Original Research Paper

Volume-10 | Issue-2 | February - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Urology

URETHRAL MOBILIZATION AND ADVANCEMENT

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ABSTRACT

Introduction: Hypospadias is one of the most common congenital anomalies occurring in 1:250 to 1:300 live births. If left uncorrected patients with hypospadias may need to sit down to void and tend to shun intimate relationships because of the fears related to normal sexuality.

Aims: The aim of this study is to evaluate urethral mobilization and advancement procedure in the management of different types of distal hypospadias and analyse the results.

Methods: This prospective study was done from March 2018 to August 2019. Urethral mobilization and advancement procedure was used in the management of distal hypospadias in 25 children whose ages range from 2years to 12 years. Children with distal hypospadias were chosen for this study. Most of the cases were operated by a single surgeon.

Results: In this study, thirteen cases had associated findings like chordee and meatal stenosis. Out of the 25 cases, 21 (84%) cases had successful outcome. The follow up period ranges from 6 months to 2 years. Based on the length of urethra to be mobilized the operating time for this procedure ranges from 45 minutes to 60 minutes. The overall hospital stay ranged from 7 days to 13 days.

Conclusion: The ratio of the gap between hypospadiac meatus and the glans tip to the length of urethra mobilized should be 1:3. The main indications are presence of glanular chordee, failed meatal advancement and glanuloplasty incorporated procedure (MAGPI), circumcised children with distal hypospadias, immobile fibrotic urethral meatus and as an alternative to MAGPI.

KEYWORDS : Hypospadias, urethral mobilization, urethral advancement

INTRODUCTION:

Hypospadias is one of the most common congenital anomalies occurring in approximately 1:250 to 1:300 live births. In patients with severe hypospadias the genitalia may look ambiguous at birth resulting in emotional and psychological stress for parents in that the gender assignment of their baby immediately comes into question. If left uncorrected patients with hypospadias may need to sit down to void and tend to shun intimate relationships because of the fears related to normal sexuality. The general principles of hypospadias surgery combine correction of penile curvature with reconstruction of the missing urethra to provide a functional as well as cosmetically acceptable terminal urethral meatus. Many single and two stage procedures have been described to achieve this objective, which reflects the wide spectrum of this common congenital anomaly and the failure of any single technique to win uniform acceptance.

AIM OF STUDY:

The aim of this study is to evaluate urethral mobilization and Advancement procedure in the management of different types of distal hypospadias and analyse the results.

MATERIALS AND METHODS:

This prospective study was done from March 2018 to August 2019 over a period of eighteen months. Urethral mobilization and advancement was used in the management of distal hypospadias in 25 children whose age ranged from 2 years to 12 years. Children with glanular, coronal, subcoronal and distal penile variety of hypospadias was chosen for the study. All the children were non circumcised individuals. Cases with proximal penile and mid penile variety of hypospadias were excluded from this study. Ultrasonagram of abdomen was done in all cases to rule out associated urogenital anomalies. In 17 children this procedure was done at the age group of two to five years. 5 children were in the age group of five to ten years and three children belong to more than ten years age group. In two children the meatus was glanular, coronal in six children, subcoronal in eleven children and distal penile in six children. The reported patients have been followed for six months to two year.

PROCEDURE:

With the patient under general anesthesia, a traction suture was placed through the glans. A size 8 F infant feeding tube was passed into the bladder. Epinephrine 1: 200,000 dilution was injected along the incision lines. An artificial erection test was done to demonstrate the degree of chordee in all questionable cases. The technique used was a combination of Koff's and De Sy's urethral mobilization. A circular skin incision was made 4 - 5 mm from the balano-preputial groove, ventrally circumcising the urethral meatus and leaving 3 - 4 mm surrounding skin attached. If the corpus spongiosum surrounding the meatus was thin, it was excised. The penile skin was dissected free along Buck's fascia and slid toward the base of the penis. The urethra was dissected along the plane of cleavage between the spongy tissue of the urethra and corpora cavernosa (fig.1). Any fibrous bands distal to the meatus that might contribute to a degree of chordee were excised. Care was taken not to enter or injure the urethra. The separated urethra was measured against the straight penis to determine if it would reach the tip of the glans without tension. The mobilized urethra should be checked against the artificially erected penis to ensure that sufficient length has been obtained. A ratio of 1:3 is recommended i.e., to bridge 1 cm gap 3 cm urethral mobilization is needed.

