

Prevalence of Urethrocutaneous Fistula in Hypospadias Cases at Dr. Moewardi Hospital in January 2022-March 2024

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Abstract: Introduction: Hypospadias is one of the most common congenital disorders with a prevalence that has continued to increase throughout the world over the years. Despite advances in hypospadias surgical techniques, complications still occur frequently. One of the most common complications of hypospadias surgery is Urethrocutaneous Fistula. This study aims to show the prevalence of urethrocutaneous fistula in hypospadias patients at RSUD dr. Moewardi. Method: This research is a retrospective study. The research sample was hypospadias patients undergoing treatment at RSUD dr. Moewardi (RSDM) in January 2022-March 2024. The research data taken was personal identity, age, and the incidence of urethrocutaneous fistula. Patients with incomplete medical records were excluded. Data analysis is pending software Microsoft Office and Microsoft Excel. Results: Hypospadias patient data has been collected, from 2022 to 2024. Then data was also obtained on Hypospadias patients, from 2022 to 2024, who experienced complications from urethrocutaneous fistulae (UCF). The number of patients was 914, UCF was 95 (10.3%). Urethrocutaneous fistula increased in hypospadias cases in the younger age group (<20 years; 44.2%). Discussion: Hypospadias is an abnormal location of the urethra on the ventral surface of the penis. Age, type of hypospadias, cystostomy placement, neourethral length, splint size, and urethroplasty technique are factors that can influence the occurrence of urethrocutaneous fistula complications. Conclusion: The most common complication of hypospadias surgery is Urethrocutaneous Fistula. This incident in RSDM, the incidence rate increases at younger ages and is more common in posterior hypospadias. Therefore, special attention is needed in treating hypospadias, especially in pediatric patients. Further research regarding risk factors that need to be considered, surgical techniques, or other interventions to reduce complications, needs to be carried out.

Keywords: Urethrocutaneous, Hypospadias, Tubularized incised plate.

INTRODUCTION

Hypospadias occurs in approximately 0.2 to 4.1 in 1000 live births. This disorder of the male genitourinary system occurs when the embryological urethral folds fail to fuse completely between the 7th and 14th weeks of pregnancy. Therefore, the position of the urethral meatus becomes abnormally located along the ventral shaft of the penis, scrotum, or perineum. Hypospadias is classified into proximal (urethral meatus between the perineum and midshaft), distal (between the midshaft and the head of the penis), and glandular (inside the head of the penis). In other nomenclature, hypospadias is described as anterior (glandular or coronal urethral meatus), middle (penis shaft), and posterior (penoscrotal, scrotum, perineum). Approximately 50% of cases are anterior, 30% central, and 20% posterior (Sparks, T. N. & Society for Maternal-Fetal Medicine. 2021; Epelboym, Y. *et al.*, 2017; Li, X. *et al.*, 2019).

Hypospadias is considered to be one of the most common congenital disorders with a steadily increasing trend worldwide over the years. This increasing trend necessitates advances in operative methods for hypospadias repair, such as *Tubularized incised plate*, *Glandular approximation plasty Bracat*, *Preputial island flaps*, and other techniques. However, the results of hypospadias surgery are often poor with

reported complication rates of 50% or more. Urethrocutaneous fistula is the most common urethroplasty complication, followed by meatal stenosis, urethral stricture or diverticulum, glans dehiscence, and poor cosmetic profile requiring reoperation (Duarsa, G. W. K. *et al.*, 2020; Sheng, X. *et al.*, 2018; Satjakoesoemah, A. I. *et al.*, 2021).

The incidence of UCF ranges from 7.5-50%, depending on the degree of hypospadias and type of surgical technique. UCF can occur anywhere from the glans to the scrotum. UCFs have different clinical characteristics due to their different locations and sizes, so there are various surgical techniques to treat different types of UCFs. Factors known to cause postoperative fistulas include infection, poor surgical technique, urethral stricture, or meatal stenosis. The choice of surgical method is largely determined by the surgeon's own experience, and the lack of a standardized and individualized treatment process also leads to wide fluctuations in the success rate of UCF repair. According to literature reports, the overall success rate ranges from 66.5–94.9% and with a significant recurrence rate, up to 47% in some studies (Satjakoesoemah, A. I. *et al.*, 2021; Yang, F. *et al.*, 2022; Karakus, S. C. *et al.*, 2017).

This study aims to show the prevalence of urethrocutaneous fistula in hypospadias cases at

RSDM. Knowing the profile related to the incidence of ureterocutaneous fistula in hypospadias patients can be a reference for determining the appropriate management approach and preventing the occurrence of UCF.

METHOD

The research is a retrospective study. The research was conducted on patients diagnosed with hypospadias and undergoing treatment at RSUD dr. Moewardi for the period January 2022-March 2024. The research samples were all hypospadias patients with and without ureterocutaneous fistula.

