

Original Paper**Initial Experience of Buccal Mucosa Urethroplasty in Tanzania.**

C.M.S. Yongolo, Senior Lecturer, Muhimbili University of Health Sciences, P.O. Box 7845, Dar es Salaam. Email: syongolo@muchs.ac.tz

Objective: To present the experience with the use of buccal mucosa graft urethroplasty.

Patients and methods: This was a retrospective review of 53 consecutive patients who presented with urethral strictures seen by the author from January 2002 to December 2003 and were managed with different forms of urethral reconstruction.

Results: Two thirds of the 53 patients were treated by end-to-end anastomosis. Seventeen patients (32.1%) had substitution urethroplasty. The causes of the strictures in the seventeen patients were infection in 7, catheter induced stricture in 6, and external trauma in 3 patients. One patient had Balanitis Xerotica Obliterans. The sites of the stricture were penile and bulbous in the majority of the patients. Out of the 17 patients, 13 had buccal mucosa graft (BMG) urethroplasty. Among these, ten were offered the procedure as a single stage while three patients had multistage reconstruction. Complications from the donor site were bleeding, pain and infection. The results of the grafts were good in 11 patients voiding with a good stream and a normal urethroscopy. Two patients had to have Direct Vision Urethrotomy (DVU) and one needed clean intermittent catheterization (CIC). The average follow up time was 18.5 months.

Conclusion: The use of buccal mucosa for urethral reconstruction is recommended when faced with complex stricture. The procedure is well tolerated by patients and has few complications with good end result of an adaptable mucosa.

Introduction

Urethral stricture is a chronic and common urological problem in this Tanzania and its management poses a big challenge to urologists. The best way to cure urethral stricture is by some form of urethral reconstruction. Turner Wawick remarked that the best substitute for the urethra is by the use of urethra as the curative option. However this is only possible when less than 2 cm of urethra is to be excised and end to end anastomosis performed with a success rate of more than 95%¹. Where the strictures are long, multiple, associated with urethrocutaneous fistula, those associated with Balanitis Xerotica Obliterans (BXO) and failed DVU with false passages substitution urethroplasty becomes the treatment of choice. Since Devine in 1963 described the use of full thickness skin graft for urethral reconstruction, there have been other innovative materials for use for urethra substitution¹. Naturally the scrotal and penile skin, being very close to the urethra, has been used for urethral reconstruction. For patients who are not circumcised prepuce skin can be utilized. The draw back of scrotal and penile skin is their

potential to become hirsute and also they have been associated with diverticula formation. Bladder epithelium harvested via a supra pubic cystostomy (SPC) has been utilized for urethral reconstruction, however the process of harvesting the epithelia is cumbersome.

Humby² was the first person to describe buccal mucosa grafting in 1941 but the procedure became widely used in the 1990s and onwards³. Of late there are reports that are actually advocating buccal mucosa to be the standard treatment for substitution urethroplasty⁴. We learnt this technique some three years ago and we wish to present our two-year experience with buccal mucosa graft in treating complex urethral strictures.

Patients and Methods

From Jan 2002 to December 2003, a period of two years, 53 patients with urethral stricture and requiring urethral reconstruction were seen. Out of these 17 patients had their strictures reconstructed using different materials for grafting. Thirteen out of them had buccal mucosa graft substitution urethral reconstruction. The author treated the patients at

two hospitals of Muhimbili National Hospital a public hospital and Tumaini Infirmary a private hospital both of Dar-es-salaam Tanzania.

Preoperative evaluation included history taking and physical examination. The possible etiology of the stricture was identified. After routine investigations and renal function test, the patients had urethrogram done. Both ante-grade and retrograde urethrogram were performed to show the whole length of urethra. All patients had SPC, which was used, as a port for studying the proximal urethra during the ante grade study.

The patients selected to receive substitution urethral reconstruction were those with long urethral strictures of more than 2 cm, patients with strictures at different sites with areas of skip of normal urethra and those with urethra cutaneous fistulae. The other group of patients was that with strictures resulting from Balanitis Xerotica Obliterans. The complexity of the stricture determined the method of repair whether a single stage or a multistage repair. Patients with fistulae and those with BXO had multistage reconstruction while others had on-lay graft and some combined on-lay and full circumference replacement tube reconstruction. The patients had to consent on the use of buccal mucosa graft.

The urethral stricture was exposed. The urethra was dissected off the corpora and opened at the stricture dorsally. The stricture length was determined in-situ at operation before harvesting the mucosa. The donor site was then marked with one-centimeter distance from the parotid duct to avoid its injury. The BMG was then harvested by dissecting the mucosa off the buccinator muscle on the inner side of the cheek below the Stensen's duct. In one patient whose stricture was too long additional mucosa was taken from both the cheeks. The donor site was then closed. Complications from the donor site were noted and reported.

