Inverted Y on V Meatourethroplasty for Distal Penile Hypospadias: Our Experience in Queen Rania Al-Abdulla Hospital for Children

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ABSTRACT

Objective: The aim of this study was to evaluate patients with Distal Penile Hypospadias who were treated by Inverted Y on V Meatourethroplasty regarding success rate, complications and cosmesis.

Methods: This was a retrospective study, carried out at Queen Rania Al-Abdulla Hospital for Children from April 2010 to June 2012. Forty four patients with distal Penile Hypospadias without chordee underwent Inverted Y on V Meatourethroplasty. Age of the patients ranged from one and half year to eight years. Mean age was four and half years.

Results: Patients were followed up to 18 months post surgery. Thirty three patients (75%) had excellent results without any complications and excellent cosmetic result, while complications were seen in 11 patients, with retracted meatus in six cases (13.6%), fistula in four (9%), and complete disruption in one case (2.3%).

Conclusion: Inverted Y on V Meatourethroplasty can be used successfully for Distal Penile hypospadias repair with excellent cosmetic result, complications rate remains acceptable but we need further evaluation and more experience with this technique.

Key words: Cosmesis, Hypospadias, Meatourethroplasty.

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Introduction

Hypospadias is one of the most common congenital anomalies encountered in pediatric surgery. Its incidence ranges from 1/200 to 1/300 live male births.\(^{1-5}\) Hypospadias is abnormal development of penile urethra, ventral prepuce, abnormalities in penile curvature and it may be associated with abnormal or deficient penis corpus spongiosum. This is due to incomplete development of urethral folds leading to lack or improper tubularization and later formation of normal urethra.\(^{1,2}\) Hypospadias is classified according to location of the meatus into distal, middle and proximal penile hypospadias.\(^{2,4}\)

Distal Penile Hypospadias is the commonest accounting for 65-80 % of cases, while it is further subdivided into glandular, coronal and distal penile.\(^{2,6}\)
No definite cause could be identified for hypospadias but the incidence increases in boys whose fathers have hypospadias by 8% and 14% if brothers are affected. Primary evaluation for hypospadias is to evaluate meatus position, chordee, penile size and foreskin. Several surgical techniques are used for repair of hypospadias depending on the type and state of local penile tissue. The aim of repair is to locate the meatus at its normal anatomical position with accepted cosmesis. Functionally the child should have the ability to urinate during standing with single stream without difficulty.

The incidence of surgical complications post hypospadias repair ranged from 20-30%. Urethrocutaneous fistula is the commonest one. Several methods were developed to reduce the incidence of fistula such as Inverted Y on V Meatourethroplasty technique.

The aim of this study is to evaluate our experience with Inverted Y on V Meatoourethroplasty technique regarding complication, cosmesis and patient satisfaction.

Methods
This is a retrospective study conducted at Queen Rania Al-Abdulla Hospital for Children, Amman – Jordan. The study included patients who were managed by one pediatric surgical team between April 2010 and June 2012 with distal penile hypospadias. The surgical technique was explained to parents and informed consent was obtained. Children were brought to day care unit at the day of surgery and admitted post operatively. Demographic data, complications and outcome were collected for each patient and analyzed to review the outcome of this surgical technique.

Surgical Technique:
Procedure was done under general anesthesia with caudal block. Prophylactic antibiotics were given (ampicillin and gentamycin). Examination under general anesthesia was done to confirm the location of urethral meatus, the presence or absence of chordee and state of local tissue such as glans, penis size and state of distal urethra. If glans size was judged to be adequate, and glanular hypospadias was confirmed with good urethra distally, inverted Y on V meatoourethroplasty was performed (Fig. 1).

Stay suture at the tip of the glans with 4/0 prolene (polypropylene) and catheterization were done (Fig. 2). Circumferential penile skin incision was done followed by penile degloving taking care not to injure the urethra. Inverted Y shaped incision at penile glans was done and the two limbs around the meatus reaching the circumferential incision were established (Fig. 3a, b, c, d). Mobilization of urethra could be done for 0.5-1.5 cm (Fig. 4a, b).

Urethra was catheterized using Zaontz urethral stent with size range from 6 – 10 Fr. according to meatus and glans size. This stent traverses the urethra but was not indwelling in the bladder (Fig. 5). Interrupted sutures were applied between advanced stented urethra and the tip of incised glans (Meatoplasty) with 6/0 PDS (polydioxanone) (Fig. 6).
Fig. 3: Inverted Y marking around meatus (a, c), reaching the circumcision line (b), and inverted Y incision with two limbs around the catheterized urethra (d).

Fig. 4: Glandular wings (a), and urethral mobilization (b)

Fig. 5: Zaontz urethral stent

Fig. 6: Meatoplasty
Fig. 7: Glanuloplasty and circumcision (a) arrow point toward stent and glans, cosmetic appearance and new meatal position after one month of surgery (b)

Anterior dartos flap was applied over the urethra using 7/0 vicryl (polyglactin). Both wings of the glans were approximated together with 6/0 PDS over the new advanced meatus with few stiches (6/0 vicryl) applied between the meatus and the glans to decrease tension and future stenosis. Circumcision was completed and homeostasis secured with 6/0 vicryl (Fig. 7a, b).

Dressing with gentle pressure was done. All patients were admitted post operatively to the ward with adequate intra venous antibiotics and analgesia. They were discharged next day after making sure they are able to pass urine freely with oral analgesia and oral antibiotics.

All patients were followed up as outpatients after a week for reassessment and stent removal, then one month later we reviewed all patients and lastly we saw them six months and one year later.