The data taken is personal identity, age, and the incidence of ureterocutaneous fistula. Research samples with incomplete medical records were excluded from the study. The data was then analyzed using *software Microsoft Office*.

RESULTS

In this retrospective study, the research samples were obtained from hypopasdia patients undergoing treatment at RSUD dr. Moewardi in January 2022-March 2024. The following are details of the data obtained:

Table 1. Data distribution of Hypospadias and Ureterocutaneous fistulae (UCF) patients at RSDM from 2022 to 2022. 2024

No	Patient Description	Age Range	Amount
1.	Total Hypospadias	All age	225
2.	Hypospadias with UCF	<20	42
		20-50	28
		>50	25
		All age	95

There were a total of 225 hypospadias patients. The incidence of UCF is known to be 95 of the total hypospadias patients (42.2%). In the distribution of results, it can be seen that more hypospadias patients experienced UCF at a younger age (<20 years). The factors underlying the results need to be observed.

Urethrocutaneous istles were more common in hypospadias cases in the younger age group (< 20 years; 42 cases; 44.2% of total UCF cases). Risk

factors for urethrocutaneous fistula can include the type of hypospadias and the length of the urethral defect which influence the occurrence of secondary fistula recurrence after primary urethrocutaneous fistulectomy. In the data that has been collected, there is information about the type of hypospadias as in the following table. It is known that the most common type of hypospadias is Penoscrotal, most hypospadias too *unspecified*.

Table 2:-

Total Hypospadias patients 2022-2024	225
Congenital Chordee	3
Hypospadias, Balanic	8
Hypospadias, Penile	23
Hypospadias, Penoscrotal	97
Hypospadias, Perineal	3
Hypospadias, Unspecified	85
Other Hypospadias	6

DISCUSSION

Hypospadias is an abnormal location of the urethra on the ventral surface of the penis with variable association with arrested development of the urethral spongiosum, ventral prepuce, and penile

chordee. One of the most common complications of hypospadias repair is urethrocutaneous fistula (Sheng, X. *et al.*, 2018; Satjakoesoemah, A. I. *et al.*, 2021; Yang, F. *et al.*, 2022).

Kaufmann 1886	Schaefer 1950	Avellan 1975		Duckett 1996	Hadidi 2004	Hadidi 2018
Grade I	Glanular	Glanular		Glanular	Glanular	Glanular
Grade II	Penile	Penile		Sub-coronal	Distal	Penile
Grade III	Perineal	Penoperineal		Distal penile	Proximal	Proximal
Grade IV		Perineal w/o Bulb		Mid shaft		

Figure 1. Classification of Hypospadias (Hadidi, A. T. 2022)

Hypospadias International Score (MCGU)

Name of Patient: _____ (HR No.): _____ Date of Birth: _____

Family History: Positive Negative Hormone Therapy: Positive Negative Date of Examination: _____

Category	Options	Score
1. Meatus	I, Glanular Hypospadias (1) II, Distal Penile Hypospadias (2) III, Proximal Hypospadias (3) IV, Perineal Hypospadias (4)	1-4
2. Chordee	No, Superficial chordee or < 15° (0) 15-30° (1) Severe, deep chordee or > 30° (2)	0-2
3. Glans Width & Shape	good groove glans ≥ 14 mm (0) poor groove glans 12 - < 14 mm (1) flat glans < 12 mm (2)	0-2
4. Urethral Plate quality	intact (0) divided (2)	0-2

Glanular Hypospadias with good glans = Score 1
 Perineal Hypospadias with poor glans = Score 10

Total score: 1-10

Figure 2. MCGU Score for Hypospadias²¹

Urethrocutaneous fistula is the most common complication after urethroplasty, and often appears early (<12 months) at the coronal-subcoronal level with/without glandular dehiscence or late (>12 months) after urethroplasty. Successful hypospadias repair may be attributed to good tissue and vascular supply, which may be related to the patient's age and the number of previous operations the patient has undergone. Age, type of

hypospadias, surgical procedure, type of surgical repair, and degree of chordee are associated with the development of urethrocutaneous fistula (J Sheng, X. *et al.*, 2018; Satjakoesoemah, A. I. *et al.*, 2021; Salle., P. *et al.*, 2016).

The results of this study showed that there was a relationship between age and the incidence of UCF. Where younger ages (<20 years) have a

higher incidence of experiencing UCF. This is less relevant to several existing studies with the results that as age increases, the risk of post-operative complications also increases (Duarsa, G. W. K).

