

Original Article

Challenges of Surgical Repair of Hypospadias in Ile-Ife, Nigeria

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ABSTRACT

Objective: To document the presentation, outcome and challenges of management of hypospadias in a resource-limited setting.

Patients and Methods: For this retrospective study we analyzed the files of all patients with hypospadias managed at the Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria between 1996 and 2006. The parameters studied were the patients' bio-data, clinical presentation, treatment and outcome.

Results: During the 10-year period under review 51 cases of hypospadias were managed. The majority of the patients (n=39, 76.5%) presented within the first year of life with a mean age at presentation of 1 year and 8 months, though most of the repairs were done in the 2nd, 3rd and 4th years of life. Of the 51 patients 46 (90.2%) came from rural and semi-urban areas and 18 (35.3%) had been circumcised before presentation. Surgical repair consisted of preputial island flap in 22 patients (43.1%) followed by a peri-meatal based flap (Mathieu procedure) in 16 patients (31.4%). The MAGPI procedure was used in 5 patients (9.8%) and the Snodgrass procedure in 1 (2%). Staged repair was necessary in 7 patients (13.7%). Post-operative complications were encountered in 15 patients with urethrocutaneous fistula being the commonest one (11 patients, 21.6%).

Conclusion: Our results show that hypospadias can be successfully managed in a low- resource setting

Keywords : Hypospadias, neomeatus, preputial flap, penis, cryptorchidism

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INTRODUCTION

Hypospadias is a common congenital malformation of the penis in which the urethral meatus is abnormally located anywhere along the ventral aspect of the penile shaft down to the perineum. It may be associated with chordee which is often seen in association with the more severe forms. It is classified according to the location of the meatus into: anterior (glanular and sub-coronal), middle (distal penile, mid-shaft, and proximal penile), and posterior (penoscrotal, scrotal, and perineal) hypospadias¹. Several factors have

been implicated in its etiology, including genetic, endocrine and environmental, as well as paternal and maternal risk factors²⁻⁴.

The diagnosis of hypospadias is generally made upon thorough examination of the newborn infant, although nowadays diagnosis is possible by means of prenatal fetal ultrasonography. Hypospadias may be associated with congenital anomalies, of which cryptorchidism and inguinal hernias are most frequently seen⁵.

Table 1: Age at presentation

Age at Presentation	No.	%
1 st year	39	76.5%
2 nd year	6	11.8%
3 rd year	1	2.0%
5 th year	1	2.0%
7 th year	1	2.0%
9 th year	1	2.0%
15 th year	2	3.9%

The treatment of hypospadias aims to ensure a functionally normal urethra and a cosmetically acceptable penis with normal urinary and sexual functions. In former times this repair used to be delayed until the penis had reached a certain size. Currently, most surgeons attempt to repair hypospadias when the child is aged 6-18 months to avoid emotional and psychological complications associated with delayed repair⁶. Moreover, the availability of microsurgical instruments, fine suture material and magnification has improved the results of early surgery.

So far, little has been reported about the presentation and outcome of management of hypospadias in Nigeria and most parts of Africa. Therefore the present study was carried out to document the challenges associated with the management of hypospadias in a tertiary center in Nigeria.

PATIENTS AND METHODS

In this retrospective study we analyzed the files of all patients with hypospadias managed surgically in the pediatric surgical unit of the Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria between 1996 and 2006. The parameters studied were the patients' bio-data, clinical presentation, treatment and outcome. The data were analyzed using SPSS version 13.0.

RESULTS

In total, 51 cases of hypospadias were managed surgically during the 10-year period

under review. Most of the patients presented within the first year of life with a mean age at presentation of 1 year and 8 months (Table 1).

The majority of the patients (n=46; 90.2%) were from rural and semi-urban areas where farming constitutes the main source of income. In 12 of them (23.5%) intra-uterine exposure to herbal substances could be traced.

There was no history of twin gestation, but there was a family history of hypospadias in one patient (2%).

Associated anomalies discovered during clinical examination were cryptorchidism in 3 (5.9%) patients, inguinal hernia in 2 (3.9%), ambiguous genitalia in 1 (2%), and multiple anomalies (VACTERL) in 1 (2%), while the remaining 44 patients (86.3%) had isolated hypospadias.

The location of the meatal opening before surgery is shown in Table 2. Associated chordee was encountered in 30 patients (58.8%). An intact prepuce at the time of presentation was found in 33 (64.7%) patients, while 18 (35.3%) had been circumcised before presentation.