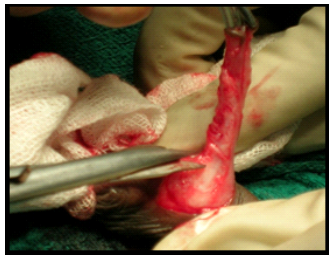

Fig.1 Proximal urethral mobilization

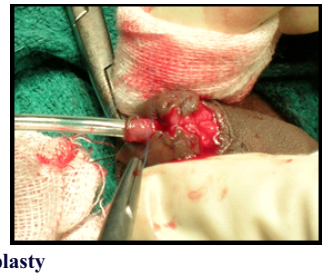

Fig.2Glanuloplasty

Initially we used a wide glanular tunnel to transmit the mobilized urethra. The skin rim around the meatus was anastomosed to glans using 6/0 polypropylene sutures. If the end of the urethra was trimmed due to insufficient spongy tissue, we preferred not to tunnel it but to create triangular glans flaps. The mobilized urethral meatus was spatulated and anastomosed to the central triangular flap; the lateral glanular wings were wrapped around it (fig.2). This technique creates a wide meatus and gives good coverage of the mobilized urethra. At present, the triangular flaps have replaced the tunneling procedure in all cases. The degloved penile skin was pulled back and sutured to the circumferential rim of inner preputial skin along the coronal sulcus. The urethral catheter was sutured to the glans and penis was dressed

using a sponge compression dressing. The catheter and dressings were removed usually on the seventh post operative day and was discharged once the child voids urine.

OBERVATION:

This study includes a total number of 25 cases over a period of 18 months from March 2018 to August 2019. Total number of hypospadias cases attended this hospital during this period was 77, which includes all types of hypospadias and accounts for 0.13 % of our hospital admissions. Among the 77 cases of hypospadias distal variety of hypospadias comprises 56 cases and proximal variety includes 21 cases. In the 56 cases of distal hypospadias 25 cases underwent urethral mobilization and advancement procedure. The age group of the patients who underwent urethral mobilization and advancement ranges from 2years to 12 years. Three patients belong to more than ten year age group, five patients belong to 5 to 10 year age group and seventeen patients belong to 2 to 5 year age group (fig.3). Among the 25 cases that underwent urethral mobilization and advancement, glanular hypospadias comprises two cases, coronal hypospadias comprises six cases, subcoronal hypospadias comprises eleven cases and distal penile comprises six cases (fig.4). In the study of 25 cases, thirteen cases had associated findings. Eight cases had associated chordee, three cases had associated meatal stenosis and two cases are failed cases following various previous procedures done for distal hypospadias. Among the eight cases with associated chordee, one case belongs to glanular variety, one case belongs to coronal variety, three cases belongs to subcoronal group and another three cases belongs to distal penile variety. Among the three cases associated with meatal stenosis two had glanular hypospadias and one case had subcoronal hypospadias. Ultrasonagram of abdomen was done in all cases to rule out associated urological anomaly which show normal study in all cases. All the twenty five children in this study were underwent urethral mobilization and advancement procedure. In five cases the mobilized distal urethra was tunneled through the glans and in twenty cases glans wings were created and approximated over the mobilized urethra after bringing the neomeatus to the tip of the glans.

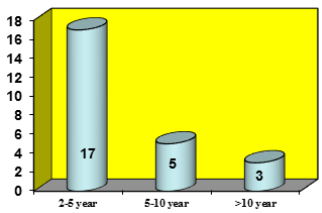

Fig.3 Age incidence

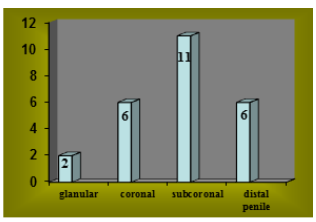

Fig.4 Types of hypospadias

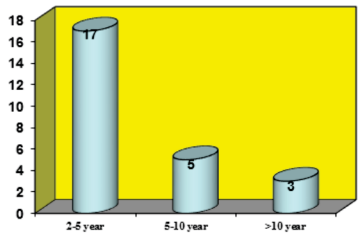

Fig.4

Four cases met with complications in this series. All the four complications occurred in the early part of this study. One six years old child with glanular hypospadias had retention of urine and retraction of the neomeatus on seventh postoperative day following catheter removal. In another five years old child with distal penile hypospadias developed meatal retraction, scrotal edema and urethrocutaneous fistula on catheter removal. Another two children one five years old and another seven years old with subcoronal hypospadias developed meatal stenosis in the third month following urethral mobilization. In this study the overall hospital stay ranges from seven days to thirteen days (average 7.9 days). In twelve cases the hospital stay was seven days, in seven cases it was eight days and in five cases the hospital stay was nine days. In one case the hospital stay was thirteen days. Based on the length of urethra to be mobilized the operating time for this procedure ranges from forty five minutes to seventy minutes.

