



Original Article

SHORT TERM OUTCOME OF URETHROPLASTY FOR DISTAL HYPOSPADIAS WITH INTERRUPTED SUTURE COMPARED TO CONTINUOUS SUTURE

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Abstract

Background: Hypospadias is one of the most common congenital anomalies, occurring approximately 1 in 200 to 1 in 300 live birth. Urethrocutaneous fistula (U-C fistula), and meatal stenosis are the most common complication of hypospadias surgery. To reduce these complications there are different surgical procedures. Snodgrass technique is now the popular technique for its low complication rate and better cosmetic outcome.

Objective: To explore the short term outcome of interrupted suture compared to continuous suture in snodgrass technique urethroplasty for distal penile hypospadias.

Method: It was a randomized control trial study carried out in the department of Paediatric surgery, BSMMU during the period of June 2008 to September 2009. 32 patients with distal penile hypospadias were selected according to set inclusion and exclusion criteria. Subjects who included in the study were randomly distributed in two groups. In group A odd number of patients and in group B even number of patients were included for randomization. Group A (interrupted suture) was treated as interventional group and Group B

(continuous suture) as control group. Penile stent was removed on 8th and 10th POD after snodgrass technique of urethroplasty in coronal and subcoronal hypospadias respectively and observed for 4 weeks for two common complications- Urethrocutaneous fistula (U-C fistula), and meatal stenosis. Unpaired t test, Fisher's exact test were used to see the level of significance.

Result: In group A out of 16 subjects; 2 subjects (12.5%) develop Urethrocutaneous fistula and 1 subject (6.3%) had developed meatal stenosis. In group B out of 16 subjects 6 subjects (37.5%) had developed Urethrocutaneous fistula and 3 subjects (18.8%) developed meatal stenosis.

Conclusion: Urethrocutaneous fistula (U-C fistula), and meatal stenosis are the most common complication of hypospadias repair and the occurrence of these two complications are less in interrupted suture than that of continuous suture in Snodgrass technique urethroplasty for distal hypospadias.

Key word: U-C Fistula (Urethrocutaneous fistula).

Introduction

Hypospadias is an abnormality of anterior urethral and penile development in which the urethral opening is ectopically located on the ventrum of the penis proximal to the tip of the glans¹. Hypospadias is one of the most common congenital anomalies, occurring approximately 1 in 200 to 1 in 300 live births².

Hypospadias is classified in three major categories based on the position of meatus after orthroplasty. They are proximal, middle and distal penile hypospadias. Proximal variety is further divided into perineal, scrotal and penoscrotal. Middle variety into proximal penile, mid shaft and distal penile. Distal variety into subcoronal, coronal and glanular type³.

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There is no single universally applicable technique for hypospadias repair. For glanular and some coronal hypospadias defects- meatoplasty and meatal advancement and glanuloplasty (MAGPI) procedure is excellent³. Another procedure describes by Snodgrass in 1994, for anterior hypospadias repair. In his technique of tubularized incised plate urethroplasty makes a narrow urethral plate wide enough for easy tubularization and provide vertically oriented and a cosmetically normal neomeatus. Snodgrass technique has additional coverage of neourethra by vascularized subcutaneous tissue dissected from dorsal preputial and shaft skin⁴.

Urethrocutaneous fistula (U-C fistula), urethral stricture and meatal stenosis are the most common complication of hypospadias surgery³. The healing factors located on the ventral surface of the penis are deficient or insufficient that may be responsible for the fistula formation⁵. To overcome these complications Snodgrass incised the urethral plate to decrease the tension on urethral tube but still fistula occurs. In Snodgrass procedure urethral plate was tubularized over infant feeding tube no 7 with vicryl 6-0 continuous subcuticular suture⁴. In the study by Cobet⁶ and Jiborn et al⁷ revealed that continuous suture showed a high incidence of complication than interrupted suture. A single layer extramucosal interrupted suture gut anastomosis is better than continuous suture⁸. Continuous suture is not as accurate as the interrupted suture and it cannot be adjusted the wound edge as easily. Another disadvantage is that it cuts off more of the blood supply to the healing wound edge that may be a cause of fistula⁹. Snodgrass technique is now the popular procedure for its low complication rate. In Snodgrass procedure urethroplasty is done by continuous suture, if it is done by interrupted suture it may give better outcome interms of U-C fistula and meatal stenosis.

