

THE RELATION OF HYPOSPADIAS TYPES, AGES, AND SURGICAL TECHNIQUES FOR URETHROCUTANEOUS FISTULA COMPLICATION IN CHILD HYPOSPADIAS CASES

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ABSTRACT

Objective: To find correlation between hypospadias type, age, and surgical technique for urethrocuteaneous fistula in child hypospadias cases. **Material & Method:** This research was an observational analytic research with cross sectional approach. It was conducted at Bina Sehat Jember Hospital, Paru Jember Hospital, and Bhayangkara Bondowoso Hospital. The research samples were hypospadias patients who had done hypospadias repair with susceptible age from 0 month until 16 years. **Result:** In this study, was found correlation between type of hypospadias with urethrocuteaneous fistula ($p=0.03$ and $r=0.43$). And the other hand, this research did not find relationship between age at hypospadias surgery with urethrocuteaneous fistula complication ($p=0.34$ and $r=0.3$). The results of this study indicate that the incidence of urethrocuteaneous fistula complications in the surgery using TIP technique was greater than Onlay Island Flap technique, but in this study, there was no association between hypospadias surgery technique used with complications of urethrocuteaneous fistula ($p=0.3$ and $r=0.22$). **Conclusion:** In this study, there was a significant relationship between hypospadias type with urethrocuteaneous fistula complication with statistically moderate strength and positive correlation direction. This study did not show any significant relationship between age and hypospadias surgery technique with complications of urethrocuteaneous fistula.

Keywords: Hypospadias, complication, urethrocuteaneous fistula.

ABSTRAK

Tujuan: Mencari hubungan antara tipe hipospadia, usia, dan teknik operasi terhadap komplikasi fistula uretrokutaneus pada kasus hipospadia anak. **Bahan & Cara:** penelitian ini adalah penelitian analitik observasional dengan pendekatan cross sectional. Penelitian ini dilaksanakan di Rumah Sakit Bina Sehat Jember, Rumah Sakit Paru Jember, dan Rumah Sakit Bhayangkara Bondowoso. Sampel pada penelitian ini adalah pasien hipospadia yang telah melakukan operasi hipospadia antara usia 0 bulan hingga 16 tahun. **Hasil:** Dalam penelitian ini ditemukan hubungan antara tipe hipospadia dengan fistula uretrokutaneus ($p=0.03$ dan $r=0.43$). Disisi lain, dalam penelitian ini tidak ditemukan hubungan antara usia saat operasi hipospadia dengan kejadian fistula uretrokutaneus ($p=0.34$ dan $r=0.3$). Hasil dalam penelitian ini menunjukkan insidensi fistula uretrokutaneus dengan menggunakan teknik TIP pada operasi hipospadia lebih tinggi dibandingkan teknik Onlay Island Flap. Namun dalam penelitian ini tidak ditemukan adanya hubungan antara teknik operasi dengan fistula uretrokutaneus ($p=0.3$ dan $r=0.22$). **Simpulan:** dalam penelitian ini, ditemukan hubungan yang signifikan antara tipe hipospadia dengan fistula uretrokutaneus dengan kekuatan hubungan sedang secara statistik dan arah korelasi positif. Namun, pada penelitian ini tidak ditemukan hubungan antara usia saat operasi dan teknik operasi dengan fistula uretrokutaneus.

Kata Kunci: Hipospadia, komplikasi, fistula uretrokutaneus.

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INTRODUCTION

Hypospadias is one of congenital abnormalities in male which the externa urethral meatus is located at the ventral part of the penis. Incidence of this abnormality is about 1 : 250 until 1 : 300 in babies birth.¹

The most complication after hypospadias repair is urethrocuteaneous fistula. Urethrocuteaneous fistula is the canal connecting the urethral meatus and the skin of penis. Incidence of urethrocuteaneous fistula is about 2-30%. Urethrocuteaneous fistula may occur due to several factor, such as hypospadias type, age, and surgical technique. Proximal type of

hypospadias may increase the risk of urethrocuteaneous fistula. Early operating age will provide better results with a low incidence of complications. There are up to 300 hypospadias surgical techniques, and no standard operating technique has been established.²⁻⁸

OBJECTIVE

To find correlation between hypospadias type, age, and surgical technique for urethrocuteaneous fistula in child hypospadias cases.

