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ORIGINAL ARTICLE

Inframeatal Vascularized Flap for Surgical Correction of Megameatus Intact Prepuce Variant of Hypospadias

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ABSTRACT

Background: The megameatus intact prepuce (MIP) variant of hypospadias is a rare variant of hypospadias that is diagnosed either early at the time of circumcision or later as the foreskin is retracted. The true incidence of the anomaly is difficult to determine precisely as some patient never come to medical attention but is felt to under 5% of all cases of hypospadias.

this stud was to assess the outcome of Inframeatal vascularized flap in surgical correction of MIP regarding as Functional outcome (Adequate forward stream)., Cosmetic., Complication.

Methods: This prospective study included 12 patients with Megameatus Intact Prepuce Variant of Hypospadias presented to Zagazig university hospitals scheduled for surgical repair by Mathieu Technique.

Results: Two patients with early complication; one patient complicated with infection and edema other patient's complicated infection only. Two patients with late complications: there were 2 cases fistula treated surgically by fistula closure after 6 months and there was no dehiscence and no meatal stenosis. According to our definition of success: Success rate 10/12 = 83.3%.

Conclusions: Inframeatal vascularized flap urethroplasty may offer better outcome regarding urinary function and cosmesis with low complication rate, however larger number of cases with longer follow up period are needed for better evaluation of such technique.

Keywords: Inframeatal Vascularized Flap, Megameatus Intact Prepuce Variant of Hypospadias, circumcision, Cosmetic



INTRODUCTION

Hypospadias is one of the most common congenital anomalies of the external genitalia in males[1]. Hypospadias is defined as an insufficient development of the urethral fold and the ventral foreskin, with or without penile curvature[2]. Based on the position of the meatus classified hypospadias into three categories: A- Anterior hypospadias with the meatus on the glans penis at the corona, subcoronal or at the distal penile shaft. B- Middle hypospadias with the urethral opening located on the midshaft of the penis. C- posterior hypospadias have a proximal penile shaft, penoscrotal, scrotal or perineal urethral meatus location[3]. The megameatus intact prepuce (MIP) variant of hypospadias is a rare variant of glanular hypospadias, occurring in approximately 3–6% of all hypospadias repair although its exact incidence is unknown given the fact that a number of patients with MIP may not be identified, come to medical

attention or the urethral anomaly is not felt to be clinically significant[4].

Several approaches are used for MIP repair, including the glanular approximation procedure (GAP), the pyramid procedure, modification of the Mathieu technique, cutaneous advancement procedure, and the subcutaneous frenulum flap with many modifications [2].

METHODS

This prospective cohort study included 12 patients with megameatus Intact Prepuce variant of hypospadias carried out at the department of Urology, Pediatric unit, Zagazig University Hospitals. Written informed consent was obtained from all children's parents and the study was approved by the research ethics committee of the Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association

(Declaration of Helsinki) for studies involving humans.

Inclusion criteria for the selected patients were Pediatric population according to institute policy (up to 16 years) with megameatus intact prepuce variant of hypospadias (MIP) and uncircumcised. No associated other congenital penile anomalies.

Exclusion criteria were Redo and complex Megameatus Intact Prepuce Variant of Hypospadias cases.

Operational design: Preoperative steps:

History taking with particular emphasis on urological history. Patient evaluation and examination of the external genitalia especially penis as regard: The prepuce, Meatal site, Width of the urethral plate, Presence of penile torsion, Presence of other genital abnormalities, and Curvature degree according to GMS score (Glans-Urethral Meatus-Shaft (GMS) score is a concise and reproducible way to describe hypospadias severity based on anatomic features (i.e. glans size/urethral plate quality, location of meatus, and degree of chordee) felt to most likely impact functional and cosmetic outcomes following hypospadias repair.). Laboratory investigations involved: Complete blood count and Renal Function Test (RFT), Liver Function Test (LFT), Random Blood Sugar (RBS), Coagulation Profile (PT, APTT, INR), Urine Analysis, and Urine Culture And Sensitivity.

