

## Factors influencing the results of Surgery for Hypospadias: Experience at NICH

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### Abstract

**Objective:** To evaluate the factors that may influence the results of surgery after hypospadias repair at National Institute of Child Health, Karachi.

**Methods:** It was a retrospective observational study. Files of all patients who had Hypospadias repair were retrieved and analysed with a view to identify the factors which may influence the results of surgery for Hypospadias. Patients with complete record available were included in the study, whereas those with incomplete data were excluded. For most patients who had penile or distal hypospadias TIP (Tubularised Incised Plate) urethroplasty was performed. Patients with severe chordee had Duckett Island flap urethroplasty as a two stage procedure. Patients having moderate chordee were subjected to the Mustardee Procedure. Some underwent MAGPI and Mathieu's repairs.

**Results:** One hundred four patients were operated. Files of only 46 patients with a mean age of 4 years could be retrieved and these were included in the study. Twenty five patients had TIP urethroplasty, 5 had island flap urethroplasty, 2 had Mustardee repair, 6 had MAGPI, 5 had Mathew's repair and 3 had Byers Staged Urethroplasty. Over all incidence of fistula formation was 26%. The frequency of fistula formation was less with TIP urethroplasty (16%) compared to those who received no dartos pedicle flap. Mathieu's repair gave good results with 20% incidence of fistula formation. Highest numbers of complications (60%) were seen in patients who had Island flap urethroplasty for proximal hypospadias with chordee.

**Conclusion:** TIP urethroplasty is a safe and reliable method of hypospadias repair. The results of surgery can however be improved by using dartos pedicle flap to protect the repair, meticulous surgical techniques, use of monofilamentous absorbable suture material and soft waterproof dressing (JPMA54:577;2004).

### Introduction

Surgery for hypospadias repair has been refined over the past two decades. Initially the incidence of complications was very high and hypospadias repair was achieved in stages. Tubularized incised plate urethroplasty was introduced in 1994.<sup>1</sup> Since then it has gained popularity due to lower complication rates. Recent studies showed that TIP urethroplasty gives better results in distal hypospadias repair. This has been proved by objective scoring system for evaluation of results of surgery (HOSE) as described by Holland et al<sup>2</sup> and by uroflowmetry evaluation as described by Hammouda et al.<sup>3</sup> The success of surgery after TIP urethroplasty can also be attributed to other refinements in hypospadias repair which include availability of fine suture material, use of dartos pedicle flap to cover the repair, better surgical techniques and use of waterproof dressings.

A retrospective observational study was therefore conducted in the department of Paediatric Surgery, National Institute of Child Health Karachi, from December 2003 to December 2004, to evaluate the factors which may influence the results of surgery after hypospadias repair. The result of surgery were assessed by the number of satisfactory repairs, complications, correction of chordee and urinary stream.

### Methods

Files of all patients undergoing Hypospadias repair, were retrieved and analysed to identify the factors which could influence the results of the corrective surgery. Only patients with complete records were included in the study. For most patients with penile or distal hypospadias a TIP urethroplasty was performed. Patients with severe chordee had Island flap urethroplasty as a two stage procedure. In patients with moderate chordee, Mustardee Procedure was undertaken. Some patients had MAGPI and Mathieu's repairs.

In all patients 6/0 or 5/0 PDS or polyglycolate

sutures were used for the repair. Dartos pedicle flap was used to cover the repair by button hole technique. A size 7 feeding tube was placed as a stent in all cases. Dressing was done with DuodermR ultra thin dressing. All patients were discharged on first postoperative day and catheters were removed after a week of surgery. The results of surgery were assessed by the number of complications like fistula formation/breakdown of repair, meatal stenosis/urethral stricture, degree of residual chordee and urinary stream after repair.

## Results

Hypospadias repair was performed on 104 patients in the study period. Complete data of only 46 (44%) patients could be retrieved who were included in the study. Age at surgery ranged from one year to 12 years. Mean age was 5 years. Level of hypospadias was Glanular in 12 patients (26%), coronal and sub coronal in 16 patients (35%), penile in 13 (28%), penoscrotal in 4 (9%) and scrotal in one patient (2%). TIP urethroplasty was performed in 25 patients (54%), MAGPI in 6 (13%), Mathew in 5 (11%) and Mustardee in 2 patients (4%). Five patients (11%) had Transverse Island flap urethroplasty and 3 (7%) had Byers staged urethroplasty.

Complications were noted in 17 patients (37%). Twelve patients had fistula formation (26%) and 5 (11%) had meatal stenosis. Catheter dislodgement took place in 3 patients (7%). TIP urethroplasty had the least number of fistulae formation. Fistula formation with TIP urethroplasty was encountered in 5 (20%) cases.. This included 3 of the 6 cases in whom dartos pedicle flap was not used as cover. In patients who had dartos pedicle flap cover the incidence of fistula formation/ breakdown was 16%. Three patients (12%) who had TIP urethroplasty had meatal stenosis which improved with dilatations. Meatal stenosis was also seen in one patient who had island flap urethroplasty and in one patient who had Mustardee repair. Both of them settled with dilatations. Mathew's repair also gave good results with fistula formations in one case (20%). The highest number of complications were seen in Island Flap Urethroplasty in 3 (60%) cases and Mustardee repair 1 patient (50%). Their number is however too small for any conclusive decision and these were performed in patients who had severe hypospadias with chordee.