MATERIAL & METHOD

This research was an observational analytic research with cross sectional approach. This research was conducted at Bina Sehat Jember Hospital, Paru Jember Hospital, and Bhayangkara Bondowoso Hospital. The inclusion criteria of sample in this research were hypospadias patients who had done hypospadias repair from October 2015-2017 with susceptible age from 0 month until 16 years. Hypospadias repair in this research was done by single surgeon. Whereas, the exclusion criteria were hypospadias patients who had previously done circumcision, secondary cases, and urethrocuteaneous fistula caused by other diseases or other abnormalities.

Type of hypospadias in this study was divided into three, that were glanular, distal, and proximal. Meanwhile, the age of hypospadias surgery was categorized into three, that were 0-5 years, 6-10 years, and 11-16 years. Patient data obtained through medical record data.

The data of this research were analyzed by correlation test of contingency coefficient using

SPSS 23.0. Relationship between variables was assessed significant if the value of significance (p value) > 0.05.

RESULTS

The samples in this study were 21 hypospadias who had done hypospadias repair. The results of this study indicate that the most hypospadias type was proximal type. Hypospadias repair in this study was mostly done in the age group of 6-10 years which was 8 cases (38.1%), while the age group 11-16 years 7 cases (33.3%) and 0-5 years as many as 6 cases (28.6%). The mean age of hypospadias surgery in this study was 8.3 ± 5.2 years (susceptible age between 1-15 years). The surgical techniques used in this study were Tubularized Incised Plate (TIP) in 19 cases (90.5%) and Onlay Island Flap in 2 cases (9.5%). In this study, the incidence of urethrocuteaneous fistula complications was 33.3%. The average susceptibility of fistulas was 96 ± 36.8 days (susceptible 14 days to 5 months) (Table 1).

In this study, the incidence of urethrocuteaneous fistula complication was based on hypospadias type, i.e. proximal type was higher in case of 8 cases (54.5%) than distal only 1 case (10.0%). In the age at surgery, the 6-10-year age group was more likely to have a urethrocuteaneous fistula complication of 4 cases (50.0%). Meanwhile, the age group 0-5 years there were 2 cases (33.3%) and the age group 11-16 years 1 case (14.3%). In this study, the surgical techniques used were TIP and Onlay Island Flap. In the case of hypospadias that were operated using TIP technique there were 7 cases from 19 cases running into urethrocuteaneous fistula complication after hypospadias repair. In the

Table 1. Charateristic of hypospadias patients.

Classification	Notes	n	%
Mean of Age	8.3 ± 5.2 years		
Categories of Age	0-5 years	6	28.6
	6-10 years	8	38.1
	11-16 years	7	33.3
Hypospadias Type	Distal	10	47.6
	Proximal	11	52.4
Surgical Technique	Tubularized Incised Plate (TIP)	19	90.5
	Onlay Island Flap	2	9.5
Duration of fistula formation	96.3 ± 536.8 days		
Fistula formation		7	33.3

Table 2. Cross tabulation between various variables with urethrocuteaneous fistula complication

Classification	Notes	Fistula		r value	p value
		No (%)	Yes (%)		
Age at surgery	0-5 years	4 (66.7)	2 (33.3)	0.3	0.34
	6-10 years	4 (50.0)	4 (50.0)		
	11-16 years	6 (85.7)	1 (14.3)		
Hypospadias Type	Distal	9 (90.0)	1 (10.0)	0.43	0.03
	Proximal	5 (45.5)	6 (54.5)		
Surgical Technique	TIP	12 (63.2)	7 (36.8)	0.22	0.3
	Onlay Island Flap	2 (100)	0 (0)		

TIP (Tubularized Incised Plate)

use of island flap onlay technique in this study there were no cases of postoperative urethrocuteaneous fistula hypospadias (Table 2).

DISCUSSION

The results of this study indicate that the proximal type is the most common type of hypospadias were 11 cases compared to the distal type of 10 cases listed in table 1. Other studies suggest that the most common type of hypospadias is the proximal type.⁶ Hypospadias surgery in this study was mostly done in the age group of 6-10 years are 8 cases (38.1%), while the age group 11-16 years 7 cases (33.3%) and 0-5 years as many as 6 cases (28.6%). The mean age of hypospadias surgery in this study was 8.3 ± 5.2 years (susceptible age between 1-15 years). The surgical techniques used in this study were Tubularized Incised Plate (TIP) in 19 cases (90.5%) and Onlay Island Flap in 2 cases (9.5%). TIP technique is a Snodgrass modification technique that is more widely used in hypospadias repair than other techniques.^{7,9,10}

