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Clinical profile and management outcomes of paediatric undescended testes in a Nigerian tertiary hospital: An 11-year review

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Abstract

Context: Undescended testis (UDT) is a common urogenital abnormality in male children, and early intervention is imperative to prevent impaired spermatogenesis or malignant transformation.
Objective: This study analysed and documented the presentation, pattern, and management outcomes of paediatric UDT at the University of Uyo Teaching Hospital (UUTH), South-South, Nigeria.
Methods: This was an 11-year retrospective descriptive study of children managed for UDT at the Paediatric Surgery Unit of UUTH between January 2012 and December 2022. Data were extracted from case notes using a structured proforma, documenting age, clinical presentation, surgical procedures, and postoperative outcomes. Statistical analysis was performed using SPSS version 24, and results are presented as frequencies, percentages, and medians with interquartile ranges (IQR).
Results: Sixty-five children were treated for UDT, with ages ranging from 7 months to 15 years (median: 5 years, IQR: 2–9 years). The most common presenting complaint was an empty scrotum in 51 patients (78.5%). Three-quarters of the patients (78.5%) presented after their first birthday, with the most frequent reason for delay being advice from healthcare workers to wait indefinitely. The right testis was undescended in 30 patients (46.1%), the left in 15 (23.1%), and bilateral in 20 (30.8%). Forty-seven (72.3%) had palpable testes, while 18 (27.7%) were nonpalpable. The canalicular position was the most frequent testicular location (48.2%), and the most common associated anomaly was congenital hernia or hydrocele (97%). Single-stage orchidopexy was performed in 53 patients (81.5%), two-stage in 8 (12.3%), and orchidectomy in 4 (6.2%). The overall success rate for orchidopexy was high, with a 21.5% complication rate, the most common being scrotal surgical site infection (13.8%).
Conclusion: Undescended testes is a common condition in male children with good surgical outcomes when treated early. In our study, most patients presented after their first birthday, often due to delayed referral by healthcare workers. Early referral and awareness campaigns are essential to reduce delays and improve outcomes.

Keywords: Cryptorchidism, Undescended testis, Orchidopexy, Delayed presentation, Paediatric surgery, Nigeria

Introduction

Undescended testis (UDT) is one of the most common urogenital abnormalities in male children, marked by a failure of the testis to descend into the fundus of the scrotum along its normal path of descent. The global prevalence varies, from approximately 4% to 5% at birth, decreasing to about 1% to 1.5% by one year of age.[1] In premature male neonates, the prevalence can be as high as 30%.[2]

Elevated temperatures in the abdominal or inguinal

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regions can adversely affect germ cell development, lower fertility, and increase the risk of testicular cancer later in life.[3,4] The risk for infertility is higher in patients with bilateral UDT.[5] The primary goals of orchidopexy are to reduce the risk of malignancy, position the testes for regular testicular self-examination, and potentially enhance testicular volume and preserve fertility.[5,6] The timing of surgery plays a critical role in influencing both fertility outcomes and cancer risk. Studies indicate that early orchidopexy can have a positive impact on sperm count.[6] Furthermore, a Swedish study found that men undergoing orchidopexy after age 13 had a 5.4-fold increased risk of testicular cancer, whereas those who had surgery before this age had a reduced relative risk of 2.23.[6,7]

Treatment guidelines recommend referral to a paediatric surgeon or paediatric urologist by six months of age if the testes have not descended or were diagnosed later.[6] Early detection and intervention (preferably before two years) are essential to prevent associated complications. However, delayed presentation and treatment are frequently reported across Nigeria.[8-11]

Despite this, there is limited data, particularly from South-South Nigeria, on the presentation patterns and management outcomes of UDT. Understanding these factors is key to identifying barriers to early treatment and improving referral practices. This study seeks to address this gap and contributes to existing literature by analysing an 11-year experience in managing UDT at a tertiary hospital in Southern Nigeria.

Materials and methods

Study Setting and Design

This retrospective, descriptive study was conducted at the University of Uyo Teaching Hospital (UUTH), Uyo, Nigeria, a 500-bed tertiary referral centre located in South-South Nigeria. The hospital provides specialist medical and surgical services and receives referrals from primary and secondary health facilities across Akwa Ibom State and neighbouring states. It serves an estimated catchment population of over five million people. The Paediatric Surgery Unit is staffed by consultant paediatric surgeons, specialist registrars, paediatric nurses, and provides care in Paediatric General Surgery, including Paediatric Urology. The study covered an 11-year period, from January 2012 to December 2022.

Study Population and Eligibility Criteria

The study included all children aged 15 years and younger who were diagnosed with undescended testes and received treatment at UUTH during the study period. Patients with incomplete records or those who did not complete treatment at UUTH were excluded. Six case records could not be retrieved during data collection and were therefore excluded from the analysis. Given the retrospective nature of the study, a consecutive sampling method was used, where all eligible and available cases within the study period were included. No formal sample size calculation was performed, as all available hospital records of children with UDT were used.