Operative steps: All patients put in Supine position and given ceftriaxone 50mg per kg with induction of general anesthesia, the smegma was removed and povidone-iodine 10% shampoo and saline wash, and Urethral catheter with suitable size was placed. A stay suture placed at the dorsal skin of the glans for easy handling, Measurement length and width of plate from hypospadias meatus to expect site of new meatus, Marked the flap, Tourniquet was applied, and Fashioning of the inframeatal flap was done. Degloving of the penis, Fine dissection of the flap to be raised to cover the plate, The glans wings separated, Flap was sutured to the ventral aspect of incised plate by vicryl 6/0 with round needle continuous suture, The glanduloplasty and meatoplasty and skin covering, and Urethral catheter fixed and dressing applied for 5days.

Postoperative steps:

The patient discharged mostly after one day with postoperative medications that include: Antibiotic in the form of oral suspension of Amoxicillin + Clavulanic acid (45mg/kg/day) divide to two doses every 12h. Analgesia in the form of oral syrup of

Acetaminophen (Paracetamol) (10-15mg/kg/dose) every 6h and Anti-edematous in the form of oral syrup of Alpha Amylase (100ml contain 20000 U) 5-10 ml every 8h..

Follow Up

The first visit after 5 days for: (Removal of the dressing and assessment the condition of the wound regarding early complications: Bleeding, Hematoma, Edema, Wound infection, and Dehiscence and Removal of the urethral catheter.

The second visit after one week from first visit for (reassessment of the wound and if the early complication subsided or not and assessment of Late complications: Fistula, Urethral stricture, and Meatal stenosis.

Our success was defend as to Have a meatus at tip of glans with Adequate forward stream(functional) without need to second operation. Follow up will be every week in first month then every month for 6 months.

STATISTICAL ANALYSIS

The collected data was entered to and analyzed by computer using Statistical Package of Social Services, version 25 (SPSS). Results were presented by tables and graphs. Quantitative data was presented as mean and standard deviation. Qualitative data was presented as frequencies and proportions. Pearson Chi square test (χ^2) and fisher's exact were used to analyze qualitative independent data. P value of ≤ 0.05 was taken as significant

RESULTS

The results of the current study showed that the mean age was 3.31 years, the mean Operative time was 73.7500 minutes, the mean GMS was 4.4167 and the mean Length of flap was 0.8583 (**Table 1**). Regarding early complications, current result showed that only two patients were complicated; one patient complicated with infection and edema other patient's complicated infection only. All complications treated medically case by case according to situation by good hygiene, proper antibiotics and continuously anti-edemetus two weeks. Regarding late complications current result showed that there were 2 cases fistula treated surgically by fistula closure after 6 months and there was no dehiscence and no meatal stenosis. The success rate in the current study was 83.3% where 16.7% of the studied group were failed and over the success rate there were two cases of fistula need to fistula closure after six months (**Table 2**).

Table (1): patient demographic data

	Age (years)	GMS	Operative time (minutes)	Length of flap (cm)
Mean	3.31	4.4167	73.7500	.8583
Median	3.15	4.0000	75.0000	.8000
Std. Deviation	1.181	.99620	9.32372	.25683
Minimum	1.5	3.00	60.00	.50
Maximum	6.3	6.00	90.00	1.50

GMS = Glans-Urethral Meatus-Shaft

Table (2): Early complications, late complication and Success rate distribution among studied group

	N	%
Infections	2/12	16.7
Edema	1/12	8.3
Fistula	2/12	16.7
Success	83.3	10
Failure	16.7	2



Figure 1 | Preoperative outlining of the incision. Note that the glans is splayed and the urethral groove is deep. The infracoronary flap has been measured to match the length of the urethral plate



Figure 2 | Intraoperative view of the urethral plate dissection. Note the clear delineation of the lateral extension of the urethral plate (green arrow). A traction suture on the inframeatal flap allows for identification of the tissue planes between urethra and glans



Figure 3 | The inframeatal flap has been deepithelialized and is rotated superiorly to cover the reconstructed urethra (green arrow).

