

Management and Outcome of Bracka's Procedure on Penile Shaft Hypospadias

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ABSTRACT

OBJECTIVES: To evaluate the outcome of Bracka's procedure in patients with penile hypospadias.

MATERIAL AND METHODS: All the patients from urology, plastic surgery and Pediatric Surgery Departments at LUHMS Jamshoro from October 2007 to September 2008 having penile shaft hypospadias were included in this study. Patients who were above age 15 years, other congenital and already circumscribed penis were excluded from this study. Detailed examination of the patients such as position and size of abnormal meatus, the presence of chordee, the quality and width of urethral plate and the configuration of glans penis were noted. All the patients were operated under general anesthesia. The surgical technique applied on the basis of stage 1 and 2. The data were entered and analyzed in Statistical Program SPSS version 16.0.

Results: Total number of 30 cases was included in this study. Twenty one (70%) patients had the Distal Penile Hypospadias, 6(20%) had the Proximal penile and 3(10%) patients had mid penile Hypospadias. Various post-operative Complications were noted, chordee 2(6.7%), Infection 1(3.3%), and loss of split thickness skin graft 1(3.3%), while after stage II, 2(6.7%) developed fistula formation and in 2(6.7%) developed edema. In this study the outcomes of Bracka's procedure include Voiding direction and meatal opening, 29 out of 30 patients had straight voiding direction and one patient had deviated voiding direction, similarly 29 out of 30 patients had near normal meatal opening and one had abnormal meatal opening.

CONCLUSIONS: From our results we concluded that on the whole Bracka's two stage technique is simple, safe and versatile adjuvant to all types of hypospadias with minimal risk of complications and better out come.

KEYWORDS: Hypospadias, Bracka's Procedure, Chordee.

INTRODUCTION

Hypospadias is a congenital anomaly of the abnormally located urethral opening. Hypospadias affects approximately 1 in 250 live births¹ and uncommon in women.² More than six hundred procedures have been experienced to correct this anomaly and in all the procedures the basic requirement is to correct the meatal opening anatomically normal.³

Hypopadiasis is the common birth defect and its incidence is increasing.⁴ According to literature the ideal age for hypospadias surgery is six to twelve months of age,⁵ while various studies does not provide evidence to support recommendations concerning the ideal age for hypospadias repair.⁶

In hypospadias meatal opening is present on the ventral surface of the penis and include penile shaft, glans or corona, penoscrotal and perineum. Prefix of the hypo refers to short or less than normal, and word span points out the idea of the tube "spanning to and drawing from" the urinary bladder.⁷

The newly born boys having hypospadias are regularly recommended not to be circumcised at birth. The

unnecessary foreskin may usually be required for surgical reconstruction of a new urethra. Ventral curvature of the penis, particularly during erection, is referred as chordee.⁷

The main cause of chordee can be due to the tightening of fibrous tissue in one of the two corporal bodies that are around and at the base of the penis. In small number of patients, chordee may cause pain during erection and difficulty in penetration during sexual intercourse. Thus the surgery releases the stiffness and pulling the corporal body of the penis. Therefore, the presence or absence of chordee is an important deciding factor for surgery in spite of the meatus position.⁸

As stated by Smith's classification the meatal position is fixed before correcting the chordee while Schaeffer & Erbes method is to wait some time on labeling until after the chordee is completely corrected.⁹ These methods account for the possibility that the meatus would appear even little lower on the glans after chordee is released and therefore, a more accurate classification can be given.

The main target of management in the hypospadias

surgery is to correct the chordee and to make a neourethra terminate at tip of the reconfigured glans to restore the usual structure and function with least complications. There are more than two hundred surgical techniques have been described for hypospadias repair.¹⁰ In 1941 Humby reported the use of Buccal mucosa graft for hypospadias repair.¹¹ Nicholle described the use of two-stage technique of hypospadias repair,¹² based on the Byars and Cloutier's description.¹³ In present era "two stage repair" has been provoked through Bracka.¹⁴ This study has been conducted to observe the clinical outcome, success rate and complications of the Bracka's procedure in our setup so that future implications of the procedure may be recommended.

MATERIAL AND METHODS

This observational (analytical) study was conducted at Urology Department, Plastic surgery Department and Pediatric Surgery Department of Liaquat University Hospital Jamshoro from October 2007 to September 2008. All the patients with penile shaft hypospadias were included in this study. Those patients who were above 15 years of age or have any other congenital anomalies and patients having already circumcised penis were excluded from this study. After taking history, baseline characteristics were collected on a pre-designed questionnaire.

Surgical Techniques:

First Stage: Total patients were operated under general anesthesia. On penile examination, location of abnormal meatus, width of urethral plate and presence of chordee were noted.

