

NIGERIAN

Journal of Urology

A Publication of Association of Urological Surgeons, Nigeria
(NAUS)

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PREFACE**Advancing Urological Excellence in a New Era:**

It is with great pride and a sense of profound responsibility that I welcome you to the first issue (Volume 11 issue 1) of 2026 of the Nigerian Journal of Urology (NJU). As we step into 2026, the landscape of urological practice in Nigeria and the wider West African sub-region continues to evolve, marked by an inspiring blend of academic rigor and clinical innovation.

This issue arrives at a pivotal moment. We are witnessing a significant expansion in specialized urological infrastructure across the country, evidenced by the commissioning and successful operations of several dedicated urology centers with Robotic Systems. These milestones are not merely architectural achievements; they represent a commitment to improving patient outcomes through centralized, high-quality care and specialized training.

The contents of this issue reflect the diverse and complex challenges we face in our daily practice. From the perennial battle against urological malignancies to the complexities of reconstructive surgery and endourology, the research presented here underscores our collective drive for excellence. A recurring theme in this volume is the concept of "frugal innovation." In our resource-limited environment, the ability to adapt global standards to local realities is not just a skill but a necessity. The papers featured in this issue highlight how Nigerian urologists are leveraging implementation science to bridge the gap between high-tech advancements and practical, accessible clinical care.

Furthermore, as the official publication of the Association of Urological Surgeons, Nigeria (NAUS), the NJU remains committed to the advancement of medical education. The integration of robust clinical research into the curriculum for the next generation of urologists is essential for the sustainability of our specialty. We continue to encourage submissions that explore medical education and residency training frameworks tailored to our unique socio-economic context.

I would like to extend my deepest gratitude to the authors for choosing this journal as the home for their intellectual contributions. My thanks also go to our dedicated peer reviewers, whose meticulous evaluations ensure the scientific integrity of our publication, and to the editorial board for their unwavering support.

As we look forward to the remainder of 2026, I invite all fellows, residents, and researchers to continue sharing their findings. It is through this exchange of knowledge that we will continue to elevate the standard of urological care in Nigeria and beyond.

I trust you will find this issue both informative and professionally enriching.

Prof. Muhammed Ahmed

Editor-in-Chief, Nigerian Journal of Urology (NJU)

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ARTICLE SUBMISSION GUIDELINE**About**

Nigerian Journal of Urology is an official publication of Association of Urological Surgeons, Nigeria (NAUS) which was established in 2011. It is a peer-reviewed Journal that publishes articles related to the science and practice of Urology. It is a biannual publication appearing in March and September of each year.

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Nigerian Journal of Urology (NJU) is a biannual publication (One volume with two issues each year) appearing in March and September. It publishes articles related to the science and practice of Urology.

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Prof. Muhammed Ahmed

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Diet and Bladder Pathophysiology

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ABSTRACT

The role that dietary factors play in the etiology of various diseases including overactive bladder syndrome (OAB), lower urinary tract syndrome (LUTS), and other urinary tract disorders is very important. The urinary bladder is an essential component of the genitourinary system that is adapted for reception, storage and excretion of large amounts of urine. Any disorder affecting the bladder negatively impacts an individual's quality of life. There is an increasing incidence of urinary tract disorders, and this comes with the need to understand the influence of external factors/choices, in this case diet, on the structure and function of bladder. There is not much literature on the impact of diet on normal bladder physiology, however, numerous studies are pointing to the role that diet has in the development of OAB, bladder outlet obstruction, LUTS and bladder cancer. This review examines the relationship between dietary macro/micro-nutrient choices and bladder physiology as well as the influence that dietary choices have regarding the incidence of various bladder pathophysiology.

Keywords: Bladder; physiology; diet; LUTS, overactive bladder, bladder obstruction

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INTRODUCTION

The bladder is a crucial component of the urinary system that serves as a storage area for urine until higher centers within the central nervous system initiates the micturition process. It is divided into 2 parts; a body and a base [1]. The bladder wall is made up of numerous smooth muscle fibers with individual cells integrally connected that are aligned in a variety of directions and are called detrusor muscle. The connection between the smooth muscle cells of the detrusor is strengthened by the presence of gap junctions and this helps it perform its major

function which is to contract during urination to void the contents of the bladder into the urethra. It also relaxes to allow for the storage of urine in the bladder [2]. The intertwining of smooth muscle cells and the formation of gap junctions also help in the rapid dissemination of signals from the nervous system to every bladder cell [1]. The base of the bladder controls the outflow of urine and is made up of the trigone, anterior bladder walls, and vesicoureteral junction [3].

The autonomic nervous system determines if the bladder continues to store urine while it is still

relaxed, or if it contracts to expel urine [4]. Some level of conscious control over the release or continuous storage of urine in the bladder is also made possible through the somatic nervous system [5].

Dietary intake has an impact on a variety of metabolic and physiological processes and the cause and effect relationships between the diets which we consume and the etiology or prevention of diseases is being studied, although it is extremely challenging [6]. Diets are made up of macro and micro nutrients. Each macronutrient, consumed in large quantities; carbohydrate, protein, and fat, has its own set of health-promoting properties, but they all provide energy [7]. Micronutrients, particularly calcium, sodium, potassium, zinc, iron, vitamin D, and folic acid, are introduced in small amounts but are required for metabolic and physiologic processes [8]. A balanced diet contains all of the individual macronutrients (and micronutrients) essential for an individual's welfare and health [9]. The intake of a well-rounded diet is important as it has been observed that deficiency in one or more of the nutrients either macro or micro is linked to several non-communicable diseases [9].

Influence of Diets on Bladder Physiology

The content of diet has an impact on bladder function [10]. The effect of diets on smooth muscle function has been investigated and a strong association has been shown; with diets rich in calcium showing reducing effects on hypertrophy smooth muscle cells of the cardiac syncytium [10]. Diets rich in blueberries have also been shown to affect the contraction of vascular smooth muscle. It was seen that blueberries appear to affect vascular smooth muscle cells via endothelial mediator release, possibly involving the NO–cyclic GMP system. It was also reported that it prevented vascular smooth muscle contractions induced by α -adrenergic receptor agonists [11]. The detrusor muscle is a major constituent of the bladder and a large portion of this is made up of smooth muscle fibres that are longitudinal and circular [2]. Adediji et al.,

hypothesized that dietary macronutrient composition of food could have an effect on detrusor smooth muscle hypertrophy and contraction in animals with normal bladders [10]. It was discovered that animals fed with high fat had a change in the overall morphology of their bladder; with an increase in bladder weight and thickness. Experiments to determine the contractile force of the detrusor of high fat diet (HFD) fed animals showed a reduction in contractile force in response to electrical stimulation [10]. All these show the negative high fat induced changes in the urinary bladder which could worsen with underlying disease conditions.

In another study by Adediji and Olapade-Olaopa, it was reported that the constituents of diets affected a lot of growth factors and mediators that are involved in the inflammatory process and fibrosis in the bladder. High intake of diets high in fat was noted as the major dietary macronutrient that causes an elevation of these growth factors and mediators, leading to fibrosis and abnormal collagen composition of the bladder [12].

Dietary intake has been directly linked to conditions like obesity, with the combination of high carbohydrate and fat intake seen to increase the risk overweight and obesity [13]. Individuals with obesity are predisposed to developing metabolic syndrome as it is strongly linked to a lifestyle that includes easy access to an endless supply of high-calorie, low-nutrient-dense foods as well as physical inactivity [14]. Visceral obesity, dyslipidemia, glucose intolerance, insulin resistance, and hypertension are just a few of the metabolic risk factors that accompany metabolic syndrome, as well as its relation to lower urinary tract symptoms which has adverse effects on the bladder [9,10,15].

Dietary Factors Associated with Bladder Pathophysiology

Overactive Bladder

The International Continence Society defines an Overactive Bladder (OAB) as a condition with characteristic symptoms of “urinary urgency,

usually accompanied by frequency and nocturia, with or without urgency incontinence, in the absence of urinary tract infection or other obvious pathology” [16]. OAB is usually diagnosed in the absence of metabolic disorders, urinary stress incontinence, or urinary tract infection [17]. Although the cause of OAB in different individuals can vary from one person to another, each theory explains the overactivity of the detrusor muscle [17]. The afferent pathway of the bladder is affected by OAB syndrome and at a low bladder volume, there is usually a desire to void [18]. The detrusor muscle is richly supplied by a lot of nerves and only a partial denervation may cause muscle contractions that leads to a desire for urinary incontinence [18].

Overactive bladder is a common chronic condition that has been linked to a lower quality of life and there is an increasing body of evidence investigating the effect of diet on OAB [19]. In a study by Dallosso *et al.*, where they investigated the effects of diets and other lifestyle factors on the incidence of OAB and it was reported that an increase in the consumption of vegetables reduced the risk of the onset of OAB [20]. The cohort study was conducted on 7046 community dwelling women and identified a positive correlation between obesity, carbonated soda consumption and overactive bladder symptoms. With the increased intake of high fat food, a predisposing factor for developing obesity, it has been implicated in the progression of overactive bladder symptoms [19]. The reduced risks noted with increased vegetable intake have been attributed to the many vitamins and minerals present in vegetables [20].

Independent studies by Adedeji *et al.*, revealed that consumption of diets high in carbohydrate on the other hand, may cause bladder overactivity by increasing Ca^{2+} sensitization both directly and indirectly via Myosin Light Chain Kinase and Rho-kinase respectively which results in increased detrusor muscle contractility beyond normal [10].

Bladder Outlet Obstruction

Bladder outlet obstruction (BOO) is a disorder that is particularly prevalent among older males and it

results from a variety of functional or anatomic etiologies and it often produces lower urinary tract symptoms (LUTS) [10]. Symptoms of BOO could include reduced urinary stream, post voiding urinary dribbling, feeling of incomplete bladder emptying and hesitancy [21]. Functional obstruction can be caused by detrusor-sphincter dyssynergia (DSD), which affects the smooth muscle or the rhabdosphincter; primary bladder neck obstruction, which can be both functional and anatomic; or dysfunctional voiding, which is linked to learned voiding disorders or pelvic floor dysfunction linked to pain syndromes. The most common causes of anatomic obstruction in men are benign prostatic enlargement (BPH) and urethral stricture. Incontinence procedures are the most common cause of anatomic obstruction in women [21].

Adedeji *et al.*, 2018 studied the effect of dietary macronutrients on animals with experimentally induced BOO. It was observed that animals with BOO fed with high fat and high protein diets had an increase in the weight and thickness of their bladder; hypertrophy of the bladder [10]. The high fat diet induced changes in the bladder morphology of the BOO animal's decreases detrusor's compensatory ability to expel urine against the obstruction which could be explained by a decrease in myosin content in hypertrophying smooth muscle [10]. The decrease in myosin content stated above is due to the inability of the rate of synthesis of myosin to be on par with the increasing smooth muscle volume of the detrusor; a result of hypertrophy due to high fat diet intake [22]. Rho Kinase I (ROK-I), Rho Kinase II (ROK-II) and Myosin Light Chain Kinase (MLCK) activity were observed to be elevated in BOO animals fed with high carbohydrate diet (HCD). Increase in MLCK activity occurs when there is an elevation in intracellular Ca^{2+} which causes calmodulin to be activated and causes the phosphorylation of myosin light chain (MLC) by MLCK, eventually, smooth muscle contraction occurs [23]. An increase in MLCK activity causes an increased detrusor tone and contractile activity which results in overactivity of the bladder; a compensatory mechanism for bladder outlet

obstruction and the enhanced contractile response [10].

The role of diet in bladder structure and function in BOO animals was displayed in a study by Adedeji *et al.*, on Dietary reversal reverts diet-induced alterations in obstructed bladders of Wistar rats [24]. HD has been hypothesized to result in an increase in circulating free fatty acids, which would then mediate biological effects related to cell proliferation, triggering an increase in epithelial height and muscle fiber diameter of the detrusor and increased bladder weight [25]. Results from Adedeji *et al.*, [24] however showed that a reversal of the diet of BOO animals from HFD to standard chow caused a significant reduction in bladder weight. The pronounced effects of high carbohydrate diet on BOO animals stated earlier also reversed after a switch from high carbohydrate diet to standard chow [24]. The study confirmed that dietary intake alters the structure and function of both normal and obstructed urinary bladders.

Urinary Incontinence

Urinary incontinence is an involuntary leakage of urine from the bladder that is majorly common in the elderly and has a major impact on the quality of life of an individual [26]. There are several forms of urinary incontinence. The involuntary leakage of urine accompanied with elevated intraabdominal pressure due to the weakness of the pelvic floor or urethral sphincter muscle is called stress urinary incontinence [27]. Due to the overactivity of the detrusor muscle, there can be an involuntary leakage of urine that is most times accompanied by a feeling of urinary urgency; this is called urge urinary incontinence [28]. Overflow urinary incontinence occurs due to an overstretched bladder [28]. The overdistension of the bladder is due to lack of detrusor contractility and BOO [28].

Priorities in research in urinary incontinence now include identifying lifestyle factors that can be modified [29]. One of the most easily modifiable lifestyle factor is diet [30]. A population based cross sectional study conducted by Maserejian *et al.*, 2010 on 'Dietary Macronutrient and Energy Intake and

Urinary Incontinence in Women' revealed that individuals who had higher intake of saturated fatty acids had greater odds of urinary incontinence [31]. This was in corroboration with studies by Dalloso *et al.*, [20] where the association of diet and stress incontinence was studied and they recorded an increase in urinary incontinence with increased HFD intake [20]. Incontinence as a result of higher HFD intake was adduced to endothelial dysfunction due to inflammation or vascular changes (a consequence of HFD consumption) affecting the bladder, detrusor, and urologic symptoms [32].

Bladder Cancer

Bladder cancer is a carcinoma of the urothelial cells that line the lumen of the urinary bladder [33]. It usually presents as visible hematuria but patients can also have isolated microscopic hematuria or irritative voiding symptoms [34]. It has been proposed that dietary factors may play a role in the development of bladder cancer because many diet-related metabolites come into direct contact with the bladder epithelium during excretion [35]. Studies by Allen *et al.*, 2012 on 'Macronutrient intake and risk of urothelial cell carcinoma in the European prospective investigation into cancer and nutrition' revealed that high intake of energy from animal protein and a low intake of energy from plant protein is associated with an increased risk of bladder cancer [36]. While more research is needed to shed light the effects of dietary macronutrients on bladder cancer, this goes to show that dietary choices do have an impact.

CONCLUSION

The influence of diet on the body physiology cannot be overemphasized as content of diets can either positively or negatively affect normal body functions. Diet alters the structure and function of both normal and diseased bladders as shown above. The intake of HFD most especially causes major changes to the morphology and function of the bladder as it is implicated in major bladder pathophysiology such as BOO, urinary incontinence and OAB. Dietary interventions could therefore be a

major way of managing patients exhibiting these diseases. Further research however is required to clarify the association between various forms of diet and bladder physiology and pathophysiology.

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Burden and Management of Urethral Stricture in a Newly Established Urology Unit of a Tertiary Hospital

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ABSTRACT

Background: Urethral stricture is a common urologic disease affecting mostly adult males. It constitutes a significant burden in the practice of urology. **Objectives:** The objective of the study is to assess the burden and management outcome of urethral stricture in our hospital. **Materials and Methods:** This is a retrospective study of patients managed for urethral stricture in our hospital between 2015 to 2019. Medical records of the patients were retrieved, basic demographic and management information were extracted, entered into proforma and analyzed. **Results:** A total of 86 patients were treated for urethral stricture over the period, the medical records of 77 patients were retrieved and analyzed. The 86 patients constitute 34.5% of all urologic surgeries performed in the hospital within the period. All were males aged 19-90years (53.6±9.01SD years). Acute urinary retention (AUR) was the commonest presentation (44.2%), others presented with lower urinary tract symptoms and chronic urinary retention. Most common complication was urinary tract infection (28.6%). Urethritis was the commonest risk factor (46.8%). Most patients were diagnosed with short segment stricture (54.4%). Recurrence rate was 26%. **Conclusion:** Urethral stricture constitutes significant workload for urologist where patients commonly present with complications. Urethritis remains the predominant risk factor for urethral stricture among our patients.

Keywords: Urethral stricture, Burden, Management, Tertiary Hospital

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INTRODUCTION

Despite changes in its presentation and risk factors, urethral stricture (US) has remained a common urologic disease globally with increasing prevalence being reported especially among males of over 65 years of age [1,2]. In Nigeria and west African sub-region, urethral stricture is seen predominantly in the 4th and 5th decade of life [3, 4, 5, 6]. Urethral stricture denotes narrowing and loss of distensibility of the urethra due to scarring of the corpus spongiosum and the urethral epithelium. [7,8] Contraction of the scar reduces the urethral lumen with subsequent development of lower urinary tract symptoms. In certain cases, there is complete obliteration of the urethral lumen leading to urinary retention necessitating suprapubic cystostomy. [8,9] In estimation, the prevalence of urethral stricture in industrialized countries is around 0.9%. [9] The prevalence of urethral stricture disease in the United states of America (USA) is estimated between approximately 200/100,000 in younger men to >600/100,000 in men older than 65. [2] Similarly, in the United Kingdom (UK) it has been estimated to be between 10/100,000 in younger men to 100/100,000 in men older than 65 years [2] In sub Saharan African, the definite prevalence is not known, however various reports from hospitals across Africa showed US constitute huge disease burden in the region [10]

A good clinical history and physical examination is essential to diagnosis of urethral stricture. However, retrograde urethrography (RUG) with/ without micturating cystourethrography (MCUG) remains the gold standard investigation while urethrosonography, computerized tomography (CT), and magnetic resonant imaging (MRI) are presently seen as adjuncts to RUG. [2, 11]

The treatment options for urethral stricture are urethral dilatation, internal urethrotomy and urethroplasty. Amongst these, urethroplasty remains the gold standard today with far more long term success rate and cost effectiveness [8]. Chance for cure may be up to 90-95% for excision and anastomotic urethroplasty and 73- 90.5% for augmented urethroplasty. [2,8]

We undertook a retrospective study to document the burden, presentation and management of urethral strictures in our hospital. This is in an environment with poor access to health care services and where no previous study on urethral stricture has been done.

MATERIALS AND METHOD

It was a retrospective descriptive study of all patients who were managed for urethral stricture at the urology unit of our hospital over the period covered in this study (January 2015 to December 2019). Before conducting the study institutional approval was obtained from the research ethics committee of the hospital with reference FMCY/HREC/20/92.

Particulars of the patients treated for urethral strictures over the period covered by the study were retrieved from the theatre register and their medical information was collected with the help of the record staffs of the hospital. Information about the patients' bio-data, presentation, risk factors, investigations done, initial treatment, definitive treatment and outcome of the treatment including complications were extracted and entered into the already designed proforma.

The generated data was entered into excel sheets and analyzed using Statistical package for social sciences (SPSS) version 21

The results were presented in tables and figures.

RESULTS

A total of 86 patients were treated for urethral stricture over the period, this constitute about 34.5% of total number of urologic patients treated. Only the case files of 77 patients were retrieved and analyzed. The age distribution of patients found is as shown in Fig 1

The age ranges from 19 – 90 years; most common age group was 61 – 70 years with a mean age of 53.6 ± 9.01 SD years. All the patients in our study were males; who are mostly farmers and traders. The distribution of the patients based on their occupation is shown in Fig 2.

Majority of our patients presented with complications of urethral stricture in an emergency setting; 44.2% presented with acute urinary retention (AUR), 7.8% with chronic urinary retention (CUR) while 39% presented with lower urinary tract symptoms (LUTS). In about 9.1% of patients the urinary retention (UR) was relieved elsewhere and presented to our facility with supra pubic catheter in situ. Previous history of poorly treated purulent urethritis was the risk factor in 36 (46.2%) patients. Others including urethral trauma are as shown in Table 1.

Majority of our patients (92.2%) had SPC as an immediate treatment; while the remaining (7.8%) had urethral dilatation before the definitive management.

Some associated complications on presentation in our patients include urosepsis (28.6%), Fournier's

gangrene (5.1%), watering can perineum (6.5%), and renal impairment (1.3%).

Sites of stricture were recorded and presented in Table 2. Length of stricture was short segment (≤ 2 cm) in 54.5%, the remaining (45.5%) patients had long segment stricture (>2 cm).

Excision and anastomotic urethroplasty was the predominant option of treatment in our patients (45.5%), others were various options of augmented urethroplasty as shown in Fig 3.

Stricture recurrence at 6 months occurred in 26% of our patients.

Factors identified as risk factors for the recurrent stricture among our patients were: post traumatic urethral stricture (resulting from PFUDD) – 10.4%, long segment strictures (post inflammatory) – 7.8%, early catheter removal (less than 3 weeks' post-surgery) – 3.9% and no identified risk factor in 3.9%.

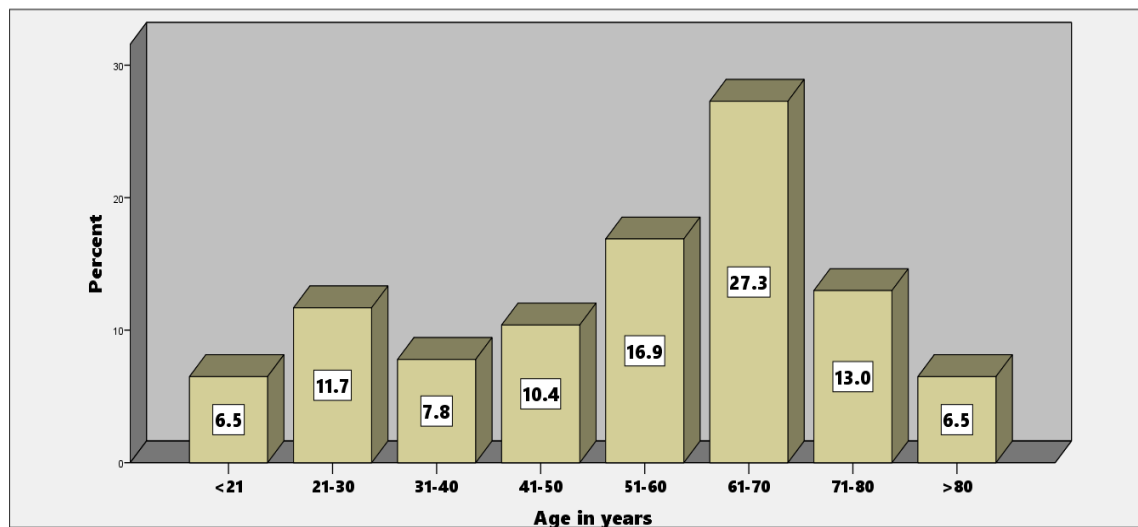


Figure 1: Age distribution among patients with urethral stricture.

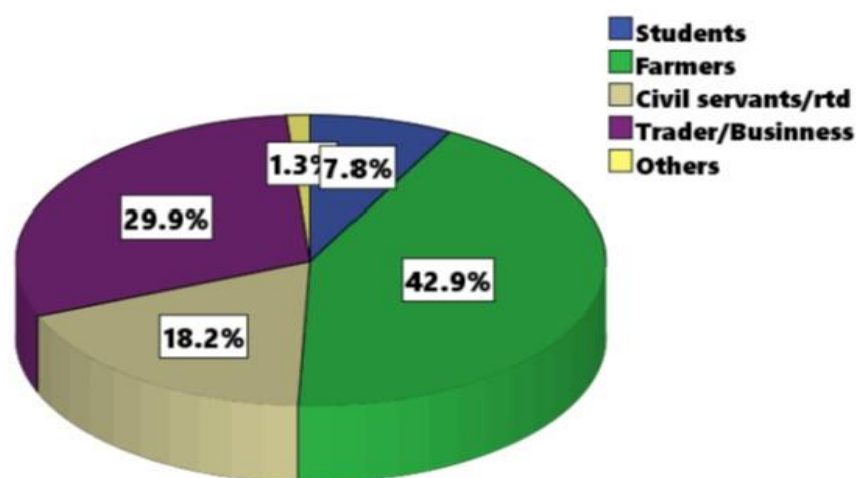


Figure 2: Distribution of the patients based on their occupation.

Table 1: Risk factors for urethral stricture among our patients

Stricture site	No of Patients	Percentage
Bulbar	40	51.9
Membranous	19	24.7
Penile	5	6.5
Peno- bulbar	10	13.0
Pan anterior urethra	3	3.9
Total	77	100.0

Table 2: Sites of urethral stricture among our patients.

Risk Factors	No of Patients	Percentage
Urethral Trauma (RTA/Fall)	18	23.4
Catheterization Trauma	5	6.5
Prolong Catheterization	6	7.8
Purulent urethral discharge	36	46.8
Previous urethral surgery	2	2.6
Falling Astride	3	3.9
Others	7	9.1
Total	77	100.0

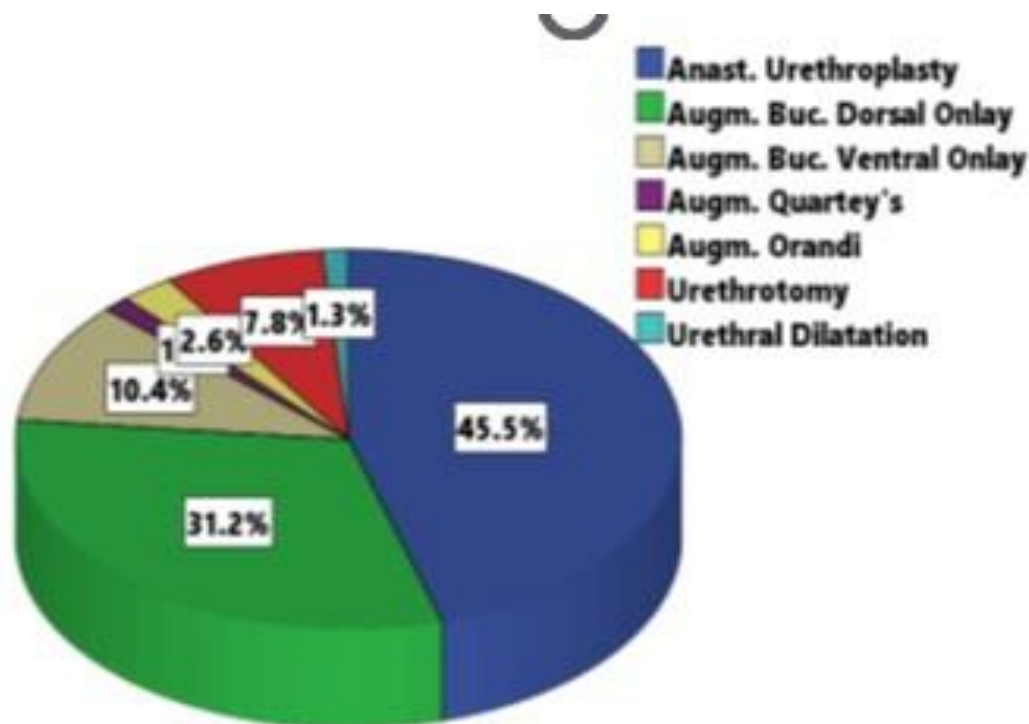


Figure 3: Treatment Modalities of urethral strictures among our patients.

DISCUSSION

Urethral stricture constitutes significant load to Urology practice particularly in developing countries where there's poor access to quality healthcare worsened by poverty and low literacy level. Mean age of our patients was 53.6 ± 9.01 SD years with more than 50% of all the patients aged between 41- 70years. Other studies done in Africa such as the one by Awajimijan NM, et'al [11] and Barnard A, et' al [12] reported similar mean age among their patients. The risk factors for urethral stricture have been reported to vary from one environment to another particularly in developing countries. In our patients post inflammatory

strictures are commonest accounting for about 54.6% (post urethritis- 46.8%, prolong catheterization- 7.8%) followed by post traumatic strictures accounting for 33.8%. This is similar to findings from the same regions such as the ones by Ibrahim G A et'a l [13], Abdulsalam K et'al [14] and Ngaroua NJE,et'al [15] but differs with findings from other parts of Nigeria.[16, 17, 18] The difference observed might be due to poor attitude to early and appropriate treatment of urethritis among our patients resulting in chronic progression of the disease. While people from other parts of Nigeria particularly from urban areas have predominantly post traumatic stricture.