In this study, the incidence of urethrocuteaneous fistula complications was 33.3%. The literature shows that the incidence rate of urethrocuteaneous fistula complications reaches 2-30%.⁵ The incidence rate of urethrocuteaneous fistula complications is higher than in literature. Another study showed a higher incidence of urethrocuteaneous fistula complications than this study, which was 34.9%.¹¹ The average susceptibility of fistulas was 96 ± 36.8 days. This is in contrast to studies suggesting that urethrocuteaneous fistula is a late complication.² Late complications are complications that occur more than six months postoperatively or after the first six months of follow-up.¹²

In this study, the most common type of hypospadias experiencing fistula complications is the proximal type (85.7%). This is in line with previous studies suggesting that the most common type of hypospadias experiencing fistula is the proximal type.^{13,14} Many factors that can affect the incidence of complications of urethrocuteaneous fistula, the degree of severity of hypospadias that the more severe the more at risk of having urethrocuteaneous fistula.¹³ The degree of severity of hypospadias are divided into two, which is mild (glanular and distal types) and weight (proximal type).¹⁵ Based on the above explanation can be concluded that the high rates of complications of urethrocuteaneous fistula in proximal type can be caused by the severity of hypospadias classified as heavy. In the proximal type, the risk of developing urethrocuteaneous fistula may also be due to high pressure in the proximal region resulting in leakage of urine at the edge of the suture.⁶ The high pressure can be caused by the length of the neomeatus with the native urethral meatus. The longer distance between the neomeatus and the native urethral meatus so that the higher pressure happened in neouretra.¹⁶ In this study, the type of hypospadias affects the occurrence of urethrocuteaneous fistula complications with p value 0.03 and the strength of statistical relationship is moderate with $r = 0.43$ and the direction of correlation is positive. The direction of positive correlation has a meaning of the severity of the hypospadias or the more proximal the external urethra meatus the greater the risk of developing urethrocuteaneous fistula complications.

The results of this study in accordance with previous research that the type of hypospadias affect the complications of urethrocuteaneous fistula.^{7,14} The recommended age of the European Association of Urology for the hypospadias repair is 6-18 months.²

In this study, the age of hypospadias surgery begins at 1-15 years. Previous studies have suggested a significant association with age of operation with fistula complications.² Other studies suggest that age is an important factor in the incidence of complications of urethrocuteaneous fistula.¹⁷ In this study showed the opposite data, there is no relationship between age when hypospadias surgery with urethrocuteaneous fistula complication with p value=0.34 and r value=0.3 indicating correlation strength is statistically weak. The results of this study are supported by other studies that explain that age of operation has no significant relationship with fistula complications.^{7,6,18}

In this study, a widely used technique is the TIP technique. The results of this study indicate that the incidence of urethrocuteaneous fistula complications in the surgery using TIP technique is greater than Onlay island flap technique. This is in accordance with previous studies showing that the level of postoperative hypospadias postoperative urethrocuteaneous fistula complications using TIP technique is higher than Onlay island flap.^{7,6} The high incidence of postoperative urethrocuteaneous fistula complications of postoperative fetula using TIP technique may be due to high pressure in the neouretra. The high pressure relates to the diameter of the neouretra. The diameter of the neouretra is inversely proportional to the high pressure, the smaller the diameter of the neouretra will generate the higher pressure in the neouretra.¹⁶

In TIP technique, neouretra is formed by tubularization technique using catheter, the diameter of neouretra formed will affect the pressure inside neouretra. In the use of TIP techniques are more susceptible running into urethrocuteaneous fistula because the diameter of neouretra small and unelastic. In the case of hypospadias using island flap onlay techniques, it is less likely to have a fistula. This can be due to the neouretra with onlay island flap technique formed from the skin, so that neouretra is more elastic and the diameter of neouretra can be enlarged compared to the tubularisation technique.¹⁶

In this study, there was no association between hypospadias surgery technique used with complications of urethrocuteaneous fistula with $p=0.3$. The results were also supported by another study which states that there is no significant relationship between surgical techniques with urethrocuteaneous fistula complications.^{6,19} In the correlation test of contingency coefficient between hypospadias

surgery technique and urethrocuteaneous fistula complication yielded $r=0.22$ which showed statistically weak correlation strength.

CONCLUSION

Many factors affect the occurrence of urethrocuteaneous fistula complications. In this study, there was a significant relationship between hypospadias type with urethrocuteaneous fistula complication with statistically moderate strength and positive correlation direction. The direction of positive correlation means the more severe the degree of severity of hypospadias or the proximal to the external urethral meatus, the higher the risk of developing urethrocuteaneous fistula complications. This study did not show any significant relationship between age and hypospadias surgery technique with complications of urethrocuteaneous fistula.

