



# Tunneled Buccal Mucosa Tube Grafts for Repair of Primary Proximal Hypospadias: Report of a case and Review of the literature.

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### ABSTRACT

Repeated attempts at surgical repair of serious complications involving either the partial or complete breakdown of the hypospadias repair are less likely to succeed because the penis is densely scarred, or significantly shortened, and the skin over the penis is immobile and hypovascular. Buccal mucosa (BM) has become the preferred material for reconstruction, whenever a child with skin-deficient hypospadias needs reoperation. We report the results of our surgical experience with staged reoperation using BM, in the repair of hypospadias a patient of 22 years with complications after multiple failed repairs.

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### Introduction

Complications of hypospadias repair include bleeding / hematoma, meatal stenosis, urethrocutaneous fistula, urethral stricture, urethral diverticulum, wound infection, impaired healing, and breakdown of the repair.[1] Inspection of the available tissue to determine whether adequate local tissue exists versus the need for an extragenital tissue graft, will significantly impact and dictate the repair options. This decision-making process is critical to achieving a successful result.[2-4]

Whenever possible, the immediately adjacent or local pedicled, well-vascularized tissue is preferred for reoperative hypospadias surgery. In the absence of the adjacent or local tissue and in more severe reoperative cases, a free graft bladder mucosa,[5] BM (dry or wet, onlay or tubularized),[5-8] or a combination of the two may be used.[9,10] BM has become the preferred material for reconstruction, whenever a patient with skin-deficient hypospadias needs a reoperation.[11] BM as a 'dry' onlay followed by tubularization, at the second stage of repair for reoperative hypospadias, is fast becoming an attractive alternative. We report our experience with the use of buccal mucosa in reoperation of hypospadias.

### Observation

This is a retrospective study interesting a 22 years old patient with proximal hypospadias. He was uncomfortable with his problem and was embarrassed. He showed some clinical signs of depression. Similarly his parents were worried of the hypospadiac problem as well as the future erectile, sexual, and fertility status. At clinical examination the patient presented urethrocutaneous fistulas following hypospadias repair. Indeed, he undergoes multiple urethroplasty which have all ended in failure. There was no healthy urethral plate or it was not suitable for retubularization, and there was paucity of the vascularized adjacent genital tissue, use of the buccal mucosal graft for urethroplasty was planned.

The removal of the oral mucosa and the preparation and exposure of the defective urethra were performed by the same operator. After general anesthesia and nasotracheal intubation (fig 1) to release the oral cavity completely. The urethra is mobilized, incised or excised and the required length of buccal mucosal graft estimated (table 3). Intra-orally, a skin marker is used to delineate the graft area. A Steinhilber mucosal stretcher/ retractor may be used to facilitate the procedure. This instrument acts as a retractor, provides haemostasis, and indicates the area to be harvested. A graft width of up to 25 mm is usually required as this is the width of the reconstructed urethra (a normal adult urethra has a circumference of 22-24 mm). The length required correlates to that of the urethral stricture. Care must be taken to stay at least 8 mm below the papilla of Stenson's duct and 1 cm posterior to the commissure of the mouth so that the vermilion border is not distorted. The submucosal administration of local anaesthesia, outside the periphery of the graft, serves not only to decrease intra-operative bleeding but also delineates tissue planes (fig 2). The initial superficial incision is made with a scalpel, and a tenotomy scissors is then used to dissect to the lamina propria and lift the graft off the underlying buccopharyngeal fascia. The graft is full thickness and includes mucosa and a submucosal layer to the lamina propria, without underlying fat and muscle. The tubularization of the buccal mucosa into the urethra was easily achieved. The buccal mucosa graft was harvested with a width of 10 to 15 mm and a length matching with the length of penile incision (fig 3). Subsequently, the buccal graft was placed with Monocryl sutures (fig 4). Thereafter, the incision was extended into the glans penis and the graft was extended into this area to prevent later meatal stenosis formation. Two parallel incisions were made on the ventral skin of the penis and urethral tubularization was completed in two layers using incision completely degloving the skin.

Then, the rotated towards the ventral surface of the penis and sutured on each other onto the neourethra controlled for any tension on either side and adjusted our sutures to prevent penile torsion.

