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Tunneled Buccal Mucosa Tube Grafts for Repair of post-traumatic urethrastricture: Report of a case and Review of the Literature

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ABSTRACT

Buccal mucosa has been used in both primary and salvage urethroplasties, as dorsal onlay. Ventral onlay, and as tubed grafts in posterior and anterior urethral strictures. It's recommended as ideal graft material which offers many advantages: availability, easy and less infectious complications. Repeat urethroplasties were performed by excising the fibrous tissue around the stricture; buccal mucosa was then harvested from the inner cheek, made into graft tubing, and interposed into the defect. We report the results of our surgical experience with staged reoperation using BM, in the repair of post-traumatic membranous urethra stricture with loss of substance estimated to 5cm a patient of 22 years with complications after multiple failed repairs.

Introduction

Reconstruction of long urethral strictures that cannot be excised and reanastomosed remains controversial.(1) Augmenting or replacing the circumference of the urethra using a patch or a tube has been introduced as a means of substitution urethroplasty.(2) Flaps are preferred for substitution urethroplasty because of the theoretical advantage that they carry their own blood supply, and there fore, their viability is more secure. Recently, there has been a trend to ward grafts, particularly buccal mucosal free grafts.

Whenever possible, the immediately adjacent or local pedicled, well-vascularized tissue is preferred for reoperative surgery. In the absence of the adjacent or local tissue and in more severe reoperative cases, a free graft bladder mucosa,(3)BM (dry or wet, onlay or tubularized),[3–4] or a combination of the two maybe used.[5,6] BM has become the preferred material for reconstruction. We report our experience with the use of buccal mucosa in reoperation.

Observation

This is a study interesting a 22 years old patient with post-traumatic membranous urethra stricture with loss of substance estimated to 5cm . He was uncomfortable with his problem and was embarrassed. He showed some clinical signs of depression. Similarly his parents were worried of the future erectile, sexual, and fertility status. At clinical examination the patient presented urethrocutaneous fistulas following.Indeed, heundergoes multiple urthroplastie 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 mobilised, incised or excised and the required length of buccal mucosal graft estimated. Intra-orally, a skin marker isused to delineate the graft area. A Steinhauser mucosal stretcher/ retractor maybe 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 cir- cumference 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 ver- million border is not distorted. The sub mucosal administration of Ephedrine outside the periphery of the graft, serves not only to decrease intra-operative bleeding but also delineates tissue planes (fig2). The initial superficial incision is made with a scalpel, and a tenotomy scissors is thenused 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 wase asily achieved.The buccal mucosa graft was harvested with a width of 10 to 15 mm and alength matching with the length of penile incision (fig3). Subsequently, the buccal graft was placed Monocryl sutures(fig 4). There after, 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 urethra ltubularization was completed in two layers using incision .Then, the rotated to wards the ventral surface of the penis and sutured on eachother onto the neourethra controlled for any tension on eitherside and adjusted our sutures to prevent penile torsion.

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Fig 1 . Nasotracheal intubation.

Fig 2 . Local anaesthesia, outside the periphery of the graft.

Fig 3 .The buccal mucosagraft.

Fig 4 . Implantation of an oral mucosal patch.

Discussion

Urethral stricture has been classically treated by different techniques ranging from dilatation and endoscopic urethrotomy to urethroplasties with flaps or free grafts, done in one or two stages. The dorsal onlay free graft urethroplasty as described by Barbagli in 1996 (7) has gained wide acceptance in the urological community for it use in bulbar and penile urethral strictures, given the ease of obtaining the free graft against the greater difficulty of dissection of flaps, especially in the bulbar urethra. To all this is joined by the good results reported in the literature with success rates of 65.8% at 111 months of follow-up (8).

In urethral reconstructive surgery the technique that performs best is resection of the stricture and termino-terminal anastomosis, but it should be performed in stenosis of the bulbar urethra not exceeding 2-3 cm in length. The grafts are reserved for more complex strictures of both the bulbar and penile urethra. The dorsal onlay free graft urethroplasty (Barbagli's technique) published in 1996 is a combination of the dorsal urethroplasty described by Devine in 1979 (9) and that described by Monseur (10) in 1980.

In a systematic review conducted by Barbagli's group (12), ventral placement of the graft was accompanied by a higher success rate (87.5%) than the dorsal onlay (68.2%) $p<0.001$.

At present there is a greater tendency to use buccal mucosa as donor tissue, although the choice has traditionally been the preputial mucosa or penile skin due to its histological features (presence of a rich subepidermal plexus allowing a good take rate and low retraction), the buccal mucosa being used in their defect .

The existence of pre-treatment may influence the outcome of urethroplasty due mainly to the presence of an extensive spongiofibrosis (13). Barbagli (8) confirms this hypothesis by demonstrating a 80% good results in patients who previously received no treatment and Kessler (14) shows an increased risk of technique failure in patients with 2 previous urethrotomies . However, other authors like McLaughlin (15) see no marked differences in their results in groups treated before urethroplasty (dilation/endoscopic urethrotomy) with a success rate of 94%. In recenly stady ,significant differences were observed in the untreated group before urethroplasty with good functional outcome versus pretreatment group with good outcome (23).

Barbagli gets mixed results in his own series, as in one does not observe differences (16) and in another (17) they do appreciate them in lengths between 3 and 4cm.

One-stage treatment is only accepted (18) when the patient presents an acceptable urethral plate (3) and always using a different graft from the preputial mucosa or penile skin because of the likelihood of disease recurrence if these tissues (17) are employed.

This point is controversial, since writers like Mundy (11) recommended the implementation of two-stage urethroplasty with excision of the urethra.

Buccal mucosa has a thick epithelium rich in elastin that makes it easy to handle and durable. The lamina propria is thin compared with the bladder mucosa and skin, which facilitate inoculation and neovascularization. It has a high capillary density and is easily harvested.(19) Such grafts may offer no advantage in terms of graft survival and stricture cure, but they are easier and quicker to apply than a flap and leave no visible scar.(2) Split skin grafts are not satisfactory for urethroplasty because they contract by as much as 50%.(2)

It is believed that the buccal cheek mucosa and the mucosa of the inner aspect of the lip are preferred for urethral repair on the shaft of the penis and the glandular urethra, respectively.(2)

Venn and Mundy have shown that the early results of buccal mucosal graft urethroplasty are encouraging (45% success rate).(21) In 1998, Wessells and McAninch reviewed the literatureon free-graft and pedicled skin-flap urethroplasty. They have claimed that free grafts are successful in 84.3% of patients, and flaps are successful in 85.9% of patients.

They also have shown that the buccal mucosal graft is the most successful method of reconstructing bulbar urethral strictures.(1)

Graft urethroplasty may be associated with meatal prolapse, stricture, and fistula formation.(21)

Age, urethral defect length, number of previous operations, extent of dissection, and the primary etiology of the urethral stricture may have some roles. In addition, recipient site vascularity is very important to neovascularization and graft take.(22)

Conclusion

Reconstruction of a urethralstricture, not amenable to end-to-end anastomosis, continues to pose adifficult surgical problem.

There is mounting evidence to suggest that oral mucosais emerging as excellent source of material for urethral substitution, and this tissue is also replacing skin graft and flaps for salvage urethroplasty in a variety of complex and recurrent strictures or failed hypospadias and epispadias repairs. Reconstructive urologists and pediatric surgeons in developing countries shouldthere fore be familiar with this versatile technique for urethral reconstruction

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