

Buccal Mucosal Graft for Crippled Hypospadias (Experience in 11 Cases)

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Abstract

Background: Hypospadias is defined as the incomplete virilization of the genital tubercle causing an incomplete development of the tissues forming the ventral urethra.

Objective: Free buccal mucosal graft is an excellent option if the genital tissue is fibrous or deficient. We would like to present our small experience with buccal mucosa on-lay graft for the treatment of anterior urethral stricture and recurrent urethra-cutaneous fistula after hypospadias repair in male children.

Methods: Between October 2004 and March 2007 we operated upon nine male patients. Their age ranged from 3-12 years old. Free buccal mucosal on-lay grafts from the inner aspect of the lower lip were taken for three cases of complicated anterior urethral stricture and for six cases of recurrent urethra-cutaneous fistula after previous multiple penile hypospadias repairs.

Nine on-lay free grafts were ventrally placed on the penile urethra. The grafts length ranged from 0.5 to 6 centimeters. All these operations were performed in one stage by a single surgeon and his team. The follow up period was from 2 to 5 years.

Results: The success was achieved in 8 out of 11(73%) patients. Urethral complications occurred in three cases which were evident by one month and three months postoperatively. The first one had severe proximal and distal urethral strictures which eventually required a proximal urethrostomy as a first stage. The second one had a mild stenosis which required two meatal dilations and at last a meatoplasty. The third one had a small fistula which was simply closed later. One patient developed a hypertrophied scar at the harvest site which spontaneously resolved over a period of three months.

Conclusion: Complex hypospadias surgery is challenging and should be done by an experienced pediatric surgeon. Utilizing the buccal mucosa in case of deficient genital skin is an efficient, practical, and safe technique of managing the crippled cases that need redo surgery.

Key words: Hypospadias, buccal, on-lay graft.

Hypospadias is defined as the incomplete virilization of the genital tubercle causing an incomplete development of the tissues forming the ventral urethra¹. The three main constituents found in hypospadias are: an ectopic position of the urethral meatus, a ventral curvature of the penis (chordee), and a defect of the ventral prepuce (hooded skin). A hypospadiac penis presents, from the tip to the base: a ventrally opened glans penis, an absent frenular artery and a missing segment of urethral tube which is replaced by a urethral plate extending from the ectopic meatus up to the glans cap. The tubular urethra proximal to the ectopic meatus is hypoplastic, not surrounded by any corpus spongiosal tissue and covered by a thin layer of skin tightly stuck on it².

In crippled or complicated hypospadias there are no standardized methods for redo procedures. The decision depends on the experience of the surgeon to adjust the most appropriate technique to each case separately. A preoperative course of injectable β HCG or testosterone, or local dihydro testosterone cream may be helpful to improve tissue vascularization and increase the bulk of the surrounding tissues. An interval of at least six months should be considered between surgical interventions to allow the local tissues to get mature.

Buccal mucosa is commonly used for redo urethroplasties when a circumcision was previously performed or when the ventral tissues are too scarred to be reused. In distal tubal breakdowns, when Mathieu or Duckett procedures failed, a buccal mucosal graft is a good option^{3,4}.

Tubularized Incised Plate (TIP) urethroplasties have successful results in

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some cases with a persistently supple urethral plate after previously failed procedures. However, it should be avoided if the urethral plate is obviously scarred⁵.

Complication rate (mainly fistulae, distal tubal stricture and urethral dehiscence) for buccal graft redo urethroplasties is about 27% (three cases) in our experience and of 20% according to Baskin and Duckett. However, secondary Duplay procedure is often possible after a dehisced buccal graft urethroplasty.

Buccal mucosa has been suggested for urethral reconstruction in children with complex hypospadias (Baskin and Duckett, 1995), (Wessels and McAninch, 1996). We report our practice of buccal mucosal on-lay graft urethroplasty in eleven patients with crippled hypospadias⁶.

Objectives:

To present our small experience with buccal mucosa on-lay graft for the treatment of anterior urethral stricture and recurrent urethra-cutaneous fistula after hypospadias repair in male children.

Methodology:

Between October 2004 and March 2007 we operated upon eleven male patients. Their age ranged from 3-12 years old. Free buccal mucosal on-lay grafts from the inner aspect of the lower lip were taken for three cases of complicated anterior urethral stricture and for eight cases of recurrent urethra-cutaneous fistula after previous multiple penile hypospadias repairs.

Grafts were marked according to length and width, then harvested carefully using sharp dissection, after that they were applied ventrally to substitute the deficient urethra. The donor sites of the grafts were compressed by an adrenaline-soaked diluted adrenaline to facilitate hemostasis. The application of the graft was supported by a silastic urethra stent size 8-10 accordingly for two weeks. A firm antibiotic dressing was applied at the end of the procedure for three days. Patients were kept in the hospital from 2-3 days under antibiotic cover and good sedation.