REFERENCES

1. Krisna DM, Akhada M. Hipospadia: Bagaimana karakteristiknya di Indonesia. Berkala Ilmiah Kedokteran Duta Wacana; 2017.
2. Yildiz T, Tahtali IN, Ates DC, Keles I, Ilce Z. Age of patient is a risk factor for urethrocuteaneous fistula in hypospadias surgery. *Journal of Pediatric Urology*. 2013; 9: 900-3.
3. Spinoit AF, Poelaert F, Groen LA, Laecke EV, Hoebeke P. Hypopadias repair at a tertiary care center: Long term followup is mandatory to determine the real complication rate. USA: *The Journal of Urology*. 2013; 189: 2276-81.
4. Yassin T, Bahaaeldin KH, Husein A, and Minawi HE. Assessment and management of urethrocuteaneous fistula developing after hypospadias repair. *Annals of Pediatric Surgery*. 2011; 7: 88-93.
5. Niedworok C, Rübber I. Hypospadias. In: Axel S Merseburger, Markus AK, Judd WM, editor. *Urology at Glance*. New York: Springer; 2014.
6. Fariz MA, Rodjani A, Wahyudi I. Risk factors for urethrocuteaneous fistulas formation after one stage hypospadias repair. *Indonesian Journal of Urology*. 2011; 18(2): 48-54.
7. Chung JW, Choi SH, Kim BS, SK Chung. Risk factors for the development of urethrocuteaneous fistula after hypospadias repair: A retrospective study. *Korean J Urol*. 2012; 53(10): 711-15.
8. Stein R. Hypospadias. *European Association of Urology*. 2012; 11: 33-45.
9. Zaidi RH, Casanova NF, Haydar B, Veopel-Lewis T, Wan JH. Urethrocuteaneous fistula following hypospadias repair: Regional anesthesia and other factor. John Wiley & Sons Ltd *Pediatric Anesthesia*.

- 2015;25:1144-50.
10. Yeap BH, FRCS, Mohan N, FRCS. Hypospadias from perspective of a single-surgeon practice in Malaysia. *Med J Malaysia*; 2008: 63.
11. Alsaywid BS, Mohammedkhalil AK, Mesawa A, Alzahrani SY, Askar AH, Abuznadah WT, et al. Role of tubularization of urethral plate in development of urethrocutaneous fistula post hypospadias repair. *Urology Annals*. 2017;9: 141-4.
12. Prat D, Natasha A, Polak A, Koulikov D, Prat O, Zilberman M, et al. Surgical outcome of different type of primary hypospadias repair during three decades in a single center. Elsevier; 2012.
13. Huang LQ, Zheng G, Jun T, Geng M, Ru-Gang L, Yong-Ji D, et al. Retrospective analysis of individual risk factor for urethrocutaneous fistula after Onlay hypospadias repair in pediatric patients. *Italian Journal of Pediatrics*. 2015; 41: 35.
14. Bush NC, M Holzer, S Zhang, W Snodgrass. Age does not impact risk for urethroplasty complication after tubularized incised plate repair of hypospadias in prepubertal boys. Elsevier. 2013;9: 252-8.
15. Mufida KA Juniarto Z, Faradz SMH, Santosa A. Analisis prevalensi dan faktor risiko pasien dengan isolated hypospadias di laboratorium cebior. *Media Medika Muda*; 2015: 4(4).
16. Braga LHP, Salle JLP, Lorenzo AJ, Skeldon S, Dave S, Farhat WA, et al. Comparative analysis of tubularized incised plate versus Onlay island flap urethroplasty for penoscrotal hypospadias. *The Journal of Urology*. 2007; 178: 1451-7.
17. Ziada A, Hamza A, Rassoul MA, Habib E, Mohamed A, Daw M. Outcomes of hypospadias repair in older children: A prospective study. *The Journal of Urology*. 2011; 185: 2483-6.
18. Sarhan OM, El-Hefnawy AS, Hafez AT, Elsherbiny MT, Dawaba ME, Ghali AM. Factors affecting outcome of tubularized incised plate (TIP) urethroplasty: Single center experience with 500 cases. Elsevier. 2009; 5: 378-82.
19. Metzler IS, Nguyen HT, Hagander L, Jalloh M, Nguyen T, Gueye SM, et al. Surgical outcomes and cultural perceptions in international hypospadias care. *The Journal of Urology*. 2014; 192: 1-4.