Data Collection and Study Variables

Data were extracted from patient case notes and surgical records using a structured data abstraction form developed by the researchers. Extracted variables included ages, clinical presentation, and diagnostic methods. Delayed presentation was defined as presentation after 1 year of age. Additional data collected included testicular location, size, consistency, surgical interventions, and postoperative complications.

Data Analysis

Statistical analysis was conducted using SPSS version 24 for Windows.[12] Categorical variables were summarised as frequencies and percentages, while continuous variables, which were not normally distributed were reported as medians with interquartile ranges (IQRs).

Ethical Considerations

Ethical principles outlined in the Declaration of Helsinki were adhered to throughout the study. Given the retrospective nature of the research, patient data were anonymised, and confidentiality was maintained in accordance with institutional standards

Results

A total of 65 male children had surgery for undescended testes during the study period. Their ages at presentation ranged from 2 months to 15 years, with a median age of 5 years (IQR: 19 months–8 years). Fifty-one patients (78.5%) presented after their first birthday, while 14 patients (21.5%) were first seen as infants.

The most common reason for delayed presentation was advice from a healthcare provider to wait until the child was older (18 cases, 35.2%). Additionally, 12 parents (23.5%) admitted fear of surgery as a reason for delay (Table 1).

Clinical Findings

The most common presenting symptom was an empty scrotum in 51 patients (78.5%). Groin swelling from an ipsilateral hernia or hydrocele was the presenting complaint in 13 patients (20.0%). In other patients, hernias or hydroceles were not part of the initial complaint but were identified during clinical or intraoperative evaluation. Overall, 76 associated congenital anomalies were recorded, the most common being inguinal hernias (57 cases, 87.7%) and hydroceles (6 cases, 9.2%).

Thirty patients (46.1%) had a right-sided UDT, 15 (23.1%) had left-sided UDT, and 20 (30.8%) had bilateral involvement, giving a right-to-left ratio of 2:1. Of the 85 affected testes, 61 (71.8%) were palpable. Clinical findings are summarised in Table 2.

Diagnosis was made clinically in all patients. However, Ultrasonography was requested in patients where the testes could not be palpated clinically. Thirteen non-palpable testes were accurately located out of 24 cases (54.2%). Due to the lack of facilities, diagnostic laparoscopy was not available as an option in this study.

Table 1: Reasons for Delayed Presentation Among Children with Undescended Testes (n = 65)

REASONS FOR DELAYED PRESENTATION	FREQUENCY (n=65)	PERCENTAGE (%)
Advised by a Doctor/Health worker to wait till the child is older or starts school	18	27.7
Fear of Surgery	12	18.5
Parent did not notice it	10	15.4
Financial constraints	8	12.3
Parent did not feel it was a problem/It was not painful	2	3.1
No access to specialist	1	1.5
No reason given	14	21.5
TOTAL	65	100.0

Table 2: Presenting Symptoms, Laterality, Palpability, and Associated Anomalies in 65 Children with Undescended Testes

PRESENTING SYMPTOM (n=65)	FREQUENCY	PERCENTAGE (%)
Empty scrotum	51	78.5
Groin swelling (hernia/hydrocele)	13	20.0
Acute scrotal pain/Testicular torsion	1	1.5
AFFECTED SIDE (n=65)		
Right	30	46.1
Left	15	23.1
Bilateral	20	30.8
PALPATION (n=85)		
Palpable	61	71.8
Nonpalpable	24	28.2
ASSOCIATED ANOMALY (n=76)		
Inguinal Hernia	57	87.7
Hydrocele	6	9.2
Hypospadias/DSD	6	9.2
Bladder Exstrophy	3	4.6
Omphalocele	1	1.5
Posterior Urethral valve	1	1.5
Prune belly syndrome	1	1.5
Anorectal malformation	1	1.5

Note: Laterality and presenting symptoms are reported per patient (n = 65), while palpability is reported per affected testis (n = 85). The total number of associated anomalies (n = 76) reflects the fact that some patients had multiple anomalies.