DISCUSSION:

A total of 77 children with hypospadias were admitted from March 2018 to August 2019 at Raja Mirasdhar Hospital attached to Thanjavur Medical College, Thanjavur. Among the 77 children, 25 (32.4%) children underwent urethral mobilization and advancement procedure. In this study, the average age of the children who underwent urethral mobilization and advancement procedure was 4.9 years. As per the literature the average age of the children was 5 years. Most of the cases in this study belong to less than 5 year age group (68 %). In most of the studies urethral mobilization was done after 2 years of age except **Prof. A.Atala**(3) and **Prof. Paolo Caione**(5) who did urethral mobilization in four months old and nine months old children respectively.

The most common variety of distal hypospadias noted in this study was subcoronal variety. In the 25 cases, 11 (44%) cases belongs to subcoronal variety, 2 (8 %) belong to glanular and 6 (24%) belong to coronal and distal penile each. This fact is in concurrence with the literature. The most common associated finding in this study is chordee which is present in 8 (32%) cases and next is meatal stenosis 3 (12%) cases. Literature also quotes that even though chordee was minimal in distal hypospadias it was the most common associated finding. Chordee was seen in 50% of cases in **Prof. Anthony Atala's**(3) study. Ultrasonagram abdomen was done in all cases to rule out associated urogenital anomaly and there were no such associated findings. As per the literature urogenital anomaly is more commonly associated with proximal hypospadias.

Adequate mobilization of the urethra is an important factor in preventing meatal retraction. The separated urethra was measured against the straight penis to determine if it would reach the tip of the glans without tension. The mobilized urethra should be checked against the artificially erected penis to ensure that sufficient length has been obtained. In our study in all the 25 cases we mobilised the urethra proximally in a ratio of **1:3** i.e. to bridge a 1 cm gap between hypospadiac meatus and glans tip we mobilised urethra to 3 cm. Most of the literatures agree with this 1:3 mobilization. In a study done at Zagazig university (**Awad Md**.)(4) the length of the urethral mobilization was based on the age of the child, 0.5 cm for 2-5 age group, 1 cm for 6-10 year group and 2.5 cm for more than 10 years old children. In our study we had two cases of meatal retraction probably due to inadequate urethral mobilization. Five cases underwent tunneling of urethra through the glans after urethral mobilization. Among the five, two cases had meatal stenosis. No meatal stenosis was noticed in cases those underwent glans wings procedure. This finding coincides with the literature reviews (**H. Hamdy** and **M.A.Awadhi**)(7). We used a wide glanular tunnel to transmit the mobilized urethra. The skin rim around the meatus was anastomosed to glans using 6/0 polypropylene sutures. If the end of the urethra was trimmed due to insufficient spongy tissue, we preferred not to tunnel it but to create triangular glans flaps. The mobilized urethral meatus was spatulated and anastomosed to the central triangular flap; the lateral glanular wings were wrapped around it. This technique creates a wide meatus and gives good coverage of the mobilized urethra. We kept 8 F infant feeding tubes as urethral catheter for a period of seven days and on seventh postoperative day this catheter was removed and the child were discharged once he voids urine. There are different opinions regarding the duration of catheter by different authors. Some kept the catheter overnight. Few studies avoided catheter (**Chang TS**(6) and **Wishahi MM**(9). Some authors retained the catheter for 48 hours (**Caione P** and **Capozza N**)(5). Since there was no anastomosis or flaps prolonged catheter placement is not warranted. The overall hospital stay in this study is 7 to 13 days (average 7.9 days). There was a prolonged hospital stay in one case (13 days). In some studies (**Caione P**)(5) the hospitalization time was 5days (± 5days) and in some studies (**Wishahi MM**)(9) it was 2 days.