Stay sutures were applied on the glans. The appearance and degree of chordee was assessed. Meatal evaluation was done with the help of dilators. After dilatation Tourniquet was used. After meatotomy Suturing of urethral mucosa to skin was made, than more two stay sutures were used on each side of the mid-line distal to the glans, which was afterward used as traction during splitting the glans. Correction of Chordee was made from proposed "neo meatus" to the ventral surface of the abnormally placed meatus. We repaired the chordee defect by making lateral incisions on either side from the sub coronal part of the vertical incision. It was carried out by the combination of tissue incision and excision with the help of scalpel and fine scissors. Correction of chordee was carried out in this way in most of the cases. Further correction was achieved by further extending the sub coronal incisions to circum coronal incision and stripping the penis.

After repairing the chordee, the size and position of the meatal abnormality was measured followed by appropriate marking. 80% of the grafts were taken

from the inner aspect of the prepuce, and the remaining 20% split thickness grafts were taken from the dorsal aspect of thigh. The graft was sutured to the defect properly from the distal margin towards proximally. After the procedure paraffin gauze was fixed over the graft and tied it with Nylon suture, followed by placement of an 8 or 10 FR silastic urinary catheter for continuous drainage of the bladder. Finally again paraffin gauze and dressing were applied around the penis.

After 48 hours dressing and catheter were removed and the patient was discharged with further advice to use paraffin ointment and tie over dressing daily. Patients were assessed in dressing's clinic after 6th or 7th days and the tie-over dressing was removed and the graft was examined. In this study, most of the grafts stayed alive. The parents were counseled to use thin layer of paraffin ointment.

Second Stage: Patients were usually assessed in our outpatient clinic in 3 months to examine the penis, any residual chordee, condition and viability of graft and plan for the "second stage" which was frequently done 4 to 6 months following first stage.

Meatal narrowing and adequacy was assessed by using the dilators. On the glans stay stitch was applied. Adequate marking of urethral tube. The graft incised and tubing over the indwelling (8F or 10F) urinary catheter with a few interrupted marking sutures followed by inverting continuous suture (vicryl 6/0). Advance protection of the repair was done by applying a vascularised facial layer dissected from the dorsal part following circum-coronal incision of the penis. This facial vascular layer reduces the risk of fistula formation.

Sterilize dressing along with paraffin gauze were applied around the penis followed by the fixation of urinary catheter to the lower abdomen to keep the position of penis vertically upward. Antibiotic was given orally for seven days. We were usually advised co-amoxiclav (augmentin) and after one week satisfactory voiding was observed. Patients were advised for the examination in our outpatient department weekly upto 3 months.

Statistical Analysis:

The data were entered and analyzed by statistical program SPSS version 16.0. Qualitative data (frequencies and percentages) such as Types of Hypospadias, Sign and Symptoms, complications and outcome of Bracka's procedure were presented as (%). Numerical variables like age, duration of hospital stay and catheterization were presented as Mean \pm Standard Deviation.

RESULTS

In this study thirty patients with penile shaft hypospadias were selected for two stage Bracka's

procedure. In this study mean age of patients was 5.10 ± 2.64 years with a range of 1-13 years (**Table I**). On examination under anesthesia, 21(70%) patients had the distal penile hypospadias, 6(20%) had the proximal penile and 3(10%) patients had mid penile hypospadias. Frequencies of different types of hypospadias are shown in (Table I).

In this study, all patients had abnormally located meatal opening. Other abnormalities include chordee 8(26.6%) and meatal stenosis 5(16.6%). Different sign and symptoms of the patients are shown in (Table I).

In this study mean duration of hospital stay after stage 1 was 2.97 ± 0.56 days and after stage 2 was 8.33 ± 1.12 days. Mean duration of Hospital Stay after 1st and 2nd stage is shown in (**Table II**).

Mean duration of catheterization after stage 1 was 2.067 ± 0.25 days and after stage 2 was 7.233 ± 0.50 days. Mean duration of catheterization after 1st and 2nd stage is shown in (Table II).

In this study, complications after stage 01 of Bracka's procedure include residual chordee in 02(25%); infection in 01(3.3%), and loss of graft in 1(3.3%) patients. Post operative complications after Stage 1 is shown in (**Table III**).

In this study, frequencies of complications after stage 2 of Bracka's procedure includes fistula formation in 02(6.7%), edema in 2(6.7%) and none of the patients had meatal stenosis, glans dehiscence, Abnormal meatal opening 1(3.3%) and deviated voiding direction 1(3.3%) patients. Post operative complications after Stage 2 are shown in (Table III).

In this study out of 30 patients, 29 patients had straight voiding direction, similarly out of 30 patients, 29 patients had normally located meatal opening. The results of outcome are shown in (Table III).

