

# Redo hypospadias surgery; experience with 27 patients with prior distal or proximal hypospadias repair failure

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## Abstract

**Background** :Urethral reconstruction in failed hypospadias poses a significant challenge. We report our experience using tubularized incised plate method in distal type of hypospadias and excision of fistulous tract with dartos flab in more proximal types of hypospadias.

**Objective:** To retrospectively review our experience in a series of re-operative hypospadias repairs for distal and proximal types of hypospadias repair failure.

**Materials and Methods:** Between December 2006 and June 2009, 27 children (mean age 4.8 years, range 2 years to 11 years) were referred for re-operation of failure of hypospadias repair. The patients were divided into 2 groups; group1 (20 patients) with distal and midshaft hypospadias. In these cases, the Tubularized incised plate (TIP) urethroplasty was covered with an additional layer of subcutaneous tissue or dartos flap. Group 2(7 patients) with proximal shaft or penoscrotal hypospadias types that were complicated with fistula formation, excision of the fistula tract was done with closure with interrupted sutures and a second layer covering (dartos) was performed

The original location, associated complications and results were recorded.

**Results:** for group 1 There were 5 (25%), incidences of complications of TIP re-operation, 3 meatal stenosis, one stenosis with small fistula and one dehiscence. Re-operation was necessary in only one patient of our series (7.6%) and the others were cured by dilatation.

Group 2: 2 patients out of 7(28.5%) had failure of repair with persistence of the fistula that required reoperation

**Conclusion:** for distal type Hypospadias using TIP urethroplasty as described by Snodgrass, is a suitable method for treating primary and re-operative cases. While for more proximal hypospadias closure of the defect and a second layer covering to prevent fistula is a viable option treatment.

**Key words:** urethroplasty; hypospadias; urethral plate; tubularized incised plate (TIP)

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## Introduction

Numerous methods for repair of hypospadias have been introduced. However, urethrocuteaneous fistula or neourethral dehiscence was the most troublesome complication. These problems are the main difficulty in re-operations, because in these cases urethral reconstruction is required, but only a small amount of penile foreskin is

available. On the other hand, the vasculature of previously operated tissues may be suboptimal, resulting in further complications. In 1994, Warren Snodgrass described a procedure using tubularized incised plate (TIP) urethroplasty with excellent results<sup>(1)</sup>. The TIP urethroplasty has also been used successfully in re-operative and complex hypospadias repairs<sup>(2-4)</sup>.

Although, tubularized incised plate urethroplasty is well described, there are few reported experiences pertaining to complicated hypospadias or circumcised patients that are re-operated by this technique. We report our results in using

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the TIP urethroplasty with a local flap in previous hypospadias repair complicated by fistula or dehiscence.

On the other hand fistula that develops after repair of more proximal types of hypospadias are more challenging, they require more delicate procedures and a higher failure rate.

#### **Materials and methods**

Between December 2006 and June 2009, 27 children (mean age 4.8 years, range 2 years to 11 years) were referred for re-operation of failure of hypospadias repair.

The patients were divided into two groups

**Group 1:** twenty [20] patients had a failed hypospadias repair of distal [18 patients] and mid shaft [2 patients] penile hypospadias (Figure 1) who had previously undergone a failed hypospadias repair. The previous techniques utilized were Mathieu repair in 6, MAGPI in 4 and unknown in 10. Glanular hypospadias were excluded from this study. The interval from the last surgery to TIP re-operation was between 6 months to 9 years.

After the primary evaluation, tubularized incised plate urethroplasty (TIP) was performed for correction of complications related to the previous hypospadias surgery. All of the re-operations were performed by the same surgeon. After general anesthesia, a stay suture was placed through the glans for traction. Then the penis was degloved and any meatal stenosis or fistula opened widely, to prevent subsequent stricture formation. An artificial erection was carried out for ventral curvature, as a necessary step. Parallel incisions separated the glans wings from the urethral plate and the plate was incised in the mid-line as described by Snodgrass<sup>(1)</sup>. An 8F or 10F Foleys

catheter was passed into the bladder for post operative urinary diversion, then, an urethroplasty was performed using subcuticular 4/0 vicryl continuous sutures. The epithelium of the urethral plate was inverted toward the lumen to avoid fistula formation. Care was taken to avoid suturing the distal urethral plate too tightly, which may result in meatal stenosis. Usually only 1 or 2 sutures beyond the mid glans penis level of the plate were needed, leaving the neomeatus oval in configuration<sup>(3)</sup>. The neourethra was covered by a second layer of dartos tissue pedicle then closing the skin with interrupted sutures and a compression dressing was applied. All patients were discharged from the hospital one to two days after surgery. Catheter and dressing were removed after five days. Patients were examined twice in the first month (Figure 2), with follow-up within a 6 month period. Patients who had an acceptable cosmetic appearance and voided from the end of the penis with no difficulty were considered as successful surgery.

**Group 2:** 7 patients had failed hypospadias repair of proximal penile [4 patients] and penoscrotal [3 patients] hypospadias (Figure 3).