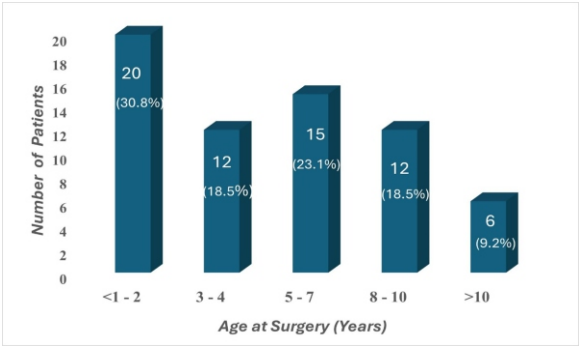

Figure 1: Age Distribution of Patients at Surgery for Undescended Testes (n = 65)

Table 3: Intraoperative Findings for 85 Undescended Testes

FINDING	FREQUENCY (n = 85)	PERCENTAGE (%)
A. LOCATION		
Canalicular (Inguinal)	41	48.2
High Scrotal	22	25.9
Deep inguinal ring (Peeping)	14	16.5
Abdominal	8	9.4
Total	85	100.0
B. MORPHOLOGY		
Macroscopically normal	66	77.6
Small and soft/atrophic	17	20.0
Rudimentary	2	2.4
Total	85	100.0

Treatment

Ages at surgery ranged from 7 months to 15 years, with a median age of 5 years (IQR: 2–9 years). Twenty patients had surgery before age two (30.8%), with 10 patients (15.4%) operated on before one year (Figure 1).

During surgery, 41 testes (48.2%) were found in the inguinal canal, the most common location. High scrotal positioning was noted in 22 testes (25.9%). (Table 3).

When palpated and compared to the contralateral testes, 66 (77.6%) were reported as normal in size

Table 4: Surgical Procedures Performed and Treatment Outcomes in 65 Patients

	FREQUENCY (n = 65)	PERCENTAGE (%)	SUCCESS RATE
A. PROCEDURE			
One-stage Orchidopexy (+Herniotomy)	53	81.5	94.3%
Two-stage Orchidopexy	8	12.3	50.0%
Orchidectomy/Excision	4	6.2	100.0%
• Rudimentary Testes	1		
• Post-pubertal patient	3		
B. COMPLICATIONS			
Superficial SSI of the Scrotal Skin	9	13.8	
Testicular retraction	5	7.7	
Total	14	21.5	

Note: SSI = Surgical Site Infection

and consistency, while 17 (20.0%) were reported as either small and soft or atrophic.

One-stage orchidopexy was performed in 53 patients (81.5%), with a 94.3% success rate. Orchidectomies were performed in four patients (6.2%) due to rudimentary testes or post-pubertal age at presentation. Complications were uncommon, affecting 14 patients (21.5%). The most frequent complication was superficial surgical site infection of scrotal skin (9 cases, 13.8%). Treatment modalities and outcomes are summarised in Table 4.

Discussion

Cryptorchidism, or undescended testis (UDT), is a common congenital anomaly encountered in paediatric surgical practice.[13] Timely diagnosis and surgical intervention are essential to reduce the risks of impaired fertility and malignant transformation. However, in resource-limited settings, challenges such as late referral, delayed presentation, and limited access to diagnostic facilities often hinder optimal management. In this study, we assessed the patterns of presentation, clinical and anatomical findings, and management outcomes of children treated for UDT at a tertiary referral centre in South-South Nigeria, with the aim of identifying gaps in care and proffering strategies to promote earlier intervention.

In our study, more than three-quarters of patients presented after their first year of life, with delayed referrals from primary healthcare provider cited as the most common reason. This is concerning because prolonged exposure to higher temperatures in the abdomen or inguinal region can lead to the gradual reduction and degeneration of germ cells within the testis, thereby compromising fertility and increasing the risk of malignancy.[14] Early orchidopexy has been shown to mitigate these risks. Feyles et al., found that boys who had surgery within their first year of life were much more likely to have normal sperm count and motility compared to those who had the procedure later.[15] These finding support international guidelines which advocate for early orchidopexy. Specifically, the American Urological Association recommends the surgery between 6 months and 1 year of age for boys with undescended testes, while the European Association of Urology advises that the testis should ideally be in the scrotum by age 1, or by 18 months at the latest.[6,16,17]

Delayed presentation is a common finding in many studies within our subregion. Ekwunife et al.[8] reported that only 28.3% of their patients presented within the first year of life, while Shitta et al.[10] found that 53% presented after 18 months. In a similar trend, Agbo et al. observed that 91.9% of patients presented after the age of two years. Common reasons cited for delayed presentation in the literature include delayed diagnosis and the hope that the testis would spontaneously descend.[8,18,19] These delays are often influenced by the primary care doctor's limited familiarity with current management guidelines for UDT.[20-24] Lim et al.[22] highlighted knowledge gaps among primary care providers regarding the timing and urgency of UDT intervention, finding that many were unaware that surgery should ideally occur before the age of one year. Additionally, only 65% of healthcare providers in their study could correctly identify a physical sign of UDT, and many believed that waiting indefinitely for spontaneous descent was acceptable. This misconception can contribute to delays in referral, as children with asymptomatic presentations may be advised to defer specialist evaluation for convenience rather than clinical necessity. Boehme et al.[23] found that only 41% of general medical practitioners were aware of current referral guidelines, and that children referred by them often underwent surgery at a later age. It is therefore important to strengthen undergraduate and continuing medical education on the timely management of undescended testis.

