

A prospective study of two-stage primary repair for proximal hypospadias and its short term outcomes.

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Abstract :

Aims: To study two stage repair in primary cases of proximal hypospadias using inner preputial graft and analyze short term outcomes.

Methods: Single institutional prospective study of patients who underwent primary repair of proximal hypospadias between Jan 2011 to Dec 2016. Failed hypospadias repair cases or proximal hypospadias with DSD or already circumcised cases were excluded from the study.

Results: 60 patients completed 2-stage repair with inner preputial graft with a mean age of 42 months (range 36m-96m) in 1st stage and 50m (range 42m-105m). Graft uptake was 100%. On a mean follow up of 12 months (range 6m-28m), there were 10 cases of urethrocutaneous fistula- 4 closed on regular dilatation and ultimately 6 (10%) required closure of fistula. 2 cases of meatal stenosis required dilatation. No cases of urethral stricture were reported.

Conclusions : Two stage repair for primary proximal hypospadias gave good cosmetic results overall with fewer complications. Longer follow up is required to assess quality of life in terms of sexual function.

Keywords : two-stage repair, proximal hypospadias, outcome

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I. Introduction

Hypospadias is one of the most common anomalies of the male urethra with an incidence of approximately 1 in 250 live male newborns (1) and the proximal variety accounting for approximately 20% cases. (2)

Hypospadias is characterized by an arrest in the development of urethral spongiosum and ventral prepuce, hence an arrest in the correction of penile curvature. In proximal hypospadias, the urethral opening is more proximally located: penoscrotal, scrotal or perineal and are more severe forms of hypospadias with moderate to severe chordee. (3)

The aim of hypospadias surgery is a cosmetically and functionally acceptable straight penis so that urine is passed in a single, projectile stream with good sexual function in later life. (4)

There is no ideal method of repair for proximal hypospadias. Single stage versus two-stage repair in proximal hypospadias remains a topic for debate. (3)

After the initial enthusiasm for single stage repair, most surgeons are gravitating towards two-stage repair for proximal hypospadias as they believe the two-stage repair gives good cosmetic and functional results with relatively fewer complications. (4,5) The two-stage repair has also the advantage of ease of execution with results easily replicable by less experienced surgeons. (3)

In this study, we share our experience of two stage repair for primary cases of proximal hypospadias and analyse the short term outcomes over a period of 6 years.

II. Materials and methods :

Single institutional prospective study was carried out between Jan 2011 to Dec 2016 with informed consent from the parents.

Detailed examination of the patients was performed and the following points noted down:

- 1) Anatomical location of hypospadiac meatus before release of chordee noted: penoscrotal, scrotal or perineal.
- 2) Presence of chordee or ventral curvature
- 3) Quality of urethral plate or groove
- 4) Glans groove
- 5) Gonads

- 6) Penile torsion
- 7) Size of the phallus
- 8) Penoscrotal transposition

Inclusion criteria:

- 1) All cases of primary repair of proximal hypospadias
- 2) Hypospadias with undescended testes(UDT) after karyotyping and hormonal studies.

Exclusion criteria:

- 1) Cases of failed hypospadias repair
- 2) Proximal hypospadias with disorders of sexual differentiation(DSD).
- 3) Already circumcised at the time of presentation

Surgical technique:

First stage:

After catheterisation and correction of chordee by degloving, inner preputial graft was harvested, meshed (to increase the surface area and prevent any collection) , quilted on the ventral defect with fine vicryl sutures and immobilised by a tie over dressing.

Second stage: was performed 6 months after the first stage. After tubularisation over a feeding tube of 8F/10F (mostly 8 F) depending on the age of the patients using Snodgrass/ Duplay technique.with subepithelial continuous fine PDS sutures. A second vascularized layer coverage was given by tunica vaginalis or dartos flap depending upon the availability.

Dressing was changed on 5th postoperative day and the catheter removed on 10th post operative day.(4)

Patients were followed up in the outpatient department for graft uptake or any scarring of the graft in the 1st stage and to look for short term (urethrocutaneous fistula, urethral stricture, glans dehiscence, meatal stenosis) and long term (voiding, sexual and ejaculatory function) complications if any.

For short term outcome analysis, a patient after two staged repair with a straight penis with no/minimal ventral curvature and passing urine in a single, projectile stream was considered as a successful outcome.

III. Results:

60 primary cases of proximal hypospadias completed two-staged repair between Jan 2011 to Dec 2016. The mean age in our study at 1st stage was 42 months (range 36months – 96 months) and at 2nd stage was 50 months (range 42 months -105 months). The mean period of follow up was 12 months (range 6 months- 28 months). 50 pts had penoscrotal hypospadias and 10 patients scrotal hypospadias. Severe chordee with poor urethral groove was present in all patients. Undescended testis was found in 10 patients.: unilateral in 8 and bilateral in 2. Orchiopexy was performed before proceeding to do urethroplasty.

For the two-staged repair, inner preputial graft was used in all the 60 patients. For the 2nd vascularized layer coverage, tunica vaginalis flap was used in 52 patients and dartos flap in 8 patients.

No incidence of graft loss was noted, so graft uptake was 100% . Scarring of the graft was noted in 6 patients which on application of steroid based ointment for 1-2 months became supple and pliable to a large extent. So revision of 1st stage was not needed in any of the patients.