The graft was washed in saline before it was defatted meticulously on the skin graft wooden board with the angles held by stay sutures by assistance of the assistants. The buccal mucosa graft was then patched to the corpora bodies and was further reinforced with quilting sutures between the graft and the tunica to minimize the possibility of haematoma or seroma formation

under the graft and to facilitate take up of the graft. Sometimes the buccal mucosa was patched dorsally to the corpora and partly tubularized ready for an end-to-end anastomosis with the spatulated proximal urethra. The mucosa of the proximal urethra was everted to allow mucosa-to-mucosa anastomosis. A catheter size 16CH was introduced and left in-situ for the next 14 days when a urethrogram was done. If no extravasation was demonstrated, the urethral catheter was removed.

Those patients found to have fistulae, had the fistula excised, the urethra stricture excised and the harvested buccal mucosa laid on the corpora bodies with reinforcing quilting sutures over the graft. The patient who had BXO had the unhealthy urethra excised and the BMG placed dorsally on the raw area of the corpora bodies. The edges of the normal skin were approximated to the margins of new urethral plate made from the buccal mucosa and the neo urethra plate reinforced by quilting sutures. This was then dressed with Sofratule or Vaseline gauze and the proximal urethra were catheterized with catheters coming out at the urethrotomy site. The patient was then followed up for three to six months for the graft to the take up. The new urethra was fashioned by tubularization of the neo urethral plate. The subcutaneous tissues and the scrotal tissues were used to cover the mucosa stitch line and the skin was then closed. The patient remained with a catheter for 14 to 21 days before a urethrogram was done and removed if there was no extravasation. In case of extravasations the catheter was left in for a longer time.

Successful repair was declared only when the patient was able to void without assistance of instrumentation and this had to be confirmed by urethroscopy three months after the treatment. Those patients who had recurrent stricture were treated by Direct Vision Urethrotomy (DVU) followed by clean intermittent catheterization (CIC).

Results

Out of the 53 patients with urethral stricture who required urethral reconstruction during the period under study, seventeen patients (32.1%) needed substitution urethroplasty. Their ages ranged from 23 to 71 years. The causes of the stricture were meatal lesion (BXO) in one

patient, post-inflammatory strictures in 7 patients, catheter stricture in 6 and other form of trauma in 3 patients (Table 1). The sites of the stricture were meatal and distal spongiosa in one patient who had BXO, penile and peno-scrotal in 7, bulbous and peno-scrotal in 6 and bulbous in 3 patients (Table 2).

Four patients were offered substitution urethral reconstruction using penile skin and one patient who was not circumcised had prepuce skin used. The rest had substitution-using BMG Table 3. Among these thirteen patients, three patients required multistage reconstruction. One of the patients had urethro-cutaneous fistula and the other patient had a long urethral stricture followed by a skip area of normal urethra then followed by another short stricture in the bulbous area. The bulbous stricture in this patient was excised and treated by end-to-end anastomosis while the penile stricture of this patient was excised and a patch of BMG was laid on the corpora bodies. After the patched BMG take up it was latter tubularized to complete the urethral reconstruction. The third patient had a stricture as part of BXO.

Excision of the stricture was done after opening of the urethra beyond the fossa navicularis to

reach a normal urethra. BMG was then laid dorsally forming a state like a distal hypospadias. Trauma secondary to catheter and external trauma as in pelvic injury or fall astride was the commonest cause of urethral stricture.

The other strictures were of 3 to 8 cm that needed buccal mucosa patch urethra reconstruction placed dorsally. Two of these patients had dorsal BMG with a small length of stricture reconstructed by tubularization of the graft before anastomosis to proximal urethra.

The complications associated with the harvesting of the buccal mucosa included primary bleeding with one patient forming a haematoma and two patients developed postoperative infection. All patients had pain and developed swelling of the cheeks. Five patients had difficult in feeding in the first two days post surgery. There has been no report of loss of sensation of the cheek or damage to the parotid duct. Eleven patients had good stream with a normal urethroscopy findings.

Two patients needed DVU and one of them was put on clean intermittent catheterization. The average follow up period was 18.5 months.

Age Distribution and etiology of strictures of the patients who were offered BMG

Age	Infective	Catheter	External Trauma	BXO	Total
20-29	0	0	2	0	2
30-39	2	2	0	0	4
40-49	0	2	1	0	3
50-59	3	0	0	0	3
60-69	1	2	0	1	4
>70	1	0	0	0	1
Total	7	6	3	1	17

Table 2. Site of the Urethra stricture of patients for BMG.

