

# SEVERITY LEVEL IN HYPOSPADIAS PATIENTS AT HASAN SADIKIN HOSPITAL BANDUNG 2019-2023

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## ABSTRACT

**Objective:** The aim of this study is to determine the level of severity in hypospadias patients at Hasan Sadikin Hospital Bandung from 2019–2023. **Material & Methods:** This is a descriptive and observational study. The data collected includes information from all patients with hypospadias who underwent treatment at the hospital from January 2019 to November 2023, meeting the inclusion criteria and selected through total sampling. The data were presented using descriptive statistics in frequency and percentage. **Results:** The incidence of hypospadias at Hasan Sadikin Hospital in Bandung from 2019 to 2023 was 296 patients, with an average age of  $8.6 \pm 6.9$  years, and the age group of 0–5 years being the most affected. Out of the total, 163 patients (56%) had moderate hypospadias, 99 patients (33%) had severe hypospadias, and only 34 patients (11%) had mild hypospadias. The average scores were G (glans)  $2.2 \pm 0.9$ , M (meatus)  $3.4 \pm 0.9$ , and S (shaft)  $3.1 \pm 1.0$ . **Conclusion:** In conclusion, early detection and surgical intervention faced no obstacles, and public awareness of this condition is good.

**Keywords:** Hypospadias, severity level, Hasan Sadikin.

## ABSTRAK

**Tujuan:** Tujuan dari penelitian ini adalah untuk menentukan tingkat keparahan pada pasien hipospadia di Rumah Sakit Hasan Sadikin Bandung dari tahun 2019 hingga 2023. **Bahan & Cara:** Penelitian ini merupakan studi deskriptif dan observasional. Data yang dikumpulkan mencakup informasi dari semua pasien dengan hipospadia yang menjalani perawatan di rumah sakit dari Januari 2019 hingga November 2023, memenuhi kriteria inklusi, dan dipilih melalui total sampling. Data disajikan menggunakan statistik deskriptif dalam bentuk frekuensi dan persentase. **Hasil:** Angka kejadian hipospadia di Rumah Sakit Hasan Sadikin Bandung pada tahun 2019–2023 sebanyak 296 pasien dengan rata-rata usia  $8,6 \pm 6,9$  tahun dengan kelompok usia 0–5 tahun sebagai kelompok paling banyak. Terdapat 163 pasien hipospadia (56%) yang memiliki hipospadia derajat sedang, 99 pasien (33%) derajat berat, dan hanya 34 pasien (11%) derajat ringan. Didapatkan rata-rata skor G (glans) adalah  $2.2 \pm 0.9$ , M (meatus)  $3.4 \pm 0.9$  dan S (shaft)  $3.1 \pm 1.0$ . **Simpulan:** Deteksi dini dan intervensi bedah lebih dini tidak mengalami hambatan dan kesadaran masyarakat akan penyakit ini sudah baik.

**Katakunci:** Hipospadia, tingkat keparahan, Hasan Sadikin.

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## INTRODUCTION

Hypospadias is one of the most common congenital abnormalities in males. It is a condition where the urethral opening is located on the ventral side of the penis.<sup>1-2</sup> In newborn males, hypospadias is the second most common congenital disorder after undescended testicles.<sup>3</sup> Recent reports indicate an increasing incidence of hypospadias worldwide over the last decade. The average prevalence is highest in Asia at 0.6-69%, followed by North America at 34.2%, Europe at 19.9%, Africa at 5.9%, and South America at 5.2%.<sup>4-5</sup> In Indonesia, based on a study in

Central Java, there were 120 cases of hypospadias, comprising 48.33% severe hypospadias, 41.67% isolated mild hypospadias, and 10% syndromic hypospadias.<sup>6</sup>

The management of hypospadias performed at a young age shows that the ideal age for repair is between 6 to 18 months. Surgical management includes various techniques such as tubular incision plate, Glandular Approximation Plasty Bracat, and preputium island closure.<sup>7-8</sup> The Glans-Urethral Meatus-Shaft (GMS) score is a concise method used to describe the severity level of hypospadias.<sup>9</sup> This scoring system was developed as a tool for

qualitative assessment, based on the easily observable components of the glans, meatus, and penile shaft. Each of the three components is assigned a numerical score on a scale of 1-4, and these values are then summed to determine the total GMS score. Therefore, the lowest possible GMS score is 3 (very mild hypospadias), and the highest score is 12 (severe hypospadias).<sup>10</sup>

## OBJECTIVE

Based on the above description, the author's research objective is to determine the severity level in hypospadias patients at Hasan Sadikin Hospital in Bandung from 2019 to 2023.

