



Initial experience with ‘inverted U’ staged buccal mucosa graft (bracka) for hypospadias repair

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Abstract Objective: To describe a modification of the Bracka procedure (‘inverted U’), used to enlarge the graft and diminish the risk of graft contracture compromising the subsequent urethral reconstruction.

Material and methods: Inverted U Bracka procedure was performed in 10 children in whom previous hypospadias correction had failed. The surgical steps are identical to the original Bracka procedure. The only modification is reconfiguration to enlarge the graft.

Results: Significant contraction of the graft was not seen in any patient and the second stage was performed uneventfully. After the second surgery there were two complications: one fistula and one wound infection.

Conclusion: In this preliminary study, the modification avoided significant contracture of the graft giving a more predictable size of the neourethra for the second-stage procedure. An amplified series is necessary to confirm this initial result.

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Introduction

The staged buccal mucosa graft (Bracka procedure) has gained acceptance in hypospadias surgery, despite sparse published mention since its initial description [1]. The main indication for the Bracka procedure is in repeat surgery cases where scarred tissues are not suitable for urethral reconstruction. It also may be indicated as the first-stage

procedure in severe cases. In the Bracka procedure all urethral plate or scar tissue from the meatus to the top of the glans is removed. All these tissues are substituted by buccal mucosa or foreskin graft that is sutured to the corpora cavernosa in order to stabilize the graft. Six months later, after the graft is stable, the mucosa is tubularized. The advantages of this technique include a well-vascularized graft for urethral reconstruction, a low number of postoperative complications and a vertical, slit neomeatus [1,2]. Bracka [1] recommends using a preputial graft when there is no balanitis xerotica obliterans, otherwise preferring to use buccal mucosa. The buccal mucosa graft is

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preferred by many surgeons to reconstruct the urethra in the first-stage procedure, but in some patients there is contracture of the graft, making re-grafting necessary [2]. This contracture can be a result of a partial graft take but more commonly is a result of the natural tendency of the graft to reduce its width. The article presented here describes a modification of the Bracka procedure ('inverted U'), which aims to enlarge the graft and diminish the risk of graft contracture compromising the subsequent urethral reconstruction.

Material and methods

The 'inverted U' Bracka procedure was performed in 10 children: nine who had undergone failure of previous hypospadias correction and one with scrotal hypospadias as the first surgery. One patient was operated on after a failed first-stage Bracka procedure due to graft contracture. The first-stage technique is described below. The second stage was performed 6 months after the first operation as described by Bracka [1]. In this second surgery we routinely cover the urethral suture with vaginal tunica.

First-stage procedure

A 'U' incision is made along the penile shaft preserving the urethral plate or scarred tissue (Fig. 1). The base of this incision is made behind the hypospadiac meatus. All scarred tissue or urethral plate is excised along the surface of the corpora cavernosa. Glans wings are created to establish a deep glandular groove. Buccal mucosa graft is primarily harvested from the lower lip with extension to the inside of one cheek. The extension of the buccal mucosa is double the length of the meatus to the top of the glans. The buccal mucosa graft after being defatted is reconfigured, forming an inverted U shape. The top of the inverted U is laid on the glans and the base is anastomosed to the full circumference of the meatus. The graft glans and meatus anastomosis is performed using interrupted PDS 6-0 sutures and graft skin anastomosis with a 6-0 PDS continuous suture. Finally, simple sutures are performed to join the graft to the corpora cavernosa. The penis is dressed as described by Bracka [1] and the bladder is drained for 5 days with a Foley catheter. We use a loose, tie-over dressing and fasten the gauze with polypropylene suture to the skin edge of the graft. All patients are discharged the day after the procedure.

Second-stage procedure

During urethroplasty we seek to include, in a first running suture line, only the mucosa graft, avoiding taking skin into the suture. After first-line suture, we perform a second running suture with dartos. Finally, we cover the sutures with a patch of tunica vaginalis. When there is a long urethroplasty we attempt to make a wider urethral meatus.

Results

The mean age of the patients was 7.2, ranging from 3 to 14 years old. The meatus was subcoronal in one, midshaft in

six and proximal in three. There was no complication in any of the procedures. Second-stage surgery was performed in seven patients, around 6 months after the first stage. Significant contraction of the graft was not seen in any patient and the second stage was uneventful. In an average follow up of 9.1 (3–19) months after stage two, one patient had a pinpoint fistula and another had wound infection with some skin loss but no urethral fistula. All patients had a glanular meatus with a vertical slit opening.

Discussion

The Bracka procedure has been quoted as a good alternative in cases of hypospadias re-operation. Advantages of this technique include a well-vascularized graft for urethral reconstruction, low number of complications and cosmetic aspect more similar to a normal neomeatus [1,2]. The principle consideration in this technical modification is to achieve a large enough graft to avoid significant contraction. The unpredictability of buccal mucosa contraction makes preputial or postauricular grafts the most commonly used. However, there is no doubt that mucosa is a better substitute of the urethra than skin. The width reached by the graft was sufficient to allow urethral tubularization without tension. The inner lower lip graft, used as described in the original technique, has a limited width. After the expected shrinkage of 20% such a graft may not be suitable for tubularization [3]. When placed over the corpora cavernosa this level of contraction can be very significant, such that a re-graft or urethral tubularization may be necessary [4]. Snodgrass and Elmore performed the Bracka procedure in 25 patients who underwent re-operation for hypospadias [2]. Graft contracture or significant focal scarring was evident in 12% of cases. All patients were patched before tubularization.