Meatus and distal spongious	1
Penile and penoscrotal	7
Penoscrotal and Boulbous	6
Bulbous	3
Total	17

Table 3. Material and Type of Reconstruction.

End to end anastomosis	36
Penile skin	3
Prepuce	1
Buccal mucosa single stage	10
Buccal mucosa multi stage	3
Total	53

The majority of the patients had end-to-end anastomosis.

Discussion

Two thirds of the patients who had urethroplasty as the treatment in our series of patients were offered end-to-end anastomosis basically on the basis of length of stricture. However in a third of the patients that are presented here were those either with long strictures of more than two cm, or those who had fistulae and a patient with BXO who required substitution urethral reconstruction. The results of the use of penile skin and prepuce skin in patients who are not circumcised are good but have some drawbacks. In our experience there has been patients dissatisfaction with the slight rotation on the penis following the use of these substitution materials. Other complications have been sited including hair growth, formation of diverticula and excoriation of the skin⁴.

The choice that remained was either the use of buccal mucosa and bladder epithelium as material for substitution. Our country is endemic with schistosomiasis and therefore this limits the use of bladder epithelium as a suitable material for substitution to our patients. However if it was to be used then it would require cystoscopy to rule out the pre-existing complications of schistosomiasis. Others have pointed out on other aspects like it's difficult in harvesting and meatal exuberance⁵ which makes it less attractive for use and despite, these patients had long standing SPC catheters.

We learnt BMG for urethral reconstruction some three years ago and we now find it as the most attractive option when substitution urethral reconstruction is required. Various factors contribute to the acceptance of buccal mucosa grafts (BMGs) as ideal substitute for urethra as suggested by others⁴. They include easy accessibility and manual handling, resistance to infection, compatibility with a wet environment a thick epithelium and a thin lamina propria

allowing early inosculation.⁴ It offers good medium-term results comparable with full-thickness skin grafts. Buccal mucosa has become popular and is emerging as a first-rate substitute for urethral reconstruction for strictures and complex hypospadias⁶. It is now been regarded as the gold standard of urethroplasty⁴.

Multi stage urethral reconstruction was performed on the very long strictures, patients with urethral cutaneous fistulae and BXO. These patients had to wait for several months to have tubularization done. The short-term results were encouraging and patients were able to void with good stream. These BMG were placed dorsally having made an incision of the urethral stricture dorsally or having excised the unhealthy urethra with the corpora bodies providing support and nutrition resulting in a very good take up of the graft as has been described by Barbagli³. Patch BMG was also done and was also, as much as possible, placed dorsally. Recently⁷ it has also been shown that with a minimal access using an incision on the ventral aspect of the urethra its is possible to put a patch in dorsally at another area of a urethra a method which may be useful in patients with multiple strictures with skip areas of normal urethra.

The BMG repair results in this series of patient were successful in 11 patients as assessed by the stream of urine, a repeat urethrogram and urethrocystoscopy. In two patients the stricture recurred and required DVU and CIC. One patient had end-to-end anastomosis and later required BMG as a repeat urethral reconstruction.

Conclusion

The use of buccal mucosa for urethral reconstruction is recommended when faced with complex urethral stricture. The procedure is well

tolerated by patients and has few complications with good end result of an adaptable mucosa.

References

1. Webster GD, Robertson CN. The vascularized skin island urethroplasty: its role and results in urethral stricture management. *J Urol* 1985; 133: 31-3.
2. Humby G. A stage operation for hypospadias. *Br J Surg* 1941; 29: 84-92.
3. Barbagli G, Palminteri E, Rizzo M. Dorsal on lay graft urethroplasty using penile skin or buccal mucosa in adult bulbourethral strictures. *J Urol* 1998; 160: 1307-9.
4. Bhargava S; Chapple CR. Buccal mucosal urethroplasty: is it the new gold standard? *BJU International* 2004; 93: 1191-1193.
5. Ransley PG, Duffy PG, Van oesch IL, Hoover D. The use of bladder mucosa and combined bladder mucosa/preputial skin grafts for urethral reconstruction. *J Urol* 1987; 138:1096-8.
6. Baskin LS, Durkett JW. Buccal mucosa grafts in hypospadias surgery. *Br J Urol* 1995; 76: 23.
7. Gupta NP, Ansari MS, Dogra PN, Tandon S. Dorsal buccal mucosal graft urethroplasty by a ventral sagittal Urethrotomy and minimal-access perineal approach for anterior urethral stricture. *BJU International* 2004;93:1287-1290