

TWO STAGE REPAIR OF HYPOSPADIAS

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ABSTRACT

Objective: To assess the results of two stage repair of hypospadias.

Material and Methods: This a prospective study was conducted in the department of Paediatric Surgery, Khyber Teaching Hospital, Peshawar from September 2001 to September 2003. Forty-five patients were included in this study. All patients with proximal and distal hypospadias with or without chordee, circumcised cases and those who needed revision surgery were selected for two stage repair. In stage 1 splitting of the glans and grafting of the donor area with full thickness skin graft was done. In stage 2 the tubularization of the graft and covering the repair with a waterproofing layer of fascia was done 6-8 months later.

Results: The common age of presentation was below 4 years. Distal penile hypospadias was seen in 25 patients, 13 cases had mid penile, 05 had proximal and 02 had peno-scrotal hypospadias. Chordee was seen in 14 cases. The urethrocutaneous fistula occurred in 04 cases, meatal stenosis in 02 and urethral stricture in 01 case. The functional and cosmetic results in all the operated cases were satisfactory.

Conclusion: From our experience we conclude that two stage repair of hypospadias offers unique versatility, excellent reliability and a sophistication of function and aesthetics is achieved with two stage repair.

Key words: Hypospadias, Two stage repair

INTRODUCTION

Hypospadias is a congenital abnormality of the penis in which the external meatus is located on the ventral aspect of the penis. This urethral abnormality is often associ-

ated with hooding of the prepuce, chordee, abnormalities of the glans and penoscrotal transposition. The incidence of hypospadias is 1 in 300 live births.¹ At present there are more than 200 procedures and their modifications practiced for the repair of hypospadias.² Most of the parents and surgeons are

satisfied with the repairs that creates the meatus on the under surface of the glans or corona³.

The hypospadias are classified on the basis of the location of the ectopic meatus on the penis. In 75-80% cases the hypospadiac meatus is located in glandular, coronal and distal shaft of the penis.⁴

Single stage surgery is undoubtedly attractive and is a desirable concept but in clinical practice it has some technical limitations. The single stage procedures include meatal advancement glanuloplasty incorporated (MAGPI)⁵, Mathieu's repair⁶, preputial island flaps techniques,^{7,8,9} incised plate urethroplasty¹⁰ and para meatal flaps¹¹. All single stage repairs have a limited application in proximal hypospadias.¹²

The two stage repair described here can be adapted to almost any deformity, from minor degree of primary hypospadias to the victims of failed repairs. Our objective of this study was to assess the results of two stage repair in proximal as well as in circumcised and complicated cases of distal hypospadias.

MATERIAL AND METHODS

Forty five patients were included in this study. This study was conducted in the department of Paediatric Surgery, Khyber Teaching Hospital, Peshawar from September 2001 to September 2003. All patients with proximal and distal hypospadias with or without chordee, circumcised cases and those who needed revision surgery were selected for two stage repair. On admission a thorough history was taken and physical examination was done to know about other associated abnormalities. The stage one repair of hypospadias was done at 2 years of age and the stage two after six to eight months of the first surgery. The patients were asked to come for follow-up at three

weeks interval. All the cases were followed for six months after stage 2 repair.

OPERATIVE TECHNIQUE

STAGE-1: The operation was performed under general anaesthesia. The catheter was passed and a tourniquet was applied to the base of the penis. The saline erection test was performed to know the degree of chordee. A traction stitch was applied to the glans with 4/0 silk. A vertical incision starting at the proposed dorsal limit of the new meatus to the ectopic meatus was given. Then lateral incisions were made from the mid line at a subcoronal level, and these were continued on the shaft as necessary for full access to release the chordee. All fibrous bands ventral and distal to the urethral meatus were excised. The glans was split in the mid line, deep enough for the distal ends of corpora cavernosa to be visible. The saline erection test was repeated and all the restricting tissues were excised with sharp scissors.

Having created the ventral defect a graft of appropriate dimension was harvested from the inner layer of the preputial hood in uncircumcised cases. With the prepuce stretched out, the incisions were given and the graft was elevated with sharp scissors dissection. In circumcised cases and those who needed a revision surgery a post auricular full thickness skin graft was taken. The graft was defatted over the back of finger and stitched to the ventral defect with vicryl 5/0. Quilting sutures were placed to secure the graft. A firm "tie over" dressing using bactigrass or sofra tullae was made to hold the graft snugly in place and prevent the collection of haematoma underneath the graft.

The tourniquet was released and haemostasis secured using a bipolar coagulator. The donor area was loosely closed with interrupted 4/0 catgut sutures. Then sandwich dressing was done and the

catheter strapped to the skin in hypogasteric region. The catheter was removed after four days and the tie over dressing after seven days. The application of topical antiseptic cream was prescribed for seven days.