## MATERIAL & METHODS

This study is a descriptive observational research utilizing both primary and secondary data. The data were obtained from all patients with hypospadias who underwent treatment at the hospital from January 2019 to November 2023, meeting the inclusion criteria and selected through total sampling. The inclusion criteria for this study were cases of hypospadias that had not undergone operative management and were willing to participate in the research with complete medical records.

Patients diagnosed with hypospadias, following the anamnesis and physical examination, and after the diagnosis was established, underwent an assessment using the GMS Score before surgery and before the influence of anesthesia. The GMS score consists of three domains, including glans score, urethral meatus score, and shaft score. The minimum score in the assessment is 3, while the maximum score is 12. After calculating and summing the scores based on these three domains, the scores are then interpreted into groups: mild with a score of 3-6, moderate with a score of 7-9, and severe with a score  $\geq 10$ .

Basic data such as age, total score, operative technique performed, and hypospadias type were collected. Statistical analysis was conducted using SPSS 22, and descriptive analysis was presented in mean  $\pm$  SD, frequency, and percentage.

## RESULTS

According to this study, the incidence of hypospadias at Hasan Sadikin Hospital in Bandung

from 2019 to 2023 reached 296 patients with varying levels of severity. These patients met the inclusion and exclusion criteria, with an average age of  $8.6 \pm 6.9$  years, ranging from 10 months to 32 years. The demographic and clinical characteristics of the study subjects can be seen in Table 1.

During this period, hypospadias patients coming to Hasan Sadikin Hospital in Bandung were predominantly from the age group of 0-5 years. Out of the total 296 patients participating in the study, 163 (56%) had moderate hypospadias, 33% had severe hypospadias, and only 11% had mild hypospadias. The average GMS score in this study was  $8.7 \pm 1.7$ .

**Table 1.** Descriptive characteristics of the population. Characteristics Frequency (n) Percentage (%)

| Characteristics | Frequency (n) | Percentage (%) |
|-----------------|---------------|----------------|
| Age             |               |                |
| 1-5             | 106           | 36             |
| 6-10            | 104           | 35             |
| 11-15           | 50            | 17             |
| 16-25           | 30            | 10             |
| >25             | 6             | 2              |
| Location        |               |                |
| Anterior        | 48            | 16             |
| Medial          | 75            | 25             |
| Posterior       | 173           | 59             |
| Total GMS Score |               |                |
| Mild            | 34            | 11             |
| Moderate        | 163           | 56             |
| Severe          | 99            | 33             |

Table 2 shows the average GMS scores for each component in hypospadias patients undergoing surgery at Hasan Sadikin Hospital in Bandung from 2019 to 2023. The results indicate that the average G (glans) score was  $2.2 \pm 0.9$ , while the average meatus and shaft scores were  $3.4 \pm 0.9$  and  $3.1 \pm 1.0$ , respectively.

**Table 2.** GMS Score.

| Score      | Mean $\pm$ SD |
|------------|---------------|
| G (Glans)  | $2.2 \pm 0.9$ |
| M (Meatus) | $3.4 \pm 0.9$ |
| S (Shaft)  | $3.1 \pm 1.0$ |

**Table 3.** Hypospadias patients' special characteristics.

| Score                       | Frequency (n) | Percentage (%) |
|-----------------------------|---------------|----------------|
| Urethral Plate Size         | 2.2 ± 0.9     |                |
| > 10 mm                     | 98            | 33             |
| 8–10 mm                     | 49            | 17             |
| <8 mm                       | 146           | 49             |
| Very Narrow                 | 3             | 1              |
| Meatus location             | 3.4 ± 0.9     |                |
| Glanular                    | 13            | 4              |
| Subcoronal                  | 35            | 12             |
| Midshaft, medial            | 75            | 25             |
| Scrotal, proximal, perineum | 173           | 59             |
| Chordee                     | 3.1 ± 1.0     |                |
| Non-chordee                 | 30            | 10             |
| Mild                        | 29            | 10             |
| Moderate                    | 122           | 41             |
| Severe                      | 115           | 39             |
| Scrotal Bifid               | 25            | 8              |
| Penis length                | 46.2 ± 17.1   |                |
| Associated abnormalities    |               |                |
| Penoscrotal transposition   | 46            | 18             |
| Testis retraction           | 18            | 6              |
| DSD 46 XY                   | 9             | 3              |
| Fistula                     | 5             | 2              |
| Webbed penis                | 8             | 3              |

