ORIGINAL ARTICLE

Repair of Distal Penile Hypospadias with (Meateal Based Flap) Mathieu Technique

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ABSTRACT

Hypospadias is one of the most common congenital anomalies amenable to surgery. The efficacy of Mathieu (meatal based flap) procedure for distal penile hypospadias was evaluated. The study was carried out from September 2006 to August, 2010 in the Department of Urology, Nawaz Sharif Social Security Hospital, Lahore. Seventy patients of distal penile hypospadias with age range 2-25 years were treated. Complications were seen in 19 patients. Ten (14.2%) patients developed urethrocutaneous fistula and four (5.7%) total disruption. Five (7.1%) patients developed meatal stenosis which was managed by regular dilatation. Overall success rate was 80%. It is concluded that this is a good technique and can be applied safely for the repair of distal penile hypospadias.
Key words: Hypospadias, Congenital anomalies, Mathieu technique, Fistula

INTRODUCTION

Hypospadias is a congenital deformity characterised by an abnormally located urethral opening, that can occur anywhere proximal to its normal location on the ventral surface of penis or into the perineum[1]. The penis is more likely to have associated ventral shortening and curvature, called chordae, with more proximal urethral defects. The reported incidence of hypospadias is approximately 1:300 live births[2]. There are several forms of hypospadias classified according to meatal location (1) glanular, (2) coronal, (3) penile, (4) penoscrotal and (5) perineal. About 70% of all cases of hypospadias are distal penile or coronal. Number of techniques for the repair of distal penile hypospadias such as MAGPI[3], Mathieu[4], Horton Denine flip flap procedure[5], anterior urethral advancement technique[6], tubularized incised pate urethroplasty[7] and other techniques have been described to repair distal penile hypospadias with varying degrees of success. In this study we have evaluated Mathieu procedure for the repair of distal penile hypospadias.

PATIENTS AND METHODS

This prospective study was conducted in the Department of Urology, Nawaz Sharif Social Security Hospital Lahore which is a teaching hospital attached with University College of Medicine & Dentistry Lahore. The study period spans from September, 2006 to August, 2010. Patients with chordae and previous history of hypospadias repair were excluded from the study, but previously circumcised patients were included. Seventy patients with age ≥2 years were included in this study. Diagnosis was made on clinical basis. On admission patients were thoroughly evaluated with history, physical examination and investigations. In every patient, complete blood examination, urine routine examination, renal function test, renal ultrasonography was done. Patients were observed for wound infection, oedema, fistula formation, tube disruption and meatal stenosis. Failure of procedure was considered if there was a fistula or tube disruption. Among the patients with successful repair cosmetic appearance of phallus was evaluated in terms of acceptance by the parents or adult patients. It was graded as poor, satisfactory or good.

Operative Technique: The procedure was done under general anesthesia or caudal nerve block supplemented with general anesthesia. The area was prepared with pyodine and all antiseptic measures adopted. A traction suture of 5/0 polydiaxanone (PDS) was placed in the glans penis. A feeding tube or Foly catheter, 8-16 Fr depending on the age of the patient was inserted in the urethra and passed into the bladder. A rubber tourniquet was applied around the base of the penis for hemostasis upto 45 minutes maximum. Two parallel incisions 6-12 mm apart were made lateral to meatus, one on each side. Incisions were extended in distal direction upto the tip of the glans and proximal extension according to the required length. Transverse incision was made joining the two incisions at their proximal end. Flap was raised from the skin strip between two incisions proximal to meatus preserving the continuity of flap at the meatus. The flap was brought over the distal strip (180° rotation). Neourethra was constructed over the stent by suturing the ipsilateral edges of the incision

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with 5/0 PDS. After making the neourethra, tourniquet was released. Hemostasis secured with bipolar diathermy. The original stent was replaced with a stent of relatively smaller diameter to avoid tension on suture line. Glans wings were raised and sutured over the neourethra. Skin cover was made by mobilization of preputial and distal penile skin. Any redundant skin was excised. Antiseptic dressing with mild pressure was done. First dressing was changed after 48-72 hours. Stent was removed after 10 days. Antibiotics were given for 2 weeks.

RESULTS

A total of seventy patients were included in this study. Forty (57.14%) cases were coronal, 20 (28.57%) cases were subcoronal and 10 (14.28%) cases were anterior penile hypospadias (Table 1). Age range was 2-25 years. Mean age was 9.9 years (Table 2). Fifty patients were brought because of abnormal appearance of the child's penis, while 20 (28.57%) had thin stream and dysurea (Table 3). Twenty (28.57%) patients had negligible chordae. Twenty two patients were circumcised. Other associated abnormalities were inguinal hernia in 3 (4.3%) and unilateral undescended testis in 4 (5.7%). Operative time ranged between 40-75 minutes. Mean operative time was 60 minutes. Postoperative oedema was noticed in 10 patients which improved in few days.