Urethral stricture clinically presents with LUTS predominantly obstructive voiding symptoms and

with disease progression patient may presents with complications such as urinary retention, recurrent urinary tract infection, watering can perineum and renal impairment among others.^[4]

Majority of our patients presented in urinary retention, hence required emergency suprapubic cystostomy (SPC). Other complications recorded among our patients on presentation include urosepsis, Fournier's gangrene, watering can perineum, and renal impairment. Obstruction to the flow of urine results in the urinary stasis and recurrent urinary tract infection and consequent urosepsis, Fournier's gangrene and urethro-perineal fistulae (watering can perineum). The renal impairment also results from the urinary obstruction (obstructive nephropathy).^[7] The presence of these complications are associated with long standing disease and tends to have poorer outcome.^[19] Olajide et al^[20] reported similar complications among their patients at presentation (urethrocutaneous fistula, urinary retention, bladder/urethral calculi, chronic renal impairment and significant urinary tract infection). In up to 75.3% of our patients, the stricture involves the anterior urethra out of which more than 51.9% was found in the bulbar urethra. The fact that majority of our strictures were post inflammatory explains the predilection to the bulbar region, this is similarly reported by Ibrahim G A et'al,^[13] Abdussalam K et'al^[14] and Dakum N K.^[16] Several factors were considered in the choice of treatment option for urethral stricture; these include the size, site and number of strictures. Others are the degree of spongiofibrosis, expertise of the surgeon, available resources and patient choice.^[2, 8] Most of our patients were treated by excision and anastomotic urethroplasty (45.5%), others by augmentation urethroplasty (using buccal graft and penile skin). Few patients were managed by urethral dilatation and none by endoscopic treatment (direct vision internal urethrotomy), this is because there were no facilities for endoscopic treatment in our centre during the period covered by this study. Anastomotic urethroplasty has been the gold standard for urethroplasty and this is performed in majority of our patients who also happen to have

short segment stricture. This is also the findings from other studies.^[13, 14, 20] Recurrence of stricture was the commonest complications observed among our patients. Incidence of urethral stricture recurrence ranges between 2% to 36.4% with 75% occurring within the first 6 months of surgery.^[1,3] Recurrence results in a more difficult stricture in subsequent treatment and worsen patient outcome.

We recorded recurrence in 26% of our patients at 6 months' post-operative and this will likely be higher with increasing post treatment duration. Similar high recurrence rate was also reported from other studies.^[14, 16] The recurrence was commoner in strictures resulting from PFUDD, long segment strictures (post inflammatory), and in post-operative early removal of urethral catheters. The higher recurrence rate in posterior urethral stricture (mainly affecting the membranous urethra) and long segment strictures were similarly reported in studies by Hussain A et'al^[22] and Bello J^[23] respectively. The recurrence in this group of strictures may be attributed to the advanced operative treatment required such as pubectomy with occasioned difficult anastomosis.

CONCLUSION

Urethral stricture constitutes significant workload for urologist in our centre where patients present with various form of stricture-related complications. Urethritis was the commonest risk factor among our patients with most of the strictures being short segment and located at the bulbar urethra making the most common surgical procedure being excision and anastomotic urethroplasty. At six months, majority of our patients had no reported recurrence.

Recommendations

More public education and enlightenment on prevention and treatment of urethritis in this environment will significantly reduce urethral strictures.

Government should ensure the availability and accessibility to affordable and quality drugs for the management of urethritis.

Measures to curb motor vehicle accidents and other forms of trauma will also reduce the occurrence of post traumatic urethral strictures.

Limitations

The study being a retrospective one makes it difficult to access some patients records while some patients lost to follow up hence losing some data that would have made the results more representative.

Competing interests

We declare we have no competing interests and no funding was received for the study.

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Abbreviation

- AUR Acute urinary retention
 C/S Civil servants
 CT Computerized tomography
 CUR Chronic urinary retention
 LUTS Lower urinary tract symptoms
 MRI Magnetic resonant imaging
 PFUDD Pelvic fracture urethral distraction defect
 RUG Retrograde urethrogram
 SPC Suprapubic cystostomy
 UTI Urinary tract infection

Multidisciplinary Management of Adults with Differences in Sex Development (DSD): How is Nigeria Positioned?

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ABSTRACT

Background: The management of adults living with disorders of sex development has not been discussed in literature. In Nigeria, adult presenting with DSD is common with no specific route to ensure comprehensive treatment. **Methods:** In this cross-sectional study, we surveyed 613 plastic surgeons, urologists and gynecologists targeting response from those who managed adults with DSD. **Results:** Of the 29 response we got 26(89.7%) were male while 3(10.3%) were female specialist involved with the treatment of adults DSD. Majority of the specialists 10(34.5%) had more than 15 years' experience as specialist medical doctors. Fifteen (51.8%) of them worked in hospitals located in the North-Central region of the country, 19(65.5%) were plastic surgeons and gynecomastia (31.1%) was the most common patient presenting complaint. Though 19(65.5%) specialists treated the patients alongside other specialists, the teams were not comprehensive and lacked key members. **Conclusion:** The need for a consensus document is important so these group of individuals can enjoy a happy and fulfilled life.

Keywords: Nigeria, Differences of Sex Development, DSD, Multi-Disciplinary Treatment, MDT.

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BACKGROUND

Disorders of sex development (DSD) are a wide range of conditions affecting human sex determination and differentiation.^[1] They are congenital disorders characterized by anomalies in the urogenital tract and reproductive system. In the newborn, ambiguous genitalia are the commonest reason for presenting in hospital ^[2] as parents are unable to comfortably assign a gender to the child.^[2] In adolescence, delayed or a typical sexual development and primary amenorrhoea are the usual presenting complaints.^[3,4]

These group of disorders have varying incidence rate, when considered together the global incidence rate may be as high as 1:200-300 live births.^[5] but specific incidence rate in Nigeria is lacking. Persons who receive surgical intervention from birth still face physical and emotional distress on how to conform to societal norms. Adult presentation brings with it a unique set of issues that need to be explored and addressed. A consensus statement on the best possible quality of life in persons with DSD advocates for holistic care centered on a multidisciplinary (MDT) approach.^[4] This has been domesticated in the paediatric age-group ^[6] in Nigeria but unfortunately it has not extended to adults presenting with DSD or children as they age out of paediatric care.

This study is specialist-centered that explores the extent to which multidisciplinary approach has implemented in the care of adults presenting with DSD, identifying the gaps in therapy and bring up recommendations to improve overall care of the patients.

METHODS

This was a cross-sectional Google survey-based study using both quantitative and qualitative methods. It was targeted at specialists that most frequently treated adults with DSD in our setting – OBGYN, Plastic Surgeons and Urologist. The survey was repeated on the social platforms of the all the specialists for one month.

Data collected was demography of specialist, location of practice in Nigeria, area of specialization, years as a specialist, patient presenting complaints, surgery offered, degree of multi-disciplinary treatment (MDT) and specialist satisfaction with care.

Data was collected and transferred into an excel sheet where it was analysed for frequencies, means and ranges.

RESULTS

The survey was publicized on the social platforms of the Nigerian Association of Plastic Aesthetics and Reconstructive Surgeon (NAPRAS) with 143 members, Nigerian Association of Urological Surgeons of Nigeria (NAUS) with 250 members, and Society of Obstetricians and Gynaecologist of Nigeria (SOGON) with 220 financial members.

There were 29 respondents (Specialist) to our Google survey, 26 (89.7%) males and 3(10. 3%) females. Fifteen of them practice in North-Central Nigeria, 4(13.8%) each in the North-Western and North-Eastern regions of the Country (Table 1).

Nineteen (65.5%) of the respondents were plastic surgeons, 6(20.8%) were urologist, the others were gynaecologists (Table 2); seventeen (58.6%) of the specialists were more than 10 years post-specialist qualification (table 3). Between the 29 specialists, they had treated 77 adult DSD patients, half of the patients were seen as referrals from non-specialist physicians and family physicians. Other referrals were between specialists like urologist, gynaecologist, general surgeons and paediatric surgeons.

Respondents reported gyneacomastia 9(31.1%) as the most common presenting complaint followed clitoromegaly, vaginal atresia and hypospadias at 4(13.4%) each. Other presenting complaints were infertility, primary amenorrhoea and undescended testis. Five (17.3%) did not specify the most common presenting complaints (Figure 1). Of the 77 patients treated, 61 wanted to maintain their phenotypic gender and the motivation for seeking

treatment included preparation for marriage, improving physical appearance, improving sexual function and self-esteem.

Nineteen (65.5%) of the specialists treated patients in a multi-disciplinary team but though the teams lacked specialists considered as essential like counsellors (for the patients and their spouses), psychologists, geneticists and social workers. Thirteen (44.8%) specialists were satisfied with the treatment they were able to offer patients though most of the patients were lost to follow-up once their primary concerns were treated.

DISCUSSION

The incidence of DSD in Nigeria is not known but it brings up the issues of stigmatisation and discrimination which make adjusting into adult life difficult. This study had only 29 respondents out of a combined 613 specialists on the platforms the survey was administered on. This is <5% of the total number of specialists who responded to the survey. This may indicate on the lack of awareness or expertise in treating DSD patients into adulthood. DSD is a topic explored exhaustively in the paediatric patient but globally specialists in adult DSD care are rare.^[7] Though there were respondents from each geopolitical region in Nigeria, majority were in the North-central part of Nigeria (Figure 1). It is not clear whether this region has more patients willing to present to hospital for care.

Plastic surgeons got the most referrals which may indicate that the adult DSD patient is more concerned with aesthetic rather than functional issues. This also supported by the highest presenting complains of gynaecomastia shown by the survey. Primary amenorrhoea and infertility were less common complaints which may be because of the patients believe it is spiritual.^[8]

The need for sex-change surgeries were few because most of the specialist treated patients that wanted to maintain their phenotypic sex. The patients may feel more comfortable maintaining their assigned sex rather than undergo the rigors involved transiting to their genetic sex.

About half of the respondents were part of a multidisciplinary team that included a minimum of 3 specialists, but they all agreed that the teams were not comprehensive in composition. The ideal multidisciplinary team include at the minimum urology, endocrinology, andrology, psychology, nursing, social workers, geneticists, and medical ethics.^[1] Patient advocacy groups are very important part of the MDT in adult DSD management.

The pillar of adult DSD treatment according to Nowotny et al is building a trusting relationship is the key to optimal care.^[7] The outcome of care for DSD patients can be divided into short term and long-term outcomes.^[9] Short term outcomes are related to physical appearance and functionality of the genitalia,^[4, 10] while long-term outcomes include personal satisfaction, gender satisfaction, quality of life, social adaptation, and sexual function.^[4,10,11]

All the specialists sampled stated that they lost their patients to follow up. This may be because the system does not provide other care that patients consider necessary after their primary symptoms have been treated. It is important to chart an effective plan on how to treat adults with DSD that would take care of them holistically.

CONCLUSION

Though the knowledge of DSD has evolved over the decades, this has primarily been in the care of paediatric patients. Even in this age group, transiting from paediatric to adult care program is not smooth. In Nigeria, where patients are still being diagnosed as adults, a proper framework for adult care is essential to forestall the emotional and cultural difficulties faced by these patients.

Recommendations

1. Development of a nationwide registry which all specialist treating adult DSDs will be encouraged to contribute to.
2. Formation of MDTs registers that patient can access so they reach out to specialist in their local area.

- Confidential registries for patient to enter their personal details and contact patient support advocacy groups.

List of abbreviations

- DSD – Differences in Sex Development
- MDT – Multi-Disciplinary Treatment
- NAPRAS - Nigerian Association of Plastic Aesthetics and Reconstructive Surgeon
- NAUS -Nigerian Association of Urological Surgeons of Nigeria
- SOGON - Society of Obstetricians and Gynecologist of Nigeria.

a. Declarations

Ethical Approval and Consent to Participate
Ethical Approval was received from University of Abuja Teaching Hospital HREC. Consent was obtained from all participants

b. Consent for publication

All authors have given consent to have this publication in the African Journal of Urology

c. Availability of Data and Material

The data used for this manuscript is available on demand as well as all the instruments of research.

d. Competing Interest

All authors declare no competing interest in this research.

e. Funding

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Retrospective Review of Outcomes of Open Retropubic Prostatectomy in Two Centers in Abuja, Nigeria

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ABSTRACT

Background: Prostate cancer remains the most diagnosed cancer in Nigerian men despite the lack of national Prostate Specific Antigen (PSA)-based screening. Radical prostatectomy for early prostate cancer is not a commonly performed operation by urologists in our country. **Objectives:** To report our experience with open radical retropubic prostatectomy in two tertiary hospitals in Abuja. **Materials and Methods:** Case notes and theatre records of all patients who underwent open radical retropubic prostatectomy at Federal Medical Centre, Abuja and National Hospital, Abuja between December 2021 and November, 2025 were retrospectively reviewed. Biodata, pre-operative parameters, intra-operative events and post-operative outcomes were documented and analyzed. **Results:** There was a total of 53 patients with a mean age of 60.7 years (range = 47 - 70) and preoperative PSA of 22.0ng/ml (range= 7.2 – 54). For the clinical stage, 83% had T1c disease. Lower urinary tract symptoms were reported by 52.2% of the patients while 47.8% were screen-detected. The duration of surgery, blood transfused, duration of admission and duration of catheterization averaged 3.5 hours, 2.2 pints, 9.1 days and 24.3 days respectively. The biopsy and specimen histopathology reports correlated in all cases. Sixty-five percent of patients had ISUP grade groups 1 and 2 and 30.4% had adjuvant ADT. Biochemical recurrence was documented in 3 patients (5.7%). No death was recorded. Short -term and long-term complications documented include anastomotic leak (n=6,11.3%) and bladder neck stenosis (n=5, 9.4%) and urinary incontinence (n=4,7.5%) and erectile dysfunction (n=11, 20.8%) respectively. **Conclusion:** Open radical retropubic prostatectomy was a safe procedure with acceptable oncologic and functional outcomes in selected patients at the two centres. Erectile dysfunction remains one of the most bothersome morbidities.

Keywords: Prostate cancer, Radical retropubic prostatectomy, Erectile dysfunction, Urinary incontinence.

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INTRODUCTION

Prostate cancer continues to be the most prevalent cancer diagnosis among men in Nigeria, accounting for 18,019 new cases and 11,443 fatalities in the country in 2022^[1,2,3]. Recently, there is increased awareness and implementation of routine serum prostate-specific antigen (PSA) screening, championed by organizations like the Nigerian Cancer Society and supported by the Federal Ministry of Health and Social Welfare as well as non-governmental organizations such as Project Pink Blue and Prostate Cancer Trans-Atlantic Consortium. This has led to earlier diagnoses of prostate cancer, with a notable increase in patients presenting with localized disease^[4]. However, most cases are still advanced disease at presentation in our setting^[5,6].

Although the surgical treatment for early prostate cancer has evolved considerably over recent decades, open radical retropubic prostatectomy (ORRP) remains a common choice of care^[7]. This procedure, despite its proven efficacy, is infrequently performed in Nigeria, primarily due to challenges such as limited surgical resources, insufficient training programs, and a lack of awareness among patients regarding available treatment options^[8]. Furthermore, alternative techniques, including laparoscopic and robotic-assisted prostatectomies, are in their nascent stages in Nigeria, with only three robotic surgical systems located in two major cities, further hindering access for the majority of prostate cancer patients.

The primary goals of radical prostatectomy are cancer control, preservation of urinary continence, and preservation of sexual function^[9,10]. While robotic-assisted radical prostatectomy (RARP) has gained prominence for its potential to reduce morbidity and facilitate recovery^[11], the evidence comparing its outcomes to ORRP is still evolving^[12,13].

Recent studies have highlighted that outcome following radical prostatectomy can differ significantly based on surgical technique, the proficiency of the surgical team, and the

demographic characteristics of the patient population^[14]. In Nigeria, factors such as patient demographics, the stage of disease at diagnosis, and the overall accessibility of healthcare services must be meticulously assessed to derive meaningful insights into the effectiveness of surgical interventions.

This study aims to document our four-year experiences with open radical retropubic prostatectomy across two hospitals in Abuja, Nigeria.

MATERIALS AND METHODS

This descriptive retrospective study reviewed the case notes and surgical records of all patients who underwent radical retropubic prostatectomy at the Federal Medical Centre, Abuja, and the National Hospital, Abuja, from December 2021 to November 2025. Patient selection criteria included histologically confirmed prostate cancer and the surgical procedure being performed openly. The diagnosis was made in all patients by Trans-rectal ultrasound (TRUSS) - guided 12- core systematic prostate biopsy. In addition to the routine full blood count, kidney function test, Chest x-ray, Electrocardiography, echocardiography and clotting panels, we ensured all patients had staging pelvic MRI and isotope bone scan. Following shared-decision making, informed consent was obtained from all patients and all had antibiotics as well as anti-thrombotic prophylaxis. We elected a combined epidural and subarachnoid block. The patient was catheterized and positioned supine with the middle of the operating table “broken” to open up the pelvis. A lower midline incision was developed to access the retropubic space extraperitoneally. We did not carry out pelvic lymph node dissection since the imaging was unremarkable and all patients had nerve sparing procedure. The endopelvic fascia was incised to access the prostatic apex and membranous urethra. Then, the deep venous plexus was divided and controlled, and the prostate was mobilized

retrogradely. Bladder neck was divided and Denonviller’s fascia incised at the prostatic base,

allowing access to and division of vas deferens as well as excision of seminal vesicles. Prostate and seminal vesicles removed en-bloc. This was followed by vesicourethral anastomosis over a 18-FG urethral catheter, which was removed 3-4 weeks after a satisfactory cystogram. Wound was closed, leaving a retropubic drain removed in 24-48 hours.

Data extracted encompassed demographic characteristics, pre-operative prostate-specific antigen (PSA) levels, details of the surgical procedure (operation duration, blood transfusion requirements), post-operative admission duration, catheterization duration, any complications recorded during the hospital stay, specimen histology, biochemical recurrence, metastasis and cancer-

specific survival. Statistical analysis was conducted using SPSS version 22, employing descriptive statistics to summarize the data.

Ethical approval for this study was obtained from the relevant institutional review committee (FMCA/HREC/2025/303).

RESULTS

There was a total of 53 patients who underwent open radical retropubic prostatectomy between the two centres in Abuja. The mean age of the patients was 60.7 years, with ages ranging from 47 to 70 years. Preoperatively, the mean prostate-specific antigen (PSA) level was 22.0 ng/mL, with a range of 7.2 to 54.1 ng/ml (Table 1).

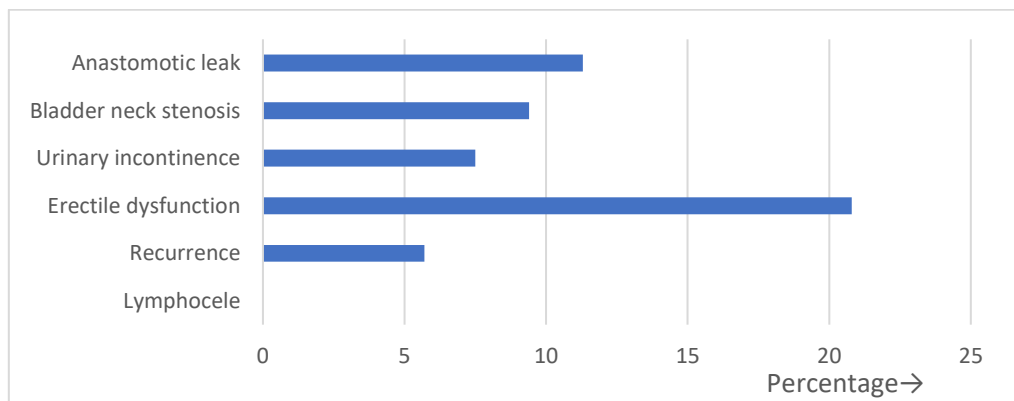


Figure 1: Bar chart showing the complications of open radical retropubic prostatectomy

Table 1: Preoperative parameters of the patients

Parameters	Frequency (n=53)	Percentage
Total PSA (ng/ml)		
0.01- 9.9	32	60.4
10.0- 19.9	12	22.6
> 20	9	17
Mean PSA= 22.0+/-5.4 (Range= 7.2- 54.1ng/ml)		
Clinical staging		
T1a-b	0	0.0
T1c	44	83
T2	6	11.3
T3	3	5.7

In terms of clinical staging, a significant majority at 83% were diagnosed with stage T1c prostate cancer, while 11.3.0% had T2 disease. A significant

proportion of patients experienced lower urinary tract symptoms, affecting 52.2% of the cohort while 47.8% of these patients were identified through screening programs.

We deployed a combined epidural and subarachnoid block and performed nerve-sparing radical prostatectomy in all cases. No pelvic lymphadenectomy was done.

The surgical procedure averaged 3.5 hours in duration, with a mean blood transfusion requirement of 2.2 pints. Postoperative recovery involved an average hospital stay of 9.1 days, and removal of catheterization lasted an average of 24.3 days after satisfactory cystogram as 4 patients (7.5%) had catheterization for up to 8 weeks.

Histopathological evaluation of the specimen correlated with transrectal ultrasound (TRUSS) biopsy with 65% of the patients fell into the International Society of Urological Pathology (ISUP) grade groups 1 and 2, with 24.5% of patients receiving adjuvant androgen deprivation therapy (ADT) as part of their treatment plan for a period of 24 months.

Figure 1 details early and long-term complications recorded. We observed anastomotic leak (n=6, 11.3%) and bladder neck stenosis in 5 patients (9.4%) as well as urinary incontinence (n=4, 7.5%) and erectile dysfunction in 11 patients (20.8%).

The cornerstone of follow-up care for all our patients was 3-6 monthly PSA and complications for the first 24 months. We did this for a median period of 16 months. Biochemical recurrence (rising PSA > 2ng/ml) was documented in 3 patients (5.7%). Importantly, there was no recorded cancer-specific fatality in this series.

DISCUSSION

The evolution of prostatectomy has seen a shift from open procedures to laparoscopic and, more recently, robot-assisted techniques in many Western countries [9] [15,16,17,18]. However, ORRP continues to be widely performed globally more so in resource-limited countries due to its established efficacy and cost-effectiveness [12] [19,20]

The findings from our study of 53 patients who had open radical retropubic prostatectomy at two centres in Abuja reveal important insights into the demographic, clinical, and postoperative outcomes associated with this surgical intervention for prostate cancer. The mean age of the cohort at 60.7 years is consistent with the literature, which indicates that the incidence of prostate cancer increases with age, particularly in men over 50 [4]

Preoperative PSA levels averaging 22.0 ng/ml and ranging from 7.2 to 54.1 ng/ml suggest a cohort with a significant burden of disease, aligning with data from the National Comprehensive Cancer Network (NCCN), which underscores the prognostic

implications of elevated PSA levels in prostate cancer patients [21].

The reported prevalence of lower urinary tract symptoms in 52.2% of the patients is noteworthy and corroborates findings from prior studies, which indicate that such symptoms are highly prevalent among patients with prostate cancer, potentially affecting their quality of life [22]. Furthermore, nearly half of the patients were identified through screening programs, highlighting the critical role of early detection in prostate cancer management and the impact of public health initiatives [23].

In this study, the average surgical duration of 3.5 hours and the average blood transfusion requirement of 2.2 pints reported are reflective of typical operative parameters reported in the literature, suggesting that the surgical teams are effectively managing the complexities of radical prostatectomy [24]. Pelvic lymph node dissection (PLND) was omitted in all our patients as majority of our patients had low-risk disease and all had unremarkable pelvic MRI, although the European Association of Urology (EAU) recommends performing PLND for high- and intermediate-risk patients [25]. However, PLND does not only prolongs operative time, but it may also result in bleeding, lymphocele and longer hospital stay [26]. Postoperative outcomes, including an average hospital stay of 9.1 days and catheterization duration of 24.3 days, fall within expected ranges, indicating a feasible recovery trajectory for patients undergoing this procedure. The relatively longer mean duration of catheterization compared to other local studies [5,6] may be accounted for by 8 patients whose catheterization lasted for 8 weeks.

Histopathological results revealing that 65% of patients fell into the ISUP grade groups 1 and 2, suggesting that our cohort includes a significant number of patients with less aggressive disease. This is consistent with other studies that show grade

group at diagnosis plays a crucial role in determining prognosis and guiding treatment decisions [27].

Our rates of erectile dysfunction and urinary incontinence are similar to those found in prior studies, which report complications ranging from 20-50% in patients' post-prostatectomy, thus reinforcing the necessity for ongoing patient education and support [28].

Functional outcomes, specifically urinary continence and erectile function, are major determinants of quality-of-life post-prostatectomy [7,9,29]. The Nigerian study reported that at 6 months post-surgery, 51.4% of patients were continent (using 0–1 pad per day), and 17.1% reported satisfactory erectile function (allowing sexual intercourse) [6]. These rates are influenced by factors such as patient age, preoperative functional status, and the nerve-sparing approach, if employed [30]. The puboprosthetic ligament preserving technique, for example, is one refinement aimed at improving continence rates [31]. In a sub-Saharan hospital study, the median time to continence (0–1 pads per day) was 3 months, with 68.6% achieving continence by 12 months [31].

Importantly, the absence of recorded fatalities in this series is a significant finding, underscoring the safety of open radical retropubic prostatectomy at these centres. This aligns with evidence that suggests that with appropriate patient selection and surgical technique, this procedure can be performed safely with low morbidity [26].

CONCLUSION

This two-centre experience indicates that ORRP is a safe procedure with manageable complication rates. Our findings will contribute to the growing body of literature supporting ORRP as a viable option for the treatment of localized prostate cancer in low-resource settings.

Recommendation

We recommend that future studies should be prospective and should aim for larger sample sizes and extended follow-up periods to better elucidate the long-term outcomes associated with surgical intervention.

Limitations

Key limitations to this study include its retrospective nature and small sample size. The study period is also short for a proper assessment of outcomes

Conflict of interest

There are no conflicts of interest

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How Far Are We Falling Short? A Single-Centre Retrospective Analysis of Prostate Cancer Detection Rate in a Low-Resource Setting.

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ABSTRACT

Prostate Cancer is the second most diagnosed cancer among men globally, and over 1.4 million men were diagnosed with the disease in 2022. Prostate biopsy practices have undergone significant evolution, transitioning from serum Prostate Specific Antigen (PSA) driven indications to multiparametric Magnetic Resonance Imaging (mpMRI) triage in many settings. Despite these, prostate cancer is still under-detected in many low-resource settings. We set out to determine the prostate cancer detection rate of our institution. **Materials and Methods:** We conducted a nine-year retrospective analysis (September 2017-July 2024) of patients undergoing digital-guided transrectal prostate biopsies at Federal Teaching Hospital, Lokoja. Medical abstraction was done for age, digital rectal examination (DRE) findings, PSA, and histopathological results. Biopsy indications included either suspicious DRE findings or elevated PSA (>4 ng/mL). Data analysis was performed using SPSS version 23, with descriptive statistics employed to determine detection rates. Results were presented in tabular formats. **Results:** A total of three hundred and sixty-three patients had prostate biopsies done over the period. The age range of patients who underwent prostate biopsy was 41 - 101 years, with a mean age of 67.8 +/- 10.4 (SD) years. The majority of patients who underwent prostate biopsies fell within the 61-70 age group; however, the cancer detection rate rose steadily with increasing age. None of the patients had their prostate biopsy done under transrectal ultrasound scan guidance, and neither did any of them have prebiopsy multiparametric Magnetic Resonance Imaging. Among the 363 biopsied patients, 234 patients had nodular hyperplasia while 129 had adenocarcinoma of the prostate, giving a prostate cancer detection rate of 35.5%. **Conclusion:** Prostate cancer was detected in slightly over a third of patients who underwent biopsy at our center, and detection rates rose steadily across increasing age groups.

Keywords- Cancer Detection Rate, Low-resource setting, Prostate biopsy, Prostate Cancer.

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INTRODUCTION

Prostate cancer (PCa) remains a significant global health burden, ranking as the second most frequently diagnosed malignancy in men, with over 1.4 million new cases reported in 2022, and this is projected to rise to 2.9 million by the year 2040.^{1 2}

The global incidence and mortality rates exhibit profound geographic and ethnic disparities, with men of African descent, particularly those in Sub-Saharan Africa, experiencing the highest mortality rates.³ These outcomes are often attributed to a combination of genetic predisposition and systemic barriers to early diagnosis and advanced therapeutic interventions.³

The diagnostic landscape for PCa has undergone a paradigm shift, transitioning from a singular focus on establishing the presence of malignancy to characterizing the tumor's potential clinical trajectory.⁴ Modern pathways aim to maximize the detection of clinically significant disease while minimizing overdiagnosis and the subsequent overtreatment of indolent tumors. In high-resource settings, Prostate-Specific Antigen (PSA) screening is now routinely followed by multiparametric Magnetic Resonance Imaging (mpMRI).⁴ This allows for the integration of targeted biopsies with systematic sampling or, in specific low-risk cohorts, the omission of biopsy altogether.⁵

In contrast, many low- and middle-income countries (LMICs) continue to rely on traditional methods. In these settings, transrectal prostate biopsies may be performed "blindly" via digital rectal guidance, as Transrectal Ultrasound scans (TRUS) are not widely available.⁶ In addition, the adoption of transperineal approaches and advanced imaging remains limited.