On follow-up, 10 pts had developed urethrocutaneous fistula out of which in 4 patients, small fistula closed on regular anterior urethral dilatation for 2-3 months. So only 6 patients (10%) required closure of fistula. Meatal stenosis developed in 2 patients and was treated with regular anterior urethral dilatation. Coronal meatus after repair was seen in 2 pts. All these complications were found between 2011-2014 in the early part of the prospective study. No instance of urethral stricture or glans dehiscence was noted in any of the patients in our follow up so far.

IV. Discussion:

Inspite of the great advances in the management of proximal hypospadias, there is no universally acceptable method of repair and the debate continues whether to choose a single stage or a two stage repair.

Chen et al and Patel et al have reported success in single stage repair for proximal hypospadias using tubularized flaps and grafts. (6,7) But many surgeons have reported higher complication rates in the range of 20-50% - fistulae, meatal stenosis and urethral stricture, hence more redo procedures which may negate the advantage of single stage repair. (5,8,9,10) In a large series, Dewan et al in a single stage repair of 189 patients with free graft reported 34% fistula rates, 12% urethral stricture, meatal stenosis at 18% and reoperation rates at 44%. Some other important series have quoted similar complication rates. (11)

After the waning of the initial enthusiasm in the wake of these disappointing results for single stage reappear, more surgeons are opting for 2-stage repair. (5) Many pediatric urologists now believe that the two-

stage repair has fewer complications and gives superior cosmetic and functional results. (12) Two – stage repair besides being safe and reliable also has the advantage of the ease of execution so that good results can be replicated by lesser experienced surgeons. (13)

Turner- Warwick rejuvenated interest in the two stage technique in which a graft provided a neourethral plate in the 1st stage which was tubularized in Snodgrass/ Duplay technique in the 2nd stage. (5, 14) It was more popularized by Bracka in his landmark paper in 1995 in which he published results of 1st 600 cases of 2-stage repair using free inner preputial graft. (15)

Bracka and Hensle et al have reported the use of inner preputial graft for 1st stage of two-staged repair for proximal hypospadias. (16) Mokhless et al on histological studies of the grafted mucosa, found excellent uptake of the free graft within 5 days which became well vascularized, supple and pliable at 6 months. (17)

We have also used inner preputial graft in the 1st stage of staged repair of all 60 patients. Graft uptake was 100% and mild scarring in 10% patients which became supple and pliable on application of mild steroid ointment for 1-2 months.

Telfer et al while investigating the role of waterproofing repair with an additional vascularized 2nd layer coverage in the 2nd stage of staged repair, reported urethrocutaneous fistula rates of 4.5% with an additional 2nd layer and 63% fistula rates without a 2nd layer. (18) In the 2nd stage after tubularization of the neourethral plate, a vascularized 2nd layer coverage was provided with tunica vaginalis flap in 52/60 pts and dartos flap in 8/60 patients in our series.

Regarding the ideal age of repair, many surgeons have recommended early intervention – 1st stage at 6 months of age in an otherwise healthy baby and the 2nd stage 6 months after the initial repair to avoid psychological effects and separation anxiety of a child. (3, 19) We, like Bracka, have opted for delayed treatment at 3 years for better cooperation and easily manageable patients and tried to complete the two stages by school going age. (13)

The mean age in our study at 1st stage was 42 months (range 36months – 96 months) and at 2nd stage was 50 months (range 42 months -105 months). The mean age was higher in our series due to choosing delayed intervention after attaining 3 years of age and the fact that being a tertiary referral centre, children came at different ages from everywhere. Also being a very busy tertiary care centre, due to long waiting periods the difference between the mean ages at 1st stage and 2nd stage was higher than the standard 6 months period. This is also considered by many as one of the disadvantages of staged repair.

Another disadvantage of staged repair is an extra procedure in the early part of the patient's life.

Major complications of staged repair include : urethrocutaneous fistula, meatal stenosis, urethral stricture and diverticulum, mostly occurring in the first year of completion of the 2nd stage.(16)

Among important large series of two stage repair , Johal et al(2006) have reported 100% graft uptake, 0% fistula, 5% meatal stenosis, 5% glans dehiscence and 0% urethral stricture on a 20-126 months follow up of 62 cases of primary repair for proximal hypospadias. (5) Joshi et al (2015) have reported 100% graft uptake , 10% fistula, 7% meatal stenosis, 0% glans dehiscence and urethral stricture on a 6-24 month follow up of 30 cases of primary repair for proximal hypospadias. (4) In our series of 60 patients undergoing primary repair for proximal hypospadias on a mean follow up of 12 months (range 6 months- 28 months), there was 100% graft uptake, 16.6% fistulae of which ultimately 10 % required closure of fistula, 3% meatal stenosis, 0% glans dehiscence and urethral stricture which compares favourably with the above mentioned important large series. Most of these complications occurred between 2011-2014 in the early part of the prospective study. As our technique improved and we gained some experience, there were fewer complications after 2015.

V. Conclusion :

The two-stage primary repair for proximal hypospadias seems to be safe with fewer complications and has an ease of execution so that good results are replicable by less experienced surgeons. As the learning curve attains a plateau, results also improve. Cosmetic results were good in the form of a straight penis with good stream of voiding . Longer follow up is required to assess quality of life in the form of sexual function and ejaculatory pattern in later life.

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