## DISCUSSION

Hypospadias is a genital developmental disorder characterized by the external urethral meatus opening on the ventral surface of the penis. This is caused by incomplete fusion of the urethral folds.<sup>11</sup> Hypospadias is one of the most common congenital disorders, occurring at a rate of 0.4 to 8.2 per 1,000 male births.<sup>3,7</sup> In our study, the age of hypospadias patients undergoing surgery at Hasan Sadikin Hospital in Bandung from 2019 to 2023 ranged from 10 months to 32 years, with an average of  $8.6 \pm 6.9$  years, and the majority falling in the 1-5 years age range, comprising 106 patients (36%).

Hypospadias is often characterized by the meatus location being posterior, medial, or anterior based on preoperative assessment. Almost 70% of hypospadias cases are located on the glans or distal penis, categorizing them as moderate severity, while the rest are more severe and complex.<sup>5</sup> Medial

hypospadias is the most commonly found type, accounting for 60-70% of hypospadias type distribution.<sup>12</sup> In contrast to available literature, this study found penoscrotal, scrotal, and perineal hypospadias (types associated with the posterior position) as the most prevalent findings.

In hypospadias, the external urethral meatus is in an abnormal position and at different levels, possibly accompanied by chordee or a curved penis. Patients may also have other genitourinary abnormalities based on the hypospadias location<sup>13</sup>. In this study, the majority of patients, approximately 70.9%, did not have associated abnormalities besides hypospadias.

Several classification systems can be used to categorize the severity level of hypospadias. Classifying anomalies in hypospadias is based on the position of the urethral opening, and in most studies related to surgical outcomes, the principle of grouping patients based on meatus position (i.e., distal, proximal) is used.<sup>14-15</sup> There is no universally accepted method for classifying the severity of complex hypospadias in a standardized manner. Due to the impact of chordee severity, gland size, and urethral plate quality on surgical outcomes, comparing studies without a standardized classification scheme, and relying solely on meatal position for patient stratification, becomes challenging. Castagnetti et al.<sup>16</sup> and Snodgrass et al.<sup>13</sup> emphasize the need for criteria to stratify patients in their 20-year review of severe hypospadias management. They highlight the lack of a clear definition for severe hypospadias and underscore the difficulties in comparing studies without a standardized classification scheme.

Just like any other assessment tool, the ideal classification for the severity level of hypospadias should be objective and easily reproducible. Responding to the need for a uniformly accepted hypospadias classification system, the GMS (Glans, Meatus, Shaft) classification system was developed by Jonathan et al. (2012) to standardize the severity classification for complex hypospadias cases. The chosen criteria were based on the perceived anatomical features of hypospadias that were likely to impact the complication level, as well as the cosmetic and functional outcomes of surgical correction.<sup>9</sup> In this study, the GMS system was used to assess the severity level of hypospadias. As of the conducting of this research, there have been no similar studies conducted in Indonesia, so it is hoped that this study could encourage the universal

application of the GMS scoring system, especially in Indonesia.

Although the GMS score provides a more detailed way to precisely evaluate the severity level of hypospadias, the score itself remains a subjective tool that depends on the surgeon's perspective.<sup>17</sup> In 2013, Merriman et al. addressed the subjective aspect of GMS scores by assessing the inter-observer reliability in assigning scores to each component. The study concluded that the GMS scores have high inter-observer reliability. Therefore, it can be concluded that this system offers a simple, consistent, and reproducible way to depict complex hypospadias abnormalities and correlates well with the risk of surgical complications. They also stated that GMS scores can be considered as a good starting point for further refinement and better evaluation.<sup>10</sup> Shukry et al. recommended more efforts to refine standard prognostic models for better evaluation.<sup>17</sup>

## CONCLUSION

Based on the research results and discussion, it can be concluded that the severity level in hypospadias patients at Hasan Sadikin Hospital in Bandung from 2019 to 2023 is as follows: 34 patients (11%) are classified as mild, 163 patients (56%) fall into the moderate category, and finally, 99 patients (33%) are classified as severe. The majority of patients in this study belong to the age group of 1-5 years, indicating that early detection and early surgical intervention face no obstacles, and public awareness of this condition is good.

