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TUBULARIZED INCISED PLATE URETHROPLASTY FOR VARIOUS TYPES OF HYPOSPADIAS

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ABSTRACT

Objective: To report out short term results of hypospadias repair using Tubularised Incised Plate (TIP) Urethroplasty as described by Snodgrass for various types of hypospadias.

Patients and Methods: A cohort of 62 patients comprising various types of hypospadias (62% distal penile, 30% mid penile and 8% proximal penile) underwent Snodgrass repair by one surgeon (F.A.) from June 2001 to November 2005. Age of the patients ranged from 1 to 20 years, the modal age being 3.2 years. There was no chordee in 90% of the cases whereas mild to moderate chordee was present in the remaining 10%. Urethroplasty was done by tubularization of the incised urethral plate as described by Snodgrass with coverage of the suture line by vasclarized dartos layer for water proofing. Chordee, if persisted after degloving of the penis, was corrected by dorsal placation. Patients were followed postoperatively on day 5, one month and subsequently on three monthly basis for a year.

Result: On the mean follow up of six months 46 patients (74%) achieved good functional and cosmetic results, with normal looking penis and ability to void urine with good forwardly directed stream. Complications were observed in 16 patients (26%). The most common complication was urethrocutaneous fistula in 14 (22%). Out of these 8 patients had minor leak which closed without requiring any further surgical intervention by regular urethral dilatation. The remaining 6 patients required re-operation for closure of the fistula. 2 patients had glans dehiscence which required re-operation 6 months later. Another 2 patients developed meatal stenosis which settled with regular post-op dilatation. So, the complications requiring surgical intervention was seen in 8 patients only.

Conclusion: TIP Urethroplasty is a simple single stage procedure applicable for the majority of the hypospadias including mid and proximal hypospadias and redo cases where urethral plate is intact. It provides excellent functional neo-urethra, cosmetically normal looking glans and vertically oriented slit like meatus with lesser complication as compared to other single stage procedures.

Keywords: Hypospadias, urethroplasty, tubularized incised plate urethroplasty (TIPU)

INTRODUCTION

Hypospadias refers to defective urethral development resulting from incomplete tubularization of the urethral plate. The external meatus may be located anywhere along the ventral surface of penile shaft down to the perineum. In more than three quarters of the cases the external meatus opens distal to mid shaft. It is the second most common birth defect of the genitor-urinary tract, the first being cryptorchidism.

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So far, more than 200 procedures have been described for the repair of hypospadias testifying to the fact that this is a field where perfect results are hard to achieve. The essential requirement for an ideal repair procedure for hypospadias is that it should be single stage, should be applicable to most if not all types of hypospadias, achieve good functional and cosmetic results with minimum or no complications. Such a procedure is yet to be found but TIP urethroplasty as described by Snodgrass [1,2] is very close to fulfilling the above requirements.

Purpose of this study is to report our short term results (6 to 9 months) using this procedure in 62 cases of hypospadias.

PATIENTS AND METHODS

A total of 62 patients underwent Sndograss hypospadias repair between June 2001 – Nov 2005 at PNS Shifa Naval Hospital Karachi and Armed Forces Institute of Urology Rawalpindi, Pakistan. Age of the patients ranged between 1 – 20 years the modal age being 3.2 years .The type and distribution of hypospadias repaired (table).

The operation was performed under general anaesthesia with tourniquet at the root of penis. A U–shaped incision was made incorporating the external meatus extending along the edge of the urethral plate all the way distally but stopping short of the penile skin. In the region of the external meatus the incision skirted the external meatus 2mm proximal to the meatus. Penis was degloved and artificial erection was done to assess for chordee which, if persisted, after degloving was corrected by dorsal placation. The limbs of the U-incision were deepened to dissect the penile skin away from the urethral plate. Proximally the penile skin was lifted from urethra and distally glans wings were mobilized for tension-free closure later.

The urethral plate was then incised in the midline from the hypospadiac meatus to the proposed future meatus. Care was taken not to incise into the penile skin distally.

Tubularization of the incised urethral plate was done over an appropriate sized Foly catheter / feeding tube depending upon the age of the patient with extra epithelial continuous inverting sutures using 6 / 0 vicril with the help of ophthalmic loupe. The urethral catheter acted more as a stent rather than for drainage. Suture line of the neo-urethra was then covered with vascularised datos flap harvested from the dorsal preputial or scrotal skin. Glans was then reconstructed by suturing the glans wings together in the midline and so was the ventral penile skin. Excess preputial skin was excised in the fashion of circumcision.

