

Incidence of febrile urinary tract infections after hypospadias repair surgery, A prospective case series study

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ABSTRACT

Background and objectives: The aim of Hypospadias repair surgery is normal micturition without spraying, a straight erection and aesthetic satisfaction. The rate of febrile urinary tract infections in boys who underwent reconstruction surgery for hypospadias was explored in this clinical trial.

Methods: In this clinical trial; 40 male patients who were diagnosed with hypospadias were underwent primary surgery for urethral reconstruction.

The patients were followed-up for possible development of febrile urinary tract infection for two weeks following reconstruction surgery from June 2019 to December 2019.

Results: The mean age of the patients was 5.5 (SD: 3.56) ranged from 1-12 years. The types of hypospadias were sub-coronal (26, 65 %), coronal (11, 27.5%), mid-shaft (1, 2.5%), and proximal penile shaft (2, 5%). The study revealed that 4 and 5 patients had once and twice previous hypospadias surgeries.

Antibiotics were used intraoperatively, and postoperatively (95.0% and 100%), respectively. The most frequently used catheters were Foley f 6 (57.5%) and Foley f12 (17.5%) for 7 to 10 days, lubricants used for all patients. The study revealed that two patients developed fever, dysuria and urgency to urinate equally (5%), two patients developed frequency (5%). Urine culture sensitivity and complete blood count tests were performed for two patients with abnormal general urine examination. The E. coli growth was observed in the culture of both patients and elevated white blood count in one patient.

Conclusions: This study showed that reconstruction surgery for hypospadias has a low rate of febrile UTI following two weeks post operatively.

Keywords: Complications; Hypospadias; Reconstruction.

INTRODUCTION

Hypospadias is defined as malformation in external urethral opening or meatus. In this medical condition, the meatus is located on the ventral side of the penis in boys or on the anterior wall of the vagina in girls. Hypospadias in girls is a rare medical condition; therefore, it has minor medical importance¹.

Hypospadias is considered to be a congenital malformation. The correction is needed in most patients². The aim of the correction of this condition is normal micturition without spraying, a straight erection, and aesthetic satisfaction^{3,4}. The incidence rate of hypospadias in Europe is between 1 and 3 cases per 1000 live-born boys⁵.

Hypospadias surgery has many complications. The complications are postoperative infections to complex fistulas, sexual problems and recurrent urinary tract infections⁶⁻⁷. The long-term complication could reach up to 54.0%⁶. Several investigations have attempted to identify the prognostic factors for the development of short and long-term complications. Some factors have been shown to contribute to the complications in hypospadias surgery is the severity of the disease, experience of the surgeon, patients age, surgery type⁶⁻⁹.

There are many different operative surgeries with higher incidence of complications for hypospadias. It is suggested that operative interventions must be only used for patients with preoperative symptoms like stenosis, curvature, or both¹⁰. A study has reported that long-term complications after hypospadias are not associated with preoperative symptoms of the boys¹¹. One of these approaches to solve the issues of frequent complications

with hypospadias surgery is using antibiotics prophylaxis and postoperative treatment¹². Some studies have reported the significant difference in complications after hypospadias by using antibiotics after hypospadias repair¹²⁻¹⁴.

The rate of febrile urinary tract infections in boys who underwent reconstruction surgery for hypospadias was explored in this clinical trial.

PATIENTS AND METHODS

In this clinical trial, the male patients who visited a tertiary surgery center in Erbil city from June 2019 to December 2019 and were diagnosed with hypospadias were included. Patients who visited the center were screened consecutively by a clinician for the eligibility criteria. Forty patients who met eligibility criteria were boys and underwent primary surgery for urethral reconstruction, inclusion criteria were children from one month to 12 years, those with initial presentation and recurrent cases, those with other relevant urological conditions were excluded for example those having VUR, neurological bladder, associated undescended testis.

All primary urethral reconstructions during this period were included. All the operations were performed by well-trained surgeons; patients were followed up for post-operative complications for two weeks.

The patients were assessed post-operatively for features of urinary tract infections both clinically and by laboratory, on that basis urinalysis was conducted, urine culture and sensitivity performed for those with evidence of urinary tract infection (UTI) on urinalysis. Other collected information in the follow-up step was sensitivity, the information of pre, peri, and post-operative antibiotics (95%

had peri operative injectable antibiotics and 100% had post-operative injectable and oral antibiotics).

