

TUBULARIZED INCISED PLATE (SNODGRASS) URETHROPLASTY FOR HYPOSPADIAS IN CIRCUMCISED AND UNCIRCUMCISED PATIENTS: A COMPARATIVE STUDY

KAMIRAN J.SADEEQ, MBCHB, FICMS*

QADIR M.SALIH, MBCHB, FICMS **

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ABSTRACT

Background: The tubularized incised plate urethroplasty has well been depicted for the hypospadias management, however, few studies have measured its complication on hypospadias. The current study aimed to compare the tubularized incised plate urethroplasty procedure in circumcised and uncircumcised patients on different locations of distal hypospadias.

Subject and Methods: Between 9-July-2012 and 9-March-2014, 81 male patients aged 6 to 108 months (mean age 42.10 ± 25.72), including 33 circumcised and 48 uncircumcised boys with distal hypospadias were recruited into the study and underwent tubularized incised plate for the first time. The complications included fistula, meatal stenosis, surgery failure or success, penile skin necrosis, and final outcome were obtained after six month follow-up of the patients.

Results: The study revealed that mean surgery duration was 60.00 ± 8.18 minutes. The study did not show that surgery in different locations ($p=0.872$), overall outcome ($p=0.153$) and specific outcomes including fistula ($p=0.261$), meatal stenosis ($p=0.337$), and penile skin necrosis ($p=0.299$), and successful rate of operation ($p=1.000$) have a significant difference in circumcised and uncircumcised patients.

Conclusion: The procedure is an effective, safe, and proper clinical technique to treat hypospadias in circumcised and uncircumcised patients. The study showed that the technique can be done in both group of patients successfully.

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Keywords: Distal hypospadias, Snodgrass procedure, Tubularized Incised Plate (TIP) Urethroplasty, Circumcised, Uncircumcised.

Normal location of urethra on the ventral surface of the phallus is defined as hypospadias. It is possibly related to incomplete development of urethral spongiosum, penile chordee, and ventral prepuce.¹ Numerous clinical techniques have been well established in order to repair all defects of hypospadias till now, however there is no single and universal technique.²⁻⁴ Hypospadias has been considered the most common abnormal condition of the genital tract in males^{3,5} with an annual incidence between

0.8 and 8.2/1000 live male newborns. Normally, the repair of hypospadias is performed following one year of age, and it is suggested that circumcision is better not to be done for the child until the hypospadias repair is accomplished.

The penile meatus in patient with hypospadiasis located in the ventral and proximal situation. The failure in urogenital folds in males in bending in different regions is responsible for this anomaly.⁶

The American Academy of Pediatrics

* Lecturer, Department of Surgery, College of Medicine, University of Duhok, Kurdistan Region, Iraq

**Lecturer, Department of Surgery, College of Medicine, University of Duhok, Kurdistan Region, Iraq

Correspondence author to: Kamiran J. Sadeeq, dr_kamiran_jalal@yahoo.com, Mobil +9647504588111

announced a policy statement on circumcision as absolute contraindications to the (TIP) Snodgrass procedure in 1975. However, in 1999, the statement was reevaluated and disseminated that the circumcision can be performed after or synchronously with hypospadias repair.⁶ TIP urethroplasty has been well depicted for the dypospadias management, however, few authors published their own experiences of hypospadias complications of the performed technique in circumcised and uncircumcised patients in the literature. In this regard, the current study aimed to compare the TIP urethroplasty procedure in circumcised and uncircumcised patients with distal hypospadias, and analyze the outcome, surgical difficulty and complication rates of TIP repair for distal hypospadias.

SUBJECTS AND METHODS

The ethical clearance was obtained from the local Health Ethics Committee-Duhok/Iraq. Between 9-July-2012 and 9-March-2014, 81 male patients irrespective of their age from 6 to 108 months (mean age 42.10 ± 25.72) included 33 circumcised and 48 uncircumcised boys with distal hypospadias were recruited into the study and underwent TIP urethroplasty for the first time at Pediatric Hospital-Duhok. The patients with co morbidities included coagulation disorders, sex development disorders, and diabetes mellitus determined through the interview with their parents and lost to follow-up were excluded from the study.

The dartos flap was used as a second layer. All the cases included in the study were of distal penile variety (coronal, subcoronal and distal shaft) without chordee, and

underwent repair for the first time using TIP urethroplasty. The complete or incomplete glans groove was determined through the physical examination. All the patients underwent TIP urethroplasty under general anesthesia with tourniquet application. An artificial erection was conducted in order to confirm the chordee absence. The following operative procedure was performed for the patients.