Microscopic histological assessment remains the gold standard for definitive diagnosis, often augmented by immunohistochemistry (IHC) or genomic profiling for precision oncology. The implementation of these standards in LMICs is

being hampered by structural constraints such as inadequate and high-cost of mpMRI equipment, shortage of specialized personnel, and the high out-of-pocket costs of care borne by patients.^{7 8} Such resource constraints are likely to result in suboptimal Cancer Detection Rates (CDR), yet this gap is poorly documented in the scientific literature. While international guidelines provide a benchmark for practice to achieve optimal and acceptable detection rates,⁹ there is a paucity of data regarding how far detection rates in resource-limited settings deviate from these global standards. Furthermore, the CDR achievable with the limited modalities currently available in a low-resource setting like ours is not systematically documented in the scientific literature. This study, therefore, aims to determine PCa CDR in a low-resource setting like ours over a determined period and compare this with the global literature to see how much we are falling short.

MATERIALS AND METHODS

This was a nine-year retrospective analysis of patients undergoing prostate biopsies at the Federal Teaching Hospital, Lokoja, a tertiary healthcare facility in North-Central Nigeria. The study involved all eligible patients who underwent prostate biopsy between September 2017 and July 2024. The study population consisted of men who presented with clinical suspicion of prostate cancer. In accordance with institutional protocols, the primary indications for biopsy were:

- Biochemical suspicion: Persistent elevation of serum Prostate-Specific Antigen (PSA) levels > 4ng /ml
- Clinical suspicion: Clinical presentations together with abnormal digital rectal examination (DRE) findings, such as the presence of nodules, induration, or asymmetry.

Patients with incomplete records regarding their PSA values, DRE status, or definitive

histopathological results were excluded from the analysis.

Clinical and demographic data were systematically retrieved from the medical records and the hospital's pathology database. Information was entered into a proforma, and the variables that were extracted were; patient age at the time of the procedure, DRE findings, Pre-biopsy serum PSA values and histological diagnosis

All biopsies were conducted using a digital-guided transrectal approach, with none done under real-time guidance with transrectal ultrasound scan. In addition, none of the patients had a prebiopsy MRI done. Patients were placed in the left lateral decubitus position under appropriate antibiotic prophylaxis and caudal anesthesia, and 10 mL of 2% plain xylocaine was administered.

The procedures were performed by urology residents or consultant urologists. Using digital palpation to identify suspicious areas or to orient the needle relative to the prostate lobes, 10 to 12 core samples were obtained per patient. Sampling was performed using 16G or 18G semi-automatic biopsy needles (Tru-Cut type). The specimens were fixed in 10% buffered formalin, submitted for microscopic histological evaluation, prepared and stained, and read by either of the two pathologists working in the hospital.

The extracted data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.0. Descriptive statistics were the primary tool for data characterization; categorical variables, such as the DRE findings and the presence of malignancy, were expressed as frequencies and percentages. Continuous variables, particularly age and PSA levels, were summarized using means or medians. The CDR was calculated as the proportion of biopsies positive for malignancy relative to the total number of procedures performed. The final results were presented in tabular formats.

RESULTS

A total of three hundred and sixty-three (363) patients who had prostate biopsies done over the period had complete sets of data. The age range of patients who underwent prostate biopsy was 41 - 101 years, with a mean age of 67.8 +/- 10.4 (SD) years. The age distribution is shown in Table 1 below-

Table 1- Age Distribution of Prostate Cancer Patients

Age Distribution (Years)	Frequency	Percentages (%)
<50	9	2.48
51-60	80	22.04
61-70	135	37.19
71-80	105	28.93
81-90	24	6.61
>90	10	2.75
Total	363	100

The majority of patients who underwent prostate biopsies fell within the 61-70 years' age group; however, the cancer detection rate rose steadily with increasing age. The table below shows the cancer detection rate of the patients according to their age distributions.

Table 2- Prostate Cancer Detection Rate of Patients according to Age Distribution

Age (Years)	Number With Prostate Cancer	Number of Patients Biopsied	Detection Rate (%)
< 50	2	9	22
51-60	21	80	26
61-70	37	135	27
71-80	48	105	46
81-90	13	24	54
> 90	8	10	80
Total	129	363	

The DRE was suspicious for prostate cancer in about a third of the patients, as shown in Table 3. Among 107 patients with abnormal DRE findings, 103 were confirmed to have prostate cancer on histological assessment, yielding a detection rate of 96%.

Table 3- Findings on Digital Rectal Examination of the patients.

DRE findings	Frequency	Percentages
Benign features	256	70.52
Malignant features	107	29.48
Total	363	100

The serum PSA levels varied widely, from 6ng/ml to over 100ng/ml, with a higher proportion of prostate cancer diagnoses observed in patients with serum PSA levels exceeding 50ng/ml. The relationship between PSA values and cancer detection rates is shown in Table 4.

Table 4- Serum PSA Values with Cancer Detection Rates

PSA Values (ng/ml)	Detection Rate (%)
4-10	20.5
11-20	16.5
21-50	28
>50	48

Among the 363 biopsied patients, 234 patients had nodular hyperplasia while 129 had adenocarcinoma of the prostate, giving a prostate cancer detection rate of 35.5%.

DISCUSSION

The findings of this nine-year retrospective analysis reveal a PCa CDR of 35.5% among patients undergoing biopsy at our center. Our CDR of 35.5% was lower than the results from some Nigerian cohorts, which were also done without real-time imaging guidance. For instance, Ogbetere et al reported a CDR of 65% using a 12-core extended biopsy, while Ojewola et al in Lagos documented a CDR of 48.8% with an extended 10-core protocol.^{10 11} Oliyide et al, however, found an overall CDR of 24% but more importantly, was that the procedures in this instance were performed under TRUS. They found that the extended protocols improved the cancer detection rate, and

these findings were similar to what was reported by Fatuga et al.^{12 13}

Hodge et al in 1989 demonstrated the advantage of TRUS-guided systematic biopsies in improving the detection rate of prostate cancer over lesion-directed prostate biopsies that were done at that time.¹⁴ A multicenter survey conducted across 58 centers within Africa reported that finger-guided biopsies were the most common mode in which prostate biopsies were being performed in 41 of these centers.⁶ Similarly, three-quarters of respondents of a survey done by Jeje et al among more than 100 urologists practicing across Nigeria reported that they were still performing prostate biopsies by digitally guided means.¹⁵ It therefore implies that many centers in low-resource settings may still be stuck in the pre-TRUS era before Hodge et al advocated for TRUS-guided systematic prostate biopsies.¹⁴

Another finding in our study was the 96% detection rate among patients with suspicious findings on DRE. Closely related to this was the finding that detection rates rose to 80% in patients over 90 years old and were highest in those with PSA values exceeding 50 ng/ml. These suggest that many patients in our series presented with advanced disease. This high DRE accuracy is often a marker of advanced, late-stage disease presentation. In high-resource settings, DRE may be negative for early-stage, curable cancers and are often detected by imaging or PSA screening.¹⁶

While these rates provide a critical baseline for urological practice in low-resource settings, they must be interpreted within the context of our current diagnostic limitations. Technically, digital guidance is limited to the posterior and lateral peripheral zones—areas reachable by the examining finger. This approach systematically misses the anterior zone of the prostate, which may harbor up to 37% of clinically significant tumors.¹⁷ By remaining in the "pre-imaging era," we may be failing to detect a significant subset of the patients whose tumors are located in the anterior or apical regions, which are invisible to the finger but

accessible via TRUS or MRI.¹⁷ Unlike the contemporary global standard, which utilizes mpMRI for triage and TRUS for guided systematic or targeted biopsies, our procedures were performed using a "blind" digital-guided transrectal approach. The absence of real-time imaging guidance and pre-biopsy MRI reflects the structural and economic constraints typical of many LMICs.⁶ The global diagnostic landscape for prostate cancer (PCa) has undergone a paradigm shift, moving from PSA-driven "blind" biopsies to a pathway defined by multiparametric MRI (mpMRI) triage and targeted sampling. The landmark PRECISION Trial demonstrated that MRI-targeted biopsy is significantly superior to standard systematic biopsy for detecting clinically significant PCa, while the PROMIS Trial validated MRI as a vital tool to avoid unnecessary procedures.^{18 19}

Furthermore, our series showed that 100% of the biopsies were performed via the transrectal route as compared to the transperineal (TP) approach. In contemporary urological practice, particularly in high-income countries (HICs), there is a gradual shift away from transrectal ultrasound-guided (TRUS) biopsy toward the transperineal route.²⁰ This transition, which is primarily driven by the "sepsis advantage" since the transperineal approach involves passing the needle through the disinfected skin of the perineum rather than the rectum, it effectively eliminates the risk of introducing fecal flora into the highly vascular prostate gland and bloodstream.²¹ Besides, the TP route allows for better sampling of the anterior and apical regions of the prostate, which are often difficult to reach or missed during transrectal procedures.¹⁷

In our low-resource setting, the paucity in the number of TP biopsies that are being performed is a reflection of broader systemic challenges. Adopting the TP approach typically requires specialized equipment, such as brachytherapy-style grids or freehand needle guides, and can

involve a steeper learning curve for surgeons accustomed to the transrectal digit-guided or TRUS-guided techniques. The requirement for regional anesthesia will increase the cost for this procedure in a population that is already negatively impacted by the high cost of care.²⁰ As we look to modernize prostate cancer diagnostics in institutions in low-resource settings like ours, transitioning to or adopting transperineal techniques may represent a vital future direction to minimize the morbidity of biopsy-related sepsis while potentially improving cancer detection in non-palpable, anterior lesions.

Context is essential when responding to the rhetorical question on how far we are falling short. While we may be falling short based on global gold standards with respect to the use of technology, approach, and technique, we may not necessarily be falling short considering our current resource envelope. The 35.5% CDR may represent a baseline rate for institutions in low-resource settings like ours. The variable difference notable in our CDR when compared to others may be more of a reflection of external barriers impacting health, such as late presentation, high cost of care due to out-of-pocket payment for healthcare by the majority of the population, inadequate specialists to cater to a large population, and a lack of advanced imaging modalities.

The goal, however, is not to assign blame for these differences, but to advocate for the structural support needed to transition from this "pre-imaging era" towards more contemporary, evidence-based practice.

CONCLUSION

Prostate cancer was detected in over a third of patients who had digital guided prostate biopsy done at our center, with detection rates increasing progressively with age. A high detection rate was found among patients with suspicious DRE findings and those with PSA values exceeding 50

ng/ml, suggesting that many patients presented with advanced, late-stage disease.

While this CDR serves as a vital institutional baseline and a realistic reflection of what is achievable within our current resource envelope, it highlights a major challenge and departure when it is compared to global gold standards.

RECOMMENDATIONS

To align with contemporary, evidence-based practices, there is an urgent need for structural support to transition from the "pre-imaging era" toward TRUS-guided and mpMRI-targeted biopsy pathways. Furthermore, adopting transperineal approaches represents a critical future direction to improve detection in non-palpable lesions while minimizing the risk of biopsy-related sepsis. Ultimately, the goal is to bridge these gaps through systemic investment in diagnostic technology and specialized training to improve early detection and patient outcomes in low-resource settings.

Limitations

All biopsies were performed using a blind digital guided method without ultrasound or MRI guidance, likely missing cancers in certain prostate areas. This is part of what this article speaks to. In addition, the study was retrospective in nature and from a single hospital, so the results may not apply to other settings even within the country.

Conflict of Interest

None

Acknowledgements

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Penile Vibratory Stimulation for Semen Collection in Patients with Ejaculatory Disorders

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ABSTRACT

Background: Ejaculation is a complex physiological process that is mediated by interwoven neurological and hormonal pathways. Any interference with those pathways may cause a wide range of ejaculatory disorders including delayed ejaculation (DE) anejaculation or premature ejaculation. The aim of this study is to assess the efficacy of penile vibratory stimulation using a vibrator for semen collection in patients with DE or anejaculation for seminal fluid analysis or assisted reproductive technique. **Materials and Method:** The study was a combined retrospective and prospective study on which demographic information, risk factors for DE/anejaculation, history of prior ejaculation and outcome of vibration were all retrieved from the clinic register for the retrospective component; these were combined with those documented from the prospective component. All the Patients were trained on how to place and maintain the erect penis on the vibrator and stimulated for initially less than 30mins which may be extended to 60mins. The findings were recorded. **Results:** The age of the patients ranged between 23 to 89 years with a mean age of 39 ± 9.7 years. The risk factors for the DE among our patients were diabetes mellitus (28.1%), prolong penile stimulation requirement (24.5%) and spinal cord injury (19.3%) among others. Patients with lifelong (primary) DE accounted for 19.3% and acquired (Secondary) DE accounted for 80.7%. Following the procedure, the semen yield based on the duration of the vibratory stimulation (<30mins vs 30-60mins) was statistically significant ($P=0.0022$). **Conclusion:** The success of semen yield with PVS improves with increasing duration of vibratory stimulation and the procedure is largely safe in majority of the patients **Recommendation:** Penile Vibratory stimulation can be recommended for patients unable to produce semen for the purpose of conducting seminal fluid analysis (SFA) or use in assisted reproductive technique (ART).

KEYWORDS: Anejaculation, Delayed Ejaculation, Penile Vibratory Stimulation.

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INTRODUCTION

Ejaculation is a complex physiological process that is mediated by interwoven neurological and hormonal pathways. Any interference with those pathways may cause a wide range of ejaculatory disorders. The spectrum of ejaculation disorders includes premature ejaculation (PE), retarded or delayed ejaculation, anejaculation, painful ejaculation, retrograde ejaculation, anorgasmia and haemospermia.⁽¹⁾

The 3rd International Consultation on Sexual Medicine defined Delayed ejaculation (DE) as a persistent or recurrent difficulty, delay in, or absence of attaining orgasm after sufficient sexual stimulation, which causes personal distress.^(2,3) While the American Psychiatric Association in the Current diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, defines DE as either a marked delay in or a marked infrequency or absence of ejaculation on 75% to 100% of occasions for at least 6 months of partnered sexual activity without the individual desiring delay and causing significant distress to the individual.⁽²⁾ Anejaculation, is a complete absence of ejaculation and is considered as the severe form of DE.⁽³⁾ Therefore, the terminology DE aimed to describe all ejaculatory disorders that lead to a delay or absence of ejaculation.⁽⁴⁾ DE can be lifelong, acquired or situational.⁽⁵⁾

The 4th International Consultation on Sexual Medicine defined Lifelong (primary) DE as a lifelong experience or inability to ejaculate in all or almost all (75%-100%) occasions of coital activity, associated with distress. Voluntary cessation of coital activity may subsequently occur after a variable time to avoid frustration, physical exhaustion, or genital irritation of self or partner. Men with lifelong DE might or might not be able to achieve ejaculation by subsequent non-coital activity, including masturbation.^(2,5)

While Acquired (secondary) was defined as a distressing lengthening of ejaculatory latency that occurs in most (>50%) coital experiences after a period of normal ejaculatory function or a clinically meaningful change that results in distress. Voluntary

cessation of coital activity may subsequently occur after a variable time to avoid frustration, physical exhaustion, or genital irritation of self or partner.⁽⁵⁾

Ejaculation is triggered by integration of tactile (e.g., sensation from genital or other peripheral nerves) and non-tactile (e.g., sexually arousing audio and visual inputs) stimuli in the brain.⁽¹⁾ It consists of two distinct phases; Firstly, emission, a centrally-mediated action characterized by closure of the bladder neck and contraction of smooth muscles throughout the seminal tract (mediated by the sympathetic nervous system), which includes secretion of seminal fluid into the proximal urethra. The second phase is ejection, a reflex driven by the somatic nervous system, specifically the pudendal nerve, which is characterized by repeated contractions of the bulbospongiosus and ischiocavernosus muscles leading to forceful expulsion of seminal fluid from the urethral meatus.⁽²⁾ The act of ejaculation has important connotations for many men, aside from its association with orgasmic pleasure and necessity for procreation. Loss or anomaly of ejaculation may lead to a diminished sense of masculinity and disruption of pleasure from orgasm for many men. Delayed ejaculation is caused by the failure of semen emission from the seminal vesicles, prostate, and ejaculatory ducts into the urethra.⁽²⁾ True anejaculation is usually associated with a normal orgasmic sensation and is always associated with central or peripheral nervous system dysfunction or drugs.⁽¹⁾

There is a general agreement that low rates of DE are reported in the literature, it is the least common form of male sexual dysfunction. The prevalence of DE is reported to range from 1% for lifelong DE to 5% for acquired DE.^(3,4)

It may result from spinal cord injury, ejaculatory duct obstruction, retroperitoneal lymph node dissection, diabetes mellitus (DM), transverse myelitis, pelvic irradiation, multiple sclerosis, or psychogenic causes. The psychogenic causes include insufficient stimulation (mental and physical), performance anxiety, uncomfortable

environment, poor relationship factors and unusual masturbation techniques.⁽¹⁻⁵⁾

Treatments include sex therapy, vibrator stimulation, electro ejaculation, drugs and surgery.⁽⁶⁻⁹⁾ Penile vibratory stimulation (PVS) and electro-ejaculation are well-known techniques for semen collection.⁽⁸⁾ Penile vibratory stimulation evokes the ejaculation reflex, which requires an intact lumbo-sacral spinal cord segment; it is non-invasive and does not require any major equipment or technical assistance.⁽⁹⁻¹³⁾

Delayed ejaculation severely decreases the potentials of fertility in an individual; hence sperm retrieval in these individuals for the purpose of seminal fluid analysis (SFA) and assisted reproductive technique (ART) is paramount to the overall management of the patients.^(1,2) Sperm collection for these patients will improve their quality of life as they may be able to bear children.^(13, 14)

Very few studies have been conducted in Africa to establish the effectiveness of PVS for semen collection hence the motivation to conduct this study. The aim of the study was to determine the effectiveness of PVS using a vibrator for semen collection for SFA or ART.

MATERIALS AND METHOD

The study was a combined retrospective and prospective study to clinically assess the Effectiveness of PVS for Semen Collection in Patients with DE/anejaculation who presented to our hospital from January 2017 to June 2024. The subjects were all consenting Patients with DE or anejaculation of various aetiologies who presented to our hospital. Patients excluded from this study were those with established obstruction as a cause of anejaculation and retrograde ejaculation.

For the retrospective component of the study, data on the patients' demographic information, risk factors for DE/anejaculation, history of prior ejaculation (intercourse, masturbation, and wet dreams), psychogenic assessment, history of drugs and concoction use, spontaneous or induced erection, PVS findings (type of stimulator used, duration of stimulation, semen expulsion and complications) were all retrieved from the register at

the clinic that was kept since commencement of the therapy. These were combined with the findings from the prospective component.

All patients were initially counseled on the modality of procedure, rationale behind it, it's working, duration of stimulation and possible complications; these are contained in patient information sheet. Before beginning the session for each patient, materials needed were made available; these include vibrator, Bimix (papaverine + chlorpromazine), injection phenylephrine, semen collection sample bottle, 1ml syringes, gloves, methylated spirit and dry cotton wools etc.

Each patient was given tabs tadalafil 20mg to ingest 1hr before the planned procedure. At the commencement of the procedure, in a private procedure room each patient was stimulated to have an erection by being asked to fantasize with or without watching a porn. Where a patient was unable to have an erection, or couldn't take the tadalafil, he then had intracavernous bimix (papaverine + chlorpromazine) 0.5-1ml to induce erection. Patient was then trained on how to place and maintain the erect penis on the vibrator and stimulated for initially less than 30mins (5- 29mins) and if not successful then extended to 30-60mins [Fig IV and V]. A semen collecting container was made available to the patient for semen collection. Where the first session did not yield semen, this procedure was repeated at another time following same routine.

The information obtained were entered into Excel sheets, refined, grouped and then transferred into SPSS Version 21 and analyzed. Chi squared test was used to assess significance of association. Differences were considered statistically significant where p-value was less than 0.05 ($p < 0.05$).

The ethical approval for the conduct of the study was obtained from the Research Ethics Committee (REC) of the hospital with the reference no-NHREC/28/01/2020/AKTH/EC/3692. Patients signed informed consent.

RESULTS

A total of 57 patients were recruited into the study including 45 whose records were retrieved and

reviewed retrospectively and the 12 treated prospectively.

The age distribution of the patients is as shown in Fig 1, age ranged between 23 to 89 years with a mean age of 39 ± 9.7 years.

The risk factors for the DE/ anejaculation found among our patients are shown in Table I, with DM being the commonest risk factor. In addition, the patients were grouped based on their type of DE (according to classification by The 4th International Consultation on Sexual Medicine) into lifelong (primary) DE accounting for 19.3% and acquired (Secondary) DE accounting for 80.7%.

In 40.4% of the patients, an adopted massager (Fig V) was used for the vibration, this was at the early years of the practice when it was the only available vibrator in the clinic, it was substituted by a vibrect-X3 (Fig IV) in the later years and used in 59.6% of the patients.

Following the procedure, the semen yield among the patients was compared based on the type of vibrator used and the duration of the vibratory stimulation. In terms of the semen yield, no statistically significant difference was found based on the type of vibrator (Massager vs vibrect-X3) used as shown in Table II, however, the duration of the vibratory stimulation (<30mins vs 30-60mins) was statistically significant (Table III).

Few complications were recorded in all the patients while the majority had none (Fig III).

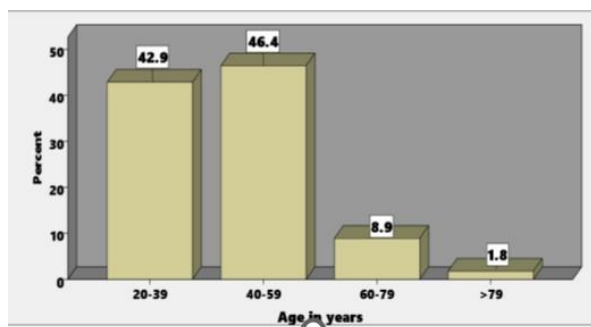


Figure 1: Age Distribution of the patients.

Majority of the patients were married (Fig II)

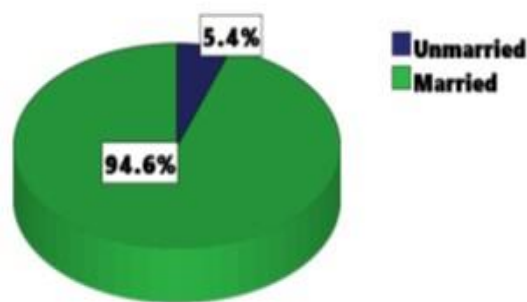


Figure II: Marital Status of the Patients.

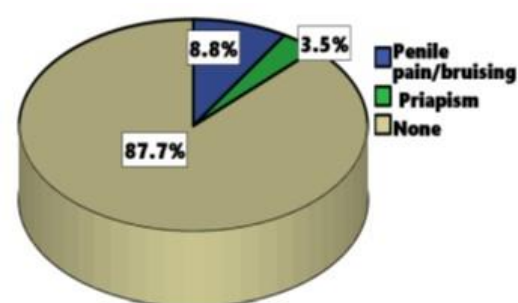


Figure III: Complications of Penile Vibratory Stimulation



Figure IV: Vibration with a Vibrect-X3.



Figure V: Vibration with an adopted massager.

Table I: Risk Factors for Delayed Ejaculatory/Anejaculation

Risk Factor	Frequency	Percent
Diabetes Mellitus	16	28.1
Spinal cord compression/Injury	11	19.3
Anxiety	9	15.8
Uncomfortable Environment	7	12.3
Prolong Penile Stimulation Requirement	14	24.5
Total	57	100.0

Table II: Semen Yield Based on Type of Vibrator Used.

Vibrator Type	Frequency (semen production)			Cumulative freq/percent
	None	<1.5mls	>1.5mls	
Vibrect-X3	11	5	18	34(59.6)
Massager	10	5	8	23(40.4)
Total	21	10	26	57(100.0)

Chi square value= 1.87 P= 0.39

Table III: Semen Yield Based on Duration of Vibratory Stimulation

Duration of vibration	Frequency (semen production)			Cumulative freq/percent
	None	<1.5mls	>1.5mls	
<30mins	15	4	5	24(42.1)
30-60mins	6	9	18	33(57.9)
Total	21	13	23	57(100.0)

Chi square value= 12.17 P= 0.0022

DISCUSSION

Ejaculation represents the climax of the sexual cycle, its occurrence in an individual signals successful completion of the sexual cycle. Ejaculation has both psychological and reproductive significance; DE (including anejaculation) has tremendous negative effect on both the psychosexual and reproductive function of the individual. From this study, patients' age range (23 to 89 years) and mean age (39 ± 9.7 years), indicates the age individuals began to be worried about their ejaculatory function which affect their ability to impregnate their partners. In the few reported cases of DE/anejaculation, most patients were also of young age.^(8,9,14) Majority of the patients were married, this is also expected as regular intercourse and strong stimulation is required to ascertained individuals' capabilities to ejaculate. Several possible risk factors for DE have been documented in previous articles,^(1,2,3,5) from this study, DM, spinal cord injury (SCI) and anxiety were frequent among our patients and this is similar to previous reports, however, a significant percentage of them (24.5%) had none of the known risk factors but that they required long penile stimulation to ejaculate. The pathophysiologic explanation of DE/ anejaculation in patients with DM and SCI has been fully documented in earlier reports,^(4, 12) however the explanation in other rare cases require further elucidation of the processes involved. Most of the patients attended to in this study had earlier ejaculated and might ejaculate in some situation (acquired). These patients might have been ejaculating prior to onset of their disease condition (as in SCI) or would have ejaculated in a more secure and comfortable environment. In some, the DE results from consequences of long standing disease (as in DM). Similar findings were reported in other studies.^(4,8,12)

Penile vibratory stimulation remains a first-line, simple, effective and safe option for inducing ejaculation in patients with DE (particularly those with SCI), in this study, PVS was tested in patients with various risk factors for DE, using 2 different types of vibrators and extending duration of vibration in order to improve effectiveness. No statistically significant difference between using an

adopted massager and a Vibrect-x3 in terms of semen yield (p value- 0.39), however, extending the duration of vibration to up to between 30 to 60mins is statistically significant (p value- 0.0022) in improving the chances of ejaculation when compared to shorter duration of vibration (< 30mins). This might be explained by the fact that stronger and longer duration of penile stimulation has been shown to improve attainment of orgasm (and eventual ejaculation) in some patients.^(3,5)

Penile vibratory stimulation has been found to be safe in majority of our patients with only few reports of priapism following inducing erection and mild penile bruises, PVS has been reported generally as a safe procedure with no significant complications^{10, 11,12} as the procedure employed the use of simple technology with safety measures being observed.

CONCLUSION

Penile Vibratory stimulation for patients with DE/anejaculation is an important adjunct in the general management of patients with DE which can be used to induce ejaculation for use in SFA and ART. The success of semen yield with PVS improves with increasing duration of vibratory stimulation and the procedure is largely safe in majority of the patients.

RECOMMENDATION

Penile Vibratory stimulation can be recommended for semen collection in patients unable to produce semen for the purpose of SFA or use in ART.

Limitations: Being a rare disorder, the sample size is small, hence a bigger sample size, wider coverage is needed in subsequent study in order to generalize findings.

Conflict of Interest: No conflict of interest. The researcher has no affiliation to any of the companies whose products were used in the course of this study.

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Pre- and Post-Prostatectomy Detrusor Wall Thickness and the Symptom Profile in Patients with Benign Prostatic Enlargement: A Prospective Review in Nigerian Men

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ABSTRACT

The urinary bladder undergoes morphological and functional changes in patients with symptomatic benign prostatic enlargement (BPE). These detrusor changes reflect chronically increased intravesical pressure as a result of outlet obstruction. This study aims to determine the relationship between the Pre- and Post-op detrusor wall thickness (DWT), international prostate symptom score (IPSS) and duration of lower urinary tract symptoms (LUTS) in patients who had open simple prostatectomy (OSP). **Method:** This was a prospective study of a cohort of patients who had OSP for symptomatic BPE. The IPSS and symptom duration for each patient was noted. Each patient also had abdominal ultrasound scan with measurement of their DWT. Retropubic OSP was done for each patient. The detrusor wall thickness measured was also measured 12 weeks after the prostatectomy. **Results:** Fifty-two patients completed the study; mean age was 66.37 ± 8.09 years. The median pre-operative IPSS was 28 (IQR = 13.75), and the median duration of symptoms was 24months (IQR = 37 months). The mean pre-operative DWT was $4.41 \pm 1.38\text{mm}$ while the mean post-operative DWT was $2.16 \pm 0.98\text{mm}$. The pre-operative IPSS ($p = 0.833$) and duration of symptoms ($p = 0.375$) did not significantly correlate with the pre-operative DWT. There was significant reduction in the mean DWT ($p < 0.001$) and IPSS ($p < 0.001$) following prostatectomy. **Conclusion:** DWT appears not to be significantly influenced by the severity or duration of LUTS. However, it reduced significantly following OSP with corresponding improvement in urinary symptoms.