DISCUSSION

Number of cases in our study is 12 cases which is nearly to Duckett et al.,[5] study on 14 cases, and Derouet et al.,[6] study on 9 cases, but Marc Cendron,[4] study on 25 cases, Bar-Yosef et al.,[7] study on 24 cases and there is big different with Khalil et al.,[8] study on 68 cases and Hadidi et al.,[9] on very large different study on 923 cases. Our study reported 2 cases with complications in the form of fistula associated with 2 cases infection and 1 case edema in comparable with other studies, where Marc Cendron,[4] reported 2 cases with complications 1 case wound dehiscence and 1 case with minor fistula that mean better than our study, also in Hadidi et al.,[9] reported 25 cases with complications in the form of 14 cases with fistula, wound disruption in 7 cases and meatal stenosis in 4 cases, Derouet et al.,[6] reported 1 case with complications in the form of edema, Bar-Yosef et al.,[7] reported 4 cases of complications in the form

of 3 cases complicated by meatal stenosis and 1 case complicated by fistula, Khalil et al.,[8] reported 12 cases with complications in the form of 7 cases with fistula and 5 cases with meatal stenosis, and lastly Duckett et al.,[5] which is the best one there is no complications was reported in his study.

Our study took period of follow up 6 months in comparable with other studies Marc Cendron,[4] took 6 – 18 months, Duckett et al.,[5] taken 36 months, and similar to Bar-Yosef et al.,[6] also took 36 months while Khalil et al.,[8] took 36 – 48 months, nearly to Derouet et al.,[6] took also 7 – 47 months but Hadidi et al.,[9] took the largest period of follow up 22 – 72 months.

In our study all cases done just by Mathieu technique while other studies Derouet et al.,[6] technical operation used is 5 from 9 by Mathieu technique and 4 from 9 done by onlay urethroplasty with paramental foreskin flap II (OUPF II), while

in the study of Marc Cendron,[4] done by Mathieu technique in 15 from 25 cases and 10 cases from 25 done by TIP, Khalil et al.,[8] The remaining 68 patients were randomly divided into two groups. Group 1: Mathieu incised-plate (Mathieu-IP) included 34 patients who underwent Mathieu-IP technique and Group2 (TIP) included 34 patients who were managed using the TIP technique. In Hadidi et al.,[9] slit-like adjusted Mathieu (SLAM) technique was performed on 923 patients, Bar-Yosef et al.,[7] study on 24 cases 2 underwent MAGPI technique and 11 underwent GAP technique, and 8 cases underwent TIP, technique and 3 cases the procedures were performed by TIP urethroplasty technique. And lastly Duckett et al.,[5] was done pyramid technique to 14 cases.

In our study the success rate is (83.3%), which in agreement with the study of Khalil et al.,[8] who reported success rate of (82.4%) and our study nearly same of success rate in, Bar-Yosef et al.,[7] was reported (83%). All the other studies as Derouet et al.,[6] had success rate (88.9%) that may explained by less number of cases, and the age of cases is little aged in comparable with our study, and Marc Cendron,[4], Hadidi et al.,[9] that had success rate (92.1%) (97.6%) respectively than may be due to the difference in number of cases and the range of aged patients, the best success rate done in Duckett et al.,[5] (100%) that may be suspected due to operated by the pyramid procedure and small aged patients than our study.

CONCLUSION

Inframeatal vascularized flap urethroplasty may offer better outcome regarding urinary function and cosmesis with low complication rate, however larger number of cases with longer follow up period are needed for better evaluation of such technique.

No conflict of interest

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