Bladder was drained by suprapubic catheter for 2 weeks. Urethral stent was removed on the 5th post op day. Regular urethral bouginage was done in all cases twice weekly for three weeks.

RESULTS

The average hospital stay was 2.5 days. Patients were followed up in the out patients one month postoperatively and subsequently at three months interval for a year. Six patients required dorsal plication to correct chordee. Of these four were proximal penile and the remaining two were mid penile hypospadias.

The outcome was analyzed on the basis of functional and cosmetic results including shape of the glans, direction and force of the urinary stream and any complications.

On the mean follow up of six months 46 patients (74%) patients achieved good functional and cosmetic results i.e. central vertically oriented meatus, conical glans and ability to void with good forwardly directed urinary stream. Complications were observed in 16 patients (26%) as follows:

- Urethrocutaneous fistula was seen in 14 patients (22%) patients. Out of these

8 patients had minor leak in the form of few drops of urine during micturition which closed spontaneously without requiring any surgical intervention by regular post op dilatation for three weeks. The remaining six patients required re-operation for fistula closure.

- Glans dehiscence was seen in 2 patients (3%) cases. These required re-operation six months later.

- Two patients (3%) developed meatal stenosis which settled with regular urethral dilatation.

So the complication requiring operative intervention was seen in 8 patients (13%).

DISCUSSION

TIP urethroplasty as described by Dr. Warren Snodgrass [1,2] has been extensively used all over the world and most of the studies[1,3-6] have reported encouraging results. This procedure is basically a modification of previously described tubularization of the urethral plate (Thiersch and Duplay) [7]. Essentially it extends the concept of hinging the urethral plate which was described by Rich et al [8] by incising it in the midline so that tension free closure of the neo-urethra and the glans could be achieved. Initially the procedure was described for distal hypospadias [1] but lately several studies [5,6,15] have confirmed the utility of this procedure in the proximal penile hypospadias as well. In addition this procedure is equally suitable for redo cases where urethral plate is intact [10,11].

There were two cases of meatal stenosis in our study which required regular dilatation. These could have been due to inadvertent extension of the midline incision into the penile skin. Snodgrass [2] has emphasized not to incise beyond the urethral plate because that portion of the incision will close by fibrosis resulting in the narrowing of

Table: Types of hypospadias repaired (total = 62).

Distal penile (coronal & subcoronal)	39 (62%)
Mid penile	18 (30%)
Proximal penile	6 (8%)

a. Distal penile hypospadias.
b. U-shaped incision incorporating the external meatus along the limbs of urethral plate.

c. Midline incision of the urethral plate.
d. Tubularization of the incised urethral plate.

e. Tubularization completed.
f. Reconstruction of the glans and skin cover.

the meatus. Bleustein et al [9] have shown that healing of the incision in the dorsal urethral plate takes place by re-epithelization with normal tissue in growth and not by desmoplastic reaction.

There were two cases of the dehiscence of the glans in our study. In both cases the glans was rather small sized and tension free closure of the glans could not be achieved despite mobilization of the glans wings. Some workers have described complete degloving of the penile skin because this step reduces the tension on the suture line.

Urethrocutaneous fistula still remains the most common and troublesome complication. Fortunately majority are in the form of small leak which close spontaneously on regular bouginage. In our study six patients required re-operation for the closure of the fistula. Use of well vascularised dartos layer harvested from the prepuce or scrotum is a well recognized step in reducing the rate of fistula.

The redeeming feature of this procedure is its wide applicability even in circumcised patients as preputial skin is not required. It provides excellent functional neo-urethra, cosmetically normal looking glans and vertically oriented slit like meatus with lesser complication as compared to other single stage procedures [12-14].

CONCLUSION

TIP Urethroplasty is a simple single stage procedure applicable for the majority of the hypospadias including mid and proximal hypospadias and redo cases where urethral plate is intact. We were able to achieve good functional and cosmetic results in majority of the cases of hypospadias. There are two notable contraindication to this procedure viz. presence of severe chordee and absence of urethral plate due to previous operation.

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