Key Words: Benign prostatic enlargement, detrusor wall thickness, international prostate symptom score, open simple prostatectomy

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INTRODUCTION

Benign prostatic enlargement (BPE) is a common urological condition, and a leading cause of Bladder outlet obstruction (BOO) in middle aged and elderly men¹⁻³. Open simple prostatectomy (OSP) is still a common surgical treatment for BOO from BPE in developing countries⁴. The urinary bladder undergoes certain changes due to its increased workload in bladder outlet obstruction⁵. These structural and functional compensatory changes are aimed at overcoming the increased resistance at the bladder outlet⁶. They result from alteration in the cellular composition and metabolism of the bladder wall⁷. These detrusor changes depend on the severity and duration of obstruction; and they include detrusor hypertrophy, detrusor instability and reduced detrusor contractility^{6,8}. Structural bladder wall changes that may also occur include trabeculations, sacculation and diverticula formation⁹⁻¹¹. Detrusor hypertrophy results from increased collagen deposition and can still adversely affect bladder function even after relief of obstruction.

Measurement of detrusor wall thickness (DWT) is done during abdominal ultrasound scan, with the use of high frequency probes. The detrusor appears hypoechoic and is seen in between the hyperechoic outer serosa layer and the hyperechoic inner mucosa/submucosa layers of the bladder^{1,12}. The DWT depends on the level of distension of the bladder and is considered accurate when the bladder volume reaches 250mls¹³. Kessler et al.¹ reported a median DWT of 1.7mm for unobstructed; 1.8mm for equivocal and 2.7mm for obstructed patients. Detrusor hypertrophy may be completely reversed within twelve weeks of surgical treatment for BOO⁸.

OBJECTIVES

This study determined the relationship between the pre- and post-op DWT and symptom profile in patients with symptomatic BPE who underwent OSP. The symptom profile was assessed using the international prostate symptom score (IPSS) and the duration of lower urinary tract symptoms.

PATIENTS AND METHOD

This was a prospective hospital-based study of a cohort of patients who had OSP on account of symptomatic BPE at the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) from January 2018 to December 2019. The minimum sample size for the study was estimated to be 35 patients using Leslie-Fischer's formula, and 52 patients were recruited into the study. The IPSS and duration of LUTS were determined. A Toshiba real time ultrasound scanner model TUS-F30 equipped with ultrasound transducer 7.5MHz (Year of manufacture 2010) was used to measure the DWT, which was taken as the hypoechoic middle bladder layer of the anterior bladder wall. The DWT was measured at three points on the anterior bladder wall and the average value was used for this study. Open retropubic prostatectomy was done for all the patients. DWT was also measured 12 weeks after prostatectomy. All bladder ultra-sound scans were performed by a single radiologist to prevent inter-observer variability.

The exclusion criteria include patients with neurogenic bladder, uncontrolled diabetes mellitus, history of previous bladder surgery (such as suprapubic cystostomy) which might affect the thickness of the anterior bladder wall, gross structural bladder wall abnormality (such as bladder diverticula), as well as those on prolonged urethral catheterization with continuous bladder drainage for more than 3 months duration. Informed consent was obtained from each patient. Ethical approval was obtained from the Ethics and Research Committee of OAUTHC (IRB/IEC/0004553), and the study was performed in accordance with the ethical standards. The data obtained was analysed using the Statistical Package for Social Sciences (SPSS) software for windows version 20. Correlations of IPSS and duration of symptoms with pre-operative DWT was determined using Pearson coefficient. The association between pre- and post-operative DWT was determined using paired sample T-test. For all statistical tests, $P < 0.05$ was considered significant

RESULTS

Fifty-two patients participated and completed the study and were included for analysis. The age distribution of the patients ranged from 49 - 89 years, with a mean of 66.37 ± 8.09 years and a peak in the 7th decade. The symptom profile comprised the pre-operative IPSS and quality of life, as well as the duration of symptoms. The median pre-operative IPSS was 28 (IQR = 13.75). Three-quarters of the patients had severe symptoms (Fig. 1) and felt mostly dissatisfied with their symptoms (Table 1).

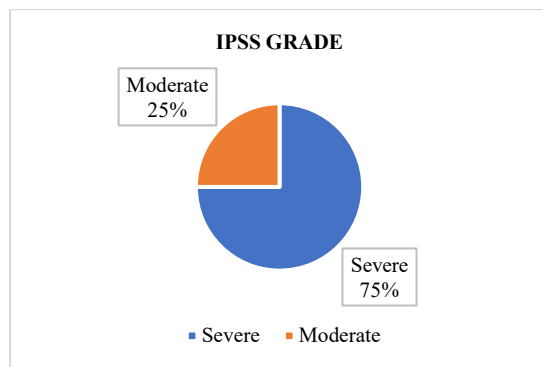


Figure 1: Severity of Symptoms

Table 1: Quality of life

Quality of Life	Frequency	Percentage (%)
3	12	23.1
4	19	36.5
5	16	30.8
6	5	9.6
Total	52	100

The median duration of symptom was 24months (IQR = 37). Most patients presented after one year of onset of symptoms. The median prostate volume of the patients was 86.45 cm^3 (IQR= 72.05 cm^3), and the most common indication for surgery was failed medical therapy.

The Pre-op DWT ranged from 1.8 – 7.3mm, with a mean of $4.41 \pm 1.38\text{mm}$; while the Post-op DWT at 12 weeks ranged from 0.8 – 6.3mm with a mean of

$2.16 \pm 0.98\text{mm}$. There was a 50% reduction in the DWT (Fig. 2).

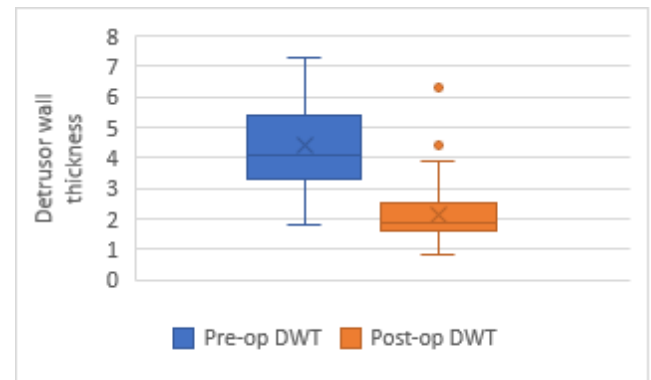


Figure 2: Detrusor wall thickness

The relationship between symptom profile and pre-operative detrusor wall thickness was examined using Pearson correlation. There was no significant correlation between pre-operative IPSS and the pre-operative DWT ($p = 0.833$; Fig. 3). There was also no significant correlation between the duration of LUTS and pre-operative DWT ($p = 0.375$; Fig. 4).

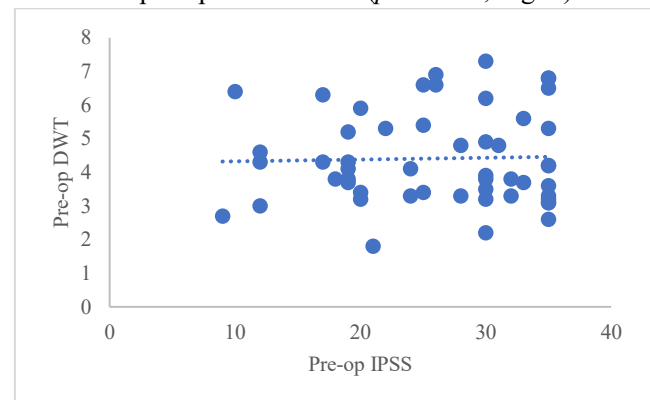


Figure 3: DWT and pre-op IPSS

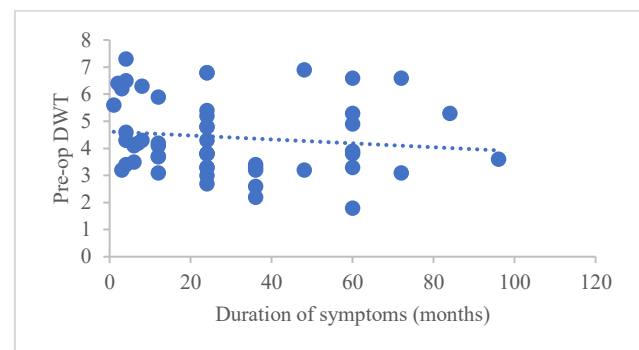


Figure 4: DWT and duration of symptoms

The relationship between pre-operative and post-operative detrusor wall thickness was determined using the Paired Sample T-test. There was a significant reduction in the mean DWT from a pre-op value of 4.41mm to a post-op value of 2.16mm ($p < 0.001$; Fig. 5). The pre- and post-operative IPSS scores were also compared, and there was significant reduction in the median IPSS value from 28 to 2 ($P < 0.001$; Fig. 6), and the patients were mostly satisfied with their voiding.

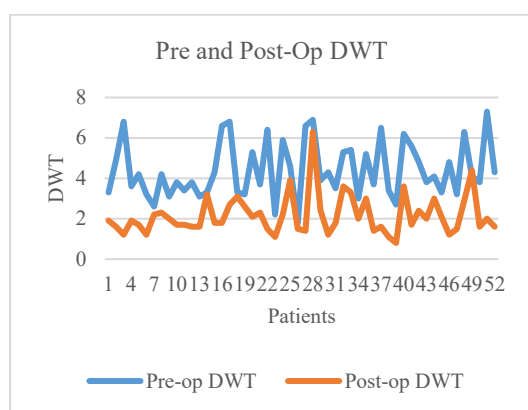


Figure 5: Relationship between pre- and post-op DWT ($P < 0.001$)

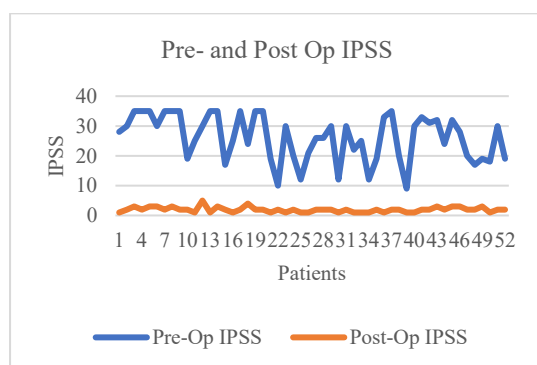


Figure 6: Relationship between Pre- and Post-Op IPSS ($P < 0.001$)

DISCUSSION

The age distribution of the patients in this study conforms with that from other studies^{14–17}. BPE is regarded as a disease of middle aged and elderly men, and this is clearly depicted by the age range of participants in this study, with a peak incidence in the 7th decade. Individuals in this age group are prone to several comorbidities and age-related

changes in the various organs of the body, one of which is the enlargement of the prostate gland. The cumulative effect of these changes is gross impairment in the quality of life of these senior citizens, many of whom have retired from active service.

Many patients in this study had their symptoms for a year or more with no form of treatment, pointing to the fact that they waited until they could no longer cope with their symptoms before they presented to the hospital. This shows that much still needs to be done in terms of public awareness and advocacy for early presentation and prompt treatment of BPE in our environment. This finding is similar to that by Salako et al⁴, in a review of 337 patients who had open prostatectomy for BPE. They reported that 56.3% of the patients presented after one year of onset. Adegun et al¹⁶ in their study of 96 patients who had open prostatectomy also noted that only 20% of their subject presented within 6 months of onset of symptoms. While this study did not evaluate reasons for delayed presentation, some authors have attributed this to various factors such as lack of knowledge of the symptoms of BPE, preference for alternative therapy and lack of quality health care system¹⁶.

Given the delay in presentation, it is not surprising that most patients had severe symptoms and were mostly dissatisfied. The predominance of severe symptoms in this study may be explained by the inclusion of only patients who were scheduled for prostatectomy. This automatically excludes patients on medical treatment, many of whom might have had mild or moderate symptoms. Many studies which evaluated non-selected population of patients reported a predominance of moderate symptoms in their cohorts^{17–20}. Lu et al.¹⁹ in their study of 122 elderly men, reported that 56.6% of patients with BPH had moderate symptoms. Eze et al.¹⁷ in their study of 101 men with BPH, noted that most of the patients (60.4%) had moderate symptoms.

Detrusor wall hypertrophy is a known anatomical change following bladder outlet obstruction. Its measurement is considered an objective way of assessing detrusor response to BOO. Normal

detrusor wall thickness has been reported to range from 1.7mm to 2mm in healthy men^{1,12}. This study revealed a mean detrusor wall thickness of 4.4mm in the study population. This far exceeds the threshold of the normal range^{12,21} and also exceeds what other authors have observed among patients with BOO^{1,22}. Kessler et al¹ reported a detrusor wall thickness of 2.7mm in men with BOO. This difference in the detrusor wall thickness among patients with BOO may be explained by the racial differences, considering that blacks are known to have larger prostate sizes^{4,23}. While the figures may vary, detrusor wall thickness has been clearly documented to be higher in patients with BOO across several studies^{9,19}.

The duration of symptoms of the study population did not also have a relationship with the pre-operative DWT. Since most of the patients had their symptoms for more than one year, it may also be possible that the detrusor has reached its limit of collagen deposition and growth⁷.

While prostatectomy is expected to address the symptoms of BPE which it often does, it is not uncommon for storage urinary symptoms to persist even after prostatectomy. Although various factors may account for this, alteration in the configuration of the detrusor wall has been implicated as one of the possible reasons why patients may have storage symptoms post prostatectomy⁷. Patients with irreversible damage to the detrusor muscle following BPE tend to have poorer outcomes in terms of symptom resolution and quality of life. It is comforting however, that despite the marked thickness in the detrusor wall in this cohort, there was a significant reduction following prostatectomy with the mean post-operative DWT being almost half of the pre-operative DWT value. The reduction in DWT is due to the relief of bladder outlet resistance and the ease of bladder emptying, without need for very high intra-vesical pressures. The reduction in DWT was irrespective of the pre-operative value, as it was noted in most patients, and this corresponded to improvement in symptoms in these patients. Two patients whose DWT did not reduce were as a result of post-operative bladder neck stenosis. They were treated with bladder neck

dilatation using metallic dilators. These findings agree with other studies which demonstrated significant changes in DWT with corresponding improvement in LUTS^{8,9}.

Following open prostatectomy, there was improvement of LUTS, with a significant drop in the IPSS scores of the patients from a median pre-op value of 28 to a median post-operative IPSS score of 2. The resolution of symptoms post prostatectomy reflects its effectiveness in the treatment of patients with BOO secondary to BPE in our environment. Other studies have also demonstrated similar relief in symptoms following open prostatectomy^{4,24,25}.

CONCLUSION

This study did not show any significant relationship between IPSS, duration of LUTS and detrusor wall thickness. However, it clearly demonstrates the impact of prostatectomy, not only on the improvement of symptoms, but also in the reduction of the thickness of the detrusor wall, to about half the pre-operative values. DWT may therefore be used as one of the outcome measures for effective relief of obstruction post-prostatectomy.

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Evaluation of Acute Kidney Injury (AKI) Markers in Children following Extracorporeal Shock Wave Lithotripsy (ESWL): A Prospective Controlled Study

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ABSTRACT

Objective: To determine the effect of ESWL on kidney damage in children and use potential AKI biomarker levels as diagnostic indicators. **Methods:** We enrolled thirty consecutive child patients who underwent ESWL (Group1) with small renal calculi. As a control, thirty child patients (Group 2) with no known urogenital disease and no known history of urologic pathology also participated in this study. **Result:** The mean age of patients was 7.9±4.3 and 7.5±2.4 years in group 1 and group 2, respectively (p=0.09). The mean stone size was 88.1±65.2 mm² in group 1. Mean levels of KIM 1/Cr were recorded at three times: before ESWL, 2 hours after ESWL, and 24 hours after ESWL. Twenty four hours after surgery, KIM-1/Cr levels increased significantly in urine compared to pre-operative levels (p=0.04). NGAL/Cr mean levels were not elevated significantly after surgery, but there were significant differences between Group 1 patients and Group 2 patients 24 hours after surgery (p<0.01). The NAG/Cr levels were higher in the study group than in the control group and increased significantly after the operation. The mean levels of LFABP /Cr in urinary specimens did not change significantly after ESWL. **Conclusion:** ESWL is safe and curative for urolithiasis in children, but there is no doubt that ESWL can lead to acute kidney injury. Our data suggests that increased NAG/Cr and KIM 1/Cr levels can help in assessing the amount of damage done to the kidney after ESWL in children.

Keywords: Acute Kidney Injury, ESWL, Children

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INTRODUCTION

Urolithiasis affects almost 2%-3% of children and this age group has a high-risk for stone recurrence (6%-44%) (1, 2). ESWL is the preferred treatment for small upper urinary tract calculi in children, with well-known advantages such as high efficiency and ease of use on children (3). Despite the small ureteral diameter, fragments pass more easily because of the flexible structure in children (4).

ESWL consists of mechanical and dynamic effects for effective stone fragmentation. Cavitation bubble collapse is responsible for stone fragmentation, which can create destructive forces. Although many benefits are attributed to this treatment, there are risks associated with this procedure. ESWL may induce acute kidney injury (AKI) by causing harm to vessels and surrounding kidney tissues, inflammation, and hemodynamic impairment (5). Moreover, once renal injury resolves, persistent kidney damage may develop (6). There are published reports in the literature that these acute effects cause hemorrhaging, releasing some inflammatory cellular mediators. Animal studies have also proven the adverse effects of ESWL on kidneys (7).

Many studies continue to investigate how to best quantify the effect of acute kidney injury by evaluating various noninvasive biomarkers of renal injury (8). The current literature suggests that the most effective biomarkers of AKI are kidney injury molecule-1 (KIM-1), neutrophil gelatinase-associated lipocalin (NGAL), N-acetyl-D-glucosaminidase (NAG) and liver-type fatty acid binding protein (LFABP), which are expressed after ischemic and nephrotoxic AKI (8). KIM-1 is a type 1 transmembrane glycoprotein. Recent reports suggest that human and animal kidneys' proximal tubule epithelial cells express high levels of KIM-1 after ischemic or toxic injury (9, 10). NGAL is another potential AKI biomarker that may be able to identify early kidney injury. NAG is a lysosomal enzyme that it is abundantly expressed in proximal tubule epithelial cells (11). LFABP is a protein that

is normally expressed in the proximal tubules of the kidney and has been observed to be elevated in animal models of AKI(12). Various studies propose that KIM-1, NGAL, NAG, LFABP are promising biomarkers for diagnosing AKI and monitoring clinical improvement of the kidney (8). We aimed to evaluate AKI levels because they can help assess the amount of damage to the kidney after ESWL in children. It is the first study to evaluate AKI levels for ESWL treatment in the child age group.

MATERIALS AND METHODS

A prospective controlled study was performed between April and September 2013. This study was approved by the Institutional Review Board of the Dicle University Medical Faculty. All patients treated with ESWL gave their informed consent before the procedure. We also obtained informed consent from all other subjects preceding their participation in the study. We enrolled thirty consecutive child patients who underwent ESWL (Group1) with renal calculi less than 2cm. Subjects who had previous renal surgery, a solitary kidney, congenital renal anomalies, kidney stones in other side, or evidence of other urinary tract disorders such as pyelonephritis were excluded from the study.

Thirty control child patients (Group 2) were randomly chosen from patients' relatives. They had no known urogenital disease and no known history of urologic. Volunteers provided one freshly voided urine sample.

Patient demographic data was collected as age, sex, and stone size. Pre-operative tests, such as routine blood tests, serum biochemistry, urinalysis, urine culture, ultrasonography, and plain X-ray were recorded. Computerized tomography (CT) was done routinely in order to analyze the size and location of the stone as well as the anatomical structure. Pre-operative antibiotics were administered based on the results of the urine culture. Electrohydraulic extracorporeal lithotripter (Multimed Classic; Elmed, Ankara, Turkey) was used for ESWL. The power of the shock wave was started from the lowest level (14 kV) and could be elevated to the maximum

level (20 kV) until fragmentation was observed in fluoroscopy. Shock waves were administered until fragmentation was observed or a maximum of 1,000 waves per session for children younger than 5 years. For older children, they were administered until fragmentation or a maximum of 2,500 waves per session.

Patient urine creatinine levels and AKI levels were measured three times: before the first session of ESWL, two hours after the first session, and 24 hours after the first session. We used an auto analyzer, the Architect C16000 (Abbott Laboratories, Abbott Park, IL, USA). Urine NGAL, KIM-1, NAG, and L-FABP levels were determined using a commercially available quantitative sandwich immunoassay technique (SunRed Biotechnology Company, Shanghai, China). All activity of the enzymes tested were given as a ratio of biomarker to urine creatinine values for each patient.

Statistical analysis

Statistical analysis was performed by Statistical Package for Social Sciences (SPSS) 15 software (SPSS Inc., Chicago, USA). All the data are presented as mean and standard deviation $\pm$ SD. Values of data were compared with ANOVA analysis and $P < 0.05$ was considered significant.

RESULTS

Demographic data was comprised of patient group [(Group 1 ($n = 30$), 16 were male and 14 were female)] and a control group [(Group 2 ($n = 30$), 15 were male and 15 were female)]. The mean age of

patients was 7.9 ± 4.3 and 7.5 ± 2.4 years in group 1 and group 2, respectively ($p = 0.09$). The mean stone size was 88.1 ± 65.2 mm² in group 1. Demographic data was established and found to be similar between the two groups (table 1).

The mean levels of creatinine, KIM-1/Cr, NGAL/Cr, NAG/Cr, and LFABP/Cr are summarized in table 2, figure 1 and the statistical comparison of the levels is shown in table 3. The mean levels of KIM-1/Cr differ in the study group of pre-procedure patients when compared to those of the control ($p < 0.01$). Creatinine levels were similar between the two groups and were not statistically elevated after ESWL. KIM-1/Cr mean levels were presented for before ESWL, 2 hours after ESWL and 24 hours after ESWL were 1.13 ± 0.34 , 1.34 ± 0.78 , 2.72 ± 0.60 respectively. Twentyfour hours after procedure, KIM-1/Cr levels had increased significantly in urine compared to before ESWL levels ($p = 0.04$). The mean levels of NGAL/Cr were 535 ± 115 , 560 ± 141 , 544 ± 146 for the different operative time points. NGAL/Cr mean levels were not elevated significantly soon after ESWL, but there were significant differences between the study group patients and the control group patients 24 hours after procedure ($p < 0.01$). The mean levels of the NAG/Cr from before ESWL, 2 hours after ESWL and 24 hours after ESWL were 0.13 ± 0.03 , 0.17 ± 0.04 , 0.24 ± 0.02 respectively. The NAG/Cr levels for the study group were higher than control group values and increase significantly after the operation. The mean levels of LFABP /Cr levels were 0.33 ± 0.1 , 0.33 ± 0.12 , 0.27 ± 0.18 respectively, and did not change significantly after ESWL in urinary specimens (Figure1).

Table 1: Patient demographics and ESWL outcomes among groups

	Group 1 (n:30)	Group 2 (n:30)	p value
Age (yr)	7.9±4.3	7.5±2.4	0.09
Sex			
Male	16 (53%)	15 (50%)	
Female	14 (47%)	15 (50%)	
Side			
Right	18 (57%)		
Left	12 (42%)		
Stone size mm ²	88.1±65.2		
Mean HU	810±124.6		
Number of mean shock waves	2480 ± 860		
Mean energy level kV	19.2±6.92		

HU: Hounsfield units, ESWL: Extracorporeal shockwave lithotripsy

Table 2. Early renal injury markers in children with urolithiasis who underwent extracorporeal shock wave lithotripsy (ESWL)

	Controls (n=30)	Before ESWL (n=30)	After 2h ESWL (n=30)	After 24h ESWL (n=30)
Kim 1 /Cr	1.06 ± 0.24	1.13 ± 0.34	1.34± 0.78	2.72 ± 0.60
NGAL / Cr	370 ± 229	535 ± 115	560 ± 141	544 ± 146
LFABP / Cr	0.32 ± 0.27	0.33 ± 0.1	0.33 ± 0.12	0.27 ± 0.18
NAG / Cr	0.07 ± 0.01	0.13 ± 0.03	0.17 ± 0.04	0.24± 0.02

Table 3. Differences (p values) in the early kidney injury markers creatinine ratio between the first measurements and the controls.

Compared modalities	Kim 1 / Cr	NGAL / Cr	LFABP / Cr	NAG/Cr
Before ESWL/ After 2h ESWL	NS	NS	NS	<0.01
Before ESWL/ After 24h ESWL	0.04	NS	NS	<0.01
Before ESWL/ Controls	0.03	NS	NS	<0.01
After 24h ESWL/ Controls	<0.01	<0.01	NS	<0.01

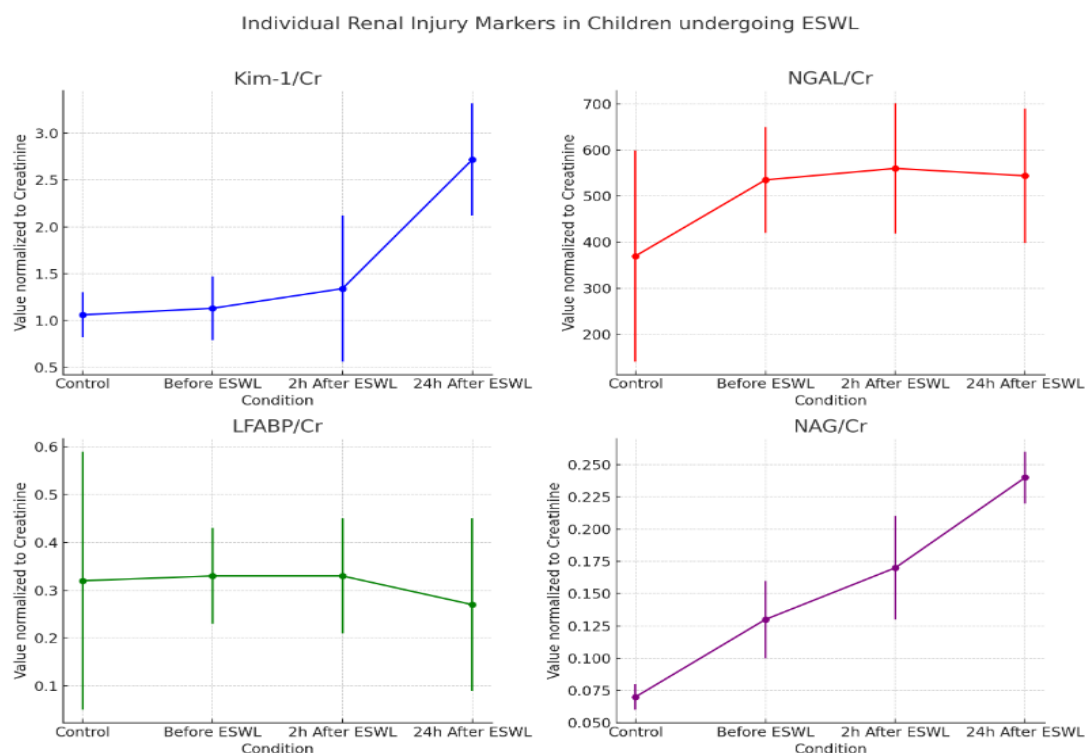


Figure1: Individual Renal Injury Markers in Children undergoing ESWL

DISCUSSION

ESWL is widely used for the management of stones located in the upper urinary tract. The safety, efficacy, and stone-free rates of ESWL have been shown in children (13, 14). Although this procedure is highly effective and safe, it is not completely free of side effects. Most of our knowledge about ESWL injury to the kidney is based on experimental animal studies where invasive methods were used to assess tissue damage (15). Morphological studies have shown that ESWL can rupture blood vessels and can damage the surrounding renal tubules in animals (15, 16). The acute effects of ESWL are defined in the literature (17). Acute trauma is usually localized in the area surrounding the stone. We encountered hematuria frequently in children after ESWL (13). In addition, there have been some published reports of severe acute injury of kidneys after ESWL, such as subcapsular or perineal bleeding (18). Although most hematomas resolve, some may cause life threatening hemodynamic instability and acute renal

failure (19). In the long term, animal and human studies have suggested that these acute hemorrhagic lesions may progress to scar formation and may lead to loss of kidney function (3, 15). Creatinine has been used for a long time to evaluate kidney damage, but it has been inadequate for early response. We aimed to determine the effect of ESWL on kidney damage in children and used potential AKI biomarkers levels as diagnostic indicators. Recently, several biomarkers have been explored for the early diagnosis of AKI, such as KIM-1, NGAL, NAG and LFABP (20). They are kidney-specific and highly sensitive for acute kidney injury. Furthermore, they are reliable and easily measurable in plasma or urine.