## REFERENCES

1. Van der Horst HJR, de Wall LL. Hypospadias, all there is to know. *Eur J Pediatr*. 2017;176(4):435–41.
2. Sheng X, Xu D, Wu Y, Yu Y, Chen J, Qi J. The risk factors of Urethrocuteaneous fistula after hypospadias surgery in the youth population. *BMC Urol*. 2018;18(1).
3. Bouty A, Ayers KL, Pask A, Heloury Y, Sinclair AH. The genetic and environmental factors underlying hypospadias. *Sexual Development*. 2015;9(5):239–59.
4. Masood O, Qureshi I, Magray M, Mohta A, Manchanda V. Correlation of Glans-Urethral Meatus-Shaft scoring system for Hypospadias with Postoperative outcome. *International Journal of Health and Clinical Research*. 2021;4(10):102–6.
5. Springer A, van den Heijkant M, Baumann S. Worldwide prevalence of hypospadias. *J Pediatr Urol*. 2016;12(3):152.e1-152.e7.
6. Maritska Z, Santosa A, Ariani MD, Juniarto AZ. JOURNAL OF BIOMEDICINE AND TRANSLATIONAL RESEARCH Profile of Hypospadias Cases in Central Java, Indonesia. Vol. 01, *Journal of Biomedicine and Translational Research*. 2015.
7. Keays MA, Dave S. Current hypospadias management: Diagnosis, surgical management, and long-term patient-centred outcomes. *Canadian Urological Association Journal*. 2017; 11(1–2): S48–53.
8. Duarsa GWK, Tirtayasa PMW, Daryanto B, Nurhadi P, Renaldo J, Tarmono, et al. Risk factors for urethrocuteaneous fistula following hypospadias repair surgery in Indonesia. *J Pediatr Urol*. 2020;16(3): 317.e1-317.e6.
9. Arlen AM, Kirsch AJ, Leong T, Broecker BH, Smith EA, Elmore JM. Further analysis of the Glans-Urethral Meatus-Shaft (GMS) hypospadias score: Correlation with postoperative complications. *J Pediatr Urol*. 2015;11(2):71.e1-71.e5.
10. Merriman LS, Arlen AM, Broecker BH, Smith EA, Kirsch AJ, Elmore JM. The GMS hypospadias score: Assessment of inter-observer reliability and correlation with post-operative complications. *J Pediatr Urol*. 2013;9(6 PARTA):707–12.
11. Halaseh SA, Halaseh S, Ashour M. Hypospadias: A Comprehensive Review Including Its Embryology, Etiology and Surgical Techniques. *Cureus*. 2022;
12. Partin AW, Peters CA, Kavoussi LR, Dmochowski RR, Wein AJ. *Campbell Walsh Urology Twelfth Edition*. Elsevier Health Sciences; 2020
13. Snodgrass WT. Hypospadias. Available from: <http://pedsinreview.aapublications.org/>
14. Bergman JEH, Loane M, Vrijheid M, Pierini A, Nijman RJM, Addor MC, et al. Epidemiology of hypospadias in Europe: a registry-based study. *World J Urol*. 2015;33(12):2159–67.
15. Aulagne MB, Harper L, De Napoli-Cocci S, Bondonny JM, Dobremez E. Long-term outcome of severe hypospadias. *J Pediatr Urol*. 2010;6(5):469–72.
16. Castagnetti M, El-Ghoneimi A. The influence of perioperative factors on primary severe hypospadias repair. *Nat Rev Urol*. 2011;8(4):198–206
17. Shoukry A, Abbas A, Abdelwahab M, Ghoneima W, Shouman A, El Ghoneimy M, et al. Glans-urethral meatus-shaft score and penile parameters as preoperative assessment tools for hypospadias surgery outcome. *African Journal of Urology*. 2021;27(1):4–11.