
COMPARISON OF DURATION OF URETHROPLASTY SURGERY BASED ON HYPOSPADIAS LOCATION: A CASE STUDY

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ABSTRAK

Hipospadia merupakan kelainan dari lahir yang ditemukan pada bayi laki-laki, dimana posisi meatus uretra eksternal tidak bermuara pada ujung penis melainkan berada pada permukaan ventral penis. Hipospadia diklasifikasikan berdasarkan posisi atau lokasi dari meatus uretra eksterna yang tidak normal. Penanganan yang dapat dilakukan pada pasien hipospadia adalah pembedahan. Pada umumnya pembedahan dilakukan dua tahap yaitu *chordectomy* dan urethroplasti. Terdapat berbagai teknik pembedahan yang dapat dilakukan pada pasien hipospadia. Hal tersebut disesuaikan dengan posisi atau lokasi hipospadia dan kemampuan dari operator bedah. Tujuan dari penelitian ini yaitu mengetahui perbedaan durasi pembedahan berdasarkan lokasi hipospadia. Metode yang digunakan adalah deskriptif analitik dengan pendekatan studi kasus dengan melakukan perbandingan durasi pembedahan urethroplasti dengan lokasi hipospadia pada pasien dengan diagnosa medis hipospadia yang melakukan tindakan pembedahan urethroplasti. Didapatkan hasil bahwa terdapat perbedaan jauh pada durasi pembedahan pada pasien dengan posisi hipospadia berada pada *distal penile* dengan pasien yang posisi hipospadia berada pada *scrotal*, meski menggunakan teknik pembedahan yang sama yaitu *Tubularized Incised Plate (TIP)*.

Kata Kunci: Durasi Pembedahan, Hipospadia, Uretroplasti

ABSTRACT

Hypospadias is a birth defect found in baby boys, where the position of the external urethral meatus does not open at the tip of the penis but is located on the ventral surface of the penis. Hypospadias is classified based on the position or location of the abnormal external urethral meatus. The treatment that can be done for hypospadias patients is surgery. In general, surgery is carried out in two stages, namely chordectomy and urethroplasty. There are various surgical techniques that can be performed on hypospadias patients. This is adjusted to the position or location of the hypospadias and the abilities of the surgical operator. The aim of this study is to determine the difference in duration of surgery based on the location of the hypospadias. The method used was descriptive analytic with a case study approach by comparing the duration of urethroplasty surgery with the location of hypospadias in patients with a medical diagnosis of hypospadias who underwent urethroplasty surgery. The results showed that there was a significant difference in the duration of surgery in patients whose hypospadias was in the distal penile position and in patients whose hypospadias was in the scrotal position, even though they used the same surgical technique, namely Tubularized Incised Plate (TIP).

Keyword: Duration of Surgery, Hypospadias, Urethroplasty

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INTRODUCTION

Hypospadias is a congenital anomaly found in newborn boys, where there is a malposition of the external urethral meatus, where the meatus does not end at the tip of the penis but is on the ventral surface of the penis. Hypospadias consists of several types according to the location of the external urethral meatus, including anterior, medial, and posterior (Donaire & Mendez, 2023). Hypospadias is the most common congenital problem of the external genital tract that occurs 0.2 - 0.6% in males (Turkyilmaz, Karabulut, Atan, & Sonmez, 2020). Hypospadias is the second most common congenital anomaly in males after cryptorchidism, but is the most common congenital malformation of the penis. The incidence of hypospadias in the United States has been reported as one in every 250 boys born (0.4%) having hypospadias, while in Denmark the estimated prevalence is 0.5% to 0.8%. A study in South America has estimated the global prevalence of hypospadias at 11.3 out of 10,000 newborns (less than 0.1%) (Donaire & Mendez, 2023). In Indonesia, the incidence of hypospadias is around 1:250 per male birth (Sabila, 2022).

The exact aetiology of hypospadias is unknown but may include genetic, endocrine and environmental factors. Hypospadias can be inherited if there is a family history of hypospadias. Hypospadias is classified based on the location of the abnormal urethral meatus. One commonly used classification is anterior (subcoronal and glandular), middle (distal penile, proximal penile, and midshaft), and posterior (scrotal, penoscrotal, and perineal) hypospadias. In 50% of cases, hypospadias was in the anterior location, 20% of cases were in the middle and the rest in the posterior. Overall, the subcoronal position is the most common abnormal location (Donaire & Mendez, 2023).

