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COMPARISON OF INTERRUPTED AND CONTINUOUS SUTURING URETHROPLASTY IN TUBULARIZED INCISED PLATE FOR HYPOSPADIAS REPAIR, PROSPECTIVE STUDY

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ABSTRACT

Background: Hypospadias is one of well-known congenital anomaly of the penis induced by abnormal or incomplete development of the urethra. The urethral meatus can be located anywhere on the ventral surface of the penis, from distal part of penis just below the glans to the perineum in more advance cases. Hypospadias prevalence seems to be increasing. There are many surgical treatment options for hypospadias correction. Defining the proper surgical techniques can decrease the complications and morbidities of the surgical procedure. **Aim of the study:** To compare the outcome of an interrupted- and continuous- suture urethroplasty regarding operative time and complication rates in Snodgrass tabularized incised- plate (TIP) hypospadias first layer repair. **Patients and Methods:** A prospective case series comparative study performed between October 2020 to October 2021, included 30 boys with sub coronal, distal shaft and midshaft hypospadias that underwent tabularized incised plate urethroplasty (age 1-10 years). those 30 boys divided into two groups 15 boys of each group, In the 1st group interrupted suturing technique performed while continuous suturing technique done in the 2nd group. **Results:** The mean operative time for both groups (133.6 vs 135.4 min) respectively, while regarding complication three cases develop fistula (20%) and three cases develop meatal stenosis(20%) and one case develop superficial wound infection(6.7%) in case of interrupted suturing and one case develop fistula (6.7)and two cases develop meatal stenosis(13.3%) and one case develop superficial wound infection(6.7%) in continuous suturing of the urethral plate. **Conclusion:** There is no significant difference between interrupted and continuous suturing regarding operative time and the occurrence of complications.

KEYWORDS: Hypospadias, urethral plate, TIP urethroplasty, meatoplasty.

INTRODUCTION

The term hypospadias is derived from the Greek word “hypo" which means below and "spadon" which means rent. The first doctor to use this term was Galen.[1]

It is a birth defect of the penis caused by incomplete development of the urethra. The urethral meatus can exist everywhere on the ventral penile surface.[2]

Hypospadias is one of the most prevalent birth defects in boys, that occurs in 1 of 150-300 live births.[3]

Fundamental cause of non-syndromic hypospadias in the majority individual cases is unknown. Many factors have been discussed, including improper prenatal hormonal stimulation, genetic predisposition, maternal placental factors, and environmental factors. Therefore, it could be multifactorial.[4,5] Hypospadias was outlined in over 200 syndromes. The best known are Wilms tumor, aniridia, urogenital malformations and mental retardation (WAGR) and Denys-Drash syndrome (urogenital malformations and susceptibility to Wilms tumors).[4,6]

There are many classification systems for hypospadias like Duckett 1996 which classified hypospadias into Anterior (glanular, sub coronal, distal penile), Middle(midshaft, proximal penile) and Posterior (penoscrotal, scrotal, perineal).[4]

Surgical Assessment

The aim of surgical reconstruction efforts in boys with hypospadias encompass correcting penile curvature to ensure a long and straight erection, advancing the urethra to allow usual passage of urine and semen through the glans, and creating an aesthetically pleasing penis.[7] The timing of the repair should balance the potential adverse psychological effects of surgery, the anesthetic risk to the child, the degree of penile development that will facilitate a successful repair, and wound healing differences. Based on these studies, the American Academy of Pediatrics Section on Urology has advised that 6 and 12 months is ideal time for elective hypospadias surgery.[7] because at 6 months, the anesthesia and procedure are well tolerated, and at 18 months, the child is toilet trained.[8]

General principles of hypospadias repair

Orthoplasty, urethroplasty, meatoplasty, glanuloplasty and skin coverage.[9]

The most commonly surgical technique used in hypospadias operation is The tubularized incised plate urethroplasty (TIP) procedure at which a longitudinal incision of the urethral plate along penile midline is done.[10]

Purpose of surgical repair is to create penis with normal function and appearance with a urethral opening as close as possible to normal meatus.[1]

Complications of Hypospadias Repair

Urethrocutaneous fistula

Is the most common reported surgical complication after hypospadias repair, with an incidence of about 10% in short-term follow-up.[11]

Urethral meatal stenosis

Occurs if blood supply to the distal urethra is compromised following hypospadias repair.[12]

Glans Dehiscence

Infection, oedema, hematoma, erections, diminished blood supply, weakened suture material, tension at suture line, and vigorous removal of dressing may lead to wound dehiscence.[13]

Urethral Stricture

Had been reported following repair.