Most of the repairs were done in the 2nd, 3rd and 4th years of life with the mean age at repair being above 3 years (Table 3). The main procedures used for repair were preputial island flap in 22 patients (43.1%) followed by a peri-meatal based flap (Mathieu procedure)

Table 2: Location of meatal opening

Meatal Opening	No.	%
Glanular	6	11.8%
Coronal	14	27.5%
Penile shaft	20	39.2%
Peno-scrotal	8	15.7%
Perineal	3	5.9%

Table 3: Age at repair

Age at Repair	No.	%
1 st year	5	9.8%
2 nd year	17	33.3%
3 rd year	9	17.5%
4 th year	9	17.5%
5 th year	5	9.8%
6 th year	1	2.0%
8 th year	1	2.0%
9 th year	1	2.0%
10 th year	1	2.0%
15 th year	2	3.9%

in 16 patients (31.4%) (Table 4). All patients had urinary diversion with suprapubic cystostomy and insertion of a urethral stent.

The commonest complication was urethrocutaneous fistula which occurred in 11 (21.6%) patients, others were urethral stricture, wound infection and residual chordee encountered in 1 patient (2%) each.

Eighty percent of our patients were lost to follow-up within the first 4 post-operative months. Those with post-operative complications kept their appointments until the problem resolved either spontaneously or otherwise.

DISCUSSION

Hypospadias remains one of the common congenital problems of the genitourinary tract with 1 in every 250 male births affected in the United States of America⁷. The incidence among primary school boys in Eastern Nigeria was estimated to be 1.1% by Okeke et al.⁸. The number of cases in this study included only the surgically operated patients and may not reflect the actual incidence of this malformation in our environment. There are also other pediatric surgery/urology centers in our area, where similar numbers of hypospadias patients may be managed. Therefore a multicenter study involving the other centers

Table 4: Treatment methods

Treatment Method	No.	%
MAGPI	5	9.8%
Mathieu	16	31.4%
Preputial island flap (onlay)	10	19.6%
Preputial island flap (tubularized)	12	23.5%
Snodgrass	1	2.0%
Staged repair	7	13.7%

would have given us a better idea about the true incidence of hypospadias in our environment.

Intra-uterine exposure to agricultural pollutants has been suggested to be a risk factor in the development of hypospadias. Most of the parents of the children in our study live in rural and semi-urban areas and are mostly uneducated farmers with possibly significant exposure to agricultural pollutants and locally prepared herbal concoctions which may contain phyto-estrogens and some forms of anti-androgens³. However, there is no evidence for the use of these pollutants among our farmers. Thus, further studies will be necessary to identify the specific chemical agents our farmers are exposed to.

Clinical examination for inguinal hernia and undescended testes remains a vital part of the evaluation of a child, because these are commonly associated anomalies⁵. However, when hypospadias is associated with unilateral or bilateral undescended testes, the possibility of intersex (disorder of sexual differentiation) necessitates further evaluation⁹. In our study one child had ambiguous genitalia.

Usually patients present in their first year of life, and one of the principles of management is to complete the repair before the age of 18 months to avoid the emotional and psychological complications associated with delayed repair⁶. Most repairs in our series were

done when the parents were financially and psychologically ready, i.e. when the children were between 2 and 4 years old (a comparison of the age at presentation and the age at repair is shown in Fig.1.) The majority of our patients are from a low socio-economic background, and their parents are unable to afford the cost of repair at initial presentation. Because health care for children is unaffordable for many, a large number of patients are on the waiting list for surgery pending availability of funds. The cost of hypospadias repair is about 60,000 NGN (\approx US\$500) which is about 4-6 times the average monthly earning of most of the parents of our study and about 3-4 times the average monthly earning of a civil servant in our environment.

Delayed treatment often is also due to the lack of facilities at our hospitals. This is one of the peculiarities in developing countries where the cost of treatment, limited theatre space and lack of facilities for genetic sex confirmation render some aspects of treatment very challenging¹⁰. In most hospitals in our environment there are no designated operating rooms; available theatre spaces are shared between various surgical units in such a way that all pediatric surgical cases, including the urological ones, can be managed only on one particular day of the week (one theatre space/week). Thus, patients are sometimes scheduled for surgery months after they are ready for the procedure. In addition, incessant industrial actions, poor electricity