Hypospadias is diagnosed usually based on genital physical examination of the neonate and can be classified into distal hypospadias and proximal hypospadias, the division determines the method of management to be chosen. Hypospadias surgery with various techniques is the main therapy, one of which is the two-stage urethroplasty technique. Modified two-stage urethroplasty can be referred to as the Sidik-Chaula technique (Sukarno et al., 2024). Urethroplasty is the best standard of care in urethral stricture disease, as it offers the lowest stricture recurrence rate (Appiah et al., 2024). Urethroplasty is a surgical procedure that creates an external urethral opening at the tip of the glans penis. Urethroplasty involves excision techniques and primary anastomotic urethroplasty or with augmentation techniques (tissue transfer to increase urethral calibre) (Rourke et al., 2020). There are several surgical techniques that can be performed on hypospadias patients, these techniques are adjusted to the location of hypospadias. The most commonly performed urethroplasty surgery techniques are Meatal Advancement-Glanuloplasty (MAGPI), Glans Approximation Procedure (GAP), and Tubularization Incision of the Urethral Plate (TIP) (Mahendra Krisna & Maulana, 2017). So that it can affect the duration of urethroplasty surgery because each hypospadias location is treated with different surgical techniques. The aim of this study was to determine the difference in the duration of surgery based on the location of hypospadias.

RESEARCH METHODS

The method used was descriptive analytic with a case study approach by comparing the duration of urethroplasty surgery with the location of hypospadias in patients with a medical diagnosis of hypospadias who performed urethroplasty surgery in the central surgical installation room (IBS) RSPTN Hasanuddin University. This data was collected during July 2024. The case report uses a perioperative checklist sheet. Researchers collected data by conducting observations and documentation (taking notes). Data analysis techniques used were data reduction, data presentation, and conclusion drawing.

RESULTS AND DISCUSSION

Table 1. Characteristics of Hypospadian Patients

Patient	Age	Location	Duration of Surgery
An. K	10 years	Distal Penile	1 hour 20 minutes
An. R	11 years	Scrotal	3 hours

Hypospadias is a congenital condition, but parents often do not pay attention to it and only realise when the child reaches school age. The exact cause of hypospadias has not been found. Some researchers explain that there is a defect in the production of testosterone hormones in the testes and adrenal glands that causes failure of conversion from testosterone to dihydrotestosterone, deficiency of androgen receptors in the penis, or decreased binding between dihydrotestosterone and androgen receptors which can cause hypospadias. In addition, it is suspected that exposure to estrogen or progesterin in pregnant women in early pregnancy may increase the risk of hypospadias (Mahendra Krisna & Maulana, 2017). In the results obtained, the patient only performed surgery for the condition at the age of 10-11 years. This happened because from the interviews some parents explained that they were only ready to do the surgery at the age of their children now. When hypospadias is detected early, it can be corrected surgically at the age of 6 to 18 months, depending on the severity (Anand & Lotfollahzadeh, 2020). Surgery on hypospadias at an early age is more favourable psychologically as patients are less likely to remember the surgery and thus have a more positive body image than those who can remember it. In addition, if surgery is performed in old age it will be associated with more complications that can occur due to increased urethral secretions and nocturnal erections (Nordenvall et al., 2017).

In general, hypospadias is categorised based on the abnormal location of the urethral meatus. The classification of hypospadias is anterior, middle, and posterior. Posterior (perineal, penoscrotal, and scrotal), middle (midshaft, proximal penile, and distal penile), and anterior hypospadias (glandular and subcoronal) (Donaire & Mendez, 2023). Some surgeons classify hypospadias based on its degree, where degree 1 (mild hypospadias), where the urethral mouth is close to the normal location and is at the middle end of the glans (glandular, coronal, subcoronal), degree 2 (moderate hypospadias), The urethral estuary is in the middle of the normal and scrotal locations (distal penile, midshaft), and degree 3 (severe hypospadias), which is the urethral estuary far from its proper location (perineal, scrotal, penoscrotal) (Mahendra Krisna & Maulana, 2017). In the results found in patient An. K the location of hypospadias is in the distal penile (middle), while in patient An. R is in the scrotal location (posterior). In a study, it was found that the most common classification of hypospadias was posterior as many as 32 cases (50%), followed by anterior as many as 39%, and the rest were medial hypospadias (Rachmawati et al., 2024). Another study found that the most cases he found were subcoronal hypospadias (35%), then glandular as much as 20%, 10% each were found distal penile, midshaft, proximal, and penoscrotal, and as much as 5% were found scrotal (Sukarno et al., 2024). Other researchers found anterior hypospadias in 33.7%, posterior hypospadias in 30.3%, and medial hypospadias in 27% (Hidianingsih & Immanuel Hutasoit, 2022). In addition to the above classification, there is also a classification that divides into distal and proximal types. The granular, subcoronal, distal penile, midshaft, to proximal penile parts are included in distal hypospadias, while penoscrotal, scrotal and perinatal are included in proximal hypospadias, so in patient An. K belongs to distal hypospadias and An. R belongs to proximal hypospadias.

