

Is Tip Repair in Hypospadias is a Confidence Building Procedure? Analysis of early Hundred Cases at A Pediatric Surgical Centre

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Abstract

Purpose: The tubularized incised plate (TIP) technique for hypospadias repairs a well-known procedure for urethroplasty. The authors in this study analyze the application and outcome of TIP by the Pediatric Surgeon. They describe how this procedure helps to start hypospadias surgery services especially to the newly established centres. The procedure can provide surgeons required confidence and prepare them to undertake the complex surgeries for hypospadias.

Method: This is a prospective study done on all cases of hypospadias operated with TIP technique in a newly established centre for Pediatric Surgery for a period of two years. The results were evaluated on the basis of outcome in the form location and shape of meatus, correction of curvature. The complications were noted and individually treated.

Results: Total 100 patients were operated with TIP technique during the study period. The Distal type of the hypospadias was the main variety treated (n=64) followed by mid penile and proximal penile type of hypospadias (n=21 and n=13 respectively). All patients were offered TIP as the method of urethroplasty and were operated by a single surgeon. The procedure was well tolerated by all the patients. There were few complications, mainly meatal stenosis and urethrocutaneous fistula. No Major complications were found. The cosmetic and functional outcome was good in all cases.

Conclusion: The TIP urethroplasty offers a considerable safe technique in the patients of

hypospadias. It can be easily learnt and reproduced. There is a learning curve associated with the procedure. The authors can conclude that the procedure of TIP in the cases of hypospadias brings a good amount of confidence in a Pediatric Surgeon to offer the services of hypospadias surgery especially in newly established setup.

Keywords: Hypospadias; Pediatric; Fistula; Hypospadias.

Introduction

With among the most common congenital urogenital disorder, hypospadias poses a challenge for all Surgeons involved in Pediatric Urology as the ideal management is still being evolved. The correction of the hypospadias is being done by Plastic Surgeons, Pediatric Surgeons, Urologists and even General Surgeons leading to a wide variation in the Surgical Procedures. Popularised by Mr Warren T Snodgrass the Tubularised Incised Plate urethroplasty (TIP) repair offers a safe method with satisfactory results in hypospadias Surgery in most of the cases of hypospadias. It is in fact simple, versatile and produces satisfactory cosmetic results.¹ The present paper describes the management of 100 children with hypospadias with TIP repair and their subsequent outcome by a Pediatric Surgeon. Although most performed surgery for hypospadias it is still associated with frequent complications. The TIP procedure helps to start hypospadias surgery services especially to the newly established centers. The procedure can provide surgeons required confidence and prepare them to undertake the complex surgeries for hypospadias. The TIP urethroplasty can be done in

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most cases of hypospadias, but one should refrain from doing it desperately.

Methods

The study is a prospective study with a total of 100 patients with hypospadias who were repaired with TIP from January 2018 to December 2019 in a newly established Pediatric Surgery centre at a tertiary teaching hospital. All patients were operated by a single Surgeon in a tertiary teaching institute. The hypospadias patients with severe defects and those needing redo surgeries were excluded from the study. The preoperative assessment included the location of meatus, condition of the urethral plate and amount of chordee. Pre-operative testosterone gel was used in 5 cases to gain the phallic length. The surgery was done in general anaesthesia with caudal block in all cases. Total occlusive dressing was applied in all cases. Postoperative outcome was assessed based on terminalizing slit meatus, residual chordee, presence of fistula, meatal stenosis and any other complication related to the procedure.

Surgical Procedure

All cases were operated under general anaesthesia with caudal block. The stay suture was taken just distal to the proposed meatus by a round body prolene suture. The haemostasis was maintained by a tourniquet applied by a thin layer of gauze piece applied circumferentially around the penis. It maintained adequate haemostasis while not being over tight. The urethral plate was marked in a U fashion and mobilised and tubularised with continuous subepithelial PDS6.0 inverting sutures commonly on 7 Fr (range 6-8 Fr) Infant feeding tube along with glansplasty. The neourethral coverage was provided by the dartos in most of the cases. Few patients (n=3) it was done by tunica vaginalis. A penile wash was given with warm saline and antiseptic ointment was applied over it. In all patients total occlusive dressing was done. The patients received iv antibiotics in the post-operative period. The stent is removed 7th post-operative day along with the dressing. They were observed till the passage of urine and subsequently discharged. Follow-up was after one week, fifteen days and one month followed by every three months for first year. All patients with meatal stenosis were calibrated in the follow up with infant feeding tube up to 8 Fr.

Results

There were 64 cases with distal hypospadias with minimal chordee, of whom 13 had meatal stenosis that needed meatal calibration before surgery. 13 cases were proximal hypospadias with wide urethral meatus and significant chordee. 21 patients had mid penile hypospadias with glanular tilt. 2 patients had circumcision done before coming to this institute (Table-1).

Table 1: Type of Hypospadias.