The patient's penis was degloved with urethral plate preservation. The glans wings were sufficiently mobilized, and the urethral plate was incised at the midline and tubularized over 8-10 F stent using continuous 6-0 polydioxanone sutures. The new urethra then covered with vascularized dartos flap harvested from the inner prepuce of uncircumcised patients and from the ventral penile skin in circumcised patients. For splint and urinary drainage, infant feeding tube number 8-10 F was applied for the patients. To close the skin, it was brought from prepuce in uncircumcised and lateral part in circumcised patients and connected to each other by 5-0 polydioxanone interrupted sutures.²

The inability of passing an 8Fr sound through the neomeatus was considered as meatal stenosis.⁷ The anterior meatal location of hypospadias was considered as subcoronal, in mid penile and distal penile.¹ Successful surgery was considered when the patient has an acceptable cosmetic appearance and no difficulties in urination.

The patient age, operation date, circumcision status, hypospadias type and location, fistula, meatal stenosis, surgery failure or success, surgery duration, penile skin necrosis, and final outcome were

obtained through the direct interview with the patients' parents, clinical examination, or six month follow-up of the patients. The dressing of the phallus was removed and the wound was left exposed on the 5th day after operation. The catheters were removed and patient was discharged from the hospital on the tenth day after operation. Urethral calibration and regular follow-up with the appropriate size of feeding tube was done 3 months to 6 months after surgery. The patients' assessment with respect to outcome and complications were conducted at the time of dressing and catheter removing and follow-up time in the hospital.

The Statistical Package for Social Sciences version 23:00 (SPSS 23:00) was performed in order to organize, analyze, and present the data of the study. Frequency, percentage, mean, and standard deviation were used for the descriptive purposes of the patients' characteristics. The percentage of outcomes and complications of hypospadias in circumcised and uncircumcised patients were used as the incidence. The chi-square test and fisher's exact tests were performed to estimate the difference of outcome in circumcised and uncircumcised patients for the low number and large number of frequencies, respectively.

RESULTS

The Table 1 presents the frequency distribution of patients' characteristics. The study results revealed that means of patients 'age and surgery duration were 42.10±25.72 month and 60.00±8.18 minutes, ranging from 6 to 108 months (102) and 45 to 80 minutes (35), respectively. Among 81boys with distal

hypospadias 14had coronal hypospadias (17.3%), 37 (45.7%) subcoronal (as the most common type in the study), and 30 (37.00%) distal shaft.

The results of the study using the TIP urethroplasty to treat the distal hypospadias showed that the overall incidence of fistula, meatal stenosis, and penile skin necrosis outcomes were 9.9% (8 patients), 11.1% (9 patients), and 4.9% (4 patients), respectively. In addition, the study revealed that approximately 98% (97.5%, 79 patients) had successful surgery of TIP urethroplasty compared to only 2 patients (2.5%) with operation failure. At the end, the complication incidence was so low in patients underwent TIP Snodgrass, in which it was 6.2% (5 cases) in comparison with 93.8 (76 cases) of them did not show any complication (as shown in the Table 1).

Table 1: Frequency distribution of patients' characteristic with hypospadias

Patients' Characteristics	Frequency distribution
Age (Mean ±SD)	42.10 (25.72) months
Surgery Duration (Mean ±SD)	60.00 (8.18) minutes
Circumcision Status	
Circumcised	33 (40.7%)
Uncircumcised	48 (59.3%)
Hypospadias Location (n, %)	
Coronal	14 (17.3%)
Subcoronal	37 (45.7%)
Distal Penile	30 (37.00%)
Fistula Outcome	
Yes	8 (9.9%)
No	73 (90.1%)
Meatal Stenosis	
Outcome	9 (11.1%)
Yes	72 (88.9%)
No	

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Operation Failure	2 (2.5%)
Yes	79 (97.5%)
No	
Penile Skin Necrosis Outcome	4 (4.9%)
Yes	77 (95.1%)
No	

The outcomes and complications of the TIP procedure were shown in circumcised and uncircumcised patients in the Table 2. The overall differences of age and surgery duration were not statistically in circumcised and uncircumcised patients, $p=0.075$ and $p=1.000$, respectively. Our study showed the meatal stenosis was the most common complication with 11.1%. Following that, the chi-square test and fisher's exact test were performed in order

to examine the comparison of outcome and complications in both groups in the case of low and large frequency numbers, respectively. The study did not reveal a significant difference between incidence of hypospadias in circumcised and uncircumcised groups with respect to hypospadias in different locations included coronal, subcoronal, and distal, $p=0.872$. Moreover, our experience did not show that the overall outcome ($p=0.153$) and specific outcomes, including fistula ($p=0.261$), meatal stenosis ($p=0.337$), and penile skin necrosis ($p=0.299$) were different statistically in both circumcised and uncircumcised underwent TIP Snodgrass surgery.