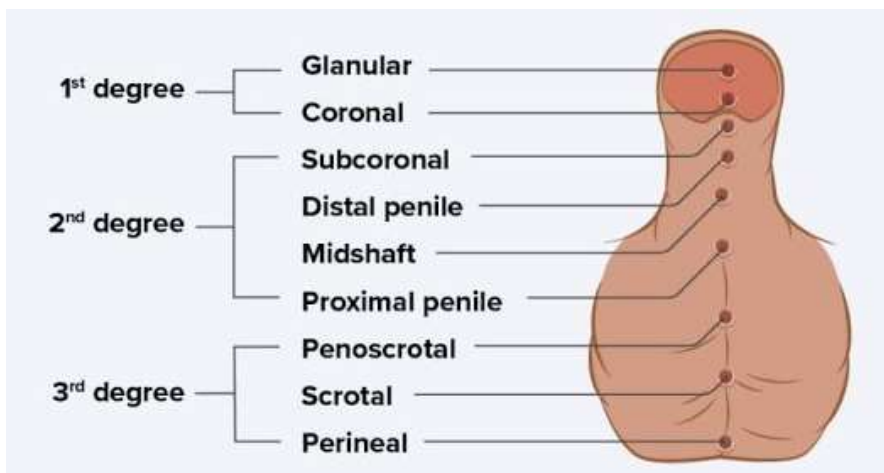


Figure 1. Hypospadian Classification

The treatment that can be done in hypospadias patients is surgery. In general, surgery is performed in two stages, namely chordectomy and urethroplasty. Chordectomy is a correction of the chorde so that it helps to make the penis straight again, while urethroplasty is a surgical procedure by making an external urethral mouth at the end of the glans penis. Some surgical techniques commonly used in distal hypospadias are Mathieu, MAGPI, King, Duplay, Snodgrass, and Onlay. As for proximal hypospadias, the surgery performed is in one or two stages. The one-stage technique is often used TIF (Transcarse Island Flap), TIP (Tubularized Incised Plate), and Koyanagi-Nonomura, while for two stages, the commonly used technique is Bracka (Alam & Wikanto, 2022). The choice of surgical technique performed on each patient is not only adjusted to the location of hypospadias but also adjusted to the capabilities of the surgical operator.