### Discussion

Hypospadias is a congenital abnormality occurring in one out of 300 live births and recent studies suggest an increase of the incidence, with considerable variation in different countries.[12,13] The current standard of care is to repair the hypospadias with a one-stage procedure in the first year of life and on an outpatient basis.[12,14] Operative failures result from wound infection, urine extravasation, hematoma, ischemia, and necrosis of flap and graft or from errors in design, technique, and postoperative care during the primary repair.[15,16] Repeated attempts at surgical repair in these complicated cases are then less likely to succeed because the penis is densely scarred, immobile, hypovascular, or significantly shortened.[16] Horton and Devine[17] used the term hypospadias cripple to describe the patient who had undergone multiple, unsuccessful hypospadias repair attempts, with significant result ant penile deformity. These patients represent perhaps the most perplexing of hypospadias repair complications, in that, they require extensive repair amid scarred and devitalized tissue.

The use of the immediately adjacent or local pedicled, well-vascularized tissue is preferred for reoperative hypospadias surgery. In 1992, Burger et al. reported the use of BM for the repair of complications, following childhood hypospadias surgery.[18] The buccal grafts were used either as a tube or patch in a one-stage operation, with three post operative fistulas requiring a new surgical approach and one meatal stenosis managed by simple dilation, with a satisfactory final outcome in all patients.[18] After the Burger article, numerous reports appeared on the use of the BM grafts in the repair of complications after failed hypospadias surgery. Unfortunately, the majority of these studies mixed both children and adults or patients with epispadias or urethral stricture without hypospadias; therefore, it was not possible to extrapolate from the overall complication rates, the results that the authors obtained, particularly in adults with failed hypospadias repair.[6,19–22]

In 1995, Bracka presented a two-stage penile skin graft technique for repairing complications after failed hypospadias, in 121 adults[23,24] This method did not claim substantial originality, but rather, represented a further refinement and evolution of the existing surgical techniques suggested for hypospadias surgery. The author concluded that a two-stage repair by splitting the glans and lining it with penile skin or BM grafts (to allow a subsequent terminalization of the meatus), was extremely adaptable and produced sophisticated results in any degree of deformity, in a skin-deficient 'hypospadias cripple'. [23,24] Nevertheless, about 10% of the patients required a revision of the first stage of their repair or underwent further cosmetic adjustment after a completion of their repairs.[23,24]

Sripathi et al.[27] retrospectively reviewed their experience in the management of hypospadias cripples and treatment of urethral strictures following hypospadias repair in 20 children, over a 41-month period and concluded that in salvage procedures performed on hypospadias cripples, a staged repair with buccal mucosa as an inlay in the first stage followed by tubularization four to six months later provided good results. Similarly Gill and Hameed[25] showed this technique in 100 patients with hypospadias cripples, who had

previously undergone multiple (3 – 16) procedures. In the first stage, a full-thickness graft of skin or buccal mucosa was used for the urethral plate reconstruction after release of the chordee. Stage II was carried out at least six months after the first procedure. The meatal opening at the tip of the glans was achieved in 94 patients, straightening of the penis in 96, and proper urinary stream in 92 patients. Fistula formation occurred in nine patients. In their opinion, the two-staged Bracka technique was a useful strategy to deal with the myriad abnormalities encountered in crippled hypospadias. This technique not only created a neourethrasuccessfully, but also gave the penis a near-normal shape and appearance.

Bracka[26] opined that the Bracka two-stage graft repair remains an ideal and versatile solution when a full circumference urethroplasty is required. It is particularly appropriate for severe primary hypospadias associated with a poor plate and marked chordee and also to replace a scarred, hairy or balanitisxeroticaobliteransdiseasedurethra, in reoperative salvage hypospadias. A staged approach may give a better cosmetic result to the patient.[23] When a hypospadias repair fails, the glans wings often contract and there is not enough width or mobility to achieve an orthotopic meatus after the second procedure. Glandular scarring can be excised and the graft can be interposed between the corporal bodies to give a deep groove for subsequent glansplasty and distal urethroplasty. A barrier is required and this can be obtained from the tunic vaginalis or a subcutaneous scrotal flap, as both of them have excellent blood supply and can be mobilized to give a barrier layer. Buccal graft urethroplasty using a staged technique described by Bracka[23] has improved outcomes when compared with single stage buccal repairs.

### Conclusion

Reconstruction of a urethral stricture, not amenable to end- to-end anastomosis, continues to pose a difficult surgical problem. The novel technique of a TBMTG in proximal hypospadias can offer a highly successful option for urethroplasty in patients with skin paucity. Once the learning curve plateaus, the complication rate is low, and the voiding function is excellent.

### Figure



**Fig 1. Local Anaesthesia, Outside The Periphery Of The Graft.**



**Fig 2 .The Buccal Mucosagraft.**



**Fig 3 . Implantation of an oral mucosal patch.**

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