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Original Research Article

Does the early removal of urethral stent can reduce postoperative complications of Snodgrass urethroplasty for hypospadias repair? a prospective randomized trial

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ABSTRACT

Background: Hypospadias is a relatively common congenital defect of the male external genitalia. The objective of this study was to evaluate whether the early removal of urethral stent following TIP Snodgrass repair of hypospadias can reduces postoperative complications of this procedure.
Methods: In Al-Yarmouk teaching hospital, the surgical procedure included 61 tabularized incised plate (TIP) repairs for penile hypospadias. The patients were prospectively observed over 36 months and randomized into 2 groups, group (A) was 30 patients where the urethral stent was removed after 24 hours of operation, and group (B) was 31 cases where the stent removed in the 6th postoperative day. Suprapubic urinary diversion was done for all patients. All of the operations were performed by the same surgeon. Complications and cosmetic appearance were documented at last follow-up.
Results: The average age of the patients was 3.9 years, urethra-cutaneous fistula was observed in 2 cases in group A (6.6 %), while 11 patients had fistula in group B (35.4 %) with a statistically significant difference ($p < 0.05$). meatal stenosis was reported in 4 patients in (group A) (13.3%), while 12 patients had such complication in group B (38.7%) with a statistically Significant difference as ($P< 0.05$). 6.6 % of group A developed wound infection, while 32.2 % had wound infection postoperatively in group B with a statistically significant difference ($P< 0.05$). Complete surgical failure when wound dehiscence occurs, it was found that no significant difference between the 2 groups (P value=0.1).
Conclusions: TIP repair is a versatile operation that can be performed in almost all cases of penile hypospadias. We believe that early stent removal after 1 day of surgery for hypospadias repair simplifies postoperative care, highly reduces risk of development of urethra-cutaneous fistula, meatal stenosis and wound infection, so obviates the need for antibiotics.

Keywords: Complication, Hypospadias, Stent, Snodgrass, Urethral

INTRODUCTION

Hypospadias is a relatively common congenital defect of the male external genitalia. It is present in approximately 1 in 250 male newborns. Hypospadias may be an isolated defect or a phenotypical component of a more complex condition such as an intersex state.[1,2] Hypospadias, is defined as an association of three anomalies of the penis: (1) an abnormal ventral opening of the urethral meatus that may be located anywhere from the ventral aspect of

the glans penis to the perineum, (2) an abnormal ventral curvature of the penis (chordee), and (3) an abnormal distribution of foreskin with a "hood" present dorsally and deficient foreskin ventrally.[3] The second and third characteristics are not present in all cases. Hypospadias causes not only functional problems but also psychological problems for patients and their parents.

In all commonly used classification systems, glanular, coronal, and sub coronal (anterior/distal) defects constitute the great majority (50% to 70%) of hypospadias.[4-6] It has reported overall rates of approximately 50%, 30%, and 20% for distal, middle, and posterior/proximal hypospadias, respectively. The goals of treatment in hypospadias surgery are to correct the chordee and to create an even-caliber neo-urethra terminating in a slit-like neomeatus at the apex of the reconfigured glans restoring the normal anatomy and physiology with minimal complications.

From the earliest recorded description of hypospadias to the present, several hundred surgical approaches and/or variations on a theme have been described. Several comprehensive accounts of historical aspects and early technical reviews regarding hypospadias are available.[7-11] Regardless of the technique employed for repair of hypospadias and its associated defects, attention to penile curvature and its correction (orthoplasty), urethroplasty, meatoplasty and glanuloplasty, and, finally, skin coverage are universal concerns.

The current standard of care is to repair hypospadias with a one-stage procedure in the first year of life and on an outpatient basis. With changing concepts in modern hypospadiology, Snodgrass first described the tubularized, incised plate (TIP) urethroplasty for distal hypospadias repair in 1994 and recently extended its application to proximal hypospadias with promising results.[12,13] the major principles are deep longitudinal incision of the urethral plate, which allows for its tubularization without the need for additional flaps, and the interposition of a barrier layer of dartos pedicle between the neourethra and overlying skin, which is crucial in reducing the likelihood of urethra-cutaneous fistula.[13,14]

Surgeons use small variations in the technique to limit the Complications. The distal limit of the deep longitudinal incision may be either the mid-glans or the tip of the glans. The covering flap of the neourethra is usually raised from the preputial skin; however, this may result in penile torsion and devascularization of the preputial skin that is often used in reconstruction of the penile skin.[15] A ventral dartos flap has been used to cover the neourethra in order to avoid these complications.

Despite such modifications, complications of hypospadias repair, such as fistulae, urethral stricture, meatal stenosis, penile torsion, persistent chordee, infections and wound dehiscence, are still reported.[15] Repeated attempts at surgical repair in these complicated cases are then less likely to succeed because the penis is densely scarred, immobile, hypo vascular, or significantly shortened.[16,17]

In this paper, we describe our experience with two Variations in performing Snodgrass TIP urethroplasty with respect to postoperative complications and outcomes, with Emphasis on meatal stenosis, urethral stricture, urethrocutaneous fistulae formation, wound infection and wound dehiscence. The objective of this study was to evaluate whether the early removal of urethral stent following TIP Snodgrass repair of hypospadias can reduces postoperative complications of this procedure.

METHODS

This is a randomized prospective study was undergone in the period between January 2010 and December 2012. In this study, 61 patients aged between 1-8 years with distal (sub coronal) and midshaft hypospadias underwent TIP urethroplasty at Al-Yarmouk teaching hospital in Baghdad, using the technique as described previously by Snodgrass (18), using 4/0 and 5/0 Vicryl suture for closure of the urethral, dorsal preputual Flap as protective second layer over suture line and urethral stent was used in the anterior urethra with range of 6-8 Fr. Some cases had mild chordee which were managed by degloving penile skin. Urinary diversion was done through percutaneous suprapubic cystostomy that is removed 10 days after operation.