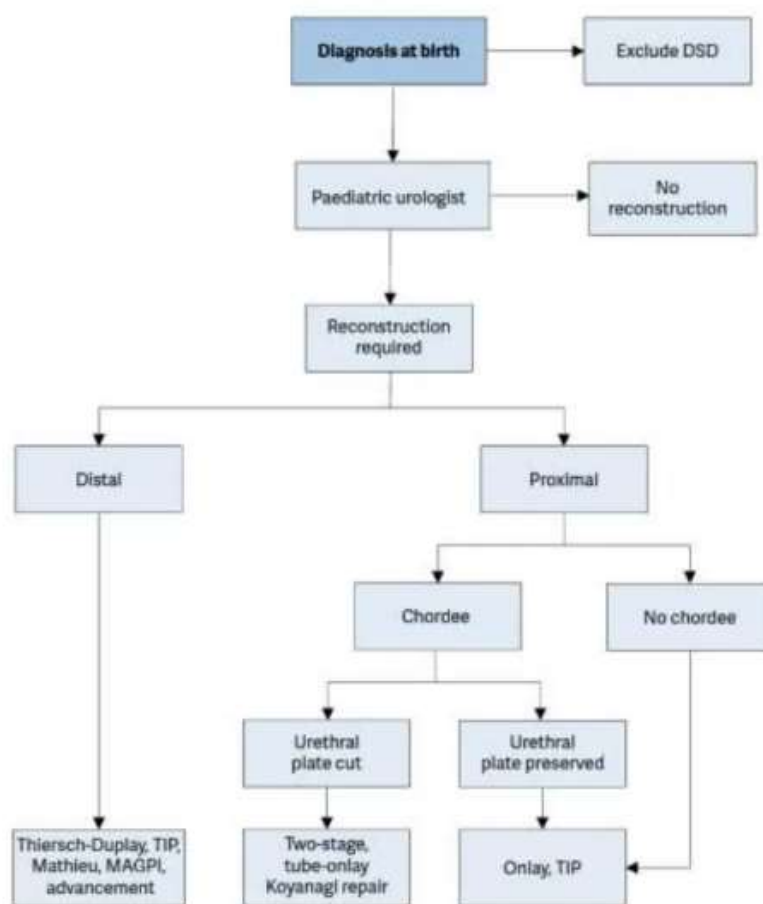


Figure 2. Hypospadiac Management Algorithm

In Indonesia, the most commonly used penile reconstruction technique is urethroplasty. These techniques include Meatal Advancement-Glanuloplasty (MAGPI), Glans Approximation Procedure (GAP), and Tubularization Incision of the Urethral Plate (TIP) (Hidianingsih & Immanuel Hutasoit, 2022). In accordance with the algorithm of hypospadias management, distal hypospadias can be performed surgically with Thiersch-Duplay, TIP, Mathieu, MAGPI, advancement techniques. So that in patient An. K with the position of hypospadias in the distal classification was performed surgically with the TIP technique. As for patient An. R with the position of hypospadias in the proximal classification with no chordee so that the techniques that can be done are onlay and TIP, and the surgical operator chooses to perform the TIP technique on patient An. R. TIP technique is the most commonly used technique in Indonesia, this is because the technique is flexible, the complication rate is fairly low, and produces a vertical urethral mouth, and the most common type of hypospadias found is distal hypospadias (Mahendra Krisna & Maulana, 2017). The surgical technique performed in both patients was the same but the duration of surgery in the two patients was significantly different, in the case found the duration of surgery for patient An. R was longer than patient An. K. It was found that the duration of surgery for patient An. R for 3 hours, while patient An. K for 1 hour and 20 minutes. This was due to the position of hypospadias patient An. R was far from the tip of the glans penis so that the surgical operator had enough difficulty when making the patient's urethral mouth, besides that the surgical operator also made many incisions or incisions on the patient's penile skin which made suturing also quite time-consuming. Posterior structural urethral disease presents challenges for even skilled urologists. The narrow channel between the pubic rami laterally, the pubic symphysis anteriorly, and the rectum posteriorly limits the space for visualisation and suturing (Balzano et al., 2021).

Tubularized Incised Plate (TIP) is a modified technique discovered by Snodgrass. The basic principle of this technique is to make an incision on the midline up to the urethral plate that is adjusted to the position of the hypospadias so that the resulting field can be made a channel for the neourethra. This technique is usually used in hypospadias at the midshaft or distal location but in line with the development of technology and surgical materials, this technique is currently widely used in proximal hypospadias with quite good operating results. The stages performed in TIP technique surgery in general, including first identifying the urethral plate, then designing the part to be incised. After that, make longitudinal incisions on both sides of the urethral plate along the boundary line of the urethral plate and glans wing. Then make an incision on the centre line of the urethral plate. A stent is then inserted, but in this case a silicone foley cath is inserted to support the new urethra, which is then sutured for tubularisation. The sutures on the new urethra are then lined with a flap of dartos fascia, then covered with skin.



Figure 3. Post Operation An. K



Figure 4. Post Operation An. R

CONCLUSION

Hypospadias is a birth defect acquired by male infants. Hypospadias treatment should be done at the age of 6 to 18 months or before entering pre-school age, but some parents are only ready to perform surgery on their children at school age. Hypospadias is classified based on the location of the abnormal meatus. There are several references to the classification of hypospadias. Some are divided into anterior, posterior, and middle, besides that there are also those who classify based on the degree of severity, and there are also those who divide into two parts, namely distal and proximal. There are two stages of treatment that can be performed on hypospadias patients, namely chordectomy and urethroplasty. There are several surgical techniques that can be performed on hypospadias patients, these techniques are adjusted based on the classification or position of hypospadias and also the ability of the surgical operator.

Both patients used the Tubularized Incised Plate (TIP) surgical technique despite having different hypospadias positions but this is appropriate when referring to the hypospadias management algorithm. Although the surgical technique is the same, there is a very different duration of surgery, this is due to the surgical operator who has difficulty when making incisions or incisions to create a new urethral canal because the position of hypospadias is far from the normal position at the end of the glans penis so that the suturing time also takes a long time which causes the duration of surgery to lengthen.

SUGGESTIONS

Hopefully this case study research can be useful for readers and can become literature material. It is hoped that future researchers will conduct a comparative case study of the duration of surgery in patients with different hypospadias positions and different surgical techniques so that it can be seen more clearly the difference in the duration of surgery in patients with different hypospadias locations using different surgical techniques.

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