Table 2 Incidence rate of TIP Snodgrass outcome and complications in circumcised and uncircumcised patients

Patients' Characteristics	Circumcised	Un- circumcised	P-value (2-sided)
Age (Mean± SD)	48.39(27.75) months	37.71 (23.55) months	0.075*
Surgery Duration (Mean(+/-SD)	60.00 (9.27) min	60.00 (7.44) min	1.000*
Hypospadias Location (n, %)			
Coronal	5 (15.2%)	9 (18.8%)	0.872**
Subcoronal	16 (48.5%)	21 (43.8%)	
Distal Penile	12 (36.4%)	18 (37.5%)	
Fistula Outcome (n, %)			
Yes			0.261***
No	5 (15.2%) 28 (84.8%)	3 (6.3%) 45 (93.8%)	
Meatal Stenosis Outcome (n, %)			
Yes			0.337**
No	5 (15.2%) 28 (84.8%)	4 (8.3%) 44 (91.7%)	
Disruption (n, %)			
Yes	1 (3.0%)	1 (2.1%)	1.000***
No	32 (97.0%)	47 (97.9%)	
Penile Skin Necrosis Outcome (n, %)			
Yes	3 (9.1%)	1 (2.1%)	0.299***
No	30(90.9%)	47 (97.9%)	
Final Outcome (n, %)			
Normal	29 (87.9%)	47 (97.9%)	0.153***
Complication	4 (12.1%)	2 (2.1%)	

*Independent t-test, **chi-square, and *** fisher's exact tests were performed.

DISCUSSION

In the current study, the TIP Snodgrass surgery technique was performed for 81 male circumcised and uncircumcised children aged 6 to 108 month with the mean age and surgery duration of 41.10 months and 60.00 minutes, respectively. Our experience showed that circumcision was not the factor for worse outcome and greater rate of complications, including fistula, meatal stenosis, penile skin necrosis in circumcised patients underwent TIP urethroplasty compared to the uncircumcised patients, and it is worthwhile to mention that successful rate of operation was not so different in both groups, 97% in circumcised compared with 97.9% in uncircumcised patients, $p=1.000$.

The low rate of complications and high successful rate can infer the high level of surgeons' experience to the TIP Snodgrass technique. Khan, Majeed⁵ and Manzoni, Bracka³ accented on this point that hypospadias surgery requires a long learning period to obtain surgical skills, a high level of temperament, and magnification acquaintance. In addition, the statistically lower complications have been found by Khan, Majeed⁵ in performing the TIP Urethroplasty by specialist plastic surgeons than residents (P -value = 0.0086).

Other authors reported non-significant complications following TIP Snodgrass technique as well for example, Kazemi Rashed and Gholizade⁶ showed equal number of meatal stenosis and urinary fistula in circumcised and uncircumcised patients. In addition, other complications, including severity of bladder spasms and

painful erection had no statistically significant difference, $p=0.97$ and $p=0.74$, respectively in circumcised and uncircumcised patients. In agreement with effectiveness of the TIP procedure, Mousavi⁸ put the hands on confirmation of the technique as an appropriate method to manage primary and re-operative cases. Also, it can be performed successfully to those patients with a healthy skin flap or in circumcised patients at the time of foreskin lack. The current excellent results were confirmed by Mousavi⁸ in patients underwent circumcision with the strong and vertical urinary functions and slit-like meatus.

In this study we took into account fistula, meatal stenosis, and penile skin necrosis as the possible TIP Snodgrass complications, however glans dehiscence, neourethral strictures, diverticula and edema could be considered as complications.^{5,7}

Moreover, the six month period was considered for the follow-up of fistula, meatal stenosis, and penile skin necrosis complications. In agreement with the current follow-up period of the study, Snodgrass, Villanueva⁷ determined in prospective analysis of the available database on follow-up period following primary distal and proximal TIP and TIP reoperations that 64% of urethral complications could be uncovered at the first visit postoperatively and 81% were detectable within the first year following hypospadias repair. The median time of 6 months (1.5-95 months) was determined for complications included meatal stenosis, fistulas, urethral strictures, and diverticulum and 2 months (1 week-24 months) was considered for glans dehiscence.

In conclusion, the TIP urethroplasty as described by Snodgrass, Bush and Cost⁹ is an effective, safe, and proper clinical technique to treat the hypospadias in circumcised and uncircumcised patients. The study showed that the technique can be done in both groups successfully.

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ثوخته

نەشتەرگەریا پوری کرنی (سنودگرەس) ل نەخوشی ن سونەت کری و نەسونەت کری، فەکۆلینی نەکا

نیشەکی: نەشتەرگەریا بشیوهیی بوری کرن وەکو تاکە چارەسەریا ئەندامی نیرینه ب کونخواری دەهتە دیتن، لی هیشتا فەکۆلین لدور فی چەندی کیمن. ل فەکۆلینا بەردەست نەشتەرگەریا بشیوهیی بوری کرنی ل نەخوشین سونەت کری و نەسونەت کری هاتە ئەنجام دان.