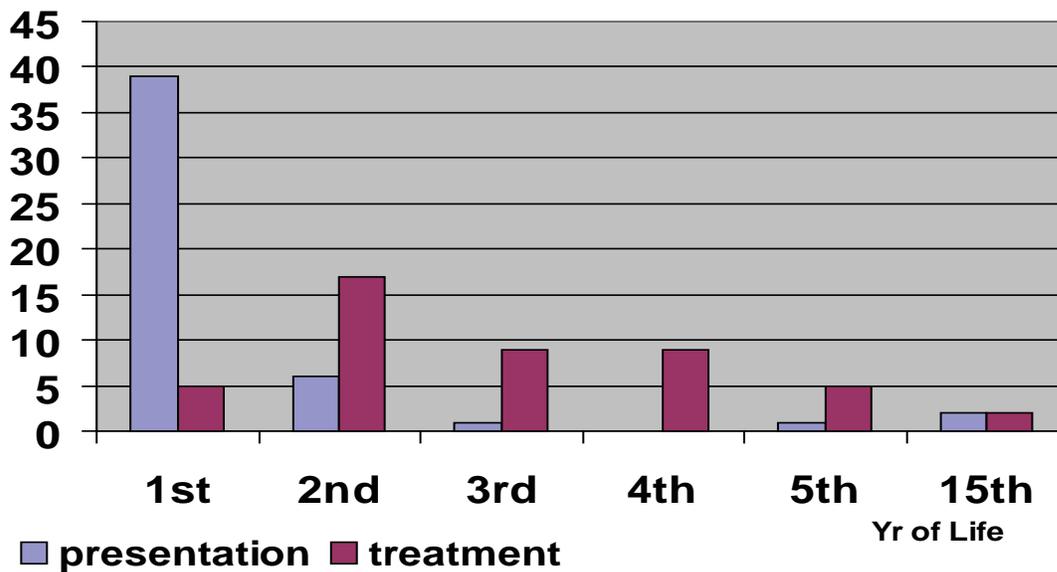


Fig. 1: Comparison of age at presentation and repair

supply and unavailability of necessary material contribute to the delays.

The preputial skin is considered the ideal material for the reconstruction of flaps for hypospadias repair because it is relatively thin and pliable with a good blood supply, it is easily mobilized on a pedicle and it tolerates prolonged contact with urine better than any tissue other than bladder mucosa¹¹. Circumcision in our environment is mostly done by the Village Health Workers (VHWs), Traditional Birth Attendants (TBAs) and Community Health Extension Workers (CHEWs) who may not understand the importance of an intact prepuce for the repair of hypospadias. When the preputial skin has been removed before presentation, the options available for reconstruction are limited, especially in proximal hypospadias. A multi-stage procedure may be necessary to correct all the abnormalities, which involves multiple hospital admissions, anesthesia and surgery with an increased cost of repair, an increased risk of anesthesia and surgery and a less satisfactory overall outcome. Thus, better health education should be offered to the community

health care providers to avoid circumcision in a child with hypospadias, because about 1 out of every 3 of our patients with hypospadias had circumcision before presentation.

Several methods of repair have been introduced in the history of hypospadias surgery and in the last decade significant progress in the knowledge and management of external genital anomalies has been achieved. This has led to a considerable improvement in surgical approaches with a subsequent decrease in complications and improved cosmetic outcomes^{12,13}. Whichever method is used, the objective is to achieve a functionally normal urethra and a cosmetically acceptable penis with good urinary and sexual function¹⁴. Multi-stage repair methods were earlier described, particularly for proximal cases with severe chordee, but there are many single-stage procedures which are widely used in modern practice and popularised according to the severity of chordee and the location of the meatus. These methods include MAGPI for cases with a glanular location of the meatus¹⁵, the peri-meatal based flap for cases without chordee¹⁶, and preputial tube flaps for cases with

chordee^{6,17}. More recently, Snodgrass introduced the tubularised incised urethral plate (TIUP) as an alternative method for cases without chordee or with minimal chordee to achieve a cosmetically acceptable neo-meatus¹⁸. No single method will be sufficient to treat all forms of hypospadias, hence the need for a surgeon involved in the treatment of hypospadias to gain experience in most of these procedures and to update his knowledge as newer techniques are emerging.

Despite the limitations described, we have achieved acceptable results in the treatment of our patients with hypospadias. The most common early complication encountered was urethrocutaneous fistula which required a secondary operation in some of the patients.

Post-operatively, we would like to see our patients once a month up to 6 months when they can be referred to a private or public hospital closer to their homes for further follow-up. However, post-operative follow-up remains a major problem in our environment, because the referral systems are not well organised. Telephone services are also not widely available in rural areas, and the financial burden of keeping clinic attendance is enormous for such patients who, in most cases, are from a low-income social background.

In conclusion, hypospadias is a common congenital problem in the pediatric age group. In developing countries management may be challenging because of the poor population who may not be able to readily afford the cost of treatment. Wide-spread health education is necessary to reduce the high rate of circumcision in these patients and thus to increase their chance of successful repair. Provision of free access to surgical repair for such patients and improvement of the referral scheme to ensure proper post-operative follow-up will also solve some of these problems. In addition, adequate provision of necessary hospital equipment will increase the success rate of primary surgery.

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