We found that more than two-thirds of our patients had palpable testis allowing for clinical diagnosis without the need for advanced imaging. This aligns with findings of by Ameh and Mbibu[25] as well as Ekpemo and Onyearugha[9] who reported that 74% and 75% of their patients, respectively, presented with palpable testis. However, in contrast, Kadilo et al.[26] reported that only 27.5% of patients had palpable testes in a Tanzanian study, a difference that may

reflect geographical variations or the larger sample size in their cohort. Nonpalpable testes present a unique diagnostic challenge, particularly in resource-limited settings where imaging options may be constrained. Ultrasound is frequently used in our context due to its accessibility and ease, but its accuracy in locating nonpalpable testes, especially those situated intra-abdominally, is limited.[27] The sensitivity of ultrasound has been reported at 45% and its specificity at 78%.[28] Other studies have shown that ultrasound failed to accurately locate UDT in 48–56% of cases.[25,29,30] Our findings are consistent with these reports, as ultrasound accurately identified the location in more than half of the cases in our cohort. Studies have demonstrated that experienced clinicians often have greater success in locating undescended testes by clinical examination than through imaging techniques like ultrasound, computed tomography or magnetic resonance imaging, which have limited sensitivity for identifying soft tissue masses smaller than 1 cm.[27] For this reason, diagnostic laparoscopy followed by laparoscopic orchidopexy is now recommended as the preferred method for assessing and managing nonpalpable testes.[1,31] However, the unavailability of laparoscopy at our facility underscores the ongoing impact of resource constraints on diagnostic and treatment options in our setting.

The surgical management of UDT varies depending on the location of the testis. In our study, one stage orchidopexy was the most frequently performed procedure. One-stage orchidopexy with spermatic vessel preservation is the standard procedure for palpable inguinal testes.[9,25,26,32] However, intra-abdominal testicles are often limited by short spermatic vessels, and a two-stage orchidopexy is often necessary to reduce the risk of vascular compromise. We performed two-stage open orchidopexies in eight patients. In seven of these, staged traction and mobilisation were used to achieve gradual elongation of the spermatic cord, while one patient underwent a open Fowler-Stephens procedure. Two patients experienced testicular retraction following the second stage orchidopexy. Additionally, in two other patients, we were unable to successfully mobilise the testes to the base of the scrotum even after the second stage, yielding a 50% success rate for this approach. This limitation may be attributed to the extremely short length of the testicular vascular pedicle. These outcomes align with the findings of Ameh and Mbibu,[25] as well as Gasana et al.[30] As with many studies from our region, all surgeries in our study were performed via an open approach due to the lack of paediatric laparoscopy facilities at the time of this report.

The management of post pubertal patients with unilateral UDT is controversial. Some studies suggest that testicular preservation may be beneficial in select cases due to findings of residual testicular function in some of the cryptorchid testes.[33-35] However, most guidelines continue to recommend orchidectomy in these patients due to the increased risk of malignancy associated with a retained undescended testis.[31,36,37] In our series, all post-pubertal patients with unilateral undescended testes had orchidectomies. Our decision to perform orchidectomy in these cases reflects the need to prioritise long-term safety over potential preservation of function, particularly given the limited potential for fertility in the unilateral UDT at this stage

Overall, our complication rate was low, with superficial surgical site infection of the scrotal skin being the most frequently encountered issue. These findings are consistent with reports from other centres, which also report low complication rates and good surgical outcome.[10,25,26,38] Despite the resource limitations within our setting, our results demonstrate that effective and safe management of UDT is achievable, with the majority of patients experiencing positive short-term outcomes following surgery.

This study has some limitations. Its retrospective design relied on medical records, which may have introduced information bias, as data collection and documentation were not planned prospectively. This could have influenced the level of detail available for certain variables, such as reasons for delayed presentation. Additionally, the study focused on immediate postoperative outcomes. There was no data on the long-term follow-up and outcomes of management, particularly concerning fertility and malignancy risks in adulthood.

Conclusion

This study examined the clinical presentation, anatomical patterns, and management outcomes of undescended testes in children at a tertiary hospital in South-South Nigeria. The study highlights that most children with undescended testes presented after

infancy, often following advice from healthcare workers to wait. Canalicular testes were the most frequent anatomical finding, and congenital hernia or hydrocele was the most common associated anomaly. Despite delayed presentation and limited access to advanced diagnostic tools, single stage orchidopexy was successfully performed in most cases, with low complication rates. To further improve these outcomes, we recommend targeted education for primary healthcare providers, routine neonatal screening for UDT by healthcare workers, and community awareness campaigns to encourage timely presentation. Additionally, further research with long-term follow-up is needed to assess the impact of early intervention on fertility and malignancy risks in adulthood.

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