Ideally, child genital surgery is performed at the age of 6–18 months based on research conducted by *The American Academy of Pediatrics*. Most babies develop good tolerance to anesthesia and surgery by 6 months of age. At the age of 18 months, they are aware of their genitals and are toilet trained. In some cases of hypospadias repair, some surgeons prefer to perform surgery earlier at 4 months of age because of faster healing time, less scarring, and because of the belief that babies can more easily handle the stress of surgery.⁴ Another theory says that with increasing age, erections occur more frequently, resulting in post-operative bleeding and dehiscence, as well as having an impact on post-operative complications, especially in urethrocutaneous fistulas (Sheng, X. *et al.*, 2018).

In this study, the most common type of hypospadias is explained, namely penoscrotal. However, there is no data regarding the type of proximal or distal hypospadias that occurs in patients with UCF. Existing studies suggest proximal or posterior hypospadias is associated with more severe clinical features and a higher incidence of complications compared with distal hypospadias (Duarsa, G. W. K. *et al.*, 2020; Xia, Y. *et al.*, 2023; Tanseco, P. P. *et al.*, 2019). Posterior hypospadias is also associated with a higher rate of need for urethroplasty (Satjakoesoemah, A. I. *et al.*, 2021; Mammo, T. N. *et al.*, 2-018). This often occurs due to a distal urethral stricture that causes high intraluminal pressure proximally. The most common location for fistulas in this situation is at the junction of the anastomosis between the pars fixa and pars pendulans where it is thought that blood flow is disrupted, causing poor healing of the anastomosis and relative obstruction due to sudden reduction in the anastomosis (Xu, A. J. *et al.*, 2023; Jun, M. S. *et al.*, 2019). Many factors cause complications in the development of proximal urethrocutaneous type, such as obstruction of urine flow distal to the neourethra, urethral diverticula, urine extrusion, and local infections (Duarsa, G. W. K. *et al.*, 2020; Permana, W. T. and Renaldo, J. 2021).

In other studies, there were opposite results where distal hypospadias had a higher prevalence of UCF compared to proximal hypospadias. This may be influenced by the fact that the coronary sulcus area

has a hypovascular transition area, namely the blood vessels between the skin and the glans penis. Hypospadias repair of the urethral plate in the glans area can cause disruption of the blood supply to the coronary sulcus. In addition, an erection can have a traction effect on the neourethra. This explains why healing of the neourethra in the coronal region is more likely to be impaired and why the majority of urethro-cutaneous fistulas are of the distal hypospadias type (Permana, W. T. and Renaldo, J. 2021).

In this study, the data on the types of hypospadias listed are Balanic, Penile, Penoscrotal and Perineal types. Balanic hypospadias involves the urethral meatus located on or near the glans penis. The search results did not specify outcomes for balanic hypospadias specifically, but surgical techniques such as Snodgrass urethroplasty (Tubularized Incised Plate, TIP) and its modifications are commonly used for distal hypospadias, including balanic hypospadias. Penile hypospadias includes hypospadias where the meatus is located along the shaft of the penis. The search results discuss various techniques for managing urethrocutaneous fistulas after hypospadias repair of penile hypospadias, including the vest-over-pants technique, Snodgrass urethroplasty and its modifications, as well as the use of buccal mucosal patch grafts. These techniques aim to reduce the incidence of fistulas, which are a common complication. Penoscrotal hypospadias is of higher severity, with the meatus located at the junction of the penis and scrotum. The search results mentioned the use of buccal mucosal patch grafts for recurrent urethrocutaneous fistulas, which can be applied to penoscrotal hypospadias due to its complexity and higher risk of complications. The results of specific surgical techniques in penoscrotal hypospadias are not detailed in the results provided. Perineal hypospadias is the most severe form, with the meatus located in the perineum. The search results do not directly address perineal hypospadias. However, given its severity, management of urethrocutaneous fistulas in perineal hypospadias is likely to require surgical interventions that are more complex, similar or more sophisticated than those described in penoscrotal hypospadias (Akan, A.B. *et al.*, 2022; Jasim, A. K. *et al.*, 2023; Jasim, A. K. H. 2015; Dar, O. A. *et al.*, 2023).

CONCLUSION

Hypospadias is a disorder of the male genitourinary system that results in an abnormal

location of the urethral meatus along the ventral shaft of the penis, scrotum, or perineum. A complication that often occurs after urethroplasty in cases of hypospadias is urethrocutaneous fistula. This study shows that younger age increases the incidence of urethrocutaneous fistula at RSDM. Therefore, special attention is needed in treating hypospadias, especially in pediatric patients. Further research regarding risk factors that need to be considered, surgical techniques, or other interventions to reduce complications, needs to be carried out.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Lesmana, E.R. and Wibisono " Prevalence of Urethrocutaneous Fistula in Hypospadias Cases at Dr. Moewardi Hospital in January 2022-March 2024." *Sarcouncil Journal of Medicine and Surgery* 3.6 (2024): pp 84-89.