STAGE-2: The patient was readmitted after 6-8 month of stage one repair. The proper size silicon catheter was passed and the tourniquet applied at the base of the penis. The ventral limit of the neo-meatus was marked on either side, which outlines a "U" shaped strip of the skin usually 1.5-2 cm wide skirting around the ectopic meatus. The incision was made and the strip of the skin was mobilized from the shaft of the penis. The edges of the skin strip were de-epithelialized with sharp scissors. Then a sub coronal circumferential incision was made and the skin from the penis was mobilized down to ectopic meatus or lower level as required. The meatus was constructed first by joining the marked points and the rest of the urethra by tabularizing the mobilized skin strip over the catheter with continuous inverting sutures using 5/0 vicryl. Few interrupted sutures were also applied. To prevent fistula formation the sutures line was covered with waterproofing layer of fascia mobilized from preputial subcutaneous tissues or loose tissue from the shaft, tourniquet was released and haemostasis secured with bipolar coagulator. The skin was repaired with 4/0 catgut. After antiseptic dressing catheter was strapped to the abdominal wall so that it could rest on the intact dorsal wall without distributing the suture line. The catheter was removed after 7 days and urination from the neo-meatus was observed.

RESULTS

Forty five patients of hypospadias were operated in two stages. The age distribution at the time of presentation is

shown in Table-1. The patient's age ranged from 2 years to 12 years and the most common age of presentation was below 5 years. Three patients were circumcised while five patients were previously operated.

AGE DISTRIBUTION AT THE TIME OF PRESENTATION

Age	No. of cases N=45	%age
Below 5 years	33	73.33
5-10 years	10	22.22
Above 10 years	02	4.44

TABLE-1

As shown in Table-2 distal penile hypospadias was very common (55.56%), mid penile in 13 (28.89%), proximal penile in 05 (11.11%), and peno-scrotal in 02 (4.44%) cases. Associated anomalies were found in four patients, including undescended testes in 02 patients, inguinal hernia in 01 and ano-rectal anomaly in 01 case.

TYPES OF HYOSPADIAS

Types	Number of patient N=45	%age
Distal Penile	25	55.56
Mid Penile	13	28.89
Proximal Penile	5	11.11
Peno scrotal	2	4.44

TABLE-2

Table-3 shows the complications encountered. Four patients (13.33%) developed fistulae of these 03 had a small leak, which closed spontaneously in 4 weeks time while the other one required surgery to close the fistula. Two patients (6.66%) developed meatal stenosis and one (2.22%) had stricture which responded to repeated urethral dilatations.

COMPLICATIONS

Complication	Number of patient N=45	%age
Fistula	4	13.33
Meatal stenosis	2	6.66
Stricture	01	2.22

TABLE-3

DISCUSSION

The hypospadias repair is a challenging reconstructive surgery and is evolving continuously. The aim of surgery is to have a straight penis with terminal meatus and low complications rate. Single stage surgery is undoubtedly attractive and desirable in concept but in practice many inherent technical limitations make it difficult to be practiced in every case of hypospadias. In salvage cases when the previous surgery has resulted in scarring, fistulae and meatal stenosis, the options are limited and the failure rates are high in single stage repairs^{14,15}. All single stage procedures have limited role in the repair of proximal hypospadias¹³.

The two stage repair of hypospadias, using full thickness skin/mucosal graft in the first stage and its tubularization with waterproof covering layer of fascia in second stage is a simple operation and gives excellent results in selected cases. It is technically quite straight forward procedure and is easy to learn¹⁶. The innate tendency of stricture formation in one stage repairs due to circumferential anastomosis is minimized in two stage repair. In two stage repair the natural looking meatus is achieved rather than a puckered orifice as in most of the single stage repairs.

In proximal hypospadias paramedial based flaps and their modifications were used with high complication and re-operation rates. Glanuloplasty with in-situ tabularization is applicable to distal and mid penile hypospa-

dia with a complication rate of 42.9%⁹. Incised tube urethroplasty is an attractive procedure but long term follow-up is lacking¹⁰. In proximal hypospadias the repair using vascularized preputial islands flaps (tube, onlay and double onlay)^{7, 8} have gained popularity but the ischemia of the flaps occur in these repairs due to diverted arterial supply from outer flap¹⁷. In tabularized preputial flaps rotational deformity of the penis occurs in about 60%^{15, 18}. The complication rate with double onlay flaps is less but fistula rate is up to 17% has been reported⁷. The cosmetic results are poor and long term results are still awaited. MAGPI and Mathieu's repairs have limited application^{5, 6}. With two stage urethroplasty we were able to reduce certain complications like strictures, asymmetry, rotational deformity and meatal stenosis. In two stage repair the waterproofing layer of fascia over the urethral repair helps in reducing the fistula formation¹⁹. The quality of the end result is of greater relevance psychologically than the number of operations with which it is achieved. The hospital stay is longer as compared to single stage procedures.

CONCLUSION

Two stage repair reconstructing the new urethra with full thickness skin graft, offers a realistic alternative to almost any kind of deformity. From our experience we conclude that two stage operation is an acceptable price to pay for repair that offers unique versatility, excellent reliability and a sophistication of function and aesthetics that is hard to achieve with one stage procedure.

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