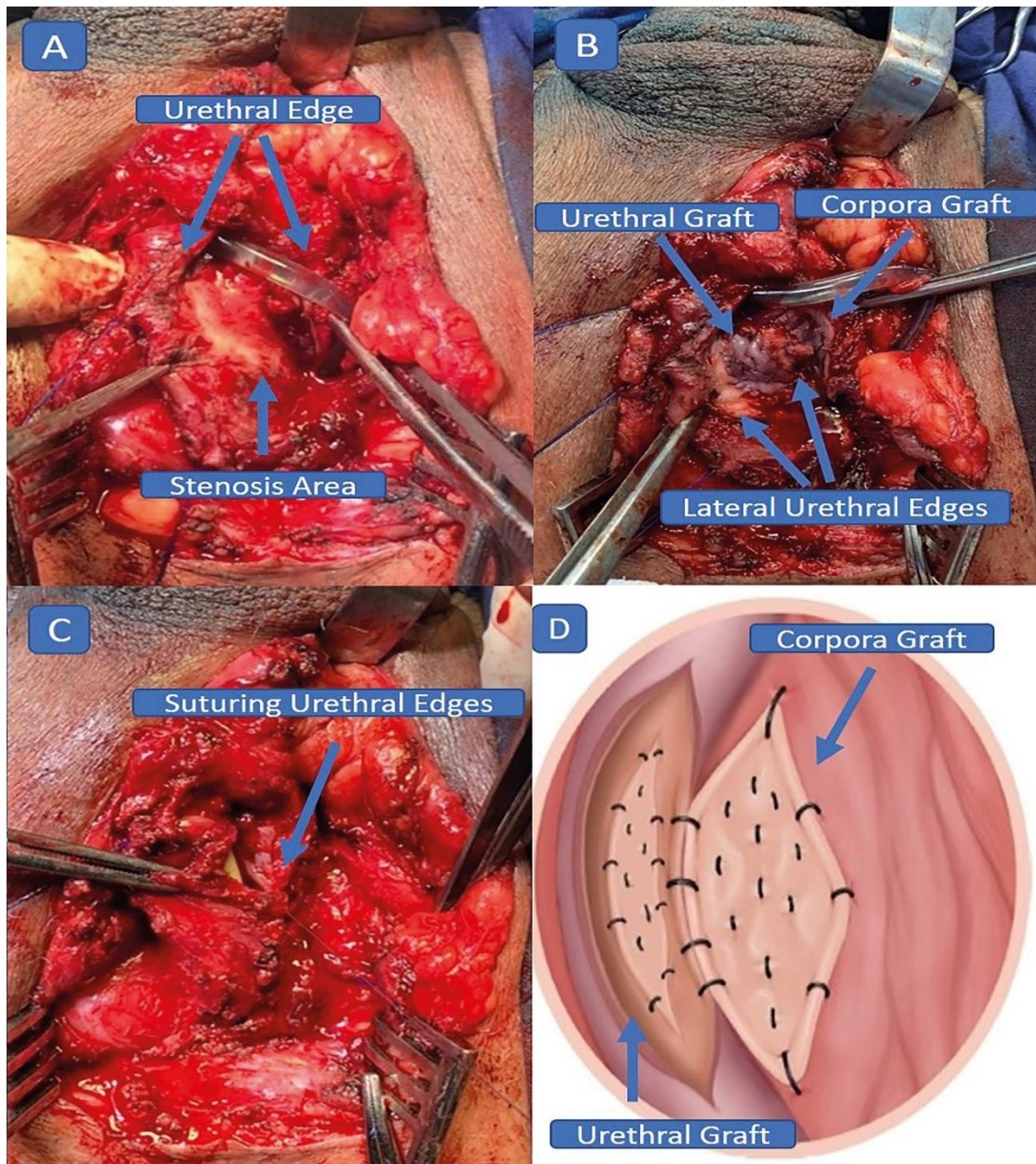
The patient is placed in an exaggerated lithotomy position. A 16Fr urinary catheter is inserted, identifying the distal end of the segment affected by stenosis, and methylene blue is injected. A longitudinal incision is made in the perineum. The left and dorsal surfaces of the urethra are dissected, with the right border maintained.(12) A longitudinal incision is made along the midline of the dorsal wall of the urethra affected by stenosis, extending up to 1cm beyond the area of stenosis, preserving

the spongy tissue (Figure-1A). The defect created in the urethra acquires an elliptical form and the oral mucosa will be placed as an inlay graft onto this segment (Figure-1B). The incision in the urethra should proceed until the maximum degree of relaxation is achieved, preserving the corpus spongiosum. The graft is secured to the corpus spongiosum, as is usual with these grafts, using separate oral mucosa/corpus spongiosum

sutures with 4-0 vicryl. Next, the edge of the graft is fixed to the edge of the urethra using continuous sutures with 5-0 vicryl. The remaining portion of oral mucosa is fixed onto the corpus cavernosum, as described by Barbagli et al.(12) The edges of the urethra are then sutured to the dorsal oral mucosa using 4-0 vicryl suture (Figure-1C). A schematic

drawing is provided to further illustrate the placement of the mucosal grafts.(1)

Figure 1 - (A) Longitudinal incision in the dorsal surface of the urethra, with rotation of 180°, (B) Oral mucosa dorsal onlay and ventral inlay graft, (C) Suturing of the edges of the urethra, (D) Schematic drawing showing placement of the mucosal grafts.(1)



The complications will be graded using the modified Clavien-Dindo classification system.(13)

FOLLOW UP: The follow up period will be at least 6 months

The patients will be treated with broad spectrum IV antibiotics for 48–72 h, which will be followed by oral antibiotics until catheter removal. The patients will be also treated with analgesics, bladder antispasmodics, stool softener, and diazepam to help prevent erections.

The patients will be discharged after the drain is removed, if it was put, usually within 2–3 days after surgery.

They will be followed up at the clinic after 1 week for wound assessment. Another visit will be scheduled 30 days after surgery where the urethral catheter will be removed, and a voiding urethrogram will be taken.

A 3 monthly follow-up visits thereafter will be scheduled for assessment of LUTS with performing simple uroflowmetry, treatment satisfaction and sexual function.

The follow-up will rely mainly on patient symptoms (subjective diminished force-of-stream, UTI, urinary retention, etc.), while diagnostic procedures such as urethroscopy and/or retrograde urethrogram will be done selectively.

OUTCOME

Anatomic (Objective): Urethral patency will be evaluated by

- ✓ Uroflowmetry, and
- ✓ Urethrography.

Functional (Subjective): LUTS, sexual function, and satisfaction.

Through:

- ✓ IPSS (international prostate symptom score).(7)
- ✓ IIEF-5 Score (international index of erectile function). (9)
- ✓ MSHQEJD (male sexual health and ejaculatory dysfunction questionnaire). (9)

USS-PROM (patient reported outcome for urethral stricture surgery).
(14)

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