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Management and out Come of Bracka's Procedure on Penile Shaft Hypospadias

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Abstract: To evaluate the outcome of Bracka's procedure in management of patients with penile hypospadias admitted at Liaquat University Hospital Jamshoro. Observational (analytical) Study. The 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 hypospedias were included in this study and those patients who were above age 15 years, other congenital and already circumscribed penis were excluded from this study. All the patients were operated under general anesthesia. Then the detailed examination on the table is carried out regarding the position and size of abnormal meatus, the presence of chordee, the quality and width of urethral plate and the configuration of glans penis. 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. Total number of 30 cases were included in this study. 21(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 included Chordee 6.7%, Infection 3.3% and loss of split thickness skin graft 3.3% and after stage II 6.7% developed fistula formation and edema in 6.7% of patients. 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 only one patient had deviated voiding direction, similarly 29 out of 30 patients had near normal meatal opening and only one had abnormal meatal opening. From this study we concluded that Bracka's technique gives good result. Its versatility enables its use in all types of hypospadias with consistently reproducible results with minimal complications. At the end of the second stage a circumcised penis with naturally looking vertical slit neo-meatus at the apex of the glans is produced.

Key words: Hypospadias · Bracka's Procedure · Chordee

INTRODUCTION

Hypospadias is a developmental abnormality, presents with a urethra that does not open in a normal position on the genitals. This condition occur rarely in females, with the urethra opening inside the vagina, but the urethral mal-position on the ventral/underside of the penis or on the perineum, is one of the most common congenital defects in baby boys [1].

Hypospadias is easily diagnosed at birth. Meatus is a natural passageway from the body to excrete urine. For the evaluation of patency and function of this natural passageway in a newborn baby boys, commonly use a rectal thermometer which serve as a double purpose and the witnessing of the baby boy urinating is recorded (but sometime not observed from the exact "hole"). In hypospadias, the meatus is positioned elsewhere on the ventral aspect or underside of the penis, including the glans or corona, penile shaft, penoscrotal junction or perineum.

Unlike hypospadias, in epispadias the urethra is malpositioned on the dorsal surface of the penis. Epispadias usually requires multistage and complicated surgeries. The child usually subject to incontinent until around age 5 before the final reconstruction surgery is performed. Epispadias is frequently associated with

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additional other congenital abnormalities, such as "exstrophy of the urinary bladder," in which the bladder situated outside the abdominal wall [1].

Epispadic condition appears 50 times less common than hypospadias [2], also tends to occur most commonly in children conceived by in-vitro fertilization [3].

On the basis of abnormal meatal position, hypospadias may categorize as mild, moderate and severe form. The prefix “hypo” refers to low or below normal and the word span indicates the purpose of the tube "spanning to and drawing from" the urinary bladder [4].

Newborn Baby boys with hypospadias are routinely advised not to be circumcised at birth. The unwanted foreskin may usually needed for surgical reconstruction of a new urethra, or neourethra. A ventral curvature of the penis, especially during erection, is referred to as chordee [4].

The chordee is caused by a tightening of fibrous tissue in one of the two corporal bodies that are around and at the base of the penis near the scrotum. This chordee, which is usually noticed at birth or later, results in the shorter penis than usual along with downward bending appearing as curved. In many men chordee is a bend which is some time so substantial that penetration may be very difficult for the man and for his sexual partner. In these men the erection process are often associated with pain, which may becomes more problematic for them.

Therefore, surgery to release the tightness and pulling the corporal body of the penis of these men is usually not postponed. In fact, the presence or absence of chordee is often a important deciding factor for surgery regardless of the position of the meatus [5].

According to Smith's classification the meatal position is corrected before correcting the chordee while Schaeffer and Erbes method is to wait some time on labeling until after the chordee is fully corrected [6]. These methods accounts for the possibility that the meatus would appear even little lower on the genitals after the abnormal tight chordee is released and therefore, a more accurate classification can be given.