## Discussion

Surgery for hypospadias remained a challenge for the treating surgeons for a long time. Several surgical procedures have been described each claiming good results. In hypospadias repair the

goal of surgery is to achieve a straight phallus for normal voiding from the tip. An objective assessment of this may be performed for evaluating the results of hypospadias surgery after hypospadias repair by HOSE2 or uroflowmetry.<sup>3</sup> Uroflowmetry is an easy way of assessing urinary stream and is available in many centres and this may be an important area for future research. A good looking meatus, correction of chordee, straight smooth urinary stream are however indicators of good results of surgery. Fistula formation is the commonest complication after hypospadias repair.<sup>4</sup> With refined surgical techniques, fine suture materials, special dressings etc, the results of surgery after hypospadias repair have improved significantly. We performed various procedures as described earlier but the best results were achieved with TIP Urethroplasty. TIP urethroplasty was introduced in 1994.<sup>1</sup> Since then several studies have proved its superiority over other procedures.<sup>4,5</sup> Our study also proves its efficacy as a safe repair for hypospadias with mild chordee. The reason for its success are vascularised flaps which give a tension free repair by a single anastomotic line and dartos pedicle flap cover. Since its introduction the incidence of fistula formation and breakdown has decreased to as low as 6%.<sup>6</sup> The other important benefit of TIP urethroplasty is achievement of a natural looking meatal opening. The incidence of complications after TIP urethroplasty has been reported from 6-16%.<sup>4,6</sup> Our study shows a relatively high incidence of complications. This was partially due to the fact that in few of our initial cases the dartos pedicle flap was not used to cover the anastomosis. Similarly in few cases the polyglycolate interrupted sutures were used for the repair. These initial cases showed high complications rate. Other procedures like Mathieu's repair also gave good results in our study as surgeons were familiar with the procedures. This is a time honoured procedure and comparative studies have proved it to be useful procedure in most cases.<sup>7</sup> Island Flaps gave the highest number of complications. It may however be realised that this procedure was performed only in cases having proximal hypospadias with chordee who tend to have high incidence of complications. Mustardee meatal based flap repair also had high rate of fistula formation. This was also done in patients who have distal chordee. As we gained more experience with the TIP urethroplasty we have substituted Mustardee with TIP urethroplasty.

TIP urethroplasty has its limitations. It cannot be performed in cases having severe chordee. Mild to moderate chordee however can easily be corrected by skin mobilization and dorsal plication as

described by Baskin et al.<sup>8,9</sup> Meatal stenosis is a complication seen more frequently with TIP urethroplasty.<sup>10</sup> This is usually due to technical error by over enthusiastic closure of distal meatus. This can easily be managed by serial graduation of the new urethra or dilatations.<sup>11</sup> The incidence of meatal stenosis was high in our patients but responded well to serial dilatations and one to two dilatations were sufficient in all three cases. This complication has also been reported in other series.<sup>10,11</sup> Complete dehiscence of wound is unlikely with TIP urethroplasty as meticulous well vascularized cover is achieved for the repair.

In our study there were some other observations which were also documented in other studies. In some cases dartos pedicle flap was not used to cover the repair. These patients showed highest number of fistula formation. Similarly the incidence of fistula formation was less if subcuticular mono filamentous sutures were used.

Several improvements have been done to the established procedures to avoid complications. Preparation of the phallus for surgery with androgenic local crèmes or injections increases the size of the phallus and its vascularity which helps in better flaps construction and wound healing. This has definitely helped us during surgery due to the good size of the phallus. This was however used in selected cases only. We did not encounter any complication of intravenous testosterone in toddlers. Use of mono filamentous fine sutures for surgery have also contributed in the improvements of results of surgery so are the special dressings like silicone Gel foam dressing or Duoderm dressing after the repair. All these factors have changed the whole scenario of hypospadias repair. As so many factors have changed therefore the success of surgery after hypospadias cannot be attributed to a specific type of repair only. Furthermore the success of repair also depends upon the level of hypospadias and whether associated chordee is present or not. Mild chordee as mentioned earlier can be corrected by dorsal plication but in case of severe chordee a staged repair or tubularized flaps give better results but incidence of fistula formation is much higher as several repairs are performed at one time.<sup>12,13</sup>

## Conclusion

TIP urethroplasty is a safe technique for hypospadias repair. Good results of surgery have been achieved by this repair. Similar results of surgery can also be produced with other procedures like Mathew's repair. The main factors which help in getting optimal results of hypospadias

repair include, preparation of phallus with testosterone therapy in selected cases, use of fine suture material, covering the repair with the dartos pedicle flap, use of waterproof dressings and above all tissue respect and meticulous surgical techniques.

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