KIM-1 Kidney injury molecule 1 (KIM-1) has been found to be a sensitive marker of acute ischemic injury of the proximal tubular cells. It is excreted in

urine and thus has been used as a biomarker for AKI mostly in various types of kidney pathology (21). KIM-1 is a type I transmembrane glycoprotein. It has been shown that it is markedly upregulated in ischemic rat kidneys (9). Previous studies have shown KIM-1 levels were significantly higher in patients with ischemic acute tubular necrosis compared to levels in patients with other forms of acute renal failure (21). Another study demonstrated that levels of KIM-1 were associated with the severity of kidney injury (22). Authors found a positive correlation between the degree of scarring and KIM-1 levels in patients diagnosed with vesicoureteral reflux (23). Patients had significantly increased KIM-1 and NAG levels after ESWL when compared to their pre-procedure baseline levels. Urinary markers returned back to baseline levels within 2 weeks following ESWL (24). In our study we observed significantly higher levels of the KIM-1/Cr and NAG/Cr 24 hours after surgery. The results of the control group and pre-operative values of patients with kidney stones were similar for KIM-1/Cr, but NAG/Cr 24 levels were significantly higher in the study group than in the control group.

NGAL is a protein member of the lipocalin family, expressed by neutrophils and epithelial cells including proximal tubule cells. It has been identified as one of the fastest upregulated genes in the early phase of the post-ischemic animal kidney (25, 26). However, patients who did not experience AKI also displayed a significant increase in urine NGAL in the early postoperative period, although to a much lesser degree than those who subsequently developed AKI. Patients' NGAL/Cr values did not change significantly after operation, but control group levels were significantly lower than post-operative 24 hour levels.

L-FABP is a protein expressed in the proximal tubule of the kidney, filtered via the glomerulus and reabsorbed in the proximal tubules. Increased expression and urinary excretion have been described in animal models after renal tissue injury (27, 28). In patients with septic shock and AKI, urinary L-FABP measured at admission was

significantly higher in the control group than in the survivors (29). In our study, L-FABP/Cr value was found to be stable in urine for extended periods of time, and did not change urinary levels significantly.

NAG is a lysosomal enzyme that actively indicates damage to tubular cells in the kidney (30). Increased urinary NAG excretion has been reported in acute renal disease of varying etiology, primarily induced by cardiac surgery and renal transplantation (31). Chronic glomerular diseases limit the utility of NAG because urinary excretion of the enzyme is also elevated (30). Pre-operative NAG/Cr levels of group 1 patients were higher than the control group, plus the post-operative 2 hour and 24 hour levels also showed significant increases compared to pre-operative levels. We found NAG/Cr levels to be more sensitive than other biomarkers.

In our study, levels of AKI markers split to levels of creatinine for diminished effects of volume change. According to the results of our study, the pre-operative KIM-1 and NAG/Cr levels were observed to be significantly higher than the healthy volunteer patients, and they were more sensitive to detect damage to the kidney. The Kim-1/Cr and NAG/Cr values showed a significant increase in the first 24 hours after surgery.

Conventional imaging techniques or creatinine levels alone are not enough to rule out potentially significant injury to ESWL treated kidneys. In our study it was not changed in 24 hours after ESWL. We need to find a noninvasive diagnostic test that can reliably identify kidney injuries, especially in certain populations such as children, patients with renal disease or those undergoing multiple ESWL treatments. We had limitations in our study: patients numbers were low and we should have had longer patient follow-up to see when they start to fall back to preoperative levels. It is important to record ESWL shock wave numbers and kV for each child. After the first session of ESWL, we should adjust our treatment accordingly.

CONCLUSION

ESWL is safe and curative for urolithiasis in children, but there is no doubt that ESWL can lead to acute kidney injury. We aimed to determine the effect of ESWL on kidney damage and used potential AKI biomarkers levels as diagnostic indicators. In the future, we hope to use these biomarkers to evaluate ESWL's effect on kidney tissue after each session. Our data suggests that increased NAG/Cr and KIM 1/Cr levels may be one of the initial indicators of AKI after ESWL in children.

Conflict of interest: All the authors declare that there is no conflict of interest with any financial organization.

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Renal Cancers in Ibadan, Nigeria (2013-2022): An update

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ABSTRACT

Background: Renal cancer (RC) is projected to be stable in the developed countries and increase in the developing countries. In the last review in our environment over 5 years; 69 patients had RC, a rise in clear cell carcinoma, tumours in young adults and less use of abdominal CT scan. We present an update of RC in Ibadan. **Methods:** This was a retrospective study of patients who presented with clinical, imaging studies and histological diagnosis of RC between 2013 to 2022. We analysed these data as well as histology types, treatment offered and outcome of management using Kaplan-Meier survival curve. **Results:** There were 68 patients with RC, mean age was 49.7 ± 14.8 years. Males were 52.9% and 47.1% were females. They presented with pain and total haematuria (20.6%), pain and swelling (19.1%), pain alone (17.6%) and 7.4% had incidental RCs. Abdominal CT scan performed in all that confirmed 98.5% and 1.5% were unilateral and bilateral respectively. Localized and locally advanced renal cancers accounted for 79.4% while 20.6% were metastatic disease. Paraneoplastic manifestations of RC were seen in 57.4%. RC rose gradually and peaked in 2019 and thereafter stabilized. The commonest histological types were clear cell RC (36.9%) and papillary RC (27.9%). Rare RCs were neuroendocrine RC (3.9%) and collecting duct RC (2.0%). The treatments offered were radical nephrectomy (RN), unresectable tumours, and targeted therapy in 72.1%, 13.2%, and 7.4% respectively. The median overall survival (OS) was 37 months ($p=0.000$, Chi-square 63.413, $df=3$). **Conclusion:** There was a gradual increase number of RC that later stabilized in the last 2 years of the study. There was increased utilization of CT scan. The majority of the patients presented with locally advanced disease. RN remained the main stay of treatment with best survival rate. Neuroendocrine and collecting duct carcinoma are rare.

Keywords: update, renal cancer, overall survival, histology, imaging study.

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INTRODUCTION

Kidney cancer is the 16 most common cancer with an estimate of 431,288 (2.2%) new cases and mortality of 179,368 new deaths worldwide [1]. The highest burden of RC is North America and Europe with gradual increase in the incidence over time. Most cases are discovered incidentally from imaging studies. In the United States about two-thirds of the tumours are found in men at a mean age of 64 years. Patients with Von Hippel-Lindau disease tends to present 20 years earlier than the general population. The reported modifiable risk factors are hypertension, smoking, obesity, diet and alcohol [2].

In Africa and middle East, the incidence of kidney cancer for male and female is 1.8-4.8/100,000 populations and 1.2-2.2/100,000 populations respectively. While in Nigeria it is 0.3%-2.3% for both sexes. The mean ages are 47 and 45 years for Africa/middle East and Nigeria [3,4].

At the time of presentation in Africa most patients are symptomatic. This includes combination of symptoms pain, swelling, haematuria. The classical triad continues to be significant 16.4% and 26.7% in southwestern part of Nigeria. The incidence of incidental tumours was as low as 6.3% [3,5,6].

In Africa the identifiable risk factors for kidney cancers includes hypertension 15.7% in Nigeria; 19% in Somalia [5,7], cigarette smoking (11.8%) and obesity (3.9%) [5].

The overall survival in Africa is poor and is comparable to that of metastatic renal cell carcinoma in the United States [2,3]. Despite the late presentation of patients in Africa, the main stay of treatment is open radical nephrectomy. In the industrialized nations, a reasonable number of patients with metastatic disease are offered combination of targeted therapy (vascular endothelial growth factor inhibitor & mammalian target of rapamycin) and immune check point inhibitors. This combination increased the patient free survival and overall survival. In Africa only a very small number of patients can afford the monotherapy targeted therapy

how much more the addition of immune check point inhibitors [3,5-7]. The aim of this study is to give an update on the management of renal cell carcinoma in our environment.

MATERIALS AND METHODS

This was a retrospective study in a tertiary hospital in the Western part of Nigeria spanning a period of ten years (January 2013 to December 2022). The data of patients with clinical and radiological features of renal cell carcinoma were retrieved from the patient's surgical outpatient records, theatre operation books and subsequently entered on Microsoft Excel spread sheet during the study period. The data studied include demography, clinical presentations, stage of disease, presence of paraneoplastic syndromes obtained from the biochemical and haematological results. In addition, imaging studies used were documented. The histological types, treatments offered, and outcome of treatment offered.

Patients with clinical presentations (total haematuria, flank pain or swelling), paraneoplastic syndromes such as unexplained anaemia, Stauffer's syndrome, weight loss, and thrombocytosis). Radiological features (often well-defined, heterogeneous, contrast enhancing and sometimes containing calcifications or cystic areas, with specific patterns helping to differentiate subtypes such as clear cell (intense enhancement) from papillary (hypovascular) or chromophobe (less dense) and histological diagnosis of renal cell carcinoma. Patient with diagnosis of benign renal tumours or xanthogranulomatous pyelonephritis were excluded. The primary outcome measure was overall survival (OS) (alive or dead), the median overall survival time in months.

The data was analysed using statistical software for social sciences version 20 (SPSS IBM). The categorical variable was expressed in mean while non categorical variables were expressed in percentages, and graphs. The overall survival for the treatment options was determine using the Kaplan-

Meier survival curve and a p-value < 0.01 was deemed significant.

RESULTS

A total of 68 patients with renal cancers (RC) were managed during the study period. There was an initial reduction in number of cases from 2013 to 2014 then followed by a slow increase in number of renal carcinomas till 2017. Thereafter, was a reduction in 2018 that rose to a maximum number of cases in 2019. By the year 2020 during the covid 19 pandemic there was a another drop that rose again and remained stable in the last two years of the study. In Figure 1.

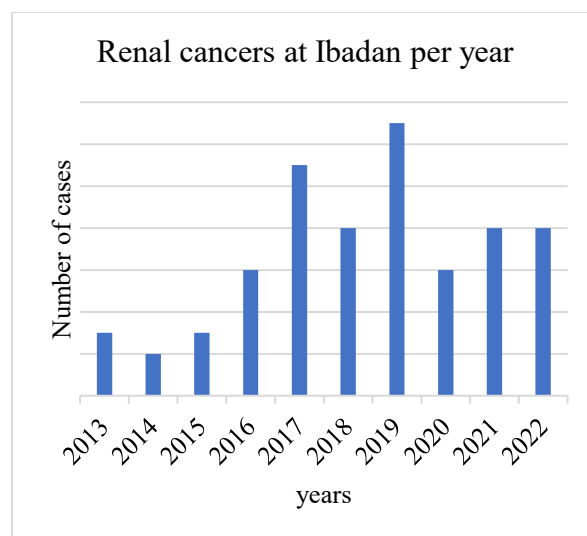


Fig. 1: Yearly distribution of number of renal cancers at Ibadan (2013-2022)

The mean age was 49.7±14.8years with age ranged of 16-76 years. There was a preponderance of male (52.9%) compared to 47.1% females. Tumours were found on the right side in 38 patients (55.9%), left side 29 (44.1%) and both sides in one case (1.5%). The commonest clinical presentations were pain and haematuria in 20.6% patients, pain and swelling in 19.1% patients, pain alone in 17.6% patients and incidental tumour was seen in 7.4% as shown in Table 1.

Table 1: The Clinical Presentations of renal carcinoma at Ibadan (2013-2022)

Clinical Presentation	N (%)	r	p-value
Pain and haematuria	14 (20.6)		
Pain and swelling	13 (19.1)		
Pain	12 (17.6)		
Incidental	8 (11.8)		
Classical Triad	6 (8.8)		
Swelling	6 (8.8)		
Haematuria	6 (8.8)		
Swelling & haematuria	3 (4.4)		
Paraneoplastic syndrome	39(57.4%)	-0.123	0.317
Abnormal LFT (Stauffer's syndrome)	19 (27.9)		
Weight loss	9 (13.2)		
Thrombocytosis	6 (8.4)		
Unexplained anaemia	4 (5.9)		
Fever	1 (1.5)		

All the patients had abdominal CT scan done that confirmed 98.5% being unilateral and 1.5% was bilateral. The smallest tumour volume 2.10 cm³ and biggest was 13,572 cm³ with a mean of 945.9 cm³ and these corresponded to a minimum tumour length of 2.00 cm and maximum tumour length of 30.00cm with a mean of 13.10cm.

Fifty-four (79.4%) of the patients presented with localised and locally advanced diseases (stages1, 2 and 3) while 14 (20.6%) presented with metastatic disease (stage 4). Thirty-nine (57.4%) of these patients had paraneoplastic manifestations of which the commonest was Stauffer's syndrome in 19 (27.9%). There were no correlations between the presence of paraneoplastic syndrome and the outcome of treatment (r = -0.123, p= 0.317). (Table 1). The commonest histological types were clear cell RC (36.9%) and papillary RC (27.9%) while the rare RCs were urothelial RC (2.9%), RC with neuroendocrine component (2.9%) and collecting duct RC (1.5%) as documented in Table 2. Seventeen (25%) that were not available because the

tumours were unresectable or inoperable (13.2%) and 7.4% each had targeted therapy or were lost to follow up.

Table 2 further showed the treatment offered were radical nephrectomy in 72.1%, 13.2% were inoperable while 7.4% each received sorafenib and were lost to follow up. The overall median survival

was 37 months which was statistically significant (Chi-square 63.413, $df = 3$, $p = 0.000$). However, radical nephrectomy had the highest median survival of 40 months and least survival of 2 months was documented in patients who were treated with targeted therapy as shown in Figure 2.

Table 2: Clinical stage and histology of patients with renal cancer at Ibadan (2013-2022)

Stage of disease	n (%)				
Stage I (T1, N0, M0)	4 (5.9)				
Stage II (T2, N0, M0)	40 (58.8)				
Stage III (T3, N0, M0) or T1, T2, T3, N1, M0	10 (14.7)				
Stage IV (T4, Any N, M0) or t, Any N, M1	14 (20.6)				
Histology	n (%)				
Clear cell RC	25 (36.9)				
Papillary RC	19 (27.9)				
Chromophobe RC	2 (2.9)				
Urothelial RC	2 (2.9)				
Renal cancer with neuroendocrine component	2 (2.9)				
Collecting duct carcinoma	1 (1.5)				
Not available (TG-5, LTFU-5, unresectable-7)	17 (25)				
Treatment/Intervention	n (%)	MS (months)	95%CI Lower	Upper	p-value
Radical nephrectomy	49 (72.1)	40	35.999	44.001	0.000
Unresectable (2 Lymph node biopsy)	9 (13.2)	3	2.076	3.924	
Target therapy	5 (7.4)	2	0.000	4.147	
Lost to follow up	5 (7.4)	NA	NA	NA	
Total	68	37	18.385	55.615	

TG – target therapy, LTFU – lost to follow up, RC – renal cancer, CI – confidence interval, NA -not available.

The comparison of the previous study and the current update is shown in Table 3.

Table 3: Comparison of previous study and updated study at Ibadan

Variable	Previous Study	Updated Study	Remark
Study period	2007 - 2012	2013 - 2022	5 years versus 10 years
Number of patients	69	68	Covid-19
Mean age (years)	48	49.1	Comparable
Sex (male/female)	1:1	1.1:1	Similar
Classical triad	7	6	Slight reduction
Side if tumours	100% unilateral	Unilateral (98.5%) Bilateral (1.5%)	Appearance of bilateral disease
CT scan	11.6%	98.5%	Improved
Metastatic disease	15 (21.7%)	14 (20.6)	Stable
Histology	CCRC (24), PRC (1), CRC (1)	CCRC (25), PRC (19), URC (2), NERC (2), CDC (1)	Increased PRC, URC, NERC and CDC
Median survival (months)	31	37	Improved
Lost to follow up	37 (53.6)	5 (7)	Improved

CCRC – clear cell renal cell carcinoma, PRC – papillary renal cell carcinoma, CRC -chromophobe renal cancer, CDC – collecting duct renal cancer, URC – urothelial renal cancer, NERC – renal cancer with neuroendocrine component.

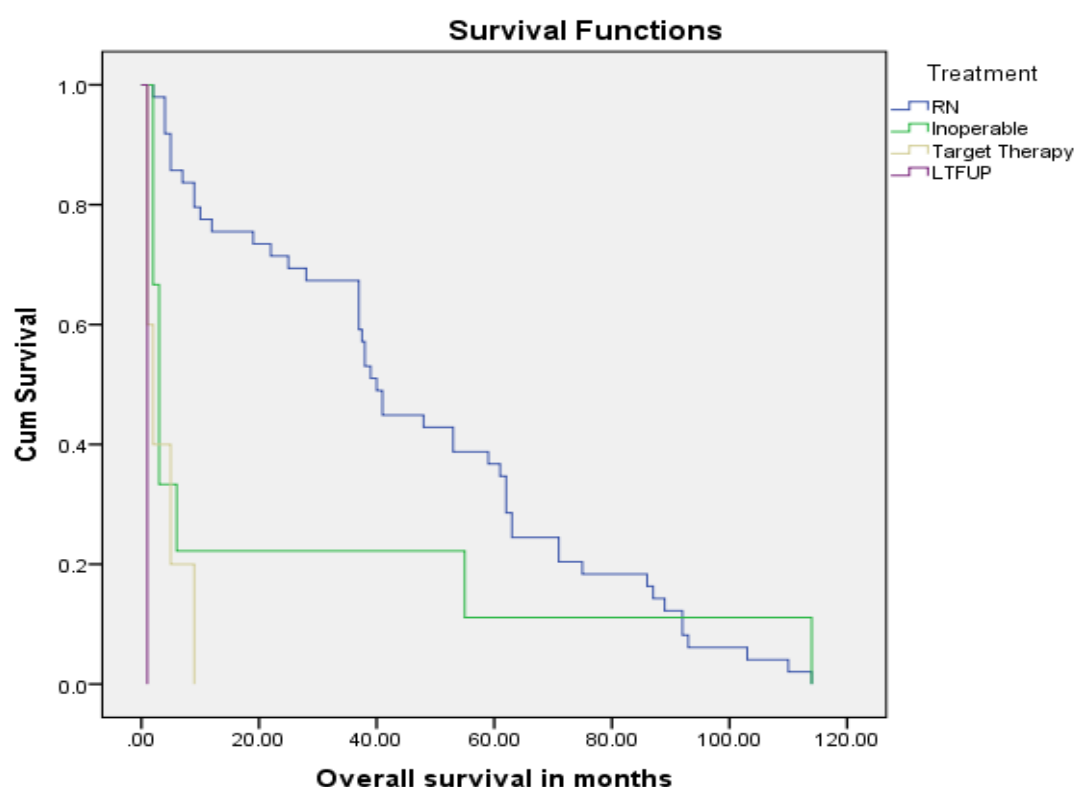


Fig. 2: Median survival in months of different treatment offered to patients with renal cancers at Ibadan.

DISCUSSION

There was a gradual increase in new cases of kidney cancers in this study inconsonant with the progressive increase reported worldwide. [2,8,9] Du et al. [14] predicted a significant increase in the incidence of renal cancer in the developing countries with a decrease in the developed countries from 2018 to 2030. The implication is that the developing countries should be more vigilant in the early detection of renal cancer to ensure better survival and decrease in the typical late presentation. Enlisting routine abdominal ultrasound as part of screening modality during pre-employment, obtaining driver's license, preadmission into tertiary institutions will assist in the early detection of renal masses that may require further CT scan. Of note was decline in cases reported during industrial

strike action by health workers in Nigeria and impact of the Covid-19 pandemic in 2018 and 2020 respectively in this present study. In the last two years of this study, the incidence of renal cancer remained stable, contrary to the prediction for the developing counties [2,8,9].

The availability, improvement of CT scan and better understanding of the features has enabled categorisation and correlations of radiological features with histological types of renal cell carcinoma. The imaging equipment have led to early identification of small size cancers worldwide [10,11,12]. This is not the case in our study where increase utilization of CT scan established the length and volume of kidney cancers. However, the smallest size of RC in our series was neuroendocrine renal

cancers while the largest were in those with clear cells renal carcinoma.

Worldwide, the peak age incidence and mean age of KC is in the 6th to 7th decades. Unlike in Africa and Nigeria where the mean age is around the 4th and 5th decade of life. This appeared consistent with the younger age group of patients with Von Hippel Lindau's (VHL) disease. It is possible that we have a reasonable number of patients with VHL disease. Therefore, a close collaboration with countries where facilities for screening for VHL gene are available may help confirm the suspicion of and incidence of VHL disease among patients with kidney cancers in our community [2,3,4,5,6].

There seems to be persistence of slight male preponderance in this update as in the previous study. This is consistent with findings worldwide except for a report from Ile Ife where there were more females [1,4,5,6,7,13].

The clinical presentation of RC is maintained in this update except for a rise in incidental RC, paraneoplastic syndrome and a case of bilateral RC. The incidental tumour is similar to report by Salako et al [5] though over 50% of renal malignancies are discovered incidentally in the developed countries [11]. In Lagos there was a correlation between the paraneoplastic especially Stauffer's and outcome of treatment, there was none in this study [6]. The incidence of metastatic disease has remained stable around 21%. This is comparable to what obtained in Zaria. [8,13].

Sixty-four percent of patients presented at stages 2 and 3, this is evidence of locally advanced disease apart from the metastatic

disease. This is in consonance with typical presentation in Africa [3,4,5,6,7,13,14,15].

Compared to our previous study, this update showed an increase in papillary and chromophobe RC while maintaining clear cell as the commonest histological type. This is a consistent finding in Nigeria, Africa and worldwide [4,5,7, 10,12,13]. A patient had collecting duct carcinoma. This is very rare and is associated with poor prognosis [12,16]. World Health Organisation (WHO) recognised the non-classified RC. Although, it is debatable, but we may consider classifying the RC with neuroendocrine components and urothelial RC reported in this update as part of this non-classified RC. Both tend to have the worst prognosis that is also the case with collecting duct renal cancers [12].

Despite this late presentation, majority of the RC are treated by radical nephrectomy with varying degree of survival as low as 13.6% at 5 years. This update showed an increase median survival from 31 months to 37 months of patient who underwent radical nephrectomy which is the main stay of treatment in Africa [3,4,5,6,7,13,15]. The introduction of the use of vascular endothelial growth factor inhibitor (VEGFI) and mammalian target of rapamycin (mTOR) in the of advanced RC almost tripled their survival. This was not the case in this update, where the median survival was 2 months [16,17,18].

Akpayak et al [15], reported a high lost to follow up of patients with RC that is similar to our previous study. However, this update revealed a significant reduction to as low as 7.4% lost to follow-up [13]

CONCLUSION

This update showed a trend toward stable RC though yearly increase was observed. It also confirmed increased utilization of diagnostic CT scan. It is not surprising since majority of the patients presented with localised and locally advanced disease, RN still remained the main stay of treatment with an interesting best survival rate compared to other studies in the sub-region. With the increasing pathologist's expertise, rare renal cancers such urothelial, collecting duct RC with neuroendocrine components are being identified.

Declarations

We declare that the patients were managed at the University College hospital at no extra cost to their treatment. Information was obtained from the theatre and urology record books without revealing the identity of patients.

Study Limitations

Acknowledgement: We appreciate the surgical trainee for data entry per case. We are grateful to the theatre nurses for the supports during the surgery. We thank the staff in pathology department who assisted in retrieving the histology reports.

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Outcome of Snodgrass Tubularized Incised Plate Urethroplasty for Distal Hypospadias in Uyo, South-South Nigeria

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ABSTRACT

Background: Hypospadias is the most common penile congenital abnormality. Snodgrass Tubularized incised plate (TIP) urethroplasty preserves the urethral plate and produces a functional and cosmetically acceptable penis with low complication rates. **Objective:** This is a review of our initial experience with the Snodgrass Tubularized Incised Plate (TIP) Urethroplasty for distal hypospadias repair. **Materials and Methods:** We retrospectively reviewed the medical records of boys who had Tubularized incised plate urethroplasty (TIP) for distal hypospadias in University of Uyo Teaching Hospital over a 5-year period (January 2016-December2020). The location of the meatus, age at surgery, technique, complications, voiding function and cosmetic results were recorded. The ectopic meatus location was subcoronal in 4 (40%), coronal in 3 (30%), distal penile in 2 (20%) and midshaft in 1(10%). Dorsal incision of the urethral plate was done with double layer tubularization over a stent, with glanuloplasty and dartos barrier layer over the neourethra before skin cover. **Results:** Ten children with age range from six to thirty months were included in the study. The mean age of repair was 27months (range 18-36months). All had healthy urethral plates and were suitable for Tubularized incised plate (TIP) urethroplasty. The postoperative results of repair showed straight urinary stream and satisfactory cosmetic appearance in four patients (40%), while three patients (30%) developed urethrocutaneous fistula, one patient (10%) had meatal stenosis; one patient (10%) had urethral stricture and one patient (10%) had partial glans dehiscence. Two pinhole fistulae closed spontaneously and one was repaired by rotation of local dartos flaps, while the meatal stenosis and urethral stricture were easily dilated. The urine stream and cosmesis improved in nine patients (90%) after treatment of complications and 3-6 months follow up. The patient with partial dehiscence had a repeat urethroplasty. **Conclusion:** Snodgrass Tubularized incised plate urethroplasty produced a functional and cosmetically acceptable reconstruction in our patients.

Key words: Distal hypospadias, Snodgrass procedure, urethral plate, tubularized incised plate urethroplasty

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INTRODUCTION

Hypospadias is the most common congenital anomaly affecting the male external genitalia consisting of arrested penile development with insufficient development of the urethral fold and ventral foreskin, with or without ventral penile curvature. The ectopic meatus is located more proximally on the ventral aspect of the penile shaft anywhere between the tip of the penis to the perineum [1,2]. The reported prevalence rates are 1 in 200 to 1 in 300 live births [1]. The incidence among primary school boys in Eastern Nigeria was estimated to be 1.1% by Okeke et al [4]. Hypospadias is classified based on the location of the meatus into three categories: distal or anterior with meatus on the glans, corona, or subcoronal (50%); midpenile, with meatal opening on distal penile shaft, midshaft, or on proximal penile shaft (30%); and proximal or posterior hypospadias with a penoscrotal, scrotal or perineal meatus location (20%) [1-3]. However, the position of the meatus can only be determined after surgical deglovement of the penis [7].

The objective of hypospadias repair is to create a straight penis with slit-like meatus at the tip of a conical symmetrical glans and a urethra of uniform calibre and length to achieve normal voiding and erection. Urethroplasty techniques can be classified into meatal based advancement techniques; tubularization of the urethral plate; supplementation or substitution of urethral plate with skin flaps; or urethral plate substitution with grafts [1,7]. Procedures for distal hypospadias repair include Meatal advancement glanuloplasty (MAGPI), Mathieu repair and tubularized incised plate urethroplasty (TIP) [1-3,9,12]. Snodgrass popularized the Tubularized Incised Plate Urethroplasty, the procedure of choice for distal hypospadias repair due to its versatility, low complication rate, good cosmetic result and technical simplicity [2,19]. TIP is one stage procedure involving dorsal midline incision of the urethral plate with subsequent tubularization and secondary healing [3]. The midline relaxing incision widens a narrow plate converting a flat plate to a deep plate groove ensuring a normal

calibre neourethra and vertical slit meatus [1]. We present our initial experience and outcome of Tubularized incised plate urethroplasty for distal hypospadias repair.

MATERIALS AND METHODS

This was a retrospective study of ten (10) boys with distal primary hypospadias repaired using Tubularized incised urethral plate urethroplasty over a 5-year period (between January 2016 and December 2020) at the University of Uyo Teaching Hospital. Patients with proximal hypospadias, severe ventral curvature, previous urethroplasty and narrow unhealthy urethral plates were excluded. Data relating to urethral meatus location, age at surgery, operative technique, complications, functional and cosmetic outcome were noted. The surgical technique was as described by Snodgrass.

Surgical Technique: The glans was first retracted with a stay suture of 4-0 nylon and a feeding tube size 8Fr passed from the meatus into the bladder. Artificial erection was induced by placing a tourniquet at the base of the penis and injecting normal saline intracorporeally to allow for accurate assessment of penile curvature. A circumferential subcoronal incision was made about 2mm proximal to the ectopic urethral meatus to deglove the penis down to the penoscrotal junction. Degloving resolved mild ventral curvature if present as we did not need dorsal plication to correct residual curvature. Adrenaline 1:100,000 was infiltrated into the glans along the junction of glans wings and urethral plate. Parallel longitudinal incisions were made along the lateral margins of the urethral plate to the junction of the glans wings and glans wings were mobilized laterally. The crucial step was the dorsal midline deep relaxing incision of the urethral plate from within the meatus down to the distal end of plate at midglans. Tubularization of the incised urethral plate over an 8-10 French feeding tube was done using 5-0 vicryl (polyglactin) to create the neourethra.