Type of hypospadias	Number	Percentage
Distal Hypospadias	64	64
Midpenile hypospadias	21	21
Proximal hypospadias	13	13
Circumcised hypospadias	2	2

Average operative time was 90 minutes and TIP was performed in all cases with dartos flap neourethral coverage in all but three patients in whom tunica vaginalis flap was put. The degloving was not needed in twenty-one patients of distal hypospadias and paraurethral penile skin was utilised for dartos cover over the neourethra in these cases. Seventy-Nine patients the penile degloving was done with correction of the chordee and preputial dartos cover was given for neourethra. Only 2 patients had dorsal plication to correct the glanular tilt. Mean hospital stay was 7 days. Meatal stenosis was found in Twelve patients who were calibrated and maximum 5 sittings of calibration were needed. Nine patients developed postoperative fistula which were repaired later. All but one patient is having normal urinary stream with no evidence of reoccurrence of fistula during follow-up. One patient developed recurrent fistula which is being planned for a redo surgery. Residual chordee was found in one patient (Table-2).

Table 2: Associated anomalies.

Associated anomaly	Number	Management
Undescended testes	3 (Left in 2 and Right sided in 1)	Orchiopexy was done in all before hypospadias repair
Penoscrotal transposition	3	Correction was done before hypospadias repair in one case.
Penile torsion	2	Corrected along with hypospadias repair
Inguinal Hernia	2	Repair done before TIP
VUR	1	Waiting for reimplantation
Anorectal malformation	1	Colostomy followed by PSARP done before TIP.

None of the patient developed skin or glans dehiscence Cosmetic appearance was satisfactory in 94 patients and the parents were happy with the outcome of the surgery(Figures 1-3).



Fig. 1: TIP in distal hypospadias.



Fig. 2: TIP in mid penile hypospadias.



Fig. 3: TIP in proximal hypospadias.

Discussion

Who should operate the hypospadias? General surgeons, General urologists, Pediatric surgeons, Pediatric urologists, or hypospadiologists? As

hypospadias surgery is technically demanding, any one of them can, provided the surgeon has a temperament for hypospadias surgery, has mastered common techniques in hypospadias and has at least 40-50 cases to operate per year. Experience in hypospadias surgery has a definite co-relation with a successful outcome. There is a significant difference in outcome of hypospadias surgery done by Pediatric urologists vs. other surgical specialists.²

The method of Snodgrass repair also known as tubularised incised urethroplasty repair (TIP) needs no introduction. It is now an established method of repair of hypospadias, especially the distal ones. The aim of TIP is widening of the narrow urethral plate for a wide neourethra to be made. The TIP repair is now learnt by all Pediatric Surgeons and it remains a preferred method of urethroplasty whenever condition permits. The first TIP repair was done in March 1990 on a 9-month-old boy with coronal hypospadias, when it was realized that the urethra can be slit deep in the midline without any adverse consequences. The first proximal TIP was done in August 1993 on a patient with a proximal shaft defect, and it was observed that TIP potentially could be used for both distal and proximal repairs.³ It was also reported that reported that the plate groove, described as "deep" or "shallow," does not correlate with urethroplasty complications.³ Two series^{4,5} found that pre-incision plate width <8 mm increased complications, but one of these authors subsequently stated that the plate may have been tubularised too far distally. In one report the authors measured the pre-incision width in 186 consecutive prepubertal boys undergoing primary TIP and found that 86% were <8 mm. There was no difference in urethroplasty complications (5 fistulas, 6 glans dehiscence's) in those with plate widths <8 vs. >8 mm.⁶ In our study the urethral plate was satisfactory in most cases except in some patients with proximal and mid penile varieties.

The best options for proximal hypospadias repair remain unclear. TIP can be done when the urethral plate remains intact after penile straightening, and the ventral curvature was <30 degrees after degloving.⁷ There are inherent problems associated with this method of hypospadias repair amounting to some high incidences of meatal stenosis and subsequent urethro cutaneous fistulae formation. In 2002, Lorenzo and Snodgrass concluded that dilatation of the neourethra is unnecessary after TIP urethroplasty, and the calibration and uroflowmetry after 6 months of surgery may be useful to detect subclinical obstruction. They attributed the meatal