The important target of treatment in hypospadias surgery is to correct the abnormal chordee and to create a neo-urethra terminating at the apex of the reconfigured glans restoring the normal anatomy and physiology with minimal complications. There is no any single satisfactory technique: hence more than two hundred surgical techniques have been described for the correction of hypospadias. [7] The surgical use of preputial skin graft in hypospadias was first described by Humby in 1941 [8]. The two-stage technique of hypospadias is world widely attributed to Nicolle [9] by many surgeons/authors and his technique was based on the descriptions by Byars [10] and Cloutier [11] In this current era the two-stage repair has been popularized by Bracka. [12]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 patient with penile shaft hypospedias were included in this study and those patients who were above age 15 years, other congenital and already circumscribed penis were excluded from this study. After taking history, baseline characteristics were collected on a pre-designed questionnaire.

Surgical Technique

First Stage: All the patients are operated under general anesthesia. Then the detailed examination on the table is carried out regarding the position and size of abnormal meatus, the presence of chordee, the quality and width of urethral plate and the configuration of glans penis.

Stay stitch was applied to the glans. Then the presence and degree of chordee was assessed. Meatal assessment was done using urethral dilators. Tourniquet was applied after dilatation. The suturing of urethral mucosa to skin was done after meatotomy. Two more stay sutures were applied on either side of the midline over the distal aspect of the glans which were later used as traction during glans split and later as first tie-over suture. Release of chordee was done from the proposed neo-meatus to the ventral aspect of the abnormal meatus. From the sub coronal part of the vertical incision, lateral incisions on either side were done to correct the chordee. This was done by a combination of incision and excision of tissues using scalpel and fine scissors. The chordee correction was achieved in this manner in the majority of cases. In cases of residual chordee further correction was done by extending the sub coronal incisions to circum coronal incision and stripping the penis.

After the chordee correction the size of the defect was measured, appropriate marking were made, where 80% of the flaps were used from the inner aspect of prepuce

and remaining 20% split thickness graft were taken from dorsum of thigh. It is important that the graft is even and quite thin. The graft was sutured to the defect from the distal margin to proximally, snugly without any excess. Then rolled paraffin gauze was placed on the graft and tied with Loop Nylon suture. An indwelling 8 or 10F silastic urinary catheter was inserted for continuous bladder drainage which was fixed to the lower abdomen. A circumferential paraffin tulle-gauze and dressing gauze were applied around the penis.

The urinary catheter and dressings were removed after 48 hours and the patient was discharged home with advice to apply paraffin ointment over the tie-over dressing daily. After six to seven days the patients were reviewed in dressings clinic and the tie-over dressing was removed by snipping the loop Nylon sutures in the middle and the graft was inspected (patient was given oral analgesics). In our series majority of grafts survived. The parents were advised to apply thin layer of paraffin ointment.

Second Stage: The patients were usually reviewed in three months in the outpatient clinic to assess the patient and to plan the second stage which was usually done four to six months following first stage under general anesthesia; the adequacy and quality of graft and chordee correction were assessed. Adequacy of the meatus was assessed by using dilators. A stay stitch was applied to the glans. Marking was done for tubing of urethra. The graft incised and tubed over the silastic indwelling (8F or 10F) urinary catheter with a few interrupted marking sutures followed by inverting continuous suture. The repair was protected and reinforced by using an intermediate vascularised facial layer dissected from the dorsal aspect following circum-coronal incision and stripping of penis. This vascular layer helps the healing process and avoids suture lines in contact with each other and thus reduces the risk of fistula formation.

Paraffin tulle-gauze and dressing gauze were applied around the penis. The urinary catheter was fixed on the lower abdomen with a "mesenteric type" of tape fixation so that the catheter was directed upwards away from the ventral suture line. The patient was given a one-week course of oral antibiotics Co-amoxiclav (a mixture of Amoxicillin and Clavulanic acid).The urinary catheter was removed in a week and the patient discharged home after voiding urine satisfactorily which was observed. Usually, we advised the patient to be reviewed in the clinic the following week, three months and annually thereafter.

Statistical Analysis: The data were entered and analyzed in 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 n (%) Numerical variables like age (in years), duration of hospital stay (in days) and catheterization (in stages) were presented as Mean ± Standard Deviation.

RESULTS

This was a one year study carried out in different surgical unit of Liaquat University Hospital from October 2007 to September 2008. 30 patients presenting with penile shaft hypospadias were selected for two stage Bracka's procedure.

