RELATION BETWEEN COMPLICATING FACTORS OF HYPOSPADIA AND COMPLICATIONS AFTER TIP: A RETROSPECTIVE STUDY

¹Johannes Aritonang, ¹Arry Rodjani, ¹Irfan Wahyudi.

Department of Urology, Faculty of Medicine/Universitas Indonesia, Cipto Mangunkusumo General Hospital, Jakarta.

ABSTRACT

Objective: This study aims to find an association between hypospadias complicating factor for complications that occurred after hypospadias reconstruction, focusing on tubularized incised plate (TIP) as reconstruction techniques are most commonly used. **Material & methods:** The study data was obtained from medical records of urologic hypospadias patients in Cipto Mangunkusumo General Hospital, Jakarta. Samples are those who underwent hypospadias reconstruction in Cipto Mangunkusumo General Hospital, since April 2002 until May 2014 with a total sampling method. Data were analyzed using SPSS ver 14. **Results:** We collected 127 patients who underwent the TIP technique with a mean patient age and treatment duration was 7.58 years and 10.95 days. Fistule is the most common complication in patients with post-TIP hypospadias accounting for as high as 32 (25.2%). Bivariate analysis showed a significant correlation between the location of the hypospadias meatus (distal) with torsion of the penis (n = 2; p 0.019). **Conclusion:** On the basis of the technical complications TIP, such as fistules, meatus stenosis, urethral stricture, torsion of the penis, and glans dehiscence, then the indication for TIP should be clear or selective.

Keywords: Hypospadias, complications, tubularized incised plate.

ABSTRAK

Tujuan: Penelitian ini bertujuan untuk menemukan hubungan antara faktor penyulit hipospadia terhadap komplikasi yang terjadi pasca rekonstruksi hipospadia, dengan berfokus pada tubularized incised plate (TIP) sebagai teknik rekonstruksi yang paling sering digunakan. **Bahan & cara:** Data penelitian retrospektif deskriptif-analitik ini diperoleh dari rekam medis dan status khusus urologi pasien hipospadia di RSUPN Cipto Mangunkusumo (RSCM), Jakarta. Sampel adalah seluruh pasien hipospadia yang menjalani tindakan rekonstruksi uretroplasti di RSCM sejak April 2002 hingga Mei 2014 dengan metode total sampling. Analisa data menggunakan program SPSS. **Hasil:** Total didapatkan sebanyak 127 pasien yang dilakukan teknik TIP dengan rerata usia dan lama perawatan pasien adalah 7.58 tahun dan 10.95 hari. Fistula merupakan komplikasi yang paling sering ditemukan pada pasien hipospadia pasca TIP, yaitu sebanyak 32 (25.2%). Analisis bivariate menunjukan hubungan yang signifikan antara lokasi meatus pada hipospadia (distal) dengan torsio penis (n = 2; p 0.019). **Simpulan:** Atas dasar komplikasi dari teknik TIP, yaitu fistula, stenosis meatus, striktur uretra, torsio penis, dan glans dehiscence, maka indikasi untuk dilakukannya TIP harus jelas atau selektif.

Kata Kunci: Hipospadia, komplikasi, tubularized incised plate.

Correspondence: Johannes Aritonang, c/o:Department of Urology, Faculty of Medicine/Universitas Indonesia, Cipto Mangunkusumo General Hospital. Jl. Diponegoro No.71, Jakarta Pusat, DKI Jakarta 10430, Indonesia. Phone: +62 21 3152892, Fax: +62 21 3145592. Mobile phone: 08119851412. Email: johannesaritonangmd@gmail.com.

INTRODUCTION

Hypospadia is a congenital disorder that is most often found in male neonates with the incidence in the US as high as 1 per 300 and 1 per 150-300 births in other west countries. ¹⁻⁵ In Indonesia, data on the incidence of hypospadias is still not available, However, patients' registration data in RSCM from

2002-2014 showed 324 cases of hipospadia.⁶

Hypospadias is often accompanied by a number of factors or concomitant complications, which are meatus location, chordee, curvature of the penis, phallus size and hood, penile torsion, penoscrotal transposision, scrotum bifida, and undescended testicles (UDT). In addition, after the reconstruction of hypospadias, there are common

complications, such as fistules, meatal stenosis, urethral strictures, diverticules, glans dehiscence, and worsening of testicular torsion. At RSUPN Cipto Mangunkusumo (RSCM) Jakarta some hypospadias reconstruction techniques are done, such as Tubularized Incised Plate (TIP), Transverse Preputial Island Flap (TPIF) or Duckett technique, Onlay Island Flap (OIF), Koyanagi, buccal mucosa graft, and 2 stages reconstruction. However, since 2002 until 2014, TIP technique is the most often done at this hospital, for the types of proximal hypospadias, midshaft, or distal.⁶

OBJECTIVE

This study aims to find an association between hypospadias complicating factor for complications that occurred after hypospadias reconstruction, and focuses on the TIP because this technique is the most widely done.