All of them were discharged from hospital in the 1st-postoperative day. Patients with history of circumcision, severe degree of chordee, history of hypospadias surgery were excluded from this study. All patients were operated by the same surgeon.

Those patients were randomized into 2 groups. In group (A), the urethral stent was removed 24 hours after operation, while with group (B), the urethral catheter was removed in the 6th-postoperative day. Patients were examined 1 week, 1 month, and 6 months after discharge. Regular dilatation of the neourethra was taught to all parents.

In the statistical analysis, outcomes and complication rates for both groups were compared using a Fisher's exact test. P values below 0.05 were accepted as significant.

RESULTS

The average age of the patients was 3.9 years, 30 patients were included in group A, while group B has 31 cases. During the early postoperative period, mild edema and/or bruising was seen in nearly all cases with no significant hematomas.

Table 1: Distribution of types of hypospadias among the 2 groups.

Hypospadias type	Group a	Group b
Sub coronal hypospadias	13	12
Midshaft hypospadias	11	14
Penoscrotal hypo.	6	5
Total	30	31

Table 2 showing urethra-cutaneous fistula developed in the 2 groups. In group A, just 2 patients out of 30 developed such fistula (6.6 %), while 11 patients had fistula in group B (35.4 %) with a statistically significant difference ($p < 0.05$). As Regard development of meatal stenosis (Table 3), it was reported in 4 patients in (group A) (13.3%), while 12 patients had such complication in group B (38.7%) with a statistically Significant difference as (P value =0.023).

Table 2: Distribution of fistulae among study participants.

	Group A	Group B
No fistula	28	20
With fistula	2	11
Total	30	31

Table 3: Distribution of stenosis among study participants.

	Group A	Group B
No meatal stenosis	26	19
With meatal stenosis	4	12
total	30	31

Complete surgical failure when wound dehiscence occurs, it was found that no significant difference between the 2 groups (P value=0.1) as seen in Table 4.

Table 4: Distribution of surgical failure among study participants.

	Group A	Group B
Surgery failure (complete dehiscence)	1	5
No dehiscence	29	26
Total	30	31

Table 5: Distribution of fistulae among study participants.

	Group A	Group B
No wound infection	28	21
Wound infection	2	10
Total	30	31

With early removal of catheter, just 6.6 % of group A developed wound infection, while 32.2 % had wound infection postoperatively in group B with a statistically significant difference (P=0.012) demonstrated in Table 5.

DISCUSSION

The main objective of all hypospadias repair procedures is to create a functional neourethra and an almost aesthetically normal penis. The TIP method has been favored in hypospadias cases by a gradually increasing number of supporters in recent years.[19-22] The fistula rate in large hypospadias studies seems to vary from 0 to 33%.[23] Failure, fistula, and meatal stenosis are the most common complications encountered and they most likely to develop within 6 months postoperatively.[6,24,29] Although most recent hypospadias repairs show a low rate of complications, fistula formation remains an important problem.[25]

Many modifications in the TIP procedure are being performed to decrease the rate of urethrocutaneous fistula formation; however, no single surgical technique can be considered a standard for preventing the formation of fistulae. In our study ,we noticed that early removal of urethral stent significantly reduced the chance of having urethrocutaneous fistula following Snodgrass repair ,as seen in group A where just 6.6% of cases had such complication in comparison with the other group in whom one third developed fistulae .these findings were similar to results seen by a number of researcher such as Turialand Demirbilek; the former found only 2 of the 41 cases underwent stent-free TIP surgery had fistulae ,while the latter compared 2 groups where Snodgrass repair was used, those with just suprapubic drainage and stent free got lower fistula repair (7.1 %) than second group that depended upon urethral catheterization (14.2%).[25-27] Radwan found that fistulae developed in only 1.5 % of 66 patients when urethral stent was early removed (within 2-3 days postoperatively).[28]

Although Ritch found no significant difference in different timing of stent removal, he recommended TIP hypospadias repair may have their urethral catheter removed safely on Post-operative day one.[29] In study done by Radwan, there was significant difference in term of development of meatal stenosis between early removal of urethral catheter within 2-3 days (0 %) and patients who had long period of urethral catheterization (12.7%) (28), such findings were closed to those seen in this research where 13.3% of group A patients had meatal stenosis and 38.7% of group B. Xu didn't find significant difference in duration of urethral stent as an effect of stenosis development as he noticed in a study of total of 254 patients with primary distal and mid-shaft hypospadias underwent TIP repair and were evaluated retrospectively, he concluded that non-catheter TIP repair is feasible and positive outcomes can be achieved with minimal complications and less patient discomfort.[25]

In our study, early stent removal was greatly reduced risk of wound infection (93.3 % of Group were free of infection), and this was also observed by Demirbilek and by Almodhen in a prospective observational study involved 32 consecutive non-toilet-trained boys.[30] Postoperative complications were also reduced in non-stented Mathieu hypospadias repair. It was obvious in a prospective study compared 36 patients undergoing Mathieu repair with catheter (n = 17, mean age 4.1 years) versus without diversion (n = 19, mean age 4.6 years).[31] None of our patients in both groups complained of significant pain, urinary extravasation had bladder distension. This can be explained by the presence of suprapubic diversion in all of our patients, and this was supported by the findings seen by Radwan.[28]

CONCLUSION

TIP repair is a versatile operation that can be performed in almost all cases of penile hypospadias. We believe that early stent removal after 1 day of surgery for hypospadias repair simplifies postoperative care, highly reduces risk of development of urethrocutaneous fistula, meatal stenosis and wound infection, so obviates the need for antibiotics

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