Results

Forty four patients with primary distal penile hypospadias underwent Inverted Y on V Meatourethroplasty. The age ranged from one and half year to eight years with mean age of four and half years. No penile chordee was noted in any patient. All patients were followed for 12 to 18 months in outpatient clinic. Mean follow up duration was 14 months.

We saw all patients after one week post operatively for reassessment and stent removal, and one month later for reevaluation then six month and one year later.

The mean hospital stay was 24 hours. Time of operation ranged from 40 to 75 minutes with mean time of 55 minutes. No complications could be seen in thirty three patients (75%) with excellent cosmetic results.

Retracted meatus was seen in six patients (13.6%). Urethrocutaneous fistula in four patients (9%). Complete disruption in one patient (2.3%). Other complications like urine retention, bleeding and meatal stenosis were not seen.

Discussion

Distal penile hypospadias is the commonest type of hypospadias, but till now there is no agreement for the best procedure to treat this anomaly. Urethral advancement techniques are carried out in 2% of distal hypospadias repair. Inverted Y on V meatourethroplasty is mainly dependant on urethral mobilization for 0.5 to 1.5cm and strong glandular flap that is approximated easily over the urethra.

Regarding urethral blood supply, it is mainly depend on posteriolateral vessels (antegrade) with no retrograde vascularization from glans due to atresia of distal spongiosus, therefore care must be excercised during dissection of urethra and glandular flaps. In this technique we raise corpus spongiosum which has separate blood supply from internal pudendal vessels so it become like a vascularized pedicle. Sometimes distal urethra may have low blood supply and picture of ischemia may occur which result in meatal stenosis.

Ventral skin covering urethra is usually thin and translucent so an expert surgeon is needed for urethral liberation, because iatrogenic...
injury is the main cause of urethrocutaneous fistula in this technique.\(^{(12)}\)

The only contraindication for doing Inverted Y on V Meatourethroplasty is severe chordee,\(^{(12,16)}\) but in most cases we can see mild chordee which is unrelated to urethral plate so it is suitable for this technique.\(^{(15)}\)

One of the most common complications of hypospadias surgery is the development of a urethrocutaneous fistula. Many techniques have been established to reduce the rate of fistula such as Inverted Y on V Meatourethroplasty, MAGPI, GAP, Mahtieu procedure, Tubularized incised plate urethroplasty and corpus spongiosum advancement.

It is reported that corpus spongiosum advancement and urethral advancement techniques abolished urethral fistula as reported by Dutta\(^{(14)}\) and Awad,\(^{(17)}\) this could be explained by the fact that no new urethra is created. In our series we report four cases (9\%) of urethrocutaneous fistula and this is could be due to iatrogenic injury during dissection and advancement of urethra which was in the early part of our series and this was nearly abolished as experience was gained with this technique.

This rate of fistula is still low in comparison with other procedures as Samuel\(^{(18)}\) reported that urethral fistula is the commonest complication in Mathieu and TIPS repair reaching up to 12.3\%.

Dutta\(^{(14)}\) commented that complications decrease with experienced hands so the only explanation for urethral fistula in inverted Y on V Meatourethroplasty is iatrogenic and the need for experience is mandatory for this procedure, but we think that surgeons will be more familiar with it in future.

Regarding the meatus there were two major complications post hypospadias surgery which includes meatal retraction and meatal stenosis. Some procedures are associated with high rate of meatal retraction such as MAGPI procedure. Hastie\(^{(19)}\) found that meatus did not stay in its position after MAGPI repair in long term follow up in most of cases, but in our study we found that 13\% of cases experience some sort of meatal retraction in short term follow up in early series and for this reason we treated this complication later on by good mobilization of urethra and meatal fixation with glandular tissue and to give more support to urethra by glandular wings.

Regarding meatal stenosis, we did not see any cases who developed this complication and this is like other advancement techniques reported by Roodsari.\(^{(13)}\) This is due to preserving blood supply during urethral dissection and performing meatoplasty in this technique which could be the reason for abolishing this complication.

Wilkinson\(^{(19)}\) reported in his review that tubularized incised plate urethroplasty has a high incidence of meatal stenosis and as we reported previously we did not find any case complaining of meatal stenosis in our review and this is a major advantage of Inverted Y on V Meautérethroplasty which encourages us to continue using it in the future for distal hypospadias repair.

Caione\(^{(15)}\) reported excellent feedback regarding functional and cosmetic results. We explained to parents everything regarding this technique such as complications, success rate, post operative care and cosmetic results, so we found that most of parents were happy and satisfied regarding this procedure and its outcome, and this is mostly due to excellent cosmetic results with nearly normal glandular shape and meatus.

Caione\(^{(15)}\) reported that urethral advancement techniques and glanuloplasty has excellent results in distal hypospadias repair with minimal complications and also we found that Inverted Y on V Meautérethroplasty is one of best choices for distal hypospadias repair with excellent results. However, Gunter De Win \(^{(3)}\) report in his review that long-term outcomes of pediatric hypospadias and surgical intervention in hypospadias repair with different techniques is good but complications increase with longer follow up. We followed up the patients for 18 months post surgery and we think that we need more time and longer follow up for more assessment and evaluation of Inverted Y on V Meatourethroplasty in order to be able to say it is an excellent procedure for distal hypospadias repair.
Conclusion
Inverted Y on V meatourethroplasty is one of the best choices for distal penile hypospadias repair with excellent results. Complications rate is acceptable in short term follow up but still we need further evaluation and long term follow up, with more experience for this procedure.

References