MATERIAL & METHODS

This study is a retrospective descriptiveanalytic study, where data obtained from secondary data derived from medical records and the special urologic status of hypospadias patients in RSCM. Samples are all patients who underwent hypospadias reconstruction uretroplasty in RSCM since April 2002 to May 2014. The samples were selected with a total sampling technique. Data analysis was performed with SPSS ver. 14.0. Descriptive analysis is presented in narrative form and tables. Correlation test performed with Chi-square test and Fisher's Exact, with a p value of < 0.05 was statistically significant, then presented in tabular form and narrative.

RESULTS

From a total of 324 uretroplasty surgeries performed on hypospadic patients between 2000-2014 at RSCM, as many as 127 patients was operated with TIP technique, with a mean patient age and treatment duration of 7.58 years and 10.95 days. The results of data processing show that fistula is the most common complication in patients with post-TIP hypospadias, as many as 32 (25.2%), followed by the glans dehiscence and meatus stenosis respectively of 5 (3.9%) and 4 (3.1%). Urethral stricture and penile torsion complications amounted 2 cases each (1.6%). There were no diverticules as complications of TIP technique. Then, we analyze nine predisposing factors for complications with the complications obtained.

The results of Chi-Square test and Fisher's Exact showed that from all complications predisposing factors assessed, there are significant correlation between the location of the hypospadias meatus (distal) with torsion of the penis (n=2; p 0.019). (Table 2) Complications of fistules, meatal stenosis and glans dehiscence mostly found in

Table 1. Patients characteristics.

Characteristics	TIP $[n = 127 (\%)]$	Complications* $[n = 45 (\%)]$	
Proximal Hypospadia	57 (44.9%)		
Proximal	8 (6.3%)	4 (19.0%)	
Penoskrotal **	41 (32.3%)	13 (62.0%)	
Skrotalis	6 (4.7%)	4 (19.0%)	
Perineal	2 (1.6%)	<u>-</u>	
Distal Hypospadias	70 (55.1%)		
Distal	18 (14.2%)	9 (37.5%)	
Midshaft***	40 (31.5%)	11 (45.8%)	
Glandular	3 (2.3%)	1 (4.2%)	
Subcoronal	7 (5.5%)	3 (12.5%)	
Coronal	2 (1.6%)	-	

^{*} Complications accounted are fistules, meatal stenosis, urethral stricture, diverticules, testicular torsion, and glans dehiscence

^{**} Most common type of hypospadias underwent TIP procedure in proximal hypospadias and followed by post operation complications

^{***} Most common type of hypospadias underwent TIP procedure in distal hypospadias and followed by post operation complications

Table 2. Predisp	osing f	actors and	complication	s in TIP	procedure.

Predisposing factors	Complications (P*)					
	Fistules N = 32 (25.2%)	Meatal stenosis N = 4 (3.1%)	Urethral stricture N = 2 (1.6%)	Testicular torsion N = 2 (1.6%)	Glans Dehiscence N = 5 (3.9%)	Total (%)
Meatal location						
Penoscrotal	10; 0.885	NS	2; 0.102	NS	1; 1.000	41 (32.3%)
Perineal	NS	NS	NS	NS	NS	2 (1.6%)
Proximal	4; 0.109	NS	NS	NS	NS	8 (6.3%)
Scrotalis	2; 0.641	1; 0.178	NS	NS	1; 0.218	6 (4.7%)
Distal	4; 1.000	2; 0.096	NS	2; 0.019**	1; 0.540	18 (14.2%)
Glandular	1; 1.000	NS	NS	NS	NS	3 (2.3%)
Coronal	NS	NS	NS	NS	NS	2 (1.6%)
Subcoronal	2; 1.000	NS	NS	NS	1; 0.250	7 (5.5%)
Midshaft	9; 0.635	1; 1.000	NS	NS	1; 1.000	40 (31.5%)
Phallus size	7; 0.252	NS	1; 0.278	NS	NS	19 (15.0%)
Chordee	8; 0.463	1; 1.000	1; 0.369	NS	1; 1.000	26 (20.5%)
Torsion degree	1; 0.442	NS	NS	NA	1; 0.077	2 (1.6%)
Hood size	15; 0.645	3; 0.619	NS	NS	3; 1.000	64 (49.6%)
Penoscrotal transposition	5; 0.434	1; 0.441	1; 0.251	NS	1; 0.519	17 (13.4%)
Scrotal bifida	5; 0.337	NS	NS	NS	2; 0.093	14 (11.0%)
UDT	1; 0.527	NS	NS	NS	NS	6 (4.7%)
Artificial erections	10; 0.164	1; 0.640	2; 0.172	1; 1.000	NS	53 (41.7%)

^{*} Dilakukan uji Chi-Square dan Fisher's Exact

patients with hypospadias without hood or small hood. Complications of urethral stricture and penile torsion observed at penoskrotal and distal hypospadias with 2 cases each.