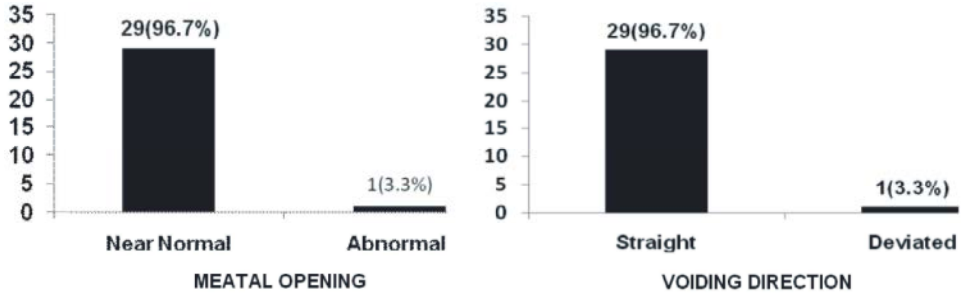
In our study evaluation from age incidence, clinical feature, application of Bracka's technique, operative time, various postoperative complications and outcome of Bracka's technique are seen. In our study the Mean age ± SD of our patients was 5.10 ± 2.64 years with a range of 1-13 years Table 1.

In our study we noticed the location of external meatus and as per location of the opening. 21(70%) patients had the Distal Penile Hypospadias, 6(20%) had the Proximal penile and 3(10%) patients had Mid penile. Frequencies Of Different types of Hypospadias are shown in Table 1.

In our study, 20(66.7%) of the admitted patients had only abnormal location of external opening. In addition to abnormal opening some patient also had the additional abnormalities such as chordee in 5(16.7%) and meatal stenosis in 2(6.7%) patients. Only 3(10%) of the patients admitted with all these abnormalities. Different sign and symptoms of the patients are shown in Table 2.

In the present study the mean duration of Hospital stay after stage 1 is 2.97±0.56 days and the mean duration of Hospital Stay after stage 2 was 8.33±1.12 days. Mean duration of Hospital Stay after stage 1 and 2 is shown in Table 1. Mean duration of catheterization after stage 1 is 2.067±0.25 days and the mean duration of catheterization after stage 2 was 7.233±0.50 days. Mean duration of catheterization after stage 1 and 2 is shown in Table 1.

In this series, few complications were also reported after stage 01 of Bracka's procedure, these include residual chordee 02(6.7%); infection 01(3.3%) and loss of graft 1(3.3%). Post operative complications after Stage 1 are shown in Table 2.



Graph 1: Shows out Comes of Bracka's Procedure (n = 30)

Table 1: Baseline characteristics of the patients(n=30)

	Frequency	Parentage
Mean age ± SD(Rang)	-	5.10±2.64(1-13)
Duration of Hospital Stay (in days):		
Stage 1	-	2.97±0.56
Stage 2	-	8.33±1.12
Duration of Catheterization (after Stage 1 and Stage 2)		
Stage 1	-	2.067±0.25
Stage 2	-	7.2333±0.50
Types of Hypospadias:		
Distal penile	21	70%
Proximal penile	6	20%
Mid penile	3	10%
Sign and Symptoms		
Abnormal opening	20	66.7%
Abnormal opening, chordee	5	16.7%
Abnormal open, meatal stenosis	2	6.7%
All	3	10.0%

Table 2: Post operative complications (Bracka's Procedure) after stage 1 and 2(n = 30)

	Frequency	Parentage
Complications after stage 1:		
Residual Chordee	02	6.7%
Infection	01	3.3%
Loss Of Graft	01	3.3%
Complications after stage 2:		
Fistula	02	6.7%
Oedema	02	6.7%
Meatal Stenosis	0	0
Glans Dehiscence	0	0

In the present study, frequencies of complications after stage 2 of Bracka's procedure includes fistula formation 02(6.7%), oedema 2(6.7%) and none of the patients had meatal stenosis and glans dehiscence. Post operative complications after Stage 2 are shown in Table 2.