TABLE I: MEAN AGE, TYPES AND SIGN AND SYMPTOMS OF HYPOSPADIAS (n=30)

Age	Mean \pm S.D 5.10 ± 2.64	
Type of penile shaft hypospadias		
Type	Frequency	%
Distal	21	70
Proximal	06	20
Mid penile	03	10
Signs and symptoms		
Abnormal opening	30	100
Chordee	08	26.6%
Meatal stenosis	05	16.6%

TABLE II: DURATION OF HOSPITAL STAY AND CATHETERIZATION

Stages	Mean \pm S.D
Duration of Hospital Stay (in days)	
Stage 1	2.97 ± 0.56
Stage 2	8.33 ± 1.12
Duration of Catheterization	
Stage 1	2.067 ± 0.25
Stage 2	7.2333 ± 0.50

TABLE III: POST OPERATIVE COMPLICATIONS AND OUT COME OF BRACKA'S PROCEDURE

	Frequency	Percentage
Complications after stage 1		
Residual Chordee	02	6.6%
Infection	01	3.3%
Loss of graft	01	3.3%
Complications after stage 2		
Fistula	02	6.7%
Edema	02	6.7%
Meatal stenosis	00	00
Glans dehiscence	00	00
Abnormal meatal opening	01	3.3
Deviated voiding direction	01	3.3
Out come of Brackas's procedure		
Normal Meatal Opening	29	96.7
Straight voiding direction	29	96.7

DISCUSSION

Hypospadias is a congenital anomaly of male urethra. It is believed to affect 1 in 250 live births.¹ Every technique has its own complications but staged repair more effectively correct chordee and allow better reconstruction of glans including better immobilization of the graft, better revascularization and fewer complication.¹⁵

Bracka's technique is very adaptable two staged procedure which can be applied to all types of hypospadias. For the neo-urethral reconstruction, first stage of bracka's technique is the elementary stage. After correction of chordee the defect size was measured, suitable marking were done, where 80% graft

was used from the inner aspect of the prepuce, while 20% split thickness graft was taken from dorsum of thigh. In the second stage, neo urethral reconstruction was achieved by incising and tubing the area of graft terminated in a vertical slit of neo meatus at the apex of the glans and trimming off the extra prepuce to make it appear like circumcised normal penis.

In this study we applied two stage Bracka's technique for penile shaft hypospadias repair. In our study the mean age of patients was 5.10 ± 2.64 years with a range of 1-13 years. Studies conducted internationally has got age range between 06 months and 26 years.^{16,17}

In this study few complications were also reported after stage 01 of Bracka's procedure. Out of 08 only 02 patients had residual chordee, which may results from fibrosis due to residual blood clots or excessive usage of cautery or ligature.¹⁸

This study showed only 01(3.3%) patient developed infection after stage one of Bracka's repair. Another study conducted by Barroso in 2009 also showed that out of ten, one patient develops infection.¹⁹

In other study poor personal hygiene (who were of low socioeconomic status), high temperature and humidity led to infection.²⁰ In this study only 01(3.3%) patient developed loss of graft after stage 1 of Bracka's procedure. The incidence of graft loss is 7% and is commonly caused by devascularization.²¹ Hematoma, vascular spasm, pressure of dressing and infection were the causes of damage to the vascular supply.²²

The incidence of graft loss can be prevented by good surgical techniques, control of infection by good antibiotics coverage and prevention of vasospasm by local application of nitroglycerin ointment.¹⁸

In this study, frequencies of complications after stage 2 of Bracka's procedure includes fistula formation 02 (6.7%), edema 2(6.7%) and none of the patients had meatal stenosis and glans dehiscence. Another study conducted by Shaikh et al showed only 3 patients developed urethrocutaneous fistula post operatively after Bracka's technique.²³ fistula prevalence is varies from 0²⁴ to 23%,²⁵ while edema incidence is about 11.11% in literature.²⁶

In this study 96.7% of patients had straight voiding direction and normally located meatal opening. Only 3.3% of our patients developed abnormal meatal opening and deviated voiding direction, which is comparable with the results of Tabassi et al who reported 3.5% meatal abnormalities.²⁷ Other studies have shown frequency of meatal abnormalities ranging from 6-20%.^{28,29}

The dressing pressure has to be sufficient enough, because un-necessary pressure disturbed the blood supply which results in tissue necrosis. Other factors that can affect wound healing includes hematoma,

edema, urine leakage and infection which further increased the risk of complications.^{30,31}

Successful results of re-constructions also depends upon proper surgical planning, use of fine instruments,³² interest and skills of surgeon for hypospadias repair.³³

CONCLUSION

From our results, we concluded that on the whole Bracka's two stage technique is simple, safe and versatile adjuvant to all types of hypospadias with minimal risk of complications and better outcome.

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