Tubularization was taken down to midpoint of dissected glans wings, about 3mm proximal to distal

extent of urethral plate to avoid iatrogenic meatal stenosis. Tubularization was done in two layers, the first subepithelial and a second reinforcing layer. A dorsal dartos pedicle flap was mobilized from inner prepuce, button holed, transposed ventrally, then interposed as a barrier layer between the neourethra and shaft skin closure to prevent fistula formation. A ventral local dartos layer was used in previously circumcised patients. Glanuloplasty was performed using 5-0 sub epithelial polyglactin sutures with the creation of neomeatus, independent of urethral plate (opening of plate not sutured to glans). Subepithelial skin closure was done using 5-0 polyglactin. For midshaft hypospadias, we used a 2-layer sub epithelial closure of the urethral plate, turning all epithelium into lumen; followed by approximation of mobilized corpus spongiosum over the neourethra and a dartos pedicle flap as barrier layer to prevent urethrocutaneous fistula formation. Tunica vaginalis flap was used in three patients instead of dartos. The postoperative stent (8 French feeding tube) anchored to the glans by the initial traction nylon suture was left for 10-14 days and used for urinary diversion into diapers. Sufratulle and compression gauze dressing was applied. Postoperatively, Oxybutynin hydrochloride 0.2mg/kg twice daily was given to reduce bladder spasms. Follow up was at one, three and six months and the meatus was calibrated at 3 and 6 months with 10Fr in smaller boys to 12Fr in older children. The cosmetic and functional outcomes were assessed by parents' satisfaction with the cosmetic appearance of the penis and urine stream, or any difficulty during urination. The surgeon visually assessed the urinary stream as there was no uroflowmetry, and inspected the phallus for complications like fistulae, stenosis or dehiscence.

RESULTS

Out of 10 patients, 3 had coronal hypospadias (30%), 4 subcoronal (40%), 2 distal penile shaft (20%), 1 midshaft (10%) (Table 1).

Table 1: Location of Hypospadias meatus

Location of Meatus	Number	Percentage
Coronal	3	30%
Subcoronal	4	40%
Distal shaft	2	20%
Midshaft	1	10%

The children's age range was between 6 months and 36 months. The mean age for repair was 27 months (range 18 months to 36 months). Cosmetic and functional outcomes were assessed by attending surgeon examination and parents' satisfaction with appearance of the penis and straight urinary stream with no difficulty. Postoperatively, urine stream was good in four patients (40%) and poor in the six patients (60%) with complications. Three patients had urethrocutaneous fistulae (30%), one had meatal stenosis (10%), one urethral stricture (10%) and one dehiscence (10%) (Table 2). Follow up was up to six months. Two of the fistulae were pin hole and closed spontaneously within three months while the remaining fistula was greater than 5mm in diameter and had to be closed with local dartos flap. Two patients with stricture and stenosis had meatal/urethral dilatation with good urinary streams after three months. The patient with dehiscence had reoperation. In nine patients (90%) the penis was straight with a conical shaped glans and a well-positioned, vertical, slit-like meatus. The final outcome at six months was assessed to be satisfactory except for the child with dehiscence who needed reoperation.

Table 2: Complications of Repair

Complication	Number	percentage
Fistula	3	30%
Meatal stenosis	1	10%
Neourethral stricture	1	10%
Dehiscence	1	10%

DISCUSSION

Tubularized incised plate urethroplasty can be used in the majority of distal hypospadias. The mean age of repair was 27 months with range from 18 months to 36 months. Recommended timing of repair is between age of 6 months to 18 months to reduce the emotional and psychological stress of delayed repair

[1,24]. Our experience is similar to findings by Olajide et al where repairs were done between 2 and 4 years when parents were financially and psychologically ready [6].

Tubularization of the incised urethral plate in two layers and glanuloplasty are key steps in Snodgrass urethroplasty. The urethral plate is composed of epithelium overlying well vascularized connective tissue with muscular backing, rich in nerve supply and gland forming capability, its preservation contributing to the success of the urethroplasty [13]. Urethral plate characteristics may determine the use of TIP urethroplasty, whether the plate is flat or deeply grooved, narrow or wide. All ten patients had wide healthy urethral plates suitable for dorsal incision and tubularization. Patients with thin, unhealthy and fibrotic plates were excluded. TIP does not require a deep urethral groove as the dorsal incision widens and deepens a narrow flat plate and TIP repair reliably corrects distal hypospadias regardless of urethral plate configuration (Snodgrass et al 2010 and Nguyen, Snodgrass) [10,19]. Contraindications to TIP hypospadias repair are severe chordee requiring plate transection and unhealthy, thin urethral plate not widened after incision [3,21]. Holland and Smith found increased complications during TIP urethroplasty when the urethral plate was less than 8mm wide or had a shallow groove before midline incision [21].

Urinary diversion with urethral stent of feeding tube or silicone catheter Fr 6-8 was used and allowed to drain into double diapers. Other workers also routinely stented their repairs [8,11,12]. Buson et al [28] found that complication rate of those who did not use urinary diversion was higher than those who used diversion, while Sarac et al [29] found that fistula complications were higher with use of foley silicon catheters than feeding tubes for drainage.

Preoperative hormonal stimulation with testosterone administration or transdermal gel improved vascularity and cosmesis [16]. Perioperative antibiotic prophylaxis reduced the risk of

complicated urinary tract infections, meatal stenosis and urethrocutaneous fistula [17].

The goal of hypospadias repair is normal appearance and functioning penis with straight urine stream, though outcomes usually reported are urethroplasty complications. Urinary stream was good in four of the patients postoperatively and improved in five more patients after fistulae closure and dilatation of meatal stenosis and stricture. The patient with glans dehiscence had redo urethroplasty. The final cosmetic appearance and functional outcome after 6 months of follow up was satisfactory in nine patients (90%) based on visual assessment of a straight phallus with conical meatus and vertical slit-like meatus. Of three patients with urethrocutaneous fistula (30%) two were pinhole and closed spontaneously within 3 months while the remaining large one had local dartos flap repair. Factors that may predispose to fistula formation are incorporation of urethral mucosa in the ventral repair and migration of urethral mucosa and skin into suture tracts, hence the importance of multi-layered repair and extra-mucosal suture technique [22]. Barrier layers using dartos pedicle flaps dissected from inner prepuce or dorsal penile skin in circumcised patients helped to prevent fistula formation. Double-layer vascularized tissue coverage over the neourethra repair can be done in several ways, including preputial dartos flap, adjacent ventral dartos flap in the absence of preputial tissue, tunica vaginalis from the scrotal sac, external spermatic fascia or the use of corpus spongiosum for coverage [5,11,18,22]. The overall complication rate for TIP in children is reported as approximately 33%, with the median fistula rate of 5.0% (mean=5.6%), ranging from 0 to 16% (Braga et al) [5]. Snodgrass reported overall complication rate of 0-4%, mostly fistulas, meatal stenosis and glans dehiscence. Total complication rate in our study was 60% with fistula rate of 30% compared with a complication rate of 30% seen by Barrack et al [8], 33% seen by Tonvichien et al [23], and 36.7% seen by Abdur-Rahman et al [15], even though the later study included both proximal and distal hypospadias repair

using various techniques. The high complication rates in our series were probably due to the small number of patients and related factors including suturing technique, no magnification, tissue handling, inadequate waterproof coverage, and initial surgeon learning curve [24]. In a review of published reports of TIP urethroplasty for distal hypospadias, Braga et al [5] noted that studies with small sample size ($n < 30$) reported more complications ($> 20\%$) in comparison to studies involving large number of patients, suggesting that surgeon experience and high volume of cases may contribute to reduce the number of complications [5]. Snodgrass recommended two-layer neourethra closure, and coverage of the urethroplasty with a tunica vaginalis flap instead of dartos flap to reduce the fistula rate. Urethral strictures and meatal stenosis can be reduced if the tubularization of the incision on the urethral plate is not carried too distally into the glans. Snodgrass reported meatal stenosis rate of less than one percent. Re-epithelialization occurs by secondary intention after incision of the urethral plate and the neourethral lumen should allow introduction of a 10-Fr feeding tube. Glans dehiscence can be prevented by dissecting the glans not only laterally but also distally off the corpora cavernosa to lengthen the wings and reduce tension on approximation. Glanuloplasty independent of urethral plate tubularization and the creation of a vertical slit meatus provided good cosmetic appearance compared with the rounded meatal configuration after Mathieu repair [12,25]. A prospective study by Oswald et al showed that TIP repair was associated with lower complication rates versus the Mathieu technique and the cosmetic results were more satisfactory with TIP operation [25]. The cosmetic appearance and urinary function in our patients were subjectively assessed by parents' satisfaction with appearance of the phallus, and urination without difficulty and by surgeon visual inspection of the phallus, glans, meatus and urinary stream. We did not use standardized photographs, hypospadias objective penile evaluation (HOPE) score and penile perception score (PPS) questionnaire which are objective outcome instruments to evaluate these

patients [26,27]. Uroflowmetry, an objective tool to assess urinary function was not available in our centre [26,27].

CONCLUSION

Snodgrass Tubularized Incised plate urethroplasty offers good cosmetic and functional results. Even though a high percentage of fistulae were seen, they were easily closed. Meatal stenosis and strictures were easily dilated and the glans dehiscence was repaired. The overall outcomes were satisfactory.

Recommendations

Adequate theatre facilities, trained personnel, paediatric microsurgical equipment including optical magnification loupes and proper suture materials would improve outcomes of hypospadias repair. Provision of uroflowmetry and standardized instruments for objective assessment of outcomes are needed.

Limitations: The study was retrospective and limited by small sample size.

Conflict of Interest: None declared.

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Unveiling Sexual Harassment in Surgery: The Experiences of Female Surgeons in Africa

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ABSTRACT

Background: Sexual harassment is defined as any non-consensual sexual behaviour that violates someone's dignity or creates a hostile environment. The unsettlingly commonplace nature of sexual harassment in surgery has been highlighted worldwide. However, there is a paucity of data regarding the experience of female surgeons in Africa. **Objective:** To explore and document the experience of female surgeons in Africa of sexual harassment. **Materials and Methods:** A retrospective cross-sectional survey was distributed via WhatsApp to female surgeons across Africa between March to May 2025. Questions focused on demographics, quantifying experiences, and suggestions for reducing sexual harassment in the workplace. Results were analysed on Microsoft excel using descriptive analysis. **Results:** One hundred and five (105) female surgeons responded to the questionnaire, with a mean age of 39.12 years ($\pm$ 7.84 SD). Most respondents (79.4%) had experienced a form of sexual harassment, ranging from sexual innuendos, unsolicited sexual advances, inappropriate physical touch, sexual assault and 2.9% even reported rape. Most participants were junior registrars when they experienced sexual harassment (64.2%). 45.7% experienced sexual harassment in the workplace and 44.4% both in the workplace and at home. 61.1% of incidents in the workplace occurred in operating theatres. Furthermore, 76.4% of sexual harassment incidents were initiated by senior colleagues and the perpetrators were predominantly male (94.4%). Only 13.7% of those who experienced sexual harassment reported their experience, a majority of which resulted in no sanctions for the perpetrator. **Conclusion:** The rate of sexual harassment experienced by female surgeons in Africa is disconcertingly high, reflecting the data shared worldwide.

Key Words: Equality, Sexual Harassment, Surgery, Experiences, Female Surgeons

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INTRODUCTION

Sexual harassment is defined as any unwanted sexual behaviour that creates a hostile environment or violates an individual's dignity(1). Sexual harassment experienced by female surgeons in the surgical field is disconcertingly common, affecting 43% of female surgeons in the United States (US) alone, perhaps because of its pre-existing gender imbalance combined with strict hierarchical structure(2,3). It has been increasingly spoken out against in the Western world, notably in 2015, Crebbin et al broadcasted about the perturbing prevalence of discrimination, bullying and sexual harassment in Australasia with 5% experiencing sexual harassment in their careers, with females being much more likely to experience any of these behaviours(4). Similarly, Fleming and Fisher (2021) published a hard-hitting discussion regarding sexual assault experienced by surgical trainees in the UK and this begat a much-needed dialogue in national mainstream media, with almost 1 in 3 female surgeons in the National Health Service (NHS) experiencing sexual assault, defined as non-consensual physical sexual contact, and twice this number facing sexual harassment(5,6).

Despite the steps being taken to address gender bias and sexual harassment in the global healthcare community, there are limited data and conversations regarding the experiences of those in Africa. This is in spite of the fact that Sub-Saharan Africa (SSA) has some of the highest rates of gender-based violence across the globe(7) and more generally, a meta-analysis in 2023 found that 1 in 3 African women have been a victim of sexual violence in their lifetime(8). There are many possible contributors to the paucity of data regarding the experience of those in healthcare, including a fear of speaking out, stigmatisation of sexual harassment and victimisation, engrained societal patriarchal views and reduced help-seeking behaviour(9,10). That being said, there is evidence from a study suggesting that 62.3% of nurses in Africa have experienced workplace violence, of which 10.3% experienced sexual harassment(11). However, there is little data regarding the experience of those in surgical careers.

The objective of this study was to explore and document the experience of female surgeons in Africa regarding sexual harassment. By doing so, we can identify effective and sustainable measures to reduce these incidents, thereby empowering and protecting women in the surgical field.

METHODS

We carried out a cross-sectional questionnaire-based study. A 24-point electronic questionnaire was designed and distributed via WhatsApp message groups accessible to female surgeons across Africa [Appendix A]. The questionnaire was open to both surgical residents and consultant surgeons from March to May 2025.

The questionnaire included items on demographic data, experiences of sexual harassment, events following any harassment and opinions on how to curb sexual harassment in the workplace. It also had an initial section on consent before participation. Participants were aware that consent was voluntary and they had a right to withdraw. All responses were collected anonymously, and strict measures were taken to ensure the confidentiality and protection of participants' identities.

Results were analysed using Microsoft Excel using descriptive statistical methods. Full ethical approval was granted by the Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital, assigned number ABUTHZ/HREC/B24/2025.

RESULTS

105 female surgeons in Africa responded to the questionnaire. All responses were included in data analysis. Most responses were in English with one written in French, this was translated using Google translate. Figure 1 illustrates some of the demographics of the participants. Namely, most participants (32%) were aged 36-40, with the average age being 39.12 years old (± 7.84 SD)

[Figure 1]. Furthermore, there were very similar response rates from junior registrars (25.7% or 26/105), senior registrars (23.8% or 24/105) and those who had been consultants for 0-5 years (21.8% or 22/105), the remaining 28.7% (29/105) had been consultants for 6 years and over [Figure 1]. 75% of respondents identified as Christian, with 24% identifying as Muslim and 1% not otherwise specified.

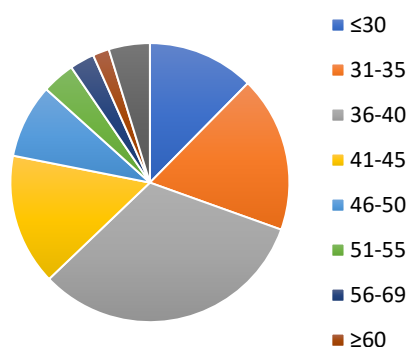


Figure 1: Demographic data; Left = Age of respondents at time of survey; Right = Level of training at time of survey

Respondents were asked to describe what the term “sexual harassment” meant to them. Majority of the responses included terms such as “unwanted”, “unsolicited”, “not consented” and often referred to both physical and verbal forms of harassment. 4 responses also referred to being discriminated against in the workplace because of their gender.

One question in the survey asked whether participants had ever experienced specific forms of sexual harassment and they were able to make multiple selections. Nearly 80% of female surgeons in our survey had experienced a form of sexual harassment, such as uncomfortable sexual innuendos or jokes, unsolicited sexual advances, inappropriate physical touch, sexual assault, and rape. Uncomfortable sexual innuendos or jokes were the commonest form of sexual harassment experienced accounting for 69.6% of respondents, 50% experienced inappropriate physical touch, and

2.9% (3/105) had been raped [Figure 2]. Regarding how many instances of sexual harassment individuals had experienced, 53.7% had experienced it 2-5 times, 23.9% more than 5 times and 22.4% once. In terms of their marital status at the time of these incidents, 45.7% of individuals were single, 40.7% were married, 2.5% separated and 11.1% did not disclose this information.

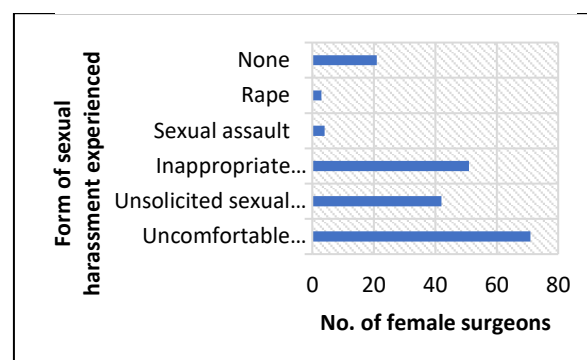
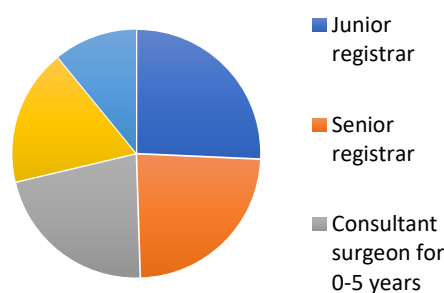


Figure 2: Form of sexual harassment experienced by survey respondents

Most participants had experienced sexual harassment only in the workplace (45.7%), with 9.9% experiencing it outside of the workplace alone, 44.4% had experienced it both in and outside the workplace. If in the workplace, a majority (61.1%) experienced this in operating theatres, with wards (45.8%) and offices (33.3%) being the next most cited locations of sexual harassment. A vast majority had experienced sexual harassment whilst in Nigeria (53.1%), but incidents were reported across the continent including Kenya (7.4%), Ghana (4.9%), South Africa (2.5%), Tanzania (1.2%) and even

when one individual went to the United States. 18.5% of participants did not disclose where these incidents took place.

Regarding the perpetrators, 55 cases of sexual harassment had been committed by senior colleagues (76.4%) [Figure 3]. There was no statistically significant difference regarding the status of the perpetrator, $p\text{-value} = 0.105$. Most of the sexual harassers were male (94.4%), with 1.0% (1/105) being female, and 2.9% (3/105) cases being committed by both male and females. A majority of participants were a junior registrar in surgery when they experienced sexual harassment (64.2%), with 22.4% being senior registrars, 11.9% being consultant surgeons for 0-5 years and 1.5% being consultant surgeons for 6-10 years.

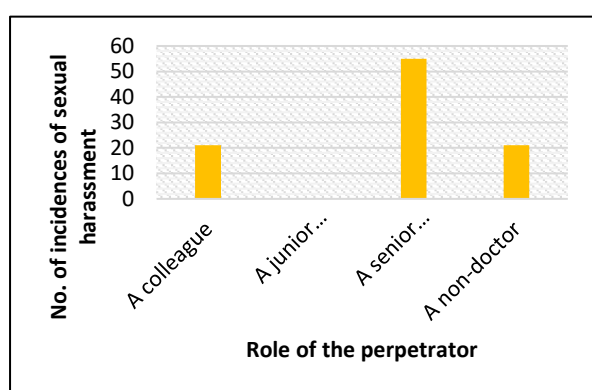


Figure 3: Number of incidents of sexual harassment classified by role of the perpetrator

As aforementioned, most cases of sexual harassment were committed by senior colleagues and this was despite the stage of training of the victims at the time, other than the individual case of when a consultant of 6-10 years experienced sexual harassment by a colleague of similar seniority [Figure 4].

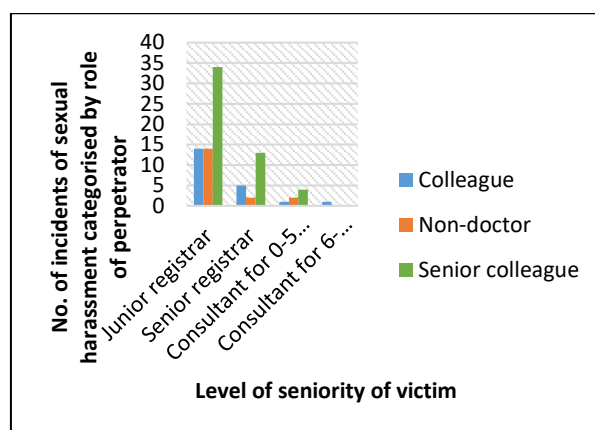


Figure 4: Sexual harassment of respondents categorised into role of perpetrator as per legend: colleague, non-doctor, senior colleague

Only 10 (13.7%) of those who took part in our survey had reported their incident of sexual harassment, a majority of which report no sanctions being placed on the perpetrator. In one case, there was an outcome of mediation and in another the perpetrator faced expulsion from the residency programme and had to issue an apology. When asked to qualify why they did not report their experience of sexual harassment, several said that they ignored it or handled it by themselves, many said that they felt embarrassed or did not know what to do/how to report the incident, or they feared being treated differently and that it would impact their training in a negative way. Many of those who experienced sexual harassment felt uncomfortable or even unsafe to be with those colleagues again, it made them feel ashamed and anxious at work. Others felt as though they had something to prove to their male counterparts to show that they too belong in surgery. Some stopped wearing perfume and would swap shifts to avoid certain colleagues at work. A few individuals also felt more protective towards younger female colleagues.

A majority (89.4%) of those who responded to the survey do not believe that there are enough measures in their place of work to discourage sexual harassment against women. Figure 5 elucidates further the measures that they believe could be put into place such as cameras in the workplace, strict

sanctions, pre-employment training programmes and so forth; participants were able to choose more than one option.

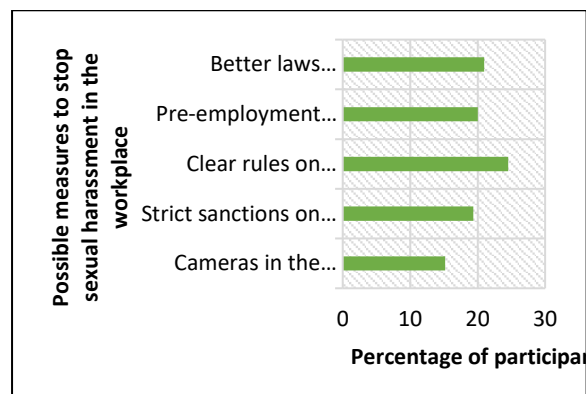


Figure 5: Percentage of participants who would want specific measures in the workplace to stop sexual harassment

When asked if they had any further thoughts/suggestions on preventing sexual harassment, many spoke about having open discussions about sexual harassment to help normalise these conversations and stop the isolation of victims and stigmatisation of reporting these incidents. They also mention specific changes such as regular training programmes and education from a young age or setting up a specific team to deal with incidents of sexual harassment.

DISCUSSION

The results from this study clearly show that in our study cohort of female surgeons in Africa, 79.4% have experienced sexual harassment to some degree, including verbal and physical iterations, with some individuals even reporting rape. Unfortunately, the rate of sexual harassment of female surgeons in Africa mirrors that of the female population more generally; the lifetime prevalence rate of intimate partner violence in Sub-Saharan Africa (SSA) is 33.3% among partnered women aged 15-49(12). Muluneh et al carried out a comprehensive systematic review in 2021 which identified multiple factors that could account for this incredibly high

level of gender-based violence in SSA; individual and relationship factors included poor education status, alcohol and substance use, young age, tolerant attitudes towards violence and so forth(10). Community and societal factors included harbouring tolerant attitudes towards violence and in many African countries, there is a patriarchal system in place that promotes male dominance(10,13).

Most of the reported incidents of sexual harassment in our study occurred in operation theatres (61.1%), perpetrated by senior colleagues (76.4%). This is mirrored in other studies, for example Freedman-Weiss found that 74% of surgical trainees who had experienced sexual harassment in sixteen different surgical training programmes in America had done so in the operating theatre(14). This seems to support the implication that operating theatre culture may be one of the main culprits behind amplifying this behaviour, perhaps due to the engrained hierarchical structure as aforementioned.

Only 13.7% of those who had experienced sexual harassment in our study reported the incident, with barely any of these incidents resulting in sanctions being placed on the perpetrator. This hesitancy to report incidents was explained by participants as being secondary to not knowing how to report them, feeling embarrassed, wanting to handle the situation themselves, fear of repercussions. This reflects data in SSA on barriers to reporting gender-based violence including fear of stigmatisation or revenge, individuals wanting to protect their privacy, perception of possible financial barriers and lack of support from law enforcement(10).

It must also be recognised that surgery remains a male-dominated profession worldwide. A 2024 census carried out in England and Wales identified that only 17% of the 2682 practicing consultant surgeons at the time were women (15). In India, women similarly only accounted for 10.25% of surgeons registered with Association of Surgeons in 2022(16). There are innumerable instances of efforts to challenge this imbalance globally and it seems as though it is gradually shifting. For example, in the United States, there has been a shift from women

representing less than 2% of surgeons to 25% in the past 50 years(17). This is mirrored in the statistics of Eastern, Central and Southern Africa where a decade ago women represented only 9% of the surgical profession, but that has since increased to 27%(17).

Several factors have been named as possible culprits causing this gender disparity such as a paucity of role models, inadequate institutional support, pregnancy and childbirth, gender discrimination and sexual harassment(18,19). To further illustrate why there is a higher proportion of women leaving surgical training in comparison to men, Liang et al created the analogy of a “Tower of Blocks”. They suggested that the stacking of multiple issues of varying calibre can lead to instability and the impetus to leave, while highlighting that small adjustments to each contributor could lead to more stability(18). The disconcerting degree of sexual harassment in surgery is undeniably a factor in this “Tower of Blocks” model and continued efforts to address and change this behaviour could empower more women to enter and remain in the surgical field.

It is undeniable that sexual harassment would have detrimental impacts on the individuals affected. Incivility and harassment in surgery has been quantified by numerous studies to lead to reduced job satisfaction, burnout and detrimental impacts on mental health including suicidal ideation(20–22). This has wider impact on patient outcomes and safety as dysfunctional teams, for example caused by staff psychological distress, have been linked to poorer patient outcomes(23,24).

This study shows that sexual harassment of female surgeons in Africa is starkly common. The potential implications and consequences of these incidents are innumerable. 89.4% of participants in this study did not believe there were enough measures in their workplace to discourage sexual harassment. Some suggested measures could involve cameras in the workplace, stricter sanctions on perpetrators, pre-employment training for healthcare workers and better laws protecting women and other vulnerable groups.

Boghdady (2023) completed a retrospective study of bullying, discrimination, and harassment of surgical trainees in the United Kingdom and Ireland and found that 72% of those who had experienced/witnessed sexual harassment did not report it with a lack of guidance on reporting harassment being named as one of the key barriers(25). Thus, they developed a clear standardised anti-bullying, discrimination, and harassment guideline in order to address this knowledge gap to encourage reporting misconduct, further analysis of this guidance has not yet been completed(25). Further to this, Dalsbø et al are completing a Cochrane review to assess the effectiveness of education and training regarding sexual harassment amongst healthcare workers to identify which programmes may be effective in order to guide policy makers in the future(26).

CONCLUSION

This study exemplifies the stark reality and commonplace nature of sexual harassment endured by female surgical trainees in Africa ranging from inappropriate sexual comments to sexual assault and rape. The limited sample size of this study unfortunately only suggests that this is a drop in the ocean of the experiences of the wider female surgical workforce in Africa.

Recommendation

There is an urgent need for Pan-African, multicentre studies to explore the prevalence and underlying themes of sexual harassment among female surgeons. Such research would provide a robust database to quantify the problem, destigmatise discussion, and guide effective strategies for prevention. Expanding both quantitative and qualitative data will also help identify vulnerable stages of training, high-risk environments, and other specific targets for change.

Limitations

It is noted that this study has its limitations; firstly, there was a relatively low uptake, given that in East, Central and Southern Africa alone there are

supposedly around 250 practising female surgeons (one tenth of the surgeons in these regions). Secondly there is likely to be an element of reporting bias, with those who had negative experiences of sexual harassment being more likely to engage in the survey to enact change – however, this may be counter-acted by the stigmatisation of reporting sexual harassment being a well-known barrier to help-seeking behaviour. There is also a likely misrepresentation of some countries, for example with a majority of respondents having experienced sexual harassment in Nigeria, due to individuals sharing the questionnaire more widely amongst their local colleagues.

Conflict of Interest

The authors have no conflicts of interest to declare.

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Participant Evaluation of the Association of Urological Surgeons of Nigeria Endourology Workshops: 2019 Survey Report

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ABSTRACT

This study presents an evaluation of feedback from participants who attended the first- and second-quarter Endourology Workshops organized by the Nigerian Association of Urological Surgeons (NAUS) in 2019. Participants completed a structured questionnaire assessing workshop content, faculty performance, documentation, relevance, benefits, deficits, and service quality. A total of 75 respondents participated: 26 consultants, 16 residents, 25 nurses, and 8 technicians. Overall ratings for course content, faculty assessment, and service quality were consistently high. Participants recommended inclusion of more advanced topics such as percutaneous nephrolithotomy, laser lithotripsy, urethroplasty, and theatre management. The overall assessment of the workshops was very good.