ریکین ظەکۆلینی: دناقبەرا ۹ هیفا ۷ یا ۲۰۱۲ حەتا ۹ هیفا ۴ یا ۲۰۱۴، ۸۱ نەخوش ب تەمەنین ۶ حەتا ۱۰۸ هیفی (بناقەندا 42.10 ± 25.72 هیف)، پیک هاتی ژ ۳۸ نەخوشین سونەت کری و ۴۸ نەخوشین نەسونەت کری و ب ئەندامی نیرینهیی کونخواری لژی نەشتەرگەریا بشیوهیی بوری کرنی هاتن دانان. ئالوزی پیک هاتن ژ فیستولا، رەق بون، نەشتەرگەریا سەرکەفتی یان نەسەرکەفتی، مرنا پیستی ئەندامی نیرینه، و ئەنجاما داوی بو دەمی شەش هەیفان هاتن نقیسین.

نەتجام: فەکۆلینی نیشان دا کو درێژا نەشتەرگەری 60.00 ± 8.18 خولەک بو. فەکۆلینی نیشان دا کو نەشتەرگەری بین ل ئالی بین جوداجودا ($p=0.872$)، ئەنجاما جوداجودا ($p=0.153$)، هەبونا فیستولا ($p=0.261$)، هەبونا رەق بون ($p=0.337$)، و هەبونا مرنا پیستی ئەندامی نیرینه ($p=0.299$)، و سەرکەفتنا داوی ($p=1.000$) دناقبەرا کورین سونەت کری و نەسونەت کری جودا هیا بەرچاڤ نینە.

دەر نەتجام: نەشتەرگەریا بوری کرنی فەکۆلینەکا کارتیکەر، ئیمن، تەکینەکا بکیر هاتی بو چارەسەریا ئەندامی نیرینه ب کونخواری ل کورین سونەت کری و نەسونەت کری یە. نەشتەرگەری دناڤ هەر دوو گرۆپین فەکۆلینی ب سەرکەفتیانە هاتە ئەنجام دان.

پەیفین سەرەکی: کونخواریا دور، شیوهیا سنودگرەس، نەشتەرگەریا بوری کرنی، سونەت کریم نەسونەت کری، ئەنجام، ئالوزی

الخلاصة

تصحيح المبال التحتاني بطريقة سنودكراس في الاطفال المختونين و غير المختونين:دراسة مقارنة

الهدف: عملية تصنيع مجرى البول عن طريق صنع انبوب من قص البليت اصبحت طريقة معتمدة لتصحيح المبال التحتاني,على الرغم من ذلك,فان هناك دراسات قليلة قد قامت بقياس مضاعفات هذه الطريقة.الدراسة الحالية تهدف الى مقارنة هذه الطريقة في الاطفال المختونين وعير المختونين في الانواع المختلفة من المبال التحتاني.

طرق البحث: ما بين 9.تموز2012 و 9 اذار 2014, 81 مريض تتراوح اعمارهم بين 6 و 108 اشهر(معدل العمر 25.72+42.10) تتضمن 33 مختون و48 غير مختون يعانون من مبال تحتاني اقصى,ادخلو في هذه الدراسة و قد اجريت لهم العملية لأول مرة.المضاعفات ,والتي تشمل الناسور,تضييق فتحة الادرار,نجاح او فشل العملية, تتخرجلد القضيب,نتائج النهائية قد تم قياسها بعد 6 اشهر من متابعة المرضى.

النتائج: الدراسة اوضحت بأن معدل وقت الجراحة كان 8.18+60.00 دقيقة.الدراسة لم توضح بأن الجراحة لاماكن مختلفة من المبال التحتاني($p=0.872$),النتائج النهائية($p=0.153$) والمضاعفات الخاصة التي تشمل الناسور($p=0.261$),تضييق مجرى الادرار($p=0.337$) و تنخر جلد القضيب($p=0.299$) و نسبة نجاح العملية($p=1.000$) ان هناك اختلاف ما بين الاطفال المختونين و غير المختونين.

الاستنتاج: هذه الطريقة هي فعالة,امينة و صحيحة لعلاج المبال التحتاني للاطفال المختونين و غير المختونين. الدراسة اوضحت بان هذه الطريقة يمكن استعمالها بنجاح في الاطفال المختونين و غير المختونين.

مفتاح الكلمات: مبال تحتاني اقصى,طريقة سنودكراس,صنع انبوب من قص البليت(TIP),مختون,غير مختون,النتائج و المضاعفات.