DOUBLE-FACE BUCCAL MUCOSAL GRAFT SUBSTITUTION URETHROPLASTY – A NOVEL TECHNIQUE FOR OBLITERATIVE BULBAR URETHRAL STRICTURES – CASE REPORT

Dr.S.Selvakumar M.S, M.Ch Urology
Consultant Urologist

INTRODUCTION

The current trend in the management of bulbar urethral strictures is non-transection, minimal urethral mobilization, and substitution of the urethra. Substitution bulbar urethroplasty can be performed using a dorsal or ventral approach, depending on the length, extent, and calibre of the stricture. Combined dorsal and ventral on-lay augmentation urethroplasty technique was described by Palminteri et al. for bulbar urethral reconstruction. In this paper, we present our report of the double-face Buccal Mucosal graft urethroplasty technique for near-obliterative bulbar urethral strictures and short-term outcomes of this technique.

CASE REPORT

A 54 years male, a known case of head injury with history of urethral catheterisation presented with severe Lower urinary tract symptoms on September 2023 and on evaluation was found to have an obliterative mid bulbar urethral stricture on ascending urethrogram (AUG). Supra pubic cystostomy was done and he was on regular follow up. On November 2023, he was re-evaluated with ascending urethrogram showing a completely obliterative mid bulbar stricture of length 3 cm. (Fig 1)

He was admitted and double face buccal mucosal graft substitution urethroplasty was done on November 2023. Urethral catheter was removed on end of December 2023. Repeat AUG revealed a normal Caliber urethra at the site of anastomosis. (Fig 2) Supra pubic cystostomy was removed on first week of January 2024. Patient is now voiding well and he is on regular follow up.

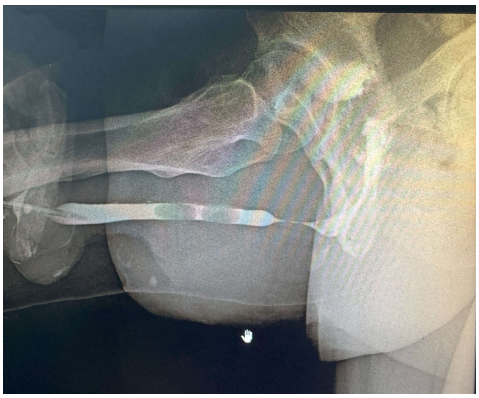

Fig. 1 - Before Surgery AUG

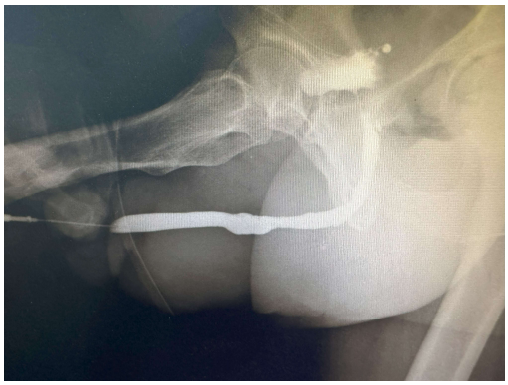

Fig. 2 – After surgery AUG

SURGICAL TECHNIQUE

The double- face BMG urethroplasty can be performed in two ways, either dorsal on-lay with ventral inlay or ventral on-lay with dorsal inlay technique. Near- obliterative bulbar strictures are the main indications of double-face graft urethroplasty. In our case we did dorsal on-lay with ventral in-lay. (Fig. 3 - 10)

The operative procedure was performed with the patient under general anaesthesia with nasotracheal intubation. The patient is placed in the exaggerated lithotomy position. Urethroscopy was performed with a 6-Fr ureteroscope to assess the urethral strictures, Caliber. A 0.032 guide wire was placed to enable the identification of the urethral lumen during the procedure. A 16Fr urinary catheter is inserted, identifying the distal end of the segment affected by stenosis. A longitudinal mid line incision is made in the perineum. The left & dorsal surfaces of the urethra are dissected, with the right border maintained, as proposed by Kulkarni et al. 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.