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INTRODUCTION

Historically, endourology was underdeveloped in Nigeria, with open surgery being the primary modality for managing bladder outlet obstruction, bladder tumours, and urinary stones. By the early 2000s, concerns emerged within Nigerian Association of Urological Surgeons, NAUS regarding limited uptake of endourological techniques, leading to collaboration with Karl Storz Endoscopy and eventual discussion and consensus on establishment of structured endourology workshops during the annual meeting of NAUS held in Calabar, Cross River State in 2007. The first pre-conference workshop was held in Jos University Teaching Hospital (JUTH), Jos, in 2008. The workshop was fully sponsored by Karl Storz Endoscopy. Subsequently, a pre-conference workshop was held annually for five years. During the NAUS meeting in Lagos, in 2013, it was decided to change the frequency of the workshops to thrice yearly at quarterly intervals.

Since then, the workshops have in general taken the format of a combination of masterclasses by invited faculty and performance of key

in November 2017, he was succeeded by Dr Samuel Osaghae who is the current coordinator.

Rationale for evaluation of the impact of NAUS endourology workshops

The faculty usually comprise experienced urological surgeons who hold appointments in university teaching hospitals or work in the private sector. They are selected based on evidence of specialized knowledge, breadth of skill and experience. In a workshop, the tasks of workshop faculty include but are not limited to introduction of topics and procedures of interest, to make the procedures accessible and understandable to participants including discussing complications.¹ Furthermore, expected outcomes should be specified and evaluated from the perspectives and needs of the participants to ensure the goals set are achieved and to improve future workshops.^{1,2} The

endourological procedures. The scope of each workshop was determined by the hosts but usually encompassed the basic endourological procedures of cystoscopy, bladder biopsy, urethrotomy, transurethral resection of the prostate (TURP), transurethral resection of bladder tumour (TURBT), insertion of ureteral stents, ureteroscopy and in-situ lithotripsy with pneumatic or laser device, instrumentation, equipment handling and sterilization. Endourological theatre management, patient selection, pre-operative assessment, anesthesia, and post-operative care were also included. The attendees have usually included Consultant Urologists, Urology Residents, Nurses, Radiologists, Radiographers, Anaesthetists, Technicians, and equipment suppliers. The pioneer coordinator was Professor Venyir Ramyil. He was appointed at the NAUS Conference, Calabar in 2007 and served in that capacity until 2014. He was succeeded by Dr Evaristus Azodoh in 2015. At the time of the NAUS pre-conference workshop in University of Benin Teaching Hospital (UBTH), Benin City i

overarching aspiration is to inspire and assist participants to gain experience and improve skills they will find useful both within and outside the operating room.^{3,4} For reliability and validity, the feedbacks from the participants should be obtained immediately following presentations and discussions.¹

Based on these principles, this article presents evaluation of feedbacks received from delegates at the first and second quarter endourology workshops organized by NAUS at the Lagos University Teaching Hospital, LUTH and University of Port Harcourt Teaching Hospital, UPTH respectively in 2019.

MATERIALS AND METHODS

A structured 25-item questionnaire was administered to attendees at the NAUS

endourology quarterly workshops which held at the Lagos University Teaching Hospital (LUTH), Lagos and University of Port Harcourt Teaching Hospital (UPTH) respectively in 2019. Items assessed were participants demographics, workshop content, faculty assessment, workshop organization, and areas for improvement. Data were analysed using Microsoft Excel 2007 and SPSS version 22.

RESULTS

A total of 75 respondents completed evaluation forms, including 35 consultants (46.7%), 16 Urology residents (21.3%), 18 nurses (24%), and 6 technicians/equipment suppliers (8%) (Figure 1). There were 31 respondents in LUTH (41.3%) and 44 in UPTH (58.7%).

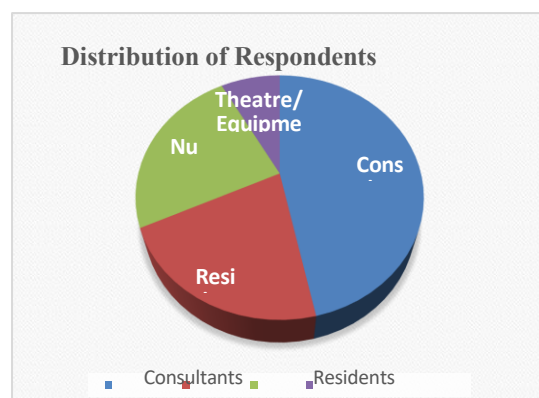


Figure 1: Distribution of study participants

Activities and Events in the workshops

The highlights of the activities during the workshops in LUTH and UPTH are shown in Table 1.

Table 1: Main events in the workshops

LUTH	UPTH
Practical demonstrations and live participation TURP	Practical demonstrations and live participation TURP
Practical demonstration of endourology instruments including care and sterilization	Practical demonstration of endourology instruments including care and sterilization

Role of the nurse in endourology theatre set up and instrument sterilization
Live demonstration/ procedural aspects of TURP, ureteroscopy, laser/pneumatic lithotripsy and radical prostatectomy
Practical for nurses
Questions and answers

Role of the nurse in endourology theatre set up and instrument sterilization.
Practical demonstration/ procedural aspects of TURP, Ureteroscopy, laser lithotripsy and laparoscopic de-roofing of renal cyst
Practical for nurses
Questions and answers

Key aspects of the workshop evaluation by the respondents

Overall rating of the Workshops

The rating of course content, tutor assessment and service quality are illustrated in Table II. Overall, the rating for UPTH was a slight improvement compared to LUTH, but there was no statistically significant difference in outcomes.

Table 2: Workshop evaluation

Parameters	LUTH	UPTH	P value	Overall Score	Max scale score
Course content	3.02	3.23	0.004	3.16	4
Tutor assessment	3.35	3.43	0.085	3.40	4
Service quality	3.05	3.29	0.002	3.23	4

The participants' rating of the course content in the two workshops is illustrated in Figure 2. Majority of the respondents rated the relevance of the workshops as very high or high.

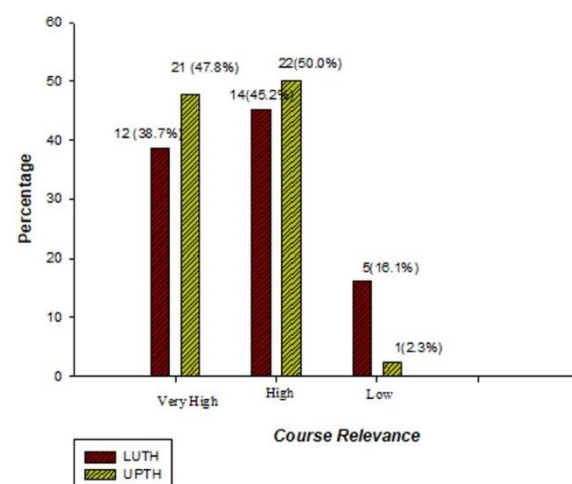


Figure 2: Participants assessment of workshop relevance.

The majority of participants rated the quality of course materials, course delivery and operations as mostly good and excellent (Table 3).

Table 3: Participants Evaluation of Workshop delivery, course material and operations performed

Parameter	Hospital	Excellent	Good	Fair	Poor
Course Delivery	LUTH	11(35.5%)	19(61.3%)	1(3.2%)	0 (0%)
	UPTH	23(52.3%)	17(38.6%)	4 (9.1%)	0(0%)
Quality of Course Material	LUTH	3(9.7%)	20(64.5%)	6(19.4%)	2(6.5%)
	UPTH	10(22.7%)	26(59.1%)	4(9.1%)	4(9.1%)
Quality of Operations	LUTH	6(19.4%)	22(71.0%)	3 (9.7%)	0(0.0%)
	UPTH	11(25.0%)	23(52.3%)	6(13.6%)	4(9.1%)

Majority of the attendees reported that the objectives of the workshop were completely or partially achieved (Figure 3). However, 20 (64.5%) and 25 (56.8%) of respondents at LUTH and UPTH respectively, reported that aspects of the course needed more time than was allocated in the schedule.

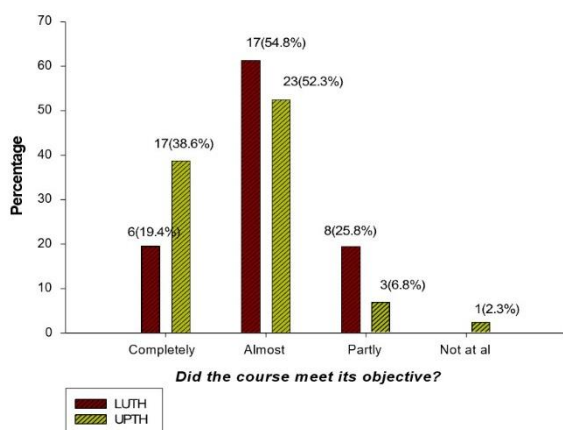


Figure 3: Participants Perception of Achievement of the workshop objectives

Knowledge and skills of Workshop Faculty

Perceptions of the respondents of the knowledgeability and technical skills of the faculty with respect to the topics taught were mostly good or excellent with minority reporting fair (Figure 4).

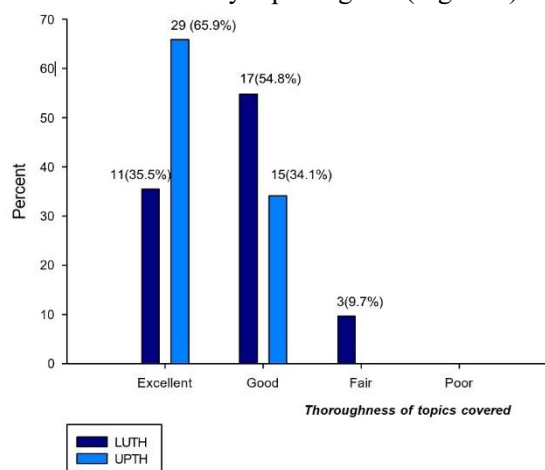
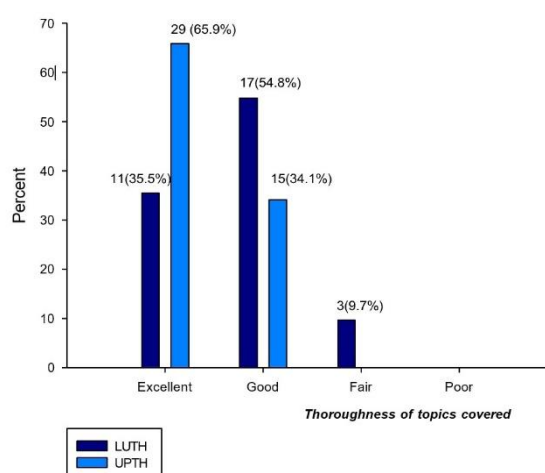


Figure 4: Participants Perception of the Knowledge and skills of the Workshop Faculty

The perceptions of the respondents about the thoroughness with which the workshop faculty covered the topics was mostly excellent and good with a minority reporting fair (Figure 5).

Figure 5: Participants perception of the thoroughness of the workshop faculty in covering the topics



Participants feedback on the non-technical skills of the faculty is shown in Figure 6. The feedback of 28 (37.3%) was excellent, while 43 (57.3%) reported good.

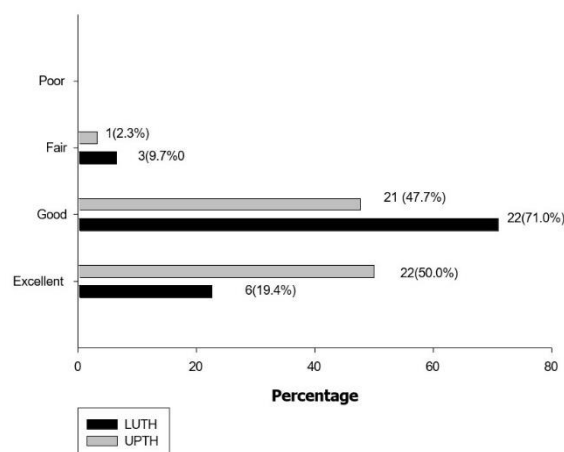


Figure 6: Participants assessment of the non-technical skills of Workshop Faculty

Reported Useful Aspects of the Workshops at LUTH and UPTH

The individual comments on the useful aspects of the workshop as reported by respondents in LUTH and UPTH are as follows:

LUTH

- All aspects
- Upper tract and Radical prostatectomy
- Running commentary on the procedure: Question and answers
- Lithotripsy and ureteroscopy
- Patient preparation and instrumentation
- Radical prostatectomy
- RIRS + TURP
- Tips and tricks in endourology and radical prostatectomy
- TURP Tips / instrument demonstration
- TURP, Semi rigid ureteroscopy
- TURP, upper tract procedures
- TURP, ureteroscopy

- Upper tract endoscopy

UPTH

- All Aspects
- Invitation of Radiologist to Talk on Radiation
- PCNL & ESWL Lecture
- Kidney Stone Removal Procedure
- Lectures, Presentation, Live Operations, Teachings in fact all Parts
- Theatre and Practical Development
- Demonstration of TURP Procedure
- Roles Of Nurses/ Live Surgery/Live Endoscopy
- Interactive Session while the operation was on
- The Role of the Nurse in Endoscopic Care and Maintenance of Instrument
- Upper Tract Endoscopy
- Discussion of TURP Theory and Practical, RIRS, TURBT/Urethroplasty
- Tips and Tricks
- Radical prostatectomy

Recommended Topics for Inclusion in Future workshops

Feedback by participants on topics to improve future workshops was sought at LUTH and UPTH. The common comments and suggestions in the hospitals were as follows:

LUTH

- Balloon dilation of PUJ obstruction, ESWL, Cystolitholapaxy
- Care of the instruments as nurses partake in the workshop
- Hands-on should be included during the workshop. Availability of manikin
- Hypospadias repair, other paediatric urologic surgeries
- Laser lithotripsy
- Laser TURP, HOLEP, PCNL; RIRS; TURBT
- PCNL and Nephrostomy tube,

- Laparoscopic nephrectomy
- Percutaneous nephrolithotomy
- Percutaneous nephrostomy, Urethroplasty, Open prostatectomy (Retropubic)
- Update lectures in areas around the workshop theme
- Upper tract, stone

UPTH

- More upper tract procedures
- Management of bladder spasm during TURP
- Identification of urological equipment and instruments; post-operative care of surgical instruments
- Catalogue of instruments
- TRUS prostate biopsy
- Indications for endourology
- BPH and Priapism
- Nurse role in setting up theatre
- Other invasive surgeries for BPH apart from TURP
- Use of flexible cystoscope and ureteroscope
- Buccal mucosa graft urethroplasty
- Urethroplasty for PFUDD
- Theatre time management
- Laparoscopy

Opportunity for development of New Skills

Most of the workshop participants reported that they developed new skills from the workshops as illustrated in figure 7.

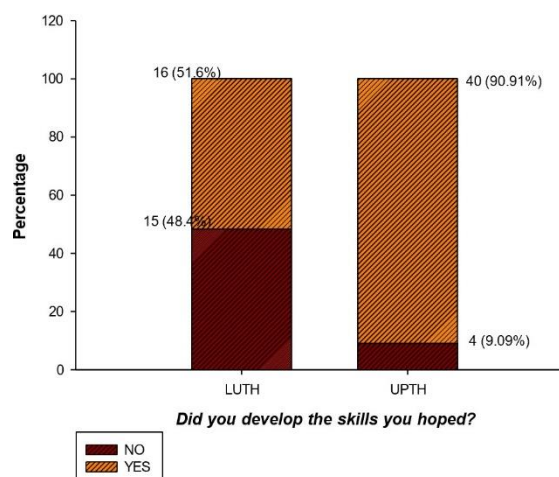


Figure 7: Workshop opportunities for new skills development by participants

The self-reported areas where new skills were developed during the workshops are presented below:

LUTH

- Better equipped for TURP, radical prostatectomy.
- Confidence to do the procedure
- Endo-urological procedures for upper tract
- Endoscopy
- Improved TURP skills
- Lithotripsy
- Necessary consumables
- Dos and don'ts of TURP and RIRS
- Percutaneous nephrostomy
- Practical maneuvers in upper tract endoscopy and safety precautions
- Tips of TURP; ureteroscopy and precautions to be taken before embarking on those procedures.
- The radical prostatectomy operation was very interesting.

UPTH

- Laparoscopy & endourology; management of delicate instruments

- In-depth knowledge of urology surgeries and care of instruments
 - Knowing more about the scopes
 - Motivation to study
 - Urology practical nursing
 - Certification on training
 - Principle of PCNL
 - Endoscopic instrument care
 - Enlightenment on urology and its procedures
 - Lower tract endoscopy
 - Cystoscopy, instrumentation
 - Laparoscopy/PCNL
 - TURP under saline
 - Safety
- procedures. These insights will strengthen future NAUS endourology workshops.

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CONCLUSION

The evaluation provided valuable feedback regarding workshop content, faculty, and organization. Participants strongly endorsed the workshop programme and suggested expanding content to cover a wider range of urological

Correlation of Varicocele and Body Mass Index Among Infertile Men in Abuja: A Cross Sectional Study

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ABSTRACT

Background: Varicocele is the most common abnormal finding among men presenting with infertility; however, there is controversy regarding its aetiology. This study aimed to determine the association between the occurrence of varicocele and Body Mass Index (BMI) at the Federal Medical Centre (FMC) in Abuja. **Materials and Methods:** This was a cross sectional study involving 51 men presenting with infertility aged 18 years and above from August 2024 to February 2025. All participants were evaluated for the presence of varicocele. Height and weight measurements were taken to calculate BMI, and a scrotal ultrasound was performed to confirm the presence of varicocele. The height, weight, and BMI of those with varicocele were compared to those without it (the control group). Data analysis was conducted using IBM SPSS Statistics version 27.0. **Results:** The mean age of the participants was 39.3 ± 10.2 years (range 18 to 68 years). The majority of patients were married (78.4%). Those without varicocele had a higher average BMI compared to those with varicocele, with values of 27.82 ± 2.74 and 25.74 ± 3.80 , respectively (p-value < 0.050), which is clinically significant. **Conclusion:** Our study indicates that there is a decreasing incidence of varicocele with increasing BMI, supporting the possibility that obesity may reduce the nutcracker effect.

Keywords: BMI, obesity, nutcracker, varicocele.

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INTRODUCTION

Varicocele is a medical condition characterized by the pathological dilation of veins of the pampiniform plexus. It is predominantly observed on the left side, with nearly 50% of affected individuals displaying bilateral involvement. The condition typically manifests around puberty, a period during which both the endocrine and exocrine functions of the testes undergo significant enhancement. The prevalence of varicocele is estimated at 15% within the general male population, escalating to 35% in individuals with primary infertility, and reaching up to 80% in those with secondary infertility [1,2].

The primary pathological mechanism underlying varicocele formation involves the dilation of the internal spermatic vein, accompanied by retrograde blood flow into the pampiniform plexus [1,2,3,4]. This phenomenon may arise from various anatomical and functional factors. Venography and cadaver studies have elucidated that the left internal spermatic vein drains into the renal vein at a perpendicular angle [5]. This anatomical configuration results in a prolonged drainage pathway and a substantial pressure differential, which may account for the higher prevalence of left-sided varicocele, as opposed to bilateral or isolated right-sided varicocele [6]. Additionally, venous incompetence and anatomical variations in the internal spermatic vein's drainage are considered contributory factors in the pathogenesis of varicoceles [7].

Moreover, a less common etiological factor contributing to varicocele formation is the nutcracker syndrome, characterized by the compression of the renal vein between the aorta and the superior mesenteric artery, leading to insufficiency of the internal spermatic vein. Epidemiological evidence suggests that this syndrome is more prevalent in adolescents than in adults, as well as among individuals possessing lower body mass indices [4,8]. A thorough clinical evaluation of patients presenting with varicocele should encompass a comprehensive reproductive and sexual history. The physical examination remains the cornerstone of varicocele diagnosis. The clinical detection and grading of varicocele are based on the criteria established by

Dubin and Amelar in 1970 [9, 10, 11], which are inherently subjective and rely on the physician's expertise.

Currently, Doppler imaging techniques—including color, power, or spectral Doppler scrotal ultrasound—are employed to enhance the evaluation of varicoceles. Utilizing high-frequency linear array transducers (≥ 7.5 MHz), Doppler findings may reveal venous flow at rest with intermittent or continuous flow reversal upon the Valsalva manoeuvre. The Sarteschi and Dubin classifications facilitate the grading of varicocele on a scale from 1 to 5.

Despite scrotal varicocele being the most prevalent abnormal finding in men evaluated for infertility, the aetiology surrounding it remains contentious. Anecdotal evidence indicates a higher prevalence of varicoceles among individuals with lower body mass indices, supporting the hypothesis of "nutcracker" syndrome. However, there remains a paucity of research investigating this relationship within our setting. Therefore, this study aims to examine the relationship between the body mass index (BMI) and varicocele in infertile male patients in Abuja.

MATERIALS AND METHODS

This study was conducted at the Urology and Fertility Clinic of the Federal Medical Centre, Abuja, between August 2024 and February 2025 whereby all adult male patients aged 18 to 58 years with varicocele were included. However, patients with a history of previous scrotal surgery, testicular masses, hydrocele or inguinal hernias were excluded after obtaining informed consent. Demographic data, including age, occupation, weight, height, and body mass index (BMI), were systematically collected and recorded using a structured proforma.

Participants were evaluated for the presence of varicocele, unilateral or bilateral and it was graded 1 to 3. Ultrasonographic assessments were conducted and graded according to the Sarteschi criteria, which range from grades 1 to 5, reflecting varying levels of severity in varicocele.

Ethical approval was obtained from the Health Research Ethics Committee (HREC) of the institution before data collection. The structured proformas utilized for data gathering were pre-tested to ensure reliability and validity. Statistical analysis was performed using IBM SPSS version 27.0. Descriptive statistics were used for demographic baseline data, with frequencies and percentages applied to continuous variables and chi-square tests utilized for categorical variables. The Pearson Chi-square test was employed to explore the relationship between the presence of scrotal varicocele and BMI. A confidence level of 95% was maintained throughout the analysis, with a p-value of ≤ 0.05 considered statistically significant.

RESULTS

A total of 51 males participated in the study with mean age of 39.3 ± 10.2 years (range 18 to 68). Most participants were married (78.4%), predominantly within the 30–39 age group (45.1%) as depicted in Table 1.

Table 1: Sociodemographic characteristics of the patients (n=51).

Parameter	Frequency	Percent (%)
Age Group		
Mean = 39.3 ± 10.2 years		
20-29	6	11.8
30-39	23	45.1
40-49	12	23.5
50-59	8	25.7
60 and above	2	3.9
Marital Status		
Married	40	78.4
Single	11	21.6

Table 2 showed there was no significant difference in height between varicocele and non-varicocele patients ($p=0.491$). A marginally significant difference in BMI was observed, with non-varicocele patients having a higher BMI (27.82 ± 2.74) compared to varicocele patients (25.74 ± 3.80) ($p=0.050$).

Table 2: Comparison of the weight, height and the BMI of patients (n=51).

Parameter	Varicocele (N=34) Mean $\pm$ SD	No Varicocele (N=17) Mean $\pm$ SD	p-value
Height	1.70 ± 0.04	1.69 ± 0.02	0.491
Weight	72.88 ± 10.52	80.47 ± 8.48	0.013*
BMI	25.74 ± 3.80	27.82 ± 2.74	0.050*

SD=Standard Deviation, * = statistically significant

Table 3A: Dubin and Amelar clinical grades of varicose veins (n=34).

Parameter	Varicocele (Bilateral) N=19	Varicocele (Left) N=34
Grade 1	2(10.5%)	2(5.9%)
Grade 2	10(52.6%)	12(35.3%)
Grade 3	7(36.8%)	20(58.8%)

Table 3B showed that Grade 4 was the most frequent for bilateral varicocele (63.2%), followed by Grade 2 (15.8%) and Grade 3 (10.5%). Similarly, on the left, Grade 4 was predominant (47.1%), followed by Grade 2 (23.5%) and Grade 5 (8.8%). The left varicocele grades were slightly more severe than the right.

Table 3B: Sarteschi grades of varicose veins (n=34)

Parameter	Varicocele (Bilateral) N=19	Varicocele (Left) N=34
Grade 1	1(5.2%)	0(0%)
Grade 2	3(15.8%)	8(23.5%)
Grade 3	2(10.5%)	7(20.6%)
Grade 4	12(63.2%)	16(47.1%)
Grade 5	1(5.2%)	3(8.8%)

DISCUSSION

This study elucidates that the mean age of adult patients diagnosed with scrotal varicocele within this community is 39.3 ± 10.2 years. This finding is congruent with earlier investigations, such as the study conducted by Jeje et al., which reported a median age of 36.65 years in Lagos, Southwest Nigeria. Similarly, Muhammad et al. noted a mean age of 35 years among patients in Sokoto, Northwest Nigeria [12, 13].

The demographic analysis revealed that a significant majority of the participants, specifically 40 individuals (78.4%), were married, predominantly

within the age range of 30 to 39 years. Notably, traders constituted the largest occupational group, comprising 35.3% of the cohort, while 64.7% of participants possessed tertiary education, thereby facilitating effective communication regarding their condition.

A comparative assessment revealed no significant difference in height between patients with scrotal varicocele and those without ($p = 0.491$). However, there was a statistically significant variance in mean weight, with patients devoid of scrotal varicocele exhibiting a higher mean weight compared to their counterparts ($p = 0.013$). These findings align with existing literature [4, 8]. A marginally significant difference in Body Mass Index (BMI) was observed, indicating that non-scrotal varicocele patients had a higher BMI ($p = 0.050$). This observation corroborates previous reports by Alsaikhan *et al* [2], which propose an inverse correlation between varicocele prevalence and BMI. While some studies have demonstrated no appreciable differences in BMI between men with and without varicocele, research by Damsgaard *et al* [4] has indicated that men with a BMI of less than 20 had a higher prevalence of varicocele compared to those with a BMI exceeding 25 ($p < 0.05$). This suggests that scrotal varicocele is more prevalent among adults with lower BMI.

Among the 51 participants analyzed, 66.67% (34 individuals) were found to have scrotal varicocele, all cases being unilateral on the left side, with 55.88% (19 individuals) exhibiting bilateral involvement. The Dubin and Amelar Clinical Grading System illustrated varying distributions of severity, with Grade 2 being the most common classification on the right side (52.6%), whereas Grade 3 was predominantly observed on the left side (58.8%). According to the Sarteschi Classification of Varicose Veins, Grade 4 varicocele was the most frequently identified across both sides, accounting for 63.2% in bilateral instances and 47.1% on the left side. These observations support previous literature indicating that varicoceles are more frequently observed and tend to exhibit greater severity on the left side. Research conducted by Keller *et al*. [1] and Alsaikhan

et al. [2] has similarly noted that varicoceles are typically larger and more prevalent on the left, with up to 50% of men with varicocele presenting with bilateral pathology.

CONCLUSION

The findings of this study suggest a decreasing incidence of varicocele associated with increasing BMI, thereby supporting the hypothesis that obesity may contribute to a reduced nutcracker effect. Further research is warranted to substantiate these findings.

Recommendation

We recommend that future studies aim for larger sample sizes.

Limitations of the Study

1. The sensitivity of the ultrasound equipment may influence the grading accuracy of varicoceles.
2. There exists a potential for observer error in both clinical and ultrasonic assessments of varicocele grades.

Conflict of interest

There are no conflicts of interest

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We express appreciation to the Heads of Department of Surgery and Radiology, Federal Medical Centre, Abuja for their support and cooperation.

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Complications of Trans rectal Ultrasound-Guided Extended 12-Core Prostate Biopsy

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ABSTRACT

Background: In Nigeria, Prostate cancer is the most diagnosed cancer in males from middle age. The only definitive way to confirm prostate cancer is through prostate biopsy. Trans-rectal Ultrasound (TRUS) guided core needle biopsy of the prostate has become the procedure of choice for obtaining high quality tissue cores for histopathologic assessment in patients with suspected prostate cancer. Despite being considered generally a safe technique, TRUS-guided prostate biopsy is an invasive process with potential risks. We assessed the complications arising from 12-core prostate biopsy performed under TRUS guidance in this prospective study. **Objectives:** The aim of this study was to report the common complications and incidence rate after 12-core extended biopsy protocol using TRUS guided needle biopsy amongst patients being evaluated for prostate cancer in Lagos University Teaching Hospital, Lagos. **Methodology:** This study was a prospective hospital-based study involving patients evaluated for prostate cancer. All study participants, mean age 68.1years received antibiotic prophylaxis five minutes to the procedure and a laxative was administered a day prior to the procedure. Also, all patients had thorough clinical evaluation including digital rectal examination (DRE), serum assay for prostate specific antigen (PSA), radiologic imaging of the prostate with Trans-Rectal Ultrasound (TRUS) and TRUS guided Extended 12-core needle biopsy of the prostate (including 6-Sextant and 6-lateral core biopsies). **Results:** Result of 134 prostate biopsies performed in selected patients were reported. 134 men (aged 37-89years) were enrolled in this study and had Extended 12-Core TRUS guided prostate needle biopsy. 78 men (58.2%) were positive for cancer, 52 men (38.8%) had BPH and 4 men (3%) had prostatitis. Complications occurred in 60.4% (81) of patients but most of these complications were minor bleeding complications. The most common complication of the biopsy was rectal bleeding which occurred in 59.7% of patients, followed by Hematuria/ bleeding per urethra in 23.9% of patients. Urinary tract infection after biopsy was most common in patients with prostatitis ($p=0.020$). Majority of patients (84.3%) found the procedure tolerable with only mild discomfort and 67.9% felt no pain. Study results were generally consistent with other reports on complication rates. **Conclusion:** The study showed that the TRUS guided 12-core extended biopsy procedure can be safely performed as it is well tolerated with no significant pain or morbidity and without significant increase in complication rate.

