

Hypospadias Repair in Children: Challenges and Treatment Outcome in Developing Country

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Abstract:

Background:

Hypospadias is a congenital anomaly of the penis and surgical repair is necessary for cosmetic and functional reasons. The aim of this study was to evaluate the outcome of hypospadias repair and the challenges encountered in the treatment of these patients.

Materials and Methods:

This was a retrospective study of children who had hypospadias repair at the pediatric surgery unit of a teaching in Enugu, Nigeria. The study covered a 3-year period. The information analyzed included the patients' age (in months) at presentation, age at surgery, class of hypospadias based on location of the meatus, state of the prepuce (circumcised/uncircumcised), method of hypospadias repair, post-operative complications, outcome and challenges of treatment.

Results:

A total of 36 cases of hypospadias in children were repaired during the study period. The mean ages of the patients at presentation and at surgery were 5 months and 30 months respectively. Coronal hypospadias was the most common type of hypospadias and about two-thirds of the patients were circumcised at presentation. Tubularized incised plate (Snodgrass) method of repair was the predominant technique of hypospadias repair. Twenty-five percent of the patients developed post-operative complications.

Conclusion:

Hypospadias repair is a corrective surgery that aims to achieve good cosmetic and functional results. In the index study, the treatment outcome is good in three-quarters of the patients. However, the repair is fraught with challenges which may include delayed presentation, unnecessary circumcision, paucity of appropriate sutures and magnifying operating loops.

Keywords: children; challenges; developing country; hypospadias; treatment outcome.

1. Introduction:

Hypospadias is a congenital anomaly of the penis in which the urethral meatus fails to open at the tip but opens at the ventral part of the penis. It is a developmental arrest of the male urethra during the 8th and 16th week of intrauterine life [1]. Hypospadias is defined by 3 typical characteristics: urethral meatus located at ectopic (ventral) position; deficiency of the foreskin on the ventral aspect of the penis and ventral penile curvature (chordee). Hypospadias can occur as a single anomaly or in association with other anomalies. Hypospadias is the second most common congenital anomaly in newborn males after undescended testis and its incidence varies between 0.4 – 8.2 per 1000 newborns and 1 in 300 male live births [2]. However, the incidence of hypospadias has been increasing due to environmental pollution [1]. The etiology of hypospadias is not known. However, hormonal factors and genetic predisposition have been incriminated in the pathogenesis [1]. The outcome of hypospadias repair could be assessed by the reoperation rate [3]. The overall complication rates of hypospadias repair ranges from 5% to 56% depending on the severity of the hypospadias [4]. Surgical correction is the mainstay of treatment of hypospadias. Over 300 hypospadias repair techniques have been described [3, 5]. However, most surgeons prefer



tubularized incised plate (TIP) urethroplasty for distal hypospadias [1]. Repair of hypospadias is important because of the patient's psychological, emotional and sexual wellbeing and the success of repair is assessed by cosmetic and functional outcomes [6]. Despite the fact that hypospadias presents a significant burden of disease data in my institution is scarce. So far, there are no published literatures on hypospadias repair from my center. Therefore, this study aims to evaluate the outcome of hypospadias repair and the challenges encountered in the treatment of these patients.

2. Materials and Methods:

This was a retrospective study of children who had hypospadias repair at the pediatric surgery unit of Enugu State University Teaching Hospital (ESUTH), Enugu, Nigeria. The study covered a 3-year period, from January 2018 to December 2020. Children who have had previous hypospadias surgeries were not recruited into the study. Children older than 15 years of age were also excluded from this study. ESUTH is a tertiary hospital located in Enugu, South East Nigeria. The hospital serves the whole of Enugu State, which according to the 2016 estimates of the National Population Commission and Nigerian National Bureau of Statistics, has a population of about 4 million people and a population density of 616.0/km². The hospital also receives referrals from its neighboring states. Information was extracted from the case notes, operation notes, operation register and admission-discharge records. The information analyzed included the patients' age (in months) at presentation, age at surgery, class of hypospadias based on location of the meatus, state of the prepuce (circumcised/uncircumcised), method of hypospadias repair, post-operative complications, outcome and challenges of treatment. The follow-up period was 12 months. Ethical approval was obtained from the ethics and research committee of ESUTH and informed consent from the patients' caregivers was not required due to retrospective nature of the study and identities of the patients were not revealed. Statistical Package for Social Science (SPSS) version 21 (manufactured by IBM Corporation Chicago Illinois) was used for data entry and analysis. Data were expressed as percentages, mean, and range.

3. Results:

3.1. Patients' demographics:

A total of 36 cases of hypospadias in children were repaired during the study period. The mean ages of the patients at presentation and at surgery were 5 months (range: 1-12) and 30 months (range: 12-46) respectively.

3.2. Class of hypospadias (n=36):

The classes of hypospadias are shown in Table 1.