The results of this study showed that the outcome of Bracka's procedure include voiding direction and meatal opening, 29 out of 30 patients had straight voiding direction and only one patient had deviated voiding direction, similarly 29 out of 30 patients had near normal meatal opening and only one had abnormal meatal opening. The results of outcome are shown in Graph 1.

DISCUSSION

Hypospadias is a congenital anomaly of male urethra. It is believed to affect 1 in 250 live births [13].

No single technique is completely free from complications. In the case of a two-stage repair, each procedure is well defined and the overall operating time maybe very similar to a lengthy single stage operation. A staged approach allows careful cosmetic reconstruction of the glans, can effectively correct chordee and can produce a near normal phallic appearance [14].

Bracka's two-stage correction is a very versatile technique which can be used to correct all types of hypospadias. This gives good results in term of restoration of normal appearance with minimal complications.

This study showed that, those patients who underwent Bracka's technique for the treatment of hypospadias, suffered less from morbidity as compared to other techniques.

The first stage of Bracka's method is a preparatory stage for neo-urethral reconstruction. After the chordee correction the size of the defect was measured, appropriate marking were made, where 80% of the flaps were used from the inner aspect of prepuce and remaining 20% split thickness graft were taken from dorsum of thigh. In the second stage, neo-urethral reconstruction is done by incising and tubing the grafted area terminating in a vertical slit of neo-meatus at the apex of the glans and trimming off the excess prepuce to make it look like a circumcised normal penis.

In this series of patients we used to treat through two stage Bracka's technique. 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 [15-20].

In this study few complications were also reported after stage 01 of Bracka's procedure. Only 2(6.7) patients in our study developed residual chordee, which may be due to excessive fibrosis resulting from residual clots, excessive use of cautery or ligature [21].

In our study only 01(3.3%) patient developed infection after stage one of Bracka's repair. Serious sepsis is absent, but mild and localized infection at the site of graft occur because of compromised vascularity, humidity and high temperature [21].

In this study only 01(3.3%) patient developed loss of graft after stage 1 of Bracka's procedure. Literature showed that loss of graft is a major complication. Devascularization is the main cause of graft loss and reported incidence is 7%.[22] Various causes of devascularization includes damage to vascular supply, hematoma, infection, vascular spasm and tight pressure dressing [21].

It can be prevented by proper graft design, good surgical technique maintaining the proper plane of dissection, good hemostasis to avoid hematoma, administration of broad spectrum antibiotics to prevent infection, avoiding tight dressings, local application of nitroglycerin ointment to prevent vasospasm and counter incisions [21].

In this study, frequencies of complications after stage 2 of Bracka's procedure includes fistula formation 02(6.7%), oedema 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 urethrocutanous fistula post operatively after Bracka's technique. [23] Incidence of fistula varies from 0 [24] to 23%. [25].

In this study oedema was observed in 02(3.3%) of patients. Incidence of edema mentioned in the literature is about 11.11% [26].

Dressing has a significant role in prevention of postoperative edema. The pressure has to be adequate, as excessive pressure may compromise the blood supply of flap and skin which may lead to tissue necrosis while no pressure may lead to hematoma, edema and infection increasing the incidences of complications [27]. The causes of fistulae remain unknown although it is likely that local infection, local ischemia and an inadequate procedure, poor tissue healing and distal obstruction due to meatal stenosis/encrustation. Anatomical factor like severity of hypospadias and satisfaction of surgeon after surgery has significant impact on the outcome of surgery. On application of stepwise binary logistic regression, unfavorable local anatomical factors and urine leakage emerge as strong risk factors for fistula formation and local infection as a moderate risk factor [28].

The successful reconstruction depends on proper planning, gentle handling of tissues with fine instrumentation and usage of intermediate vascular layer of tissues [29] It is also important that the surgeon should have a sub-specialty interest of hypospadias [30].

On the whole Bracka's two stage technique is simple, safe and versatile adjuvant to hypospadias repair with minimal risk of complications and better out come.

CONCLUSION

From this study we concluded that Bracka's technique gives good result. Its versatility enables its use in all types of hypospadias with consistently reproducible results with minimal complications. At the end of the second stage a circumcised penis with naturally looking vertical slit neo-meatus at the apex of the glans is produced.

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