The unhealthy mucosa is excised on the already exposed ventral urethra. A small patch of buccal graft is inserted ventrally and quilted with delicate sutures. On the dorsal aspect a long buccal graft is quilted on the corpora. The anastomosis is then performed over a 14 size silicone urethral catheter.

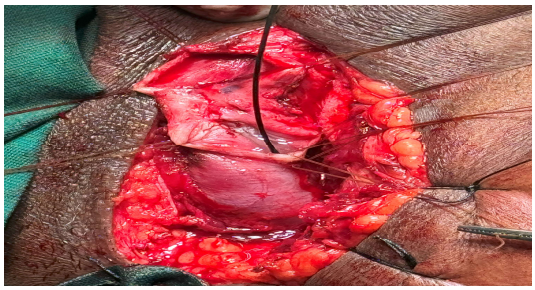

Fig 3 – Stricture area exposed

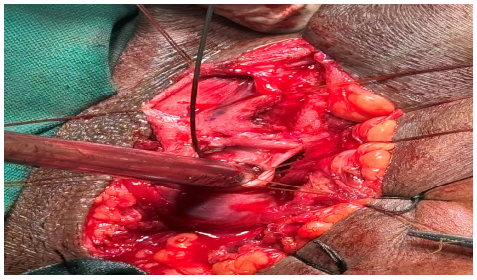

Fig 4 – proximal caliberation

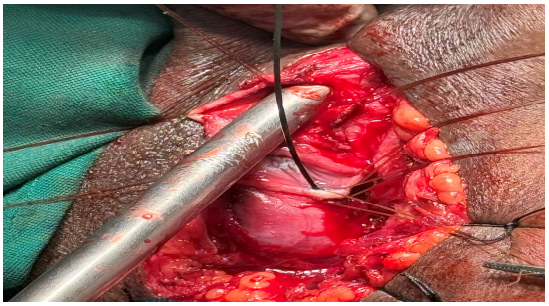

Fig 5 – Distal caliberation

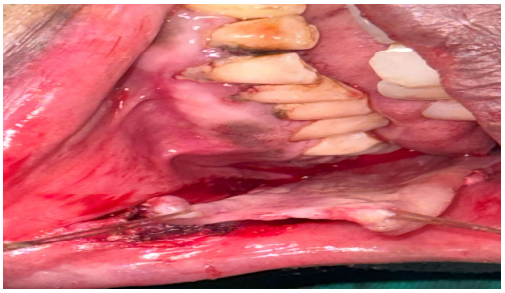

Fig 6 – BMG harvested

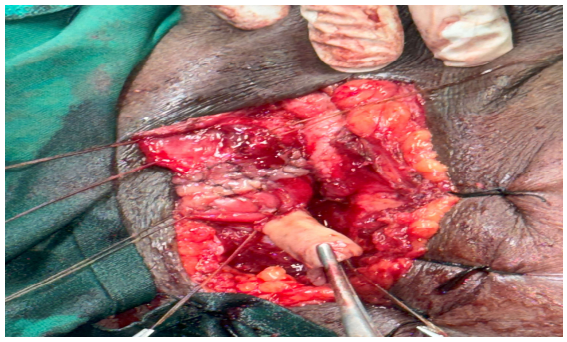

Fig 7 – Ventral graft quilted

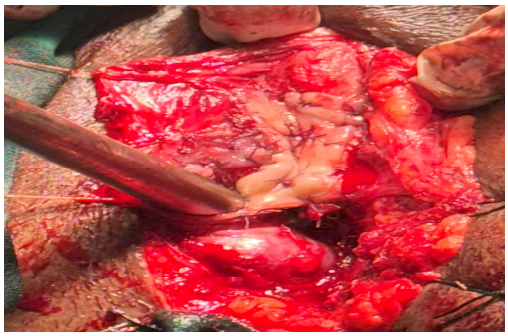

Fig 8 – Dorsal

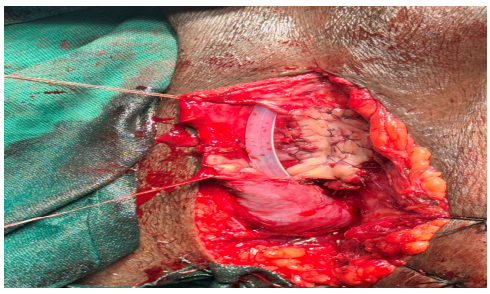

Fig 9 – Catheter inserted

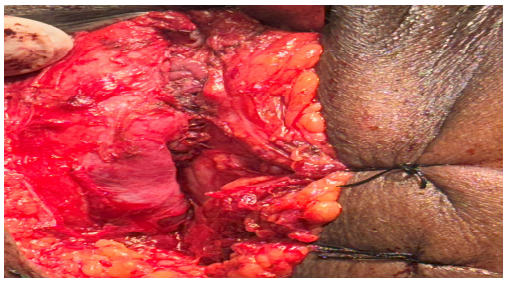

Fig 10 – Urethral Closure Completed

A BRIEF DESCRIPTION OF RELEVANT ANATOMY

Anterior urethra is divided anatomically into 2 parts, namely penile and bulbar urethra. The bulbar urethra lies between penoscrotal junction and

membranous urethra, which includes external urethral sphincter. The bulbar urethra is divided also into proximal, middle and distal bulbar urethra. The proximal and middle bulbar urethral parts are unique in terms of spongious tissue, which is more developed in these regions. These proximal and middle parts of the bulbar urethra are covered by the bulbospongio-cavernosus muscle, which is divided into 2 parts, and the proximal 2/3 of the muscle surrounds the urethra. We know from the anatomical studies that this proximal portion aids in the ejaculation, and also in the evacuation of last few drops of urine. The distal 1/3 parts of bulbospongio-cavernosus muscle surrounds the corpora cavernosa at the base of the penis. This distal muscle is known to compresses the deep dorsal vein of the penis to aid in erection. We approach the dorsal surface of urethra by one of two ways. The first one is by incising bulbospongiosous muscle in midline ventrally with circumferential mobilization of the urethra. The second is by one-sided dissection, sparing the bulbospongiosous muscle and limiting the muscle division only to the distal bulbocavernosus muscle, which is a muscle preserving approach.

DISCUSSION