Method

It was a randomized control trial study carried out in the Department of Pediatric Surgery BSMMU from June 2008 to September 2009. 32 patients with distal penile hypospadias were selected according to set inclusion and exclusion criteria. Subjects who included in the study were randomly distributed in two groups. In group A odd number of patients and in group B even number of patients were included for randomization. Group A (interrupted suture) was treated as interventional group and Group B (continuous suture)

was treated as control group. Physical examination includes urethral groove, urethral plate, status of meatal opening, perimeatal skin, chordee and its severity, penile torsion, glans tilt and hooding of prepuce. Urethral plate width was measured in mm using a compass with the help of ruler. For operation study subject was in supine position on the operative table and after G/A with endotracheal intubation and after proper painting and draping a stay suture was given on glans penis by 5-0 round body polypropylene. As operative technique urethroplasty was done in all cases using Snodgrass procedure. Local tourniquet was applied over root of the penis to minimize preoperative bleeding. 2.5 power loupes were used for optical magnification during surgery. At first a 'U' shaped incision was made round the urethral plate border and hypospadiac meatus. A circumferential incision 5 to 7 mm proximal to coronal margin was extended from each longitudinal incision, followed by degloving of penile shaft skin to correct chordee. Then midline incision of the urethral plate was carried out starting 1-2 mm proximal to the hypospadiac meatus to end just behind the glans tip and depth not extending behind the subcutaneous component of the urethral plate. A suitable size stent (8 to 10 Fr) was inserted into bladder for urethroplasty that was removed after urethroplasty and finally a stent used two Fr smaller than the previous one to prevent ischemia due to post operative edema. The urethral plate strips were approximated ventrally to reconstruct neourethra by using (7-0) polyglactin sutures with 3/8 circle in spatulated needle, an interrupted manner in group A and continuous manner in group B. Sutures were taken (1-2) mm away from margins and distance between adjacent bites was 2-3 mm. Then a vascularized dartos flap was harvested from subcutaneous tissue of the surrounding dorsal penile skin to cover the entire neourethra. The triangular glans flaps were approximated and closed over the interposed vascularized dartos flap by using (6-0) polyglactin suture with 3/8 circle round body needle with interrupted sutures in two layers. Then penis was covered with skin after trimming of excess skin and sutured circumferentially around corona and in the midline with 7-0 polyglactin interrupted suture. After urethroplasty povidone iodine ointment was given over wound and dressing was done in every case by cotton pad and gauze. Patient was treated with antibiotic accordingly. Post-operative follow-up was given. Hemorrhage from operative area, glans colour &

development of edema were observed. Penile stent was removed on 8th & 10th post-operative day in coronal and subcoronal hypospadias respectively and observed for 4 weeks for two common complications – urethrocutaneous fistula and meatal stenosis. Daily calibration was started 2 weeks after operation with an appropriate size feeding tube and advised to continue upto 3 months for all the patients. Size of the feeding tube for 1-2 years was 6 Fr, 3-4 years 7 Fr, 5-8 years 8 Fr and above 8 years 10 Fr. After stent removal developments of urethrocutaneous fistula and meatal stenosis was recorded.

If the patient can micturate without straining with good urinary stream and easy calibration with age related feeding tube was possible then the patient has no meatal stenosis. If the patient micturates with straining and spraying of urinary stream and calibration not possible with age related feeding tube then the patient recorded has meatal stenosis.

Results

A total 32 patients of distal hypospadias were selected for the study. On the basis of suturing technique during urethroplasty the study subjects were divided into two groups, in Group A 16 patients were included where urethroplasty was done with interrupted suture and in group B 16 patients were included where urethroplasty was done by continuous suture. Complications like urethrocutaneous fistula and meatal stenosis were observed.

Table I shows the age distribution of the study subjects. The mean + SD age of group A was 5.36 + 3.46 and group B was 6.14 + 3.57. Unpaired 't' test shows no significant difference between mean ages of two groups.

Table-I
Age of the study subjects

Age (years)	Group A (n=16)	Group B (n=16)	P value
Mean±SD	5.36±3.46	6.14±3.57	0.537 ^{ns}
Range	1.08 12.00	1.50 12.00	

P value reached by unpaired 't' test

The distribution of U-C fistula after urethroplasty shown in table- II. In group A out of 16 subjects, 2 subjects had developed U-C fistula whereas in group B out of

16 subjects, 6 subjects had developed U-C fistula. Fisher's exact test shows no significant difference between the occurrences of U-C fistula in two groups.