stenosis detected in other series (El bakry 2002) to the technical error including failure to deeply incise the plate and/or tubularisation of urethral plate too far distally.⁸ In our series the patients were operated by a single surgeon and the urethral plate was tubularised with continuous subepithelial PDS 6.0 sutures without tension over the 6-8 Fr infant feeding tubes and neourethral coverage was given by well vascularised dartos flap. This series also had 12 patients who developed meatal stenosis after TIP may be attributed to the tubularisation of the urethral plate too distally. Urethrocutaneous fistula, followed by hypospadias reconstruction, is one of the most common complications. Post-surgery fistula in children could occur as the result of one or more factors, such as meatal stenosis, urethral stricture, hematoma, infection, poor surgical technique, etc.⁹ However, a lot of patients, especially those in the developing countries, go to outpatient department for treatment when they are grown up, possibly restrict to economic factors, unsuccessful surgery history or other reasons. There are a few other reports specifically concerning the hypospadias surgical outcomes among the youth population. Some studies reported higher complication rate occurs among adults than children using the same techniques.¹⁰ In our series 9 patients developed urethro-cutaneous fistula which in our scenario could be attributed to the meatal stenosis. However, some patients had very poor and thin dartos to cover the neourethra and this could be the cause of development of urethro cutaneous fistula in these cases. One study in 2018 concluded that Urethral defect length and urethral operation history should be taken into consideration when planning hypospadias surgery. The study discovered that the risk of developing urethro- cutaneous fistula after hypospadias repair is associated with urethral defect length and urethral operation history. Age, surgical procedure, type of surgical repair, chordee degree and other factors were not obviously related to the development of urethro-cutaneous fistula.¹¹

The frequency of associated anomalies increases with the severity of hypospadias. For isolated anterior or middle hypospadias, laboratory studies are not usually necessary. Screening for urinary tract anomalies should be considered in patients with posterior hypospadias and in those with an anomaly of at least one additional organ system.¹² Our series had associated anomalies in 12 patients, most common being undescended testes (n=3) and penoscrotal transposition (n=3). All of them had proximal type of hypospadias. One patient had anorectal malformation (high type) was found in

one case that needed colostomy followed by ano-rectoplasty and then hypospadias repair (Table-3).

Table 3: Complications.

Complication	Number	Management
UCF	9	Layered closure -5 Layered closure +glansplasty in 2 coronal fistulae. Recurrence of fistula-1
Meatal Stenosis	12	Meatal caliberation
Residual Chordee/Rotation	1	followed-up
Dehiscence	0	-

He also had proximal Hypospadias. One patient had high grade unilateral Vesico ureteral reflux (VUR) with severe meatal stenosis preoperatively. He underwent meatotomy and kept on IV antibiotics for urinary tract infection. He underwent elective hypospadias repair and had uneventful outcome. He is being followed up for VUR.

One of the most controversial aspects of modern hypospadias surgery is the election of an appropriate wound dressing.¹³ In fact, there may be as many different types of dressing as there are types of surgical repair. Multiple dressings after hypospadias surgery have been previously reported.¹⁴ Dressing prevents postoperative edema and hematoma formation, maintaining the phallus in an upright position. We applied a complete occlusive dressing (Fig-4) in all patients without any problem which was removed on 7th post-operative day along with the catheter.

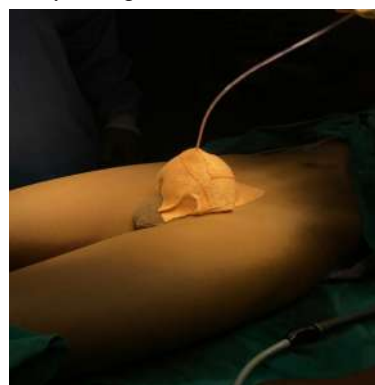


Fig. 4: Occlusiv Dressing.

The dressing sticks properly and effectively reduces the edema and promotes healing. To improve the functional and cosmetic results, the use of hormonal stimulation before hypospadias correction has been accepted as a relatively common

practice for some decades. Because of the scarcity of randomized and controlled clinical trials on this topic, the establishment of a standard protocol has not been concluded yet.¹⁵ We used Testosterone gel in 5 patients and were able to get increase in length and glanular width for effective TIP repair. Since topical medications are not absorbed through the gastrointestinal system, they don't undergo first pass hepatic metabolism and are associated with minimal side effects.¹⁵ It may be difficult to do hypospadias repairs who had circumcised penis due to lack of skin required for the repair. However, we operated 2 such cases who had circumcision done before their distal hypospadias became noticed. The TIP repair was successful in these patients with utilization of the para urethral skin dartos for the neourethral coverage. Snodgrass compared patients who circumcised before diagnosis of defects of urethra and who had not been circumcised. Results showed that prior circumcision had not been complicate subsequent hypospadias repair in males whose urethral anomaly was concealed by an intact prepuce.¹⁶

Conclusion

The patients of hypospadias are amenable for surgical correction. However, the treatment needs to be individualised and surgeons should learn different procedures to manage different kind of hypospadias. The TIP is an effective surgical procedure for the management of most of the cases of hypospadias. It gives good results in experienced hands but there is definitively a learning curve for this procedure. The Pediatric Surgeon starting to provide surgical services to these children can do TIP to gain enough confidence to perform more complex procedures especially at newly established Pediatric surgical centres. Most common associated postoperative complications are meatal stenosis and urethro cutaneous fistulae. Case selection is important for optimal results in TIP repair and one should refrain from doing desperate Snodgrass repair (TIP).

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