Urethral stricture differs according to its aetiology, extent, site, depth and density. All these factors are relevant to the management of this pathology, determining the most appropriate approach in each case. The use of urethral dilatation, internal urethrotomy and primary reconstruction are treatment options, however, there are limitations when the stenosis is complex and extensive. In such cases, the use of flaps and grafts has been proposed. These can be of different origins, including lingual mucosa, labial mucosa, postauricular mucosa, etc.

Buccal mucosa graft (BMG) was first described for urethral reconstruction by Humby in 1941. It has become an ideal urethral substitute because of ease of harvest, surgical handling characteristics, hairlessness, compatibility in a wet environment, and its early ingrowth and graft survival. Because of these unique characteristics, buccal mucosa has endeared itself to the realm of reconstructive

urology. Standard bulbar urethroplasties using buccal grafts should have a lifetime success rate approaching 92%.

In 1996, Morey et al. described ventral on-lay oral mucosa urethroplasty and proposed an improvement to the technique used to harvest buccal mucosa using two teams working simultaneously. Two years later, Barbagli et al. described the application of a dorsal on-lay graft with preservation of the ventral surface. Asopa et al. also described the use of a dorsal on-lay graft. More recently, dorsal grafts have been used in less extensive dissections of the urethra, as described by Kulkarni et al. In selected patients, double Face urethroplasty has also been used for more severe forms of stenosis, with little or no lumen for this purpose. Several variations in techniques have been used. Palminteri et al. described a technique in which a combined dorsal plus ventral double buccal mucosa graft was used in the urethra. Despite encouraging results, there are two disadvantages with that technique. The first is the need for two incisions in the urethra, one ventral and the other dorsal. The second disadvantage is that the ventral graft has little support for its fixation, since it is not fixed to the corpus spongiosum. The technique described here offers the considerable advantage of increasing the lumen, both in the dorsal and ventral parts, using only a urethral incision on the dorsal surface.

CONCLUSION

Double-face urethroplasty is indicated for near-obliterative strictures. A double-face urethroplasty with buccal mucosa using a longitudinal urethral incision preserving the corpus spongiosum and inlay graft proved a viable option, with good results in the postoperative follow-up.