Table-II
Occurrence of urethrocutaneous fistula after urethroplasty between two groups:

Complications	Group A (n=16) No. (%)	Group B (n=16) No. (%)	P value
Urethrocutaneous fistula			
Yes	2 (12.5)	6 (37.5)	0.220 ^{ns}
No	14 (87.5)	10 (62.5)	

P value reached by Fisher's exact test.

Table III shows the distribution of meatal stenosis after urethroplasty. In group A out of 16 subjects, 1 subject had developed meatal stenosis whereas in group B out of 16 subjects, 3 subjects had developed meatal stenosis (Appendix IV, Fig 5). Fisher's exact test shows no significant difference between the distributions of meatal stenosis in two groups.

Table-III
Occurrence of meatal stenosis after urethroplasty between two groups:

Complications	Group A (n=16) No. (%)	Group B (n=16) No. (%)	P value
Meatal stenosis			
Yes	1 (6.3)	3 (18.8)	0.600 ^{ns}
No	15 (93.8)	13 (81.3)	

Fisher's exact test was done as the test of significance.

Discussion

Hypospadias is one of the most common congenital anomalies. Despite obvious surgical advances in hypospadias repair, no single technique has been without complication¹⁰. The two most common complications of hypospadias surgery are fistula formation and meatal stenosis.

In this study, age of the subjects was 1.08 years to 12 years. The mean (+ SD) age of group A was 5.36 + 3.46 and group B was 6.14 + 3.57 (table 1). There is

no significant difference between mean ages of two groups. In 1975, an ad hoc committee of the American Academy of pediatrics, composed of urologist and pediatricians, concluded that the optimal time for surgery, from a psychological perspective, was during the fourth or fifth year of life¹⁰. From this data, it is evident that the mean age of urethroplasty in our country is higher.

After preoperative evaluation, urethroplasty was done in all 32 subjects by Snodgrass procedure. In 16 subjects of group A, urethral tube was made with interrupted suture and 16 subjects of group B, urethral tube was made with continuous suture. Feeding tube of 6 fr to 10fr are used as an urethral stent according to age for all the subjects and stent removed on 8th POD for coronal hypospadias and 10th POD for subcoronal hypospadias. Stent should be used for 5 to 14 days, depending on the complexity of the repair¹¹.

Postoperative hemorrhage, glans ischemia and edema formation were follow-up in early post-operative period. Urethro-cutaneous fistula formation and meatal stenosis were observed after removal of stent.

In this study, 2 subjects (12.5%) in group A and 6 subjects (37.5%) in group B developed urethrocutaneous fistula. In both group A & B urethrocutaneous fistulas were evident after stent removal. There is no established data on the occurrence of urethrocutaneous fistula after urethroplasty of distal hypospadias in our country. In this study it is also evident that U-C fistula in the continuous suture group is higher (37.5%) than that of interrupted suture group (12.5%). Singh et al. (2005) found 13.4% urethrocutaneous fistula in a study of distal hypospadias repair by Snodgrass method that is consistent with this study (12.5%) in urethroplasty with interrupted suture¹². Though the urethrocutaneous fistula formation is higher in continuous suture than interrupted suture (37.5% vs 12.5%) but the difference is statistically not significant.

In this study, meatal stenosis developed after urethroplasty in 1 subject (6.3%) in group A and 3 subjects (18.8%) in group B. Though the occurrence of meatal stenosis is higher in continuous suture than interrupted suture group (18.8% vs 6.3%) but the difference is statistically not significant. Age related feeding tube was introduced to confirm the apparent stenosis. Calibration was started after 2 weeks of operation. The meatus of a boy under 1 year of age

should accept a 5 fr feeding tube, between 1 and 8 years this increases upto 8 fr and above 8 years 10Fr¹³.

Sarhan et al. in a study concluded that use of running sutures were significantly associated with a higher reoperation rate compared to interrupted suture following distal and midpenile hypospadias repair¹⁴.

Cocke et al. argued that continuous suture is not as accurate the interrupted suture and it cannot be adjusted the wound edge as easily and continuous suture cuts off more blood supply to the healing wound edge that may be the cause of fistula¹⁴.

This study demonstrate that urethral tube making with interrupted suture in Snodgrass procedure gives better outcome than continuous suture as interrupted suture results 12.5% fistula and 6.3% meatal stenosis in contrast to 37.5% fistula and 18.8% meatal stenosis in continuous suture group. The observations of this study correlates with Sarhan's and Cocke's statement.

Conclusion

Urethro-cutaneous fistula and meatal stenosis are the most common complications of hypospadias repair and the occurrence of these two complications are less in interrupted suture in Snodgrass technique urethroplasty for distal hypospadias.

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