Urethral diverticulum

Occur more commonly in boys undergoing preputial flap repairs, two-stage repairs, and proximal repairs.[14]

Hence, this study aimed to find out whether there is any difference in operative time and complication using both surgical technique in Snodgrass hypospadias repair ?

Patients and methods

The study is prospective randomized comparative study, accomplished in Ghazi Al-Hariri Hospital at Baghdad Medical City Iraq during the period October 2020 to October 2021, the study include thirty boys (age range 1-10 years) with primary sub-coronal, distal- and mid-penile hypospadias who underwent repair for their hypospadias.

Inclusion criteria were Only primary cases with sub-coronal, distal- or mid-penile hypospadias with minimal chordee and suitable for Snodgrass TIP urethroplasty while exclusion criteria were boys with glanular recurrent, or proximal hypospadias, or moderate-to-severe chordae.

All patients were evaluated with full history and clinical examination, and routine preoperative blood tests, the patients were randomly arranged into two categories: Group A, include 15 boys who underwent interrupted subcuticular suture Snodgrass TIP urethroplasty; and Group B, include 15 boys who underwent continuous subcuticular suture Snodgrass TIP urethroplasty.

Operative technique

Prophylactic intravenous antibiotics was given in all patients, the operation was done under general anesthesia at the beginning of the procedure marking of the skin and the urethral orifice done then incision done over the marking line using 11fr knife, the glans is slinged by silk suture 3/0. Then complete degloving done then second layer dissected from the preputial skin. Foley's catheter inserted 6fr silicon, then suturing of the urethral plate done in two techniques interrupted (Group A) and continuous (Group B) suturing using 6/0 vicryl suture then second layer done by approximation the tissue around the urethral plate, after that the preputial flap sutured over the area of anastomosis then hemostasis done and glansoplasty and skin closure and dressing done. The catheter remained in situ for 7–10 days for urinary bladder evacuation Dressing done by sofra tulle antibiotic gauze with fucidin cream then by sterile gauze for hemostasis.

Follow-up and outcome assessment

Patients were examined before and at the time of Foley's removal, then every 2 weeks for the first initial 6 months, Then monthly for another six months. Outcomes were assessed in both categories based on the following criteria; (i) surgical procedure time, (ii) occurrence of complications including both early and late postoperative complications.

Statistical analysis

The data collected during the study were summarized in sheets of Microsoft Excel 2007. The statistical analysis performed by using IBM- SPSS 26. The normality of these data tested by Shapiro-Wilk test, and the parametric tests were decided to be chosen. Means and standard deviations

were calculated for numerical data. Proportions measured for nominal data. The Chi square test (x2) used for the nominal data with the fissure exact test was used instead of Chi square when any cell present with expected value less than 5. The t-test for two means was also calculated. The p-value ≤ 0.05 considered as significant.

RESULTS

A total of 30 boys were enrolled in this study with the means age for group A (5.2 ±3.5)years and group B (4.3±2.1) years with range of (1-10) years.

Table 1: The difference of the mean age between the interrupted and continuous suturing.

Parameter	Group (1) Interrupted(Mean± Sd)	Group (2) Continuous(Mean± Sd)	p- value*	95%ConfidenceInterval of the Difference	
				Lower	Upper
Age	5.2 ±3.5	4.3±2.1	0.391	-1.244	3.084
***t-test for independent two means**					

As shown in the table (1) there is no statistical significant p>0.5 regarding age between both groups.

Table (2): The differences between the interrupted and continuous suturing regarding types of hypospadias.

Types	Group (1) InterruptedNo. (%)	Group (2) ContinuousNo. (%)	p-value
CORONAL	2 (50.0%)	2 (50.0%)	1.0*
SUBCORONAL	9 (52.9%)	8 (47.1%)	1.0*
DSH	2 (66.7%)	1 (33.3%)	0.712**
MSH	2 (33.3%)	4(66.7%)	0.651*
***Fissure Exact test **Chi square test**			

Table (3): The difference of mean operative time between the study groups.