Keywords: Prostate cancer, Trans-rectal Ultrasound (TRUS), prostate needle biopsy, Prostate core biopsy protocol.

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INTRODUCTION

Prostate cancer represents a major burden on Urological services at Lagos University Teaching Hospital and is among the most common causes of hospital admission in elderly men. It is also the leading cause of cancer-related mortality in men over 50 years of age in our setting. The incidence of prostate cancer is rising worldwide and may be caused mainly by demographic factors particularly the increasing elderly population and more importantly the increasing number of cases identified from prostate specific antigen (PSA) testing.

Histological confirmation via prostate biopsy remains the definitive method for diagnosing prostate cancer¹. The procedure requires taking a biopsy through the rectal, during which an inoculum of bacteria from the rectum can be introduced into the prostate parenchyma.

Over the past three decades, rapid technological advances have facilitated the widespread integration of prostatic imaging into clinical practice. Modalities such as multiparametric ultrasound, multiparametric magnetic resonance imaging (mpMRI), and nuclear imaging with positron emission tomography (PET) are now routinely employed for prostate cancer detection and localisation, staging, active surveillance, treatment planning—including whole-gland and focal therapies and monitoring for disease recurrence.

Transrectal ultrasound (TRUS)-guided prostate biopsy is the standard technique for obtaining tissue cores for histopathological assessment in men with suspected prostate cancer. The procedure is generally safe, well tolerated, and can be performed on an outpatient basis without the need for narcotic analgesia or intravenous sedation.

Random systematic sextant biopsy was shown to be superior to lesion-directed biopsy for cancer detection and subsequently became the reference standard technique, involving bilateral parasagittal sampling from the base, mid-gland, and apex of the

prostate^{2,1}. However, increasing evidence suggests that sextant biopsy under-samples the prostate and may fail to detect a significant proportion of clinically relevant tumours. This has generated ongoing debate regarding the optimal number and anatomical distribution of biopsy cores, as well as the need to balance improved cancer detection against the risk of increased biopsy-related morbidity.

Complications associated with Transrectal Ultrasound-Guided Prostate Biopsy are well documented^{3,4,5} and may be broadly categorised into infectious and non-infectious events. Infective complications range from asymptomatic bacteriuria, reported in approximately 10–20% of cases, to symptomatic urinary tract infection in 2–6% of patients. Febrile urinary tract infection or acute prostatitis occurs in 1–3%, while sepsis has been reported in 0.5–2% of cases. Hospital admission following post-biopsy infectious complications is required in approximately 1–3% of patients.

Bleeding-related complications are more frequently observed but are typically self-limiting. Haematuria occurs in 30–60% of patients, rectal bleeding in 10–30%, and haematospermia in 40–80%. Less commonly reported adverse events include acute urinary retention (0.2–1.7%), vasovagal reactions (1–5%), and transient erectile dysfunction. Overall, while most complications are minor and resolve without intervention, infectious complications remain the most clinically significant due to their potential for systemic morbidity and need for hospitalisation.

In this prospective study, we evaluated the complication rate of Transrectal Ultrasound guided 12-core extended biopsy protocol in patients undergoing prostate biopsy as part of evaluation for prostate cancer in our hospital.

METHODOLOGY

This prospective study was carried out amongst 138 men who were being investigated for prostate cancer at our centre. Approval for the study was

obtained from the Human Research and Ethics Committee of the Lagos University Teaching Hospital administration building. The HREC assigned number is ADM/DCST/HREC/APP/2631 and approval was obtained on the 20th of February 2019 spanning a 1 year. An informed written consent was obtained from all the patients. Inclusion criteria were the presence of one or any combination of elevated total serum prostate specific antigen (PSA >4ng/ml), abnormal digital rectal examination findings of the prostate and abnormal findings on imaging studies (TRUS/MRI). Additionally, patients with painful perianal pathology, those who declined the procedure, individuals deemed medically unfit to undergo the procedure, and those with symptomatic or laboratory evidence of urinary tract infection were excluded from the study. Patients were recruited on a consecutive basis on the fulfilment of criteria and documented consent. Patients on antiplatelet medications (clopidogrel) or anticoagulants (warfarin, dabigatran) were requested to discontinue for 7-10days prior to the procedure and INR (international Normalized ratio) needed to be normalized before we proceeded. According to Unit's protocol, all patients had single preoperative day of rectal suppository (Bisacodyl 10mg nocte) the night prior to the procedure to reduce faecal loading and enhance visualization for TRUS. Single doses of broad spectrum antibiotics (i.e Intravenous levofloxacin 500mg stat and metronidazole 400mg stat) administered five minutes (5mins) prior to commencing the biopsy and the oral preparations of same antibiotics were continued for 5 days post procedure. No systematic sedatives or analgesic agents were administered. All procedures were done as day case.

Patients were usually placed in the left lateral decubitus position with knees and hips flexed at 90⁰ for biopsies. An arm board attached parallel to the table and a pillow between the knees allowed patients to maintain this position. The buttocks were flushed with the edge of the procedure table to allow easy installation of anaesthetic and manipulation of the probe without obstruction. Preliminary DRE was carried out by researcher and findings documented

and then, 10mls of 2% xylocaine hydrochloride jelly introduced intrarectally for topical anaesthesia and lubrication 15minutes before the procedure is commenced.

The TRUS probe (Mindray product DP2200 model with a 7.5MHz transducer, China) with a condom worn over it and a needle guide attached to it was lubricated with a sonogel and was inserted gently into the rectum. TRUS evaluation of the prostate was carried out and documented. Each patient then received local anaesthesia via peri-prostatic blockade using 5mls of plain 1% lidocaine injection applied to the prostate- seminal vesicle junction on each side of the basolateral region of the prostate using a 22G spinal needle introduced through the needle guide and a waiting period of 5mins to allow the anaesthetic work. After ensuring correct placement of rectal probe into individual zones of the prostate, biopsies were obtained using 18G core biopsy needle mounted on a spring-loaded automatic biopsy gun through and end fire needle guide attached to the rectal probe, six core biopsies were obtained from the apex, middle and base of each lateral lobe para-sagittal representing the sextant group. Additional six core biopsies, (three cores from each lateral lobe) was obtained in all patients to make extended 12-core biopsies from the far lateral portion of the prostate (apex, middle and base). Suspicious nodules were targeted in all groups as well as part of the biopsy protocol and included to the most approximate region in the protocol. Biopsy cores taken from the sextant, and lateral peripheral zone (PZ) were all individually and appropriately labelled and submitted separately in formalin filled containers to the department of Pathology for histopathologic analysis. The rectum was then temporarily packed with gauze. The result of the biopsy histopathology was documented as Malignant, Benign, and Prostatitis. The histological type and Gleason grade/score of biopsies that turn out to be malignant were also requested.

It was ensured that patients not on urethral catheter voided urine before discharge to detect any haematuria or urinary retention. Subsequently all patients were discharged home after 2 hours of

observation if no complications warranting admission for further care were noticed. Patients were counselled to note the onset and duration of any concerns arising from the procedure. The importance of completing prescribed antibiotics was also emphasized. Patients were followed up on their mobile phones in between the time of the procedure and first clinic visit after the procedure (usually 5 days for any complications). The second clinic visit after the procedure was approximately 3 weeks and was dedicated to the review of their investigation results and complications. All complications noted and documented. We examined bleeding complications (haematuria/per urethral bleeding, rectal bleeding and haematuria), temperature elevation above 38.0°C, signs of inflammation (Systemic inflammatory response) or infection (UTI), pain during biopsy, acute urine retention, and hospital admission amongst others.

RESULT

A total of 138 men were recruited into the study but 134 patients were eligible for evaluation. The ages of the participants ranged from 37 to 89 years, with a mean age of 68.1 ± 9.5 years. The most represented age group was 61–70 years, accounting for 42% of the study population. Histopathological analysis revealed malignant prostate disease in 78 patients (58.2%), benign histology in 52 patients (38.8%), and prostatitis coexisting with benign histology in 4 patients (3.0%).

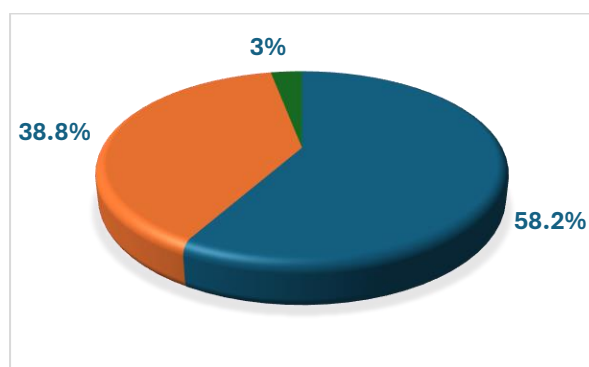


Figure 1: Distribution of Final Histopathological diagnosis

Procedure-related complications were observed in 81 patients (60.4%). The most frequently reported complication was rectal bleeding, occurring in 80 patients (59.7%), followed by haematuria or bleeding per urethra in 32 patients (23.9%). All bleeding episodes were self-limiting lasting between 24–72 hours from patient's self-report and required no further intervention.

Post-biopsy urinary tract infection occurred in 9 patients (6.7%). The incidence of infection was significantly higher among patients with histological evidence of prostatitis compared with those with benign or malignant findings ($p = 0.020$) and the commonest organism was *Escherichia coli* in 60% of cases, although other organisms like *klebsiella*, *proteus* and *pseudomonas* were cultured. No cases of severe sepsis requiring intensive care admission were recorded. Also, one patient developed post biopsy epididymitis and we had two cases of intraoperative vasovagal episodes in the study population.

Overall complication rates did not differ significantly across histopathological diagnostic categories ($p = 0.897$). Similarly, there were no statistically significant differences in rates of rectal bleeding ($p = 0.620$) or haematuria ($p = 0.861$) between patients with prostate cancer, benign prostatic hyperplasia, and prostatitis (Table 1).

Patient tolerance of the procedure was high. The majority of participants (113; 84.3%) described the procedure as very comfortable, while only 3 patients (2.2%) reported discomfort. With respect to pain perception, 91 patients (67.9%) reported no pain, 35 (26.1%) reported mild pain, and only 8 patients (6.0%) experienced moderate pain. Pain scores and patient satisfaction did not differ significantly across diagnostic groups.

Table 1: Complications in participant

	Overall	Prostate Cancer	BPH	Prostatitis	p-value
	(n=134)	(n=78)	(n=52)	(n=4)	
Presence of complication					
Yes	81(60.4)	48(61.5)	31(59.6)	2(50.0)	0.897
No	53(39.6)	30(38.5)	21(40.4)	2(50.0)	
Complications					
Urosepsis					
Yes	9(6.7)	5(6.4)	2(3.8)	2(50.0)	0.020*
No	125(93.3)	73(93.6)	50(96.2)	2(50.0)	
Rectal bleeding					
Yes	80(59.7)	49(62.8)	29(55.8)	2(50.0)	0.620
No	54(40.3)	29(37.2)	23(44.2)	2(50.0)	
Haematuria					
Yes	32(23.9)	20(25.6)	11(21.2)	1(25.0)	0.861
No	102(76.1)	58(74.4)	41(78.8)	3(75.0)	
Patient satisfaction					
Uncomfortable	3(2.2)	2(2.6)	1(1.9)	0(0.0)	0.253
Fairly comfortable	18(13.4)	11(14.1)	5(9.6)	2(50.0)	
Very comfortable	113(84.3)	65(83.3)	46(88.5)	2(50.0)	
Pain level					
None	91(67.9)	52(66.7)	38(73.1)	1(25.0)	0.117
Mild	35(26.1)	20(25.6)	13(25.0)	2(50.0)	
Moderate	8(6.0)	6(7.7)	1(1.9)	1(25.0)	

*Significant p value (<0.05)

DISCUSSION

Prostate cancer remains one of the most commonly diagnosed malignancies in men worldwide and a leading cause of cancer-related mortality⁶. Men of African descent are known to carry a disproportionately higher risk of both developing prostate cancer and experiencing adverse outcomes⁷. Current screening recommendations advocate annual prostate-specific antigen (PSA) testing and digital rectal examination (DRE) for men aged 50 years and above, with earlier screening advised for those with a positive family history^{8,9}. Although

prospective trials have yet to conclusively demonstrate a reduction in mortality attributable to routine screening, substantial advances in diagnostic modalities and therapeutic strategies have significantly transformed prostate cancer

management over recent decades. Histological confirmation via prostate biopsy remains the cornerstone of diagnosis.

Prostate biopsy techniques have evolved considerably, with image-guided approaches now central to optimising tissue yield and diagnostic accuracy. In high-resource settings, MRI-TRUS fusion biopsy has emerged as the preferred technique, while cognitive fusion TRUS-guided biopsy and the trans-perineal approach are also widely adopted. The Trans-perineal technique has gained popularity perhaps due to reduced incidence of post biopsy infective complication rate. However, in low- and middle-income settings, including our environment, routine use of multiparametric MRI is limited by cost and availability. In contrast, transrectal ultrasound (TRUS) is increasingly

accessible, underscoring the importance of evaluating extended TRUS-guided biopsy protocols within our population.

A theoretical concern associated with extended biopsy protocols is the potential for increased procedure-related morbidity due to a higher number of biopsy cores. In this study, the overall complication rate was 60.4%, a figure comparable to those reported in similar series^{10,11}, with all complications being minor. Bleeding-related complications were the most frequent, with transient rectal bleeding and haematuria observed in a substantial proportion of patients. Importantly, these events were self-limiting, resolving within minutes to days. No patient reported persistent bleeding episodes above three days and no patient required blood transfusion or further intervention.

Infective complications were infrequent and mild. Urine culture-confirmed urinary tract infection occurred in a small proportion of symptomatic patients and responded to oral antibiotic therapy without the need for hospital admission. The low rate of significant infection observed may be attributed to the routine use of antibiotic prophylaxis and pre-procedural rectal preparation. *Escherichia coli* was the most isolated pathogen, consistent with existing literature. A single case of epididymitis was successfully managed with prolonged antibiotic therapy. The two vasovagal episodes recorded resolved promptly with conservative measures.

Our findings are consistent with previously published studies^{11,12 13,4,5}, demonstrating a low incidence of major complications following TRUS-guided prostate biopsy. Prior reports have documented major complication rates of less than 2.5%, with minor complications predominating^{5,14,15,16}. In the present study, the rate of major complications was less than 1%, likely influenced by the relatively modest sample size. No demographic or clinical variables were significantly associated with the development of post-biopsy complications.

Patient tolerance of the procedure was high. The majority of participants reported minimal discomfort, with over 80% describing the procedure as very comfortable and only a small proportion experiencing moderate pain. While discomfort was more frequently reported among younger patients, the few individuals who described the procedure as uncomfortable were elderly and frail, suggesting that patient-specific factors rather than biopsy extent alone may influence procedural tolerance.

Overall, this study demonstrates that extended TRUS-guided prostate biopsy is a safe and well-tolerated procedure in our setting. Increasing the number of biopsy cores did not adversely affect patient comfort or satisfaction and did not result in a clinically significant increase in morbidity. These findings support the continued use of extended TRUS-guided biopsy protocols as a practical and effective diagnostic approach in environments where advanced imaging-guided biopsy techniques remain limited.

Limitation of the study

The transrectal ultrasound assessment used in this study focused on grayscale identification of prostatic nodules, with advanced imaging techniques like elastography and Doppler unavailable. This limitation may impact lesion characterization and targeted sampling, leading to increased reliance on systematic cores, potentially lowering cancer detection rates and raising complication risks due to higher instances of bleeding and infections associated with multiple core insertions.

CONCLUSION

This study demonstrates that extended 12-core transrectal ultrasound-guided prostate biopsy is a safe and well-tolerated diagnostic procedure, with a low incidence of clinically significant complications. The findings support the routine performance of prostate biopsy as an outpatient procedure without the need for substantial anaesthetic or additional analgesic interventions, provided that the benefits of histological diagnosis

are carefully balanced against potential procedural risks.

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Crossed Fused Renal Ectopia with Separate Collecting Systems and Functional Obstruction Treated with a Novel Common Sheath Pyeloplasty: A Case Report

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ABSTRACT

Background: Cross-fused renal ectopia (CFRE) is a rare congenital anomaly involving abnormal renal fusion and positioning, with an estimated occurrence of 1 in 1000 live births. Most patients remain asymptomatic, but complications such as hydronephrosis, urinary tract infection, or pelvi-ureteric junction obstruction (PUJO) can develop. Functional obstruction without mechanical narrowing is exceptionally uncommon. We report a case of a 2-year-old boy with CFRE and functional PUJO who was managed with a novel dismembered common sheath pyeloplasty, with a satisfactory outcome. **Case Presentation:** We report a 2-year-old male who presented with recurrent fever, progressive abdominal swelling, and abdominal pain since birth. Antenatal scans revealed an ectopic kidney. Examination showed a central cystic abdominal mass and a non-palpable right testis. Ultrasonography demonstrated bilateral ectopic pelvic kidneys with marked right hydronephrosis. Computerised Tomographic (CT) urography revealed cross-fused renal ectopia draining into a massively dilated renal pelvis with the "fountain sign." Laboratory investigations were normal. The patient underwent a novel common sheath dismembered pyeloplasty and right orchidopexy. The patient had an uneventful recovery. The drain and catheter were removed on postoperative days 8 and 10, respectively. He was subsequently discharged on postoperative day 12 and remains asymptomatic on follow-up. **Conclusion:** Cross-fused renal ectopia can rarely present with hydronephrosis due to functional obstruction. Advanced imaging is essential for accurate diagnosis. Dismembered common sheath pyeloplasty remains a successful reconstructive option of the anomalous systems of cross renal ectopia, representing a novel modification of the procedure described by Anderson and Hynes.

Keywords: Cross-fused renal ectopia, Separate system, Functional obstruction, Hydronephrosis, Pyeloplasty

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INTRODUCTION

Renal fusion anomalies represent a small portion (<10%) of congenital renal malformations, with cross-fused renal ectopia (CFRE) being the second most common form, after horseshoe kidney. [1,2] Among the four categories of cross renal ectopia (CRE), CFRE is the most frequently observed (90%). The other categories, in order of increasing rarity, include CRE without fusion, solitary CRE, and unfused bilateral CRE [3]. The incidence of CFRE occurs in approximately 1 in 1000 live births, with a male-to-female ratio of 2:1 and a left-to-right predominance [3,4]. Dominicus Panarolus first described the anomaly in 1654 [1]. It is a developmental defect that results from the abnormal ascent of the kidneys, with fusion of both kidneys within the pelvis. The two main theories suggest either an abnormal positioning of the umbilical arteries, impeding renal ascent, or the presence of two ureteric buds leading to malrotation and fusion [3,5].

Cross-fused renal ectopia involves one kidney traversing the midline to fuse with the orthotopic kidney. At the same time, its ureter crosses backward to drain into the bladder via its original opening into the trigone. [6] The crossed fused renal ectopia with a single ureter is a scarce variant that has been infrequently reported. [7,8] Most cases are asymptomatic and found incidentally during imaging. Still, some patients present with abdominal swelling, pain, recurrent urinary tract infections, or pelvi-ureteric junction obstruction (PUJO). [8,9] Intervention is necessary in symptomatic cases, and treatment should be tailored to the specific complication. [4] We report a rare case of left-to-right cross-fused renal ectopia with separate collecting systems, functional PUJO, and a single right ureter, treated with a novel common sheath dismembered pyeloplasty.

CASE REPORT

A 2-year-old male presented with recurrent fever, progressive abdominal swelling, and abdominal pain since birth. Pregnancy and delivery were uneventful,

but antenatal ultrasound revealed an ectopic kidney. He was the fourth child in a monogamous family with no family history of similar illness. General physical examination was grossly normal. There was gross asymmetrical abdominal distension, with a ballotable non-tender right flank mass (Figure 2A). The phallus was uncircumcised with a normal meatus. The left testis was normal, but the right was non-palpable. Haemogram, urine culture, serum electrolytes, urea, creatinine, serology, and clotting profile were all normal. Haemoglobin genotype was AA. Abdominal ultrasound revealed a right ectopic (pelvic) kidney with (SFU) grade 4 hydronephrosis. The left renal fossa was empty and non-palpable testis was not visualised. The CT urography revealed a fused, malrotated pelvic kidney at L4-S1 with a separate collecting system draining into a massively dilated renal pelvis (13.6×12×10.1 cm) with delayed contrast excretion and the characteristic "fountain sign" (Figure 1 A&B). The fused ectopic kidney was drained by a single ureter to the right side of the urinary bladder (Figure 1C).

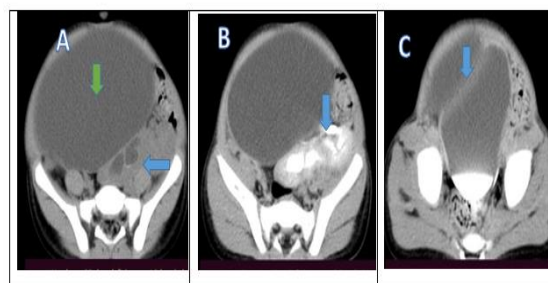


Figure 1 (CT Urogram): A (non-contrast); hydronephrotic fused pelvic kidneys (blue arrow) with a huge common renal pelvis (green arrow). **B (contrast);** Independent collecting systems of the right CFRE draining into the huge renal pelvis demonstrating the 'fountain' sign (blue arrow). **C (contrast);** shows compression of the right superior part of the urinary bladder by huge renal pelvis (severe hydronephrosis) (blue arrow)

A diagnosis of left to right cross-fused renal ectopia with pelvi-ureteric junction obstruction and right undescended (non-palpable) testis was made. He

underwent a dismembered common sheath pyeloplasty via Gibson's incision and right orchidopexy by the subdartous pouch method. Intraoperative findings included left-to-right cross-fused renal ectopia, right and left collecting systems draining separately into a large pelvis, and a single patent ureter draining into the right side of the urinary bladder (Figures 2B-E). The PUJ was found to be patent, with no form of mechanical narrowing observed. There was a right inguinal testis (Figure 2F). The procedure was novel and a modification of the technique described by Anderson and Hynes, as in our case, the 2 systems, representing each of the fused kidneys, were connected together and to the common renal pelvis drained by a single patent right ureter. The huge renal pelvis was resized, and the proximal 5 cm of the ureter including the PUJ was excised to cater for the redundancy. The anastomosis of the two collecting systems was performed side-to-side, followed by end-to-end anastomosis of the renal pelvis to the ureter. The completed reconstruction is shown in Figure 2F. Two improvised internalized stents via each kidney (fenestrated size 5 NG-tubes passed percutaneously) and a retroperitoneal drain were placed. The drain dislodged spontaneously on day 8, and the stents, along with the urethral catheter, was removed on day 10. The child was discharged home on day 12 after an uneventful recovery and postoperative period. Histopathological finding of the PUJ segment include bands of extensive fibrocollagenous tissues with few bundles of muscles. The patient has been on regular follow-up without complaint.

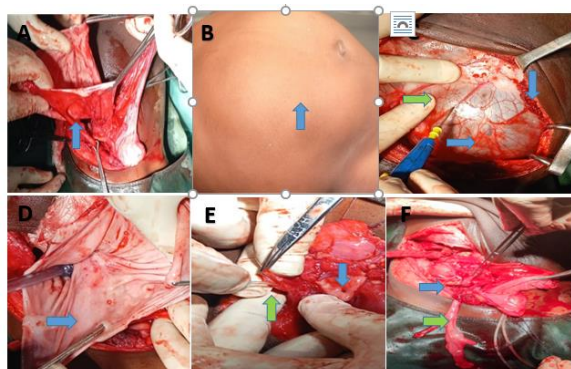


Figure 2 (Intraoperative): (A) Pre-operative photograph showing grossly distended abdomen with ballotable right flank mass (blue arrow); (B) Huge renal hydronephrotic renal pelvis (blue arrow); (C) Openings of the 2 independent systems (blue arrows) of CFRE and the pelvis ureteric junction (green arrow); (D) Single ureter (blue arrow) draining the huge renal pelvis into the urinary bladder; (E) The 2 independent collecting systems after spatulation (green and blue) of the cross fused ectopia before common sheath pyeloplasty into the single ureter; (F) Showed the completed common sheath dismembered pyeloplasty (blue arrow) and right undescended testis (green arrow).

DISCUSSION

Crossed fused renal ectopia is an uncommon birth defect in which the two kidneys are joined, resulting in a single renal mass often with two collecting systems on one side of the abdomen. However, the ureter of the 'translocated' kidney crosses the midline again to insert into the bladder through its original ureteric orifice. [6] During fetal development, between the 4th and 8th weeks, the kidneys normally ascend to the level of the L2 vertebra in the retroperitoneal space. Crossed fused renal ectopia results from abnormal renal ascent combined with fusion of both kidneys at the pelvis. Two main theories have been proposed to explain the pathogenesis of CFRE. Left-to-right fusion occurs three times more often than right-to-left, and in most cases, two separate ureters descend to the bladder, although variants with a single ureter have also been reported. [7,8,10,11] Our patient had the more common left-to-right fusion, which explained the right-sided abdominal swelling observed at presentation. In 1957, McDonald and McClellan classified crossed fused renal ectopia into six subtypes (I-VI) based on the orientation and position of the renal fusion and ureteral insertion into the bladder. [2] Type III, known as the lump kidney, involves broad fusion of both kidneys with the ureter of the ectopic kidney crossing the midline. The current case conforms to this Type III classification and features a single ureter drainage system. Habtemichael et al. [12] reported the pancake (Type

III) form of CFRE with a single ureter in a 17-year-old male in 2021.

Most cases of crossed renal ectopias are asymptomatic and often discovered incidentally. [9] However, symptomatic presentations frequently occur with accompanying urinary tract complications such as hydronephrosis, ureteropelvic junction obstruction, vesicoureteral reflux, recurrent infections, and urolithiasis. These conditions can cause symptoms like flank pain, abdominal mass, recurrent fever, hematuria, among others. [6] Our patient presented late at the age of 2 years with progressive abdominal swelling and recurrent infection due to a functional PUJO. This contrasts with findings from a previous study by Loganathan and Bal. [4] where most of their 36 patients presented within 1 year of age because of recurrent infection, abdominal pain from pelvi-ureteric or vesicoureteric junction obstruction, and reflux. However, other authors such as Kaur et al. [7], Dahal et al. [8] and Naseri [13] have reported the conservative management of much older patients at ages 22, 46, and 6 years with CFRE and a single ureter, presenting with lithuria and reflux, respectively. The late presentation (at 2 years) of our patient, despite being symptomatic for several months, may be related to limited access to specialized urological care, the necessity of out-of-pocket payment despite financial constraints, and the absence of comprehensive health insurance coverage in our society.

Other system anomalies that may be associated with CFRE include genital (penile duplication, undescended testis, vaginal agenesis), GIT (imperforate anus, gut malrotation), cardiovascular (septal defects, aortic coarctation), tethered cord, and limb abnormalities, among others. [3,14] Besides the rare duplex-drainage system and a single ureter, our patient also presented with an undescended testis. Similarly, Drevna et al. [15] and Yadavalli et al. [16] have reported instances of CFRE simultaneously associated with ipsilateral cryptorchidism in a 30-year-old and a 10-year-old male, respectively. Imaging plays a vital role in diagnosis, monitoring,

preoperative planning, and follow-up. Ultrasonography remains an essential initial modality for detecting the location of fused ectopic kidneys and the presence of hydronephrosis. [3] Advanced three-dimensional imaging such as CT and MR urography are crucial for defining urinary tract anatomy, vascular supply, presence of obstruction, and associated anomalies. [9,17] In our case, CT urography was used to establish the diagnosis, as it demonstrated the radiological features of the left-to-right cross-fused renal ectopia, including the classic “fountain sign.” [17] While asymptomatic cases are observed by periodic monitoring, symptomatic cases require intervention tailored to the presenting complication. Functional obstruction of an ectopic kidney is an uncommon but recognized phenomenon that can result from an abnormal calyceal orientation or impaired peristalsis. The finding of independent duplex systems with functional obstruction in our patient, evidenced by a massively dilated renal pelvis without intrinsic