Types of hypospadias	Number of patients (%)
Coronal	26 (72.2)
Distal penile	3 (8.3)
Mid penile	3 (8.3)
Glanular	2 (5.6)
Proximal penile	2 (5.6)

Table 1: Class of hypospadias

3.3. State of the prepuce at presentation (Circumcised/uncircumcised):

Twenty-two (61.1%) patients were circumcised whereas 14 (38.9%) patients were not circumcised.

3.4. Modalities and stages of hypospadias repair:

Thirty-one (86.1%) patients had a single stage tubularized incised plate (Snodgrass) method of repair, whereas 5 (13.9%) patients who had proximal and distal penile hypospadias received 2 stage tubularized incised plate (Snodgrass) method of repair.

3.5. Treatment outcome:

Twenty-seven (75%) patients achieved good outcome (cosmetic and functional) whereas 9 (25%) patients developed post-operative complications. There was urethrocutaneous fistula in 5 (13.9%); meatal stenosis 2 (5.6%) and one (2.8%) each had glans dehiscence and penile torsion.

4. Discussion:

A Greek physician, Galen, first described hypospadias in second century AD. In ancient times, Alexandrian surgeons practiced penile amputation distal to the urethral opening [7]. Currently, several methods of surgical repair of hypospadias have been documented. The goal of hypospadias repair is to achieve good cosmetic and functional normalities [8]. Other reasons for treating hypospadias include splaying of urinary stream, inability to urinate in standing position, penile curvature leading to difficulties during intercourse, fertility issues and unsatisfactory appearance of the genitalia in adulthood [9].

The recommended age for hypospadias repair lies between 6 months and 18 months. These age ranges were arrived at based on risk of anesthesia, penile dimension, treatment outcome, caregivers' choice and psychological impact. At 6 months to 18 months, the child has no genital awareness and does not ambulate. Moreover, hospitalization and anxiety of separation are easier to handle in this age group [6, 10]. In the present study, the mean ages at presentation and at surgery were 5 months and 30 months respectively. This finding is consistent with the report from other developing countries [11, 12]. In contrast, in developed countries, early presentation and early surgical treatment of hypospadias is routine [6]. The delayed presentation in developing countries could be due to financial issues, low parental awareness and lack of access to pediatric surgical specialist services.

Based on the location of the urethral meatus, coronal (distal) hypospadias was the most common class of hypospadias in the index study. This finding also holds true in reports from other researchers [13, 14]. However, other series on hypospadias reported posterior class of hypospadias as the most common types in Asia [15, 16]. Other studies in other parts of the world documented the middle class of hypospadias as the most common [5, Khan]. The exact reason for these differences is not known. However, the setting and the cohort of patients recruited into the specific studies may explain it.

At presentation, there were more patients circumcised. Low levels



of parental enlightenment and the culture of routine neonatal circumcision practiced in developing countries may explain this high number of circumcised patients. Furthermore, most circumcisions in our setting are performed by nurses and inadequately trained persons who may not note the hypospadiac opening before carrying out the circumcision. The surgical concern of circumcision in hypospadias is the loss of vital tissues required as urethroplasty second layer and as ventral cover during hypospadias repair.

In the current study, majority of the patients had tubularized incised plate (Snodgrass) method of urethroplasty. This is consistent with the report of other series on hypospadias [18, 19]. Tubularized incised plate urethroplasty which was described by Warren Snodgrass in 1994, has gained worldwide acceptance for repair of distal and mid penile hypospadias because of its relatively simple surgical concepts, low complication rates and good cosmetic outcome [20, 21]. However, it is worthy to note that the choice of the method of hypospadias repair is at the discretion of the surgeon. This may be based on the surgeon's experience, expertise and type of hypospadias. With regards to the type of hypospadias, proximal and severe types may require staged repair. With respect to the treatment outcome, three-quarters of the patients obtained good functional and cosmetic outcome while one-quarter of the patients developed complications. Urethrocutaneous was the most common post-operative complication recorded in the present study. This is comparable to the published report of other authors on post-operative complications [22, 23]. None of the patients expired.

The challenges encountered in the treatment of these children with hypospadias are several. Delayed presentation, which was also witnessed in the present study, of patients is a regular feature in low/middle countries. Poverty and ignorance may account for the late presentation. The late presentation comes with circumcised penis and the attendant difficulty in repair. The repair of hypospadias requires the use of small sutures such as polydioxanone 6/0 or 7/0. These small sutures may not be readily available and even when available, may have expired. This challenges the surgeon to use bigger sutures that may give unsatisfactory results. The tissues and sutures are small and require some magnification through the use of magnifying operating loops. These operating loops are unavailable and unaffordable. Moreover, there is a learning curve required in the use of operating loops. Hypospadias repair is one surgery that is destroyed by infections. Therefore, potent and effective antibiotics are needed. The cost of these antibiotics prohibits their use in most patients.

5. Conclusion:

Hypospadias repair is a corrective surgery that aims to achieve good cosmetic and functional results. In the index study, the treatment outcome is good in three-quarters of the patients. However, the repair is fraught with challenges which may include delayed presentation, unnecessary circumcision, paucity of appropriate sutures and magnifying operating loops.

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