

Experience and Results After 100 Cases of Hypospadias Operated with Tubularized Incised Plate Technique

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Aim: To report our experience with tubularized incised plate urethroplasty (TIP).

Material and methods: Tubularized incised plate urethroplasty was undertaken in 100 patients within 0 and 17 years (mean age 5.31 years), during the last two and a half years. All of them had the same procedure performed in the Clinic of Pediatric Surgery Tîrgu Mureş. The patients were followed-up at 2 weeks, 4 weeks, 3 months, 6 months and 1 year.

Results: Overall complications were encountered in 16 cases. We had 40 small patients (0–3 years) with a success rate of 95%, 46 mid age patients (4–11 years) with a success rate of 82.60% and 14 pubertal patients (12–17 years) with a success rate of 71.42%. The operation was performed for the first time in the case of 63 boys (54 had no complications) and it was a re-operation in the case of the other 37 (30 had no complications). Distal and mid shaft hypospadias had similar rate of success (89.58% and 84.61%). In proximal hypospadias, the rate of success was 61.53%.

Conclusions: The tubularized incised plate urethroplasty is a versatile single stage procedure for all types of hypospadias. We consider now that this procedure is the best in the treatment of hypospadias.

Keywords: hypospadias, tubularized, urethroplasty

Introduction

Hypospadias is a malformation in which the urethral meatus opens on the ventral side of the penis, proximal to the tip of the glans [1]. Hypospadias can be distal (glanular, coronal or very close to coronal sulcus), mid shaft, penile or proximal (peno-scrotal and perineal). The associated chordee produces a ventral bending. The glans is flat and often stenotic.

The aim of every surgeon is to repair all these abnormalities. There are more than 300 different techniques proposed for hypospadias repair. Among them, tubularized incised plate (TIP) urethroplasty has gained widespread acceptance because of its excellent functional and cosmetic results [2].

Snodgrass described in 1994 the TIP urethroplasty [3]. He proposed a simple technical innovation that has revolutionized hypospadias surgery. Snodgrass recommended a midline incision on the urethral plate, distal to the level of hypospadiac meatus, in order to extend the urethral plate and make possible to tailor a neourethra. The neourethra is reconstructed from urethral plate without additional skin flaps. It is recommended to cover the neourethra with an intermediary vascularized flap, in order to prevent any complications.

The most common complication of hypospadias repair are: fistulae, wound dehiscence, meatal and urethral stenosis [4]. A complication is another trauma for child and his parents. So, efforts continued to minimize functional and cosmetic problems [2].

At first, Snodgrass operation was proposed only for distal hypospadias. Now, many surgeons use this technique

for all anatomical types of hypospadias. It is used in primary and re-operative hypospadias [5].

Thus we retrospectively reviewed our experience and results with TIP urethroplasty over the last two and a half years and the conditions contributing to the success or complications of these urethroplasties.

Material and method

From March 2007 to November 2009 we performed 100 operations for hypospadias repair, using tubularized incised plate technique. Our consignment consists of children 0 to 17 years hospitalized in the Pediatric Surgery Clinic of Tîrgu Mureş in this period. So, our study is retrospective and we have studied the results using this technique.

The technique, with our modifications, begins with a longitudinal midline incision (Snodgrass incision) on the urethral plate, from the hypospadiac meatus to the tip of the glans. A 6, 8, 10 or 12 Ch catheter is placed in the urethra and a tourniquet is put on the root of the penis. A 'U' shaped incision is made then. This incision marks the limits of the urethral plate laterally and circumscribes the hypospadiac meatus. The lateral flaps of the future neourethra are prepared, also the wings of the glans. A longitudinal midline incision is made then from the basis of the 'U' to the basis of the penis, also on the ventral side of the penis. The lateral flaps penile skin are prepared and the chordee is cut (this is a partial degloving). In some cases we make a total penile degloving with a circumferential incision at 2 mm proximal to the coronal margin, extended from each lateral branch of the 'U' incision. The urethroplasty is made with a running subcuticular 5-0 or 6-0

Table I. Successful operations by age group

Age group	Number of patients	Successful operations
0–3 years	40	38 (95%)
4–11 years	46	38 (82.60%)
12–17 years	14	10 (71.42%)

Table II. Successful operations after criterion: first or redo

Operation	Number of patients	Successful operations
First operation	63	54 (85.71%)
Re-operation	37	30 (81.08%)

Table III. Successful operations by the morphological type of hypospadias

Type of hypospadias	Number of patients	Successful operations
Distal	48	43 (89.58%)
Mid shaft	39	33 (84.61%)
Proximal	13	8 (61.53%)

absorbable suture, over the catheter. A vascularized flap is prepared from the foreskin after de-epithelisation or from the lateral or ventral side of the penis. This intermediary layer is placed over the neourethra. The glans wings are approximated (glanuloplasty) with 2 or 3 distinct sutures. The skin is then reconstructed. In some cases we made the circumcision, in others we reconstructed the foreskin. A compressive bandage is put around the penis. We manage this operation in about 75 minutes. The catheter is left in the bladder for 7–10 days.