The tabularized incised plate repair (TIP) was performed for all patients. The TIP repair was performed using a U-shaped skin incision along with the edges of the urethral plate, and the penis was degloved. The urethral plate was widened by a midline incision along with its length and then tabularized over a stent. A pedicle of subcutaneous tissue was dissected from the ventral or dorsal penile skin to cover the neourethra. Finally, the glanular wings, mucosal collar, and ventral penile skin are closed in the midline. All patients had foley catheter and post-operative antibiotics.

The descriptive characteristics of the patients were presented in mean (Std. Deviation) or number (percentage). The incidence rate of UTI was determined in number and percentage. The incidence rate of fever, dysuria and urgency to urinate was determined in number and percentage. The statistical analyses were performed by statistical package for social sciences version 25 (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp).

The ethical approval of the present study was taken from the ethic committee of Kurdistan Board of Medical Specialties. The confidentiality of the personal information of the patients was protected throughout the study steps.

RESULTS

The mean age of the patients who underwent reconstruction surgery was 5.50 (SD: 3.56) ranged from 1-12 years. The types of hypospadias were Sub-coronal (26, 65%), coronal (11, 27.5%), midshaft (1, 2.5%), and proximal penile shaft (2, 5 %). The study revealed that 31 of 40 patients had not previous hypospadias surgery. However, 4 and 5 patients had once and twice previous

Table (1): General characteristics of patients

Characteristics (n=40)	Statistics	
	Mean	Std. Deviation
Age (range: 1-12 years)	5.50	3.56
	No.	%
Type of hypospadias		
Sub-coronal	26	65.0
Coronal	11	27.5
Mid shaft	1	2.5
proximal penile	2	5.0
Previous hypospadias surgery		
None	31	77.5
Once	4	10.0
Twice	5	12.5
Comorbidity		
No		
Preoperative antibiotic		
Yes	38	95.0
No	2	5.0
Postoperative antibiotic		
Yes	40	100
Type of antibiotics		
amoxiclav syrup	29	72.5
ceftriaxone iv	9	22.5
amoxiclav IV	2	5.0
Duration of antibiotics (Range: 3-7 days)	6.30	1.54

hypospadias surgeries respectively. Most of the patients used preoperative antibiotics (95.0%), while all patients used antibiotics postoperatively (100%). The types of the antibiotics used by patients were amoxiclav syrup (72.5%), ceftriaxone iv (22.5%), and amoxiclav IV (5.0%). The mean duration of antibiotics was 6.30 ranged from 3 to 7 days, Table 1.

Table (2): Characteristics of catheters used for reconstruction surgery

Patients' outcomes (n=40)	Statistics	
	No.	%
Type of catheter		
Foley 12 fr	1	2.5
Foley 6 fr	2	5.0
Foley 8 fr	1	2.5
Foley fr 10	1	2.5
Foley fr 12	7	17.5
Foley fr 14	2	5.0
Foley fr 6	23	57.5
Foley fr 8	3	7.5
Suprapubic catheter/no	40	100
Lubricants/yes	40	100

The most frequently used catheters were Foley f 6 (57.5%) and Foley f 12 (17.5%). The mean duration of catheters was 7.45, from 7 to 10 days. No patient used a suprapubic catheter, lubricants used for all of the patients, Table 2.

Table (3): Outcomes of reconstruction surgery of hypospadias

Patients' outcomes (n=40)	Statistics	
	No.	%
Fever		
Yes	2	5.0
No	38	95.0
Dysuria		
Yes	2	5.0
No	38	95.0
Urgency of urination		
Yes	2	5.0
No	38	95.0
Abdominal pain.no	40	100
Frequency if urination more than normal		
Yes	2	5.0
No	38	95.0
Urine color/normal	40	100
Urine odor/Normal	40	100
GUE		
Normal	38	95.0
Abnormal	2	5.0
Culture and Sensitivity test		
Not done	38	95.0
Abnormal	2	5.0
CBC		
Not done	38	95.0
Abnormal	1	2.5
Normal	1	2.5

The patients were followed-up for two weeks post operatively. The study revealed that two patients developed fever, dysuria, and urgency to urinate equally (5%). Two patients developed urinary frequency (5.0%). The GUE test was abnormal for two patients. Accordingly, culture

sensitivity and CBC tests were performed for those two patients.