This paper describes a modification of the first stage of the Bracka procedure which seems to avoid significant graft contracture. This facilitates easy tubularization during the second-stage procedure. We believe that further tubularization at the meatal area becomes easier with this approach because of the increased width of the graft in this area. Also, the shape of the arc of the superior part of the graft fits well with the shape of the glans. The extraction of the graft from the labia through the cheek has been criticized by some with regard to the possibility of contraction. To our knowledge, however, this has not been clearly demonstrated in the literature [5]. The contraction is probably related to the buccinator lesion and can be avoided with muscular layer preservation. Considering the small size of our series, caution is advisable concerning the use of long grafts.

We recognize that the accuracy of this series is limited by the small number of patients and short follow up. It is well known that complications after the two-stage procedure may take a long time to appear [6]. However, in this initial series the aim was to describe a technique that improves the result of the first-stage procedure. The increase in graft size reduces the chance of significant graft contracture. In this regard, the graft take and the feasibility of the two-stage urethral tubularization are the principal data.

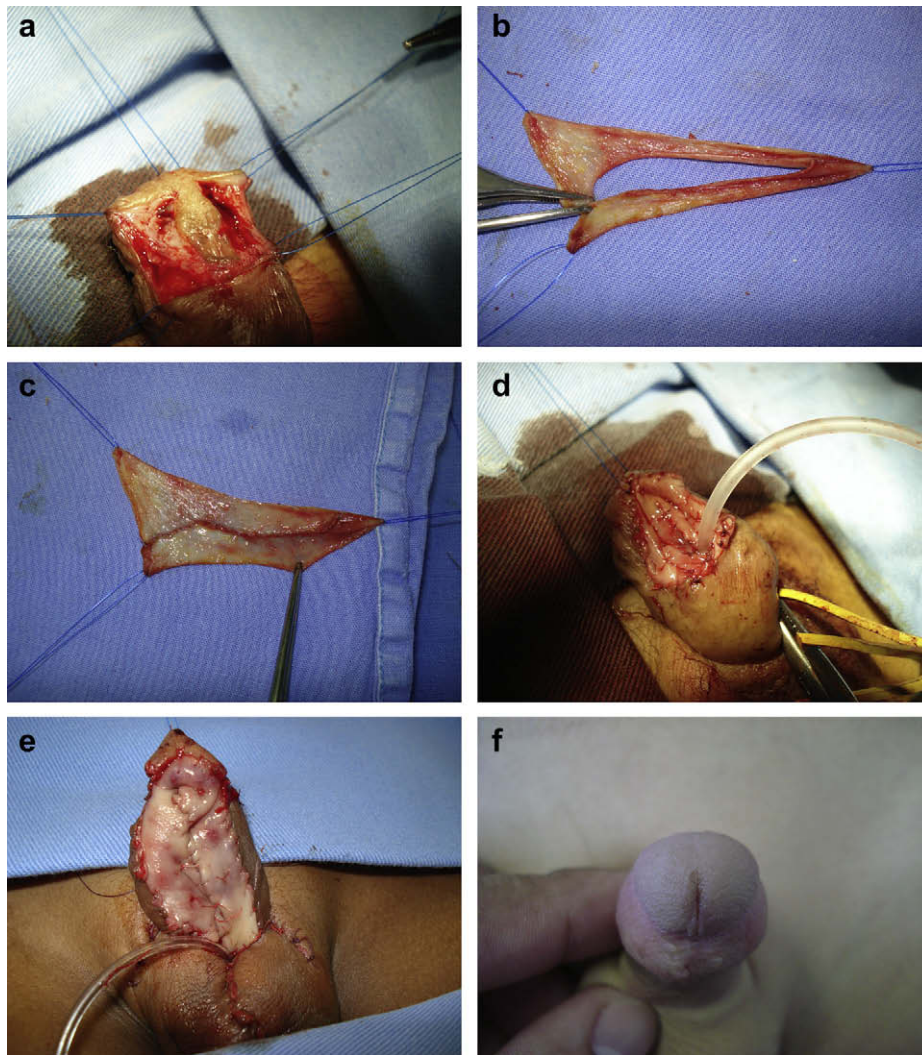


Figure 1 Inverted U first-stage Bracka procedure. (a) Penis after scar tissue or urethral plate has been excised. (b) Inverted U graft configuration. (c) Inverted U after being sutured at the midline. (d) and (e) Inverted U laid over the corpora cavernosa. The full circumference of the meatus is joined to the graft with interrupted sutures. (f) Penis after the second-stage procedure.

It is necessary to emphasize the importance of certain technical aspects that influence the taking of a successful graft. The graft should be properly defatted and attention must be given to the hemostasia of the graft bed. We avoid simultaneously performing an incision in the albuginea tunica ventrally to correct penile curvature. Finally, the dressing appears to be essential for a good result. We use a loose, tie-over dressing and fasten the gauze with polypropylene sutures to the skin edge of the graft.

Conclusion

The inverted U buccal mucosa graft for two-stage hypospadias surgery is a modification of the first-stage Bracka procedure. In this preliminary report, the modification was shown to avoid significant contracture of the graft giving a more predictable size of the neourethra for the second stage. An amplified series is necessary, however, to confirm this initial result.

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