We followed-up the patients at 2 weeks, 4 weeks, 3 months, 6 months, 1 year, then once per year.

The age of children ranged from 10 months to 17 years. The operation was performed in all types of hypospadias: distal, mid shaft and proximal. There were children at first operation and also children at re-operation.

We divided the group of 100 patients in three groups of children: small children (0–3 years), mid age children (4–11 years) and pubertal children (12–17 years), in order to study the results of operation in every age group. It is important to know the timing of this operation.

Results

The mean age of operated children was 5.31 years. Overall complications were encountered in 16 cases (16%). Glanular dehiscence developed in two cases, one child developed a meatal stenosis and 13 children had fistulae. Each of them required a secondary surgery. The locations of the fistulae were: 7 at coronal level, 4 at former hypospadiac meatus and 3 between the coronal sulcus and the former hypospadiac meatus.

There were 40 small children (0–3 years), 46 mid age children (4–11 years) and 14 pubertal children (12–17 years). We operated with success in 38 cases of small children, also in 38 cases of mid age children and in 10 cases of pubertal children (Table I).

It was the first operation for 63 children and a re-operation for 37 children. There were good results for 54 children at first operation 30 children at re-operation. Table II presents these results.

The location of the hypospadiac meatus was distal in 48 cases, mid shaft in 39 cases and proximal in 13 cases. We had 5 complicated cases of distal hypospadias, 6 complicated cases of mid shaft hypospadias and 5 complicated cases of proximal hypospadias. The results are in Table III.

All successful operations were cosmetically good. No one had residual chordee. There were no urinary or sexual malfunctions after the surgery.

Discussion

Tubularized incised plate urethroplasty is a relatively new technique for repairing hypospadias. The main difference of this technique is the midline incision of the urethral plate [3]. The incision provides an extension of the urethral plate in order to reconstruct the urethra. Before the Snodgrass procedure, we used especially the Thiersch-Duplay and Mathieu operations. The Snodgrass technique is in fact a modification of the Thiersch-Duplay procedure but with better results. The urethroplasty is tension free because of the incision of the urethral plate. For the Thiersch-Duplay procedure we used three stages for repairing: meatotomy, orthoplasty of the penis and then, urethroplasty. In the new operation, we use a single stage procedure.

In our group the percentage of successful operations with the Snodgrass technique is 84%. This percentage is similar with data from the literature [6,7,8]. For comparison, in the last group of 100 children operated for hypospadias in our clinic with Thiersch-Duplay procedure, the percentage of successful operations was 34%. The difference is evident. At the beginning, our complication rate was also higher, now it became lower.

Our best results in hypospadias repair are in small children. In these cases, the percentage of success is 95%. This percentage decreases in mid age children (82.60%), then in pubertal children (71.42%). These results are noticed also in others statistics [9]. In the past, we used to operate this malformation in mid age children or even in puberty. The reason was that an older boy is more cooperant and the penis may be larger. We concluded that these arguments are not solid. Given our results, now our option is to operate at the age of one year. The surgical results are better, also we prevent psychological consequences due to a malformed genital organ in a boy integrated in society.

We had a 85.71% rate of success for the first operation and 81.08% for the re-operations. These rates are nearly similar and correspond with data from the literature [10,2]. A re-operation is more difficult because of the scars of the skin, but in our cases the results are good enough.

Also, our best results were in distal and mid shaft hypospadias (89.58% and 84.61%). The surgery of proximal hypospadias may be very difficult because the chordee is very important, the urethral plate is narrow, the skin is hy-

potrophic, the penis is usually small and we can not use the tourniquet to control the hemorrhage. But, our percentage of operations with good results in the proximal hypospadias is also important (61.53%).

In all successful operations, the functional and cosmetic results were good. It is an interesting operation of reconstruction of the malformed penis. It is not a simple urethroplasty. During this procedure we have to make a good orthoplasty, meatoplasty, glanuloplasty, prepare the penile skin, reconstruct the foreskin or make the circumcision. It is an operation on the border of pediatric surgery, plastic surgery and urology.

Conclusions

The treatment of hypospadias remains an important challenge for every pediatric surgeon. Tubularized incised plate urethroplasty is an interesting and versatile single stage operation recommended initially for distal hypospadias. It is a technique that we could use with success in all kinds of hypospadias cases: distal, mid shaft, proximal; as a first operation or a re-operation. The timing recommended for this operation, from our statistics, is under four years. We

consider now that this procedure is one of the best in the treatment of hypospadias.

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