All the patients had fistula formation near the proximal end of the neourethra of the previous repair

After the initial assessment of the patients, repair of the fistula was decided and under general anesthesia, the procedure started with the assessment of the neourethra with calibration to exclude any stenosis or stricture, a 8 or 10 Fr Foleys' catheter was inserted to the bladder, excision of the fistula and closure of the defect with interrupted 4/0 vicryl sutures with inversion of the urethral edges towards the lumen then covering the area with a second layer of

dartos tissue pedicle harvested from the nearby tissue (Figure 4), the skin was closed by interrupted sutures (Figure 5).

At the end of the procedure suprapubic cystostomy tube was inserted as safety measure to divert the urine and a compression dressing was applied. All patients were discharged from the hospital one to two days after surgery. Catheter and dressing were removed after four days and suprapubic cystostomy on day 6. Patients were examined twice in the first month, with follow-up within a 6 month period. Patients who had an acceptable cosmetic appearance and no recurrence of the fistula and voided from the end of the penis with no difficulty were considered as successful surgery.

### **Results**

The mean follow-up after surgery was 6 months (range 4-9 months)

#### **Group1**

There were five complications; a six-year old boy that was referred after a failed repair. The day after surgery he developed severe bladder spasms. Subsequently, the patient's glanuloplasty dehiscid which required re-operation. Three children developed meatal stenosis that responded to 2-3 times calibration. The fifth child developed a pin hole fistula and stenosis. After 6 weeks calibration (twice per week), both of them were cured.

#### **Group2:**

Two children developed complication including failure of the fistula closure after repair that required another operation after 6-12 months

### **Discussion**

In the correction of complicated hypospadias, it is preferable to use vascularized preputial or penile skin. When genital skin is unavailable or insufficient, it may be necessary to

choose extragenital tissues such as skin, bladder mucosa and buccal mucosa, in order to complete a successful repair. Duckett et al<sup>(5)</sup> comment that buccal mucosa grafts are the best urethral replacement for redo surgery and for stricture disease, and the meatus will be durable.

In contrast, hypospadias repair with Snodgrass incised plate urethroplasty in primary cases, has gained widespread acceptance because it is versatile, and has the advantages of reliably creating a vertically oriented meatus, while having a lower complication rate than other techniques. These excellent results have been reported in literature as primary repair<sup>(1, 3)</sup>. Although the use of Snodgrass urethroplasty has been extended from primary to re-operative hypospadias<sup>(2, 4, 6, 7)</sup>, these reports do not appear to be very conclusive.

In group 1 patients (n=20), our complications rate (25%) was related to five patients: i.e. three meatal stenoses, one stenosis with a small fistula and one dehiscence. This study, and also the report of Yang et al.<sup>(8)</sup>, demonstrated that the meatal stenosis is the most frequent form of complications in re-operative TIP urethroplasty especially in distal types. Although a wide neomeatus has been made, the meatal stenosis had the most complications.

The results would be similar to Snodgrass and Lorenzo<sup>(3)</sup> who reported the usage of TIP urethroplasty to repair proximal hypospadias (33%). Although their cases were proximal, complications in re-operation (2) were 3 in 15 (20%), and is similar to those reported by Shanberg et al.<sup>(6)</sup> and Borer et al.<sup>(9)</sup> 24%, 15%, respectively. It is very important to note that in only one patient of our series, re-operation was necessary

while others were cured by dilatation; this indicates that the ultimate success rate without another operation was 92.4%. We had a patient with dehiscence glanuloplasty that underwent a successful second redo tubularized incised plate urethroplasty re-operation and responded satisfactorily

For prevention of fistula, when possible, the neo-urethra was covered with a blanket of tunica vaginalis (Figure 4) or some other buffering vascularized layer as an alternative flap for multilayer coverage of the urethroplasty. Therefore, the incidence of fistula was only one case that could be due to meatal stricture. Meatal stenosis is the most reported form of complication and usually responds to dilatation. Although uroflowmetry was not performed, meatal stenosis was evaluated clinically. Based on the opinion of Duckett et al.<sup>(5)</sup>, flowmetry is a good objective measure of caliber, but observation of a good full stream is subsequently more revealing in follow-up. Ideally one should have both<sup>(5)</sup>.

In conclusion, using the TIP urethroplasty as described by Snodgrass et al. is a suitable method for treating the re-operative cases. It can also be used successfully in patients who do not have a healthy skin flap and for circumcised patients when there is a complete lack of foreskin.

#### Group2:

In the management of fistula of more proximal hypospadias failed repair, the same principles of excision of the fistula tract, tension free closure and a second layer covering help decreasing the incidence of complications specially dehiscence and fistula after the redo-repair

Bracka<sup>(10)</sup> reported his experience with 600 patients with primary and secondary hypospadias repairs, he concluded that the second layer largely decrease the incidence of fistula from 63% without a second layer to only 5.4% with the use of dartos flap as a second covering layer While Massimo Catti et al<sup>(11)</sup> described the incidence of fistula in redo hypospadias repair was as high as 20% and this was more common with free graft use like buccal mucosal graft than grafts with a pedicle.

In the second group series seven [7] patients had fistula as a complication of prior proximal hypospadias repair two of them developed fistula postoperatively making the fistula rate as high as 28.5%. Although the patients' sample is small (seven patients only) this high failure rate can be explained by several reasons like the early experience of the surgeon and the type of suture material used which is vicryl 4/0 while ideally it is 6/0 or 7/0 vicryl as described by Massimo Catti<sup>(11)</sup>



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**

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