DISCUSSION

At the moment, hypospadias reconstruction techniques are growing well. However, optimal management for proximal and distal hypospadias have not been well standardized. TIP technique was first introduced by Warren T. Snodgrass in 1994. Cook et al (2011) stated that TIP is a type of distal hypospadias reconstruction technique that is most widely practiced in North America (90%) in the period from 1994 to 2011. The his study we showed that there were 50 (44.9%) cases of proximal hypospadias were treated using TIP technique at RSCM, with considerations such as whether a crossurethral plate is still enough to be maintained despite the location being proximal to the penile meatus.

Most commonly found factors that accompanies hypospadias complications are the small size of the hood and sometimes do not have a hood, followed by treatment of artificial erection and location of meatus penoskrotal and midshaft. The

most common complications of post TIP surgeries is fistula with 32 cases (25.2%). This figure does not differ from previous research by Sujijantararat and Chaiyaprasithi colleagues (25%). This study also found differences in the incidence of fistula post-TIP on hypospadias non-distal and penoskrotal just like research by Rompre et al and Braga et al (15% vs 25% and 7.9% vs 42.9%). 10,111

In this study, the most common complications of fistules in hypospadias were not accompanied by their hood or only have a small hood. Researchers also found that the small size hood or without a hood are also the most common complicating factorfollowing post-TIP meatus stenosis. In addition, the previous publication also shows that the meatus stenosis occurring after the TIP on the type of proximal hypospadias is not much different from what happened in this research (from 0.7 to 1.7% vs. 3.1%). Furthermore, it was also found that complications of urethral stricture are in an equal amount to the penoskrotal hypospadias and artificial erection.

In hypospadias accompanied by a small size hood or without hood, are often accompanied by glans dehiscencecomplications. In addition, these complications are also found in two cases of distal

^{**} p < 0.05

hypospadias, two proximal types and one of midshaft type. Previously, Snodgrass et al found that these complications are more common in post-TIP proximal hypospadias in hypospadias with and without pre-operative testosterone therapy. ^{15,16} However, it is still unclear whether the provision of pre-operative hormonal therapy and material or stitching techniques used, affects the glans dehiscence post-TIP. This study also shows that the ratio of total complications glans dehiscence happened is smaller than studies by Macedo et al (1.5 vs. 3.6). ¹⁷

Hypospadias can also be accompanied by penile torsions. However, researchers also assessed the torsion of the penis as one of the complications that can be exacerbated post-TIP. This was shown by a significant relationship between the location of the meatus distal penile torsion (p = 0.019). There are differences in the characteristics of the two samples with penile torsion, the cross-section of the urethral plate, the degree of torsion and other complications that occurred after TIP (fistula and glans dehiscence). However, it is not clear whether the patient had a history of previous penile torsion. When coupled with a history of torsion, degloving action is needed before reconstruction.¹⁸ As for the number of complications in distal hypospadias penile torsion in this study do not differ from previous research by Bertozzi et al (1.6% vs 1.6%), torsion penis generally occurs as a result of acquisition or dissection tunica dartos were inadequate during the making of the second layer.

Of the total 127 patients with hypospadias, we noticed that 53 (41.7%) patients had artificial erection with 10 of them (0.164%) hada post-TIP fistule. The number of events are the same as the number of fistule complications in penoscrotal hypospadias. As stated by Snodgrass et al that this can only be done if we cannot obtain a normal erection, rdesired econstruction prepuce, and the glanular location of meatus. However, researchers found no significant association between the treatment of artificial erectile and penoscrotal meatus with post TIP fistules complications.

CONCLUSION

On the basis of the technical complications TIP, namely fistula, meatus stenosis, urethral tricture, torsion of the penis, and the glans dehiscence, then indications for TIP should be clear and highly selective. Drawbacks of our study was

we only analyzed a small number of samples. In addition, they needed deeper study on other alternative techniques besides TIP, to reduce the number of complications in hypospadias.

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