Table 1: Types of hypospadias

Type	=n	%age
Coronal	40	57.14
Subcoronal	20	28.57
Anterior penile	10	14.28

Table 2: Age at the time of presentation

Age (Years)	=n	%age
2 – 5	28	40.0
6 – 10	13	18.6
16 – 20	8	11.4
21 – 25	9	12.9

Table 3: Presenting complaints

Complaints	=n	%age
Abnormal appearance of child's penis	50	71.4
Thin stream and dysurea	20	28.6

Eight (11.4%) patients developed wound infection, 4 patients (5.7%) had severe infection that resulted in wound dehiscence and complete breakdown of the repair. Meatal stensois was noticed in 5 patients (7.1%) which was improved by regular dilatation over a few weeks period (Table 4). Among the patients with successful repair, cosmetic appearance was good in 22(40%) and satisfactory in 33 (60%) patients (Table 5). Overall success rate was 80%.

Table 4: Complications

Complications	=n	%age
Urehtrocutaneous fistula	10	14.2
Total tube disruption	4	5.7
Meateal stenosis	5	7.1

Table 5: Cosmetic appearance

Cosmetic appearance	=n	%age
Good	22	40.0
Satisfactory	33	60.0
Poor	-	-

DISCUSSION

With an incidence of 1:300, hypospadias is one of the most common genital anomalies in male newborns.[8] However the etiology of hypospadias remains unknown.[9] In the majority of cases abnormal meatus is situated at the glanular, coronal and subcoronal levels or in the distal part of the shaft[10,11-13].

A total of seventy patients were included in this study. Their age ranged from 2-25 years, mean age was 9.9 years. Construction of neourethra is generally recommended to be completed before the school going age. In this study 60% patients presented beyond the age of 5 years and 25% patients presented above the age of 15 years. A similar trend is observed in other reports from the subcontinent.[14-16] This is because of ignorance, low literacy rate, attitude of the parents and poverty in this part of the world.

Main presenting complaint was abnormal appearance of penis in 71.4% patients. In a series conducted by Dar et al[15] the observation was same but Lahoti et al[10] presented a series in which forty seven out of 50 patients had a narrow meatus and thin stream. Djakovic et al[17] in a review article mentioned that meatal stenosis is not common in patients of hypospadias. Other associated abnormalities were inguinal hernia in 3 patients (4.3%) and unilateral undescended testis in 4 patients (5.7%). Similar results were reported in other studies[14-16].

The goal of modern hypospadias surgery is functionally and cosmetically normal penis. More than two hundred methods have been introduced through the 125 years history of hypospadias surgery.[10] This reflect unsatisfactory results with every operating technique and hypospadiologists are still in search of ideal technique. Important aspect of urethroplasty is the exact placement of each suture so that the edge

of epithelial surface is inverted and the raw surface of the subepithelial tissues are approximated.

Simple urethral tubularization (Thiersch Dupulay, King, or GAP procedure) is attractive because apparently it is simple to perform. However urethral plate is rarely wide enough to permit an adequate urethral calibre. MAGPI operation is best limited to glanular meatus. The Onlay island flap is rarely feasible option in previously circumcised patients. Meatal based flap (Mathieu) is a reliable and time tested method for correcting distal penile hypospadias. Complications are common after hypospadias repair with any technique ranging from fistula to complete loss of neourethra, requiring reconstruction.

The most common complication of hypospadias repair is urethrocutaneous fistula. The reported incidence of urethrocutaneous fistula varies from 13-20% with Mathieu technique.[14,16] In our study we observed a comparable incidence (14%) of fistula formation.

Meatal stenosis is observed in 7-30%.[14,16] We found meatal stenosis in 7% cases which is not high as compared to other studies. Total disruption of neourethra is the most concerning complication because it requires reconstruction of urethra in a patient with scarred skin. In studies by Akmal et al[14], El-Majeed et al[16], Hayashi et al[18] and Riaz-ul-Haq et al[19,] tube disruption was between 3.3 to 6%. We observed tube disruption in 5.7% cases which is comparable to the above mentioned studies. Among the patients with successful repair, cosmetic appearance was good in 22 (40%) and satisfactory in 33 (60%) patients. Total success rate in our study is 80% which is comparable to other studies.[14,16,18,19]

CONCLUSION

Meatal based flap (Mathieu) is a reliable method and can be applied safely to repair distal hyospadias.

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