Parameter	Group (1) Interrupted (Mean± Sd)	Group (2) Continuous(Mean± Sd)	p- value*	95%ConfidenceInterval of the Difference	
				Lower	*Upper*
Mean duration	133.6± 10.2	135.4±10.9	0.68	-10.7	7.1
***t-test for independent two means**					

There is no difference regrading operative time between two groups

Table (4): The difference in the complication between the interrupted and continuous suturing.

		Group (1) InterruptedNo. (%)	Group (2) ContinuousNo. (%)	p-value*
No complications		8 (53.3%)	11(73.3%)	0.450
Complications	Fistula	3 (20.0%)	1 (6.7%)	1.0
	Meatal stenosis	3 (20.0%)	2 (13.3%)	1.0
	superficialwound infection	1 (6.7%)	1 (6.7%)	1.0

***Fissure Exact test**

The table 4 demonstrate there is no significant difference regarding complications between both groups.

DISCUSSION

Hypospadias is a congenital deformity of the male external genitalia that is one of the most common congenital abnormalities in males. Hypospadias is the second most common congenital abnormality after undescended testis.[15]

Several explanations have been proposed for the genesis of hypospadias, including genetic susceptibility, insufficient prenatal hormone stimulation, maternal-placental variables, and environmental influences. As a result, it is possible that hypospadias has multiple causes.[16]

Hypospadias is commonly detected after birth during a physical exam. The conventional categorization of hypospadias is determined by the location of the urethral opening: distal, midshaft, or proximal.[17] This classification system is misleading, as some variants of distal hypospadias are associated with proximal spongiosal hypoplasia and penile curvature, which may require a more involved surgical reconstruction, while some apparent severe cases of

proximal hypospadias present less of a surgical challenge when favorable anatomy is present.[18,19]

There are in excess of 100 procedures for urethral reconstruction among this strategy the tubularized incised urethral plate (TIP) which proposed by warren Snodgrass in 1994 has been the most famous method for the maintenance of hypospadias.

Mbarouk et al in his study the main age group with hypospadias was 4 years (mean age (SD) 4.74 ± 2.99 years) and The distal type was the most common type of hypospadias (125; 50%)[21], which is comparable to this study where mean age was (5.2 ±3.5 years) group A and (4.3±2.1years) group B, distal type was most common type in the study.

Nitinkumar et al compare 4 studies regarding continuous and interrupted technique for hypospadias repair, there was no difference in consumed time during operation in both technique, this is compatible to this study,[22] while Mohamad samer et al in his study find the operative time in continuous technique repair was significantly (p = 0.006) lower than for interrupted technique repair (median = 123 min, IQR = 99.5–135min) vs (median = 130 min, IQR = 101–148 min) respectively.[23]

In this study complication rate of both suturing technique was not significantly different (P-value 1.0) as that three patients (20.0%) develop urethrocutneous fistula in interrupted suturing versus one patient (6.7%) in continuous suturing technique three patients (20.0%) develop meatal stenosis in interrupted suturing versus two patients (13.3%) in continuous suturing and one patient from each group develop superficial wound infection (6.7%), Archika Gupta et al studied the outcome of 100 patients found that the type of suturing technique had no significant effect on the occurrence of complications after Snodgrass hypospadias repair and thus suturing choice depends on surgeon preference.[24] Nitinkumar et al used pooled data from four studies that include 521 children the result of study in general show there is no significant complication between both technique.[22] Saqib ismail et al demonstrate continuous suturing technique had the success rate (81%) which is more than those with interrupted suturing (71%).[25] also Ahmed M. abdelmoneim Gafar found the use of continuous uninterrupted suturing improve the results and had lower complications rate.[26]

CONCLUSIONS

Generally speaking Snodgrass operation is ideal treatment for hypospadias repair many studies suggest that continuous suturing urethroplasty technique has same operative time and complication rate in compare with interrupted suturing technique but still few studies suggest superiority of continuous suturing urethroplasty technique so further studies with larger sample number are required to conform ideal suturing technique in hypospadias repair.

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