Among the 25 cases treated by urethral mobilization and advancement, the outcome was good in 21 (84%) cases. In this study, we had complications in 4(16%) cases. One six years old child with glanular hypospadias had retraction of neomeatus and retention on sixth postoperative day following catheter removal. In another five years old

child with distal penile hypospadias developed meatal retraction, scrotal edema and urethrocutaneous fistula on catheter removal. Two children one five years old and other seven years old with subcoronal hypospadias developed meatal stenosis in the third month during follow up. Probably the complications are due to our learning curve in the early part of this study. All the four children those who met complications were now doing well on follow up after alternate procedures. As per the literature there are other complications met by different authors like penile haematoma, glanuloplasty disruption, stricture, dribbling, wound infection, secondary chordee and preputial edema. In our study none of the cases had such complications. In some literatures the complication rate for fistula is 12% and retraction is 26% and in some study it is 2.1% and 6.4% respectively. In this study the overall complication rate was 16%. The follow up period of this study was 6 months to 2 years. We had meatal stenosis as complication which occurred in two cases in the third month. Both the children with meatal stenosis were treated conservatively with dilatation and both of them were improved following dilatations in two sessions. No chordee was made out in any of the case in the follow up period. In this study the duration of surgery ranged from 45 minutes to 60 minutes and is dependent upon the length of urethra to be mobilized for advancement. In literature also the duration of surgery ranged from 30 to 60 minutes (**Awad Mohamed**)(4).

This procedure is a good alternative for distal hypospadias. Although not a replacement for meatal- based flap procedures, and more tedious to perform than the meatal advancement and glanuloplasty procedure, this procedure has best cosmetic and functional results with minimal morbidity. The advantages of this procedure is, that it does not need other tissues for covering the urethra, no anastomosis between the urethra and the neourethra, which can be a potential site for leakage and fistula formation and can be applied to any type of distal hypospadias. This procedure can be very useful in circumcised individuals with distal hypospadias where there is no tissue available for reconstruction. Further, the chordee (whatever its extent) has no influence on this procedure. A papery thin urethra is a contraindication to this procedure because of potential urethral injury during mobilization. Adequate corpus spongiosum is an essential prerequisite for successful urethral mobilization and advancement. Even though MAGPI procedure was simple and had less complication rate, the overall complication rate was 3.8% (**Jawad AJ**)(8). It is not generally applicable to all types of distal hypospadias.

CONCLUSION:

This study on urethral mobilization and advancement for distal hypospadias at Raja Mirasdhar Hospital attached to Thanjavur Medical College Hospital establishes the following things. The average age of the children underwent this procedure was 4.9 years. The most common type of distal hypospadias was subcoronal variety and the most common associated finding in distal hypospadias was chordee. The average hospital stay in this study was 7.9 days.The ratio of the gap between hypospadiac meatus and the glans tip to the length of urethra mobilized should be 1:3. The mobilized distal urethra should be brought to the glans tip by creating a glans wing. This creation of glans wing will prevent the occurrence of meatal stenosis latter. The potential for leakage and fistula formation is less as there was no anastomosis between the urethra and neourethra. This procedure also does not need other tissues for covering the urethra. The success rate is high in experienced hands. The advantage of this procedure was its applicability to any type of distal hypospadias regardless of the severity of ventriflexion, normal appearance of the penis and good functional results. The main indications are presence of glanular chordee, failed MAGPI, circumcised children with distal hypospadias, immobile fibrotic urethral meatus and as an alternative to MAGPI. The complications occurred in this study are retraction, fistula and meatal stenosis.

REFERENCES

1. Ahmed Hadidi and Amir F.Azmy: Hypospadias Surgery an illustrated guide 2004;Springer-Verlag Berlin Heidelberg, New York.
2. Alan B. Retik, and Joseph G. Borer: Campell's Urology 2002;3:2284-27
3. Anthony Atala et al: Urethral mobilization and advancement for mid shaft to distal hypospadias. The journal of urology 2002 ;168:1738-1741.
4. Awad Mohamed M.S: Urethral advancement technique for repair of distal penile hypospadias. Indian Journal of Plastic Surgery 2006;39:34-38.
5. Caione P and Capozza N: Distal hypospadias repair by urethral sliding advancement and Y-V glanuloplasty. J Urology 1991;146:644-646.
6. Chang TS: Anterior urethral advancement. A one-stage technique for hypospadias repair. British Journal Plastic Surgery 1984; 37:530.
7. Hamdy H and M.A.Awadhi: Urethral mobilization and meatal advancement: A surgical principle in hypospadias repair. Pediatric Surgery International 1999;15: 240-242.
8. Jawad AJ: Urethral advancement and glanuloplasty vs. meatal advancement and glanuloplasty incorporated for distal hypospadias repair. Journal of Urology 1997;158: 1168-70.
9. Wishahi MM and Wishahi MK: Study on Urethral advancement technique for repair of distal hypospadias. Europian Journal of Urology 1990; 17:40-2.