The silastic stents were removed at two weeks at the clinic.

Eleven on-lay free grafts were ventrally placed on the penile urethra. The grafts length ranged from 0.5 to 6 centimeters. All these operations were performed in one stage by a single surgeon and his team. The follow up period was from 2 to 5 years.

Discussion:

The most important indications for substitution urethroplasty, using local skin flaps are recurrent or long urethral strictures⁶. Ventral onlay graft urethroplasty has been commonly used for several decades, but are prone to shrinkage, leading to recurrent stricture or diverticulum formation⁷. The dorsal onlay graft procedure for bulbar strictures introduces some advantages over traditional ventral onlay graft urethroplasty (Wright and Webster, 1996). The graft is fixed to the under surface of the corporeal bodies, which has an excellent blood supply and good mechanical support (Barbagli et al, 1996). The spreading of the graft, making use of the tensile strength in the corporeal bodies, reduces the risk of graft shrinkage and chordee, while the dorsal graft bed avoids the problem of ventral sacculation, by interposing the graft between the urethra and corporeal bodies, fistula formation appears to be limited (Wright & Webster, 1996). This technique is also useful for strictures previously operated as it allows repair on the contralateral side of the urethra and avoids the previously scarred area⁸.

Venn and Mundy (1997) reported their series of 39 patients, who underwent a 1-stage urethroplasty using buccal mucosa. They concluded that harvesting of buccal mucosa is quicker and easier, and avoids the potential morbidity of raising the penile skin flap, i.e., torsion deformity of the penis, and from circumcision or other penile scarring which is generally resented by patients. They have stopped preputial and penile skin flaps in favour of buccal mucosal free grafts as the material of choice^{9,10}.

On-lay buccal mucosal grafts had been used in all our patients. We have observed that patients seem increasingly concerned about the cosmetic aspects of the lip in the early

post-operative period but at the end they will be satisfied¹¹.

In our study, the ventral on-lay graft urethroplasty using buccal mucosa has a success rate of 73% (eight out of eleven cases) at a follow-up of 2-5 years.

We conclude that the modernization of substitution urethroplasty with on-lay buccal mucosal free grafts may prove to be a promising advance in ensuring a flourishing outcome in the treatment of crippled (complicated) hypospadias^{12, 13}.

References:

1. Filipas D, Wahlmann U, Hohenfellner R. History of oral mucosa. *Eur Urol* 1998; 34 : 165
2. Xu Y, Qiao Y, Sa Y, *et al*. One stage urethral reconstruction using colonic mucosa graft: An experimental and clinical study. *World J Gastroenterol* 2003; 15: 381-4.
3. Bhargava S, Chapple CR. Buccal mucosal urethroplasty: Is it the new gold standard? *BJU Int* 2004; 93: 1191-3.
4. Webster GD, Brown MW, Koefoot RB Jr *et al*. Suboptimal results in full thickness skin graft urethroplasty using an extrapenile skin donor site. *J Urol* 1984;131:1082-3 .
5. Jordan GH, Schlossberg SM. Surgery of the penis and urethra. In: Walsh PC, editor. *Campbell's urology*, 8th ed. Philadelphia: Saunders; 2002. p. 3886-954.
6. McAninch JW, Morey AF. Penile circular fasciocutaneous skin flaps in a 1-stage reconstruction of complex anterior urethral stricture. *J Urol* 1998; 159: 1209-13.
7. Andrich DE, Mundy AR. Substitution urethroplasty with buccal mucosal free grafts. *J Urol* 2001; 165: 1131-4.
8. Greenwell TJ, Venn SN, Mundy AR. Changing practice in anterior urethral strictures *BJU Int* 1999; 83: 631-5.
9. Kane CJ, Tarman GJ, Summerton DJ *et al*. Multi-institutional experience with buccal mucosa only urethroplasty for bulbar urethral reconstruction. *J Urol* 2002;167:1314-7.
10. Venn SN, Mundy AR. Urethroplasty for balanitis xerotica obliterans. *Br J Urol* 1998; 81: 735-7.
11. Bu'rger RA, M\$lller C, El-Damanhoury H, *et al*. The buccal mucosal graft for urethral reconstruction: A preliminary report. *J Urol* 1992;147:662-4.
12. el-Kasaby AW, Fath-Alla M, Noweir AM *et al*. The use of buccal mucosa patch graft in the management of anterior urethral strictures. *J Urol* 1993; 149: 276-8.
13. Monfort G, Di Benedetto V, Meyrat BJ. Urethral stenosis in children: Treatment using urethroplasty with a vesical or oral mucosal graft. *Ann Urol* 1993; 27: 237-42.