The results of the culture sensitivity tests were abnormal in both [E. coli growth was observed]. CBC test, one of the patients (1, 2.5%) had a high WBC, Table 3.

DISCUSSION

The present study showed that reconstruction surgery for hypospadias has a low rate of complications, including fever, dysuria, urgency to urinate and UTIs.

A study included 125 patients with hypospadias and treated at Al-Khansa'a Paediatrics Surgery center in Mosul between 2005 and 2007. The patients aged six months to 12 years, and the majority had a distal type. However, different techniques were used to repair the meatus based on the type of hypospadias. The catheters were used for various period based on the procedure used for the patients. The techniques used for the patients were MAGPI (33.6%), TIP technique (60%), Mathiew technique (3.2%), and Onlay tube flap (4%)²⁰.

The related medical issues to hypospadias repair were circumcision in ten patients and Chordee in eight patients, Torsion of the shaft of the penis in 5 patients. The complications were categorized as minor and major types. The minor complications were infection in 25 (20.0%) and hemorrhage in 16 patients (12.5%). The major complications were stricture in 18 (14.4%), fistula in 16 (12.5%), and necrosis and sloughing in 3 patients (2.4%). In our study we excluded patients who developed complications other than urinary tract infections. The rate of infection was so high in Sulaimani's study compared to our study. However, they conducted a study in a retrospective way, therefore it is not clear when the outcomes were documented, in addition the surgeries were performed by different with different techniques since there is no single procedure for all types of hypospadias.

Zain²¹ included 50 male children aged 1-10 years with distal and midshaft penile hypospadias in a prospective study in Baghdad. The TIP urethroplasty technique was used as described by Snodgrass in mid and distal penile hypospadias and followed-up the patients for one week. The reported complications were meatal stenosis (12%) and urethrocuteaneous fistula (6%), inguinal hernia (8%), and undescended testis (10%). They did not report the UTIs in the patients following one week. The difference between this and our study could be due to different follow-up periods. Similar results were reported by other studies^{13,16,19,22-23}.

Akbiyik et al²⁴ included 496 patients using the TIP urethroplasty for hypospadias in Turkey. The patients aged six months to 14 years and were followed-up for two years. The patients were hospitalized for ten days postoperatively with a urethral stent in place. They reported that 48 of 496 patients experienced 53 complications. The frequent complications were meatal stenosis (5%), urethrocuteaneous fistula (5%), dehiscence (two patients only), some other complications were reported, however no UTI was reported.

The major concern of hypospadias to the pediatric surgeons/urologists is a high variation in its forms. The surgeons use frequent antibiotic prophylaxis and postoperative treatment in order to reduce the UTI and

wound infections associated with the surgery or the malformation¹².

A study has reported 7.5% of UTI in hypospadias patients underwent TIP urethroplasty. The problem of UTI incidence in boys is so a complicated debate. The study reported that the incidence of recurrent UTIs in hypospadias patients was higher over time (1.9%) compared to boys without this malformation (0.1-0.2%) with a median of 6.5-year follow-up. The incidence of UTI could be different based on the follow-up time period and the overall procedures performed on patients. The previous investigations have different opinions about whether prophylactic antibiotics must be given in conjunction with urethral reconstruction in hypospadias patients or not¹⁴, some of these studies encourage²⁵⁻²⁶, and others did not recommend^{12, 27}.

The urine cultures could be performed regularly on all patients, regardless of whether the patients have symptoms of an infection or not. Some studies reported that there is a significantly higher incidence of UTI in patients who did not use prophylactic antibiotics²⁵⁻²⁶.

CONCLUSIONS

Many factors may play role in development of post-operative UTI, as type of hypospadias, type and technique of the surgery, duration of stents, dressings and antibiotics.

The present study showed that reconstruction surgery for hypospadias has a low rate of febrile urinary traction infections following two weeks.

We recommend the study to be expanded over larger number of samples with different procedures.

Limitations of the study: The number of cases who developed complications was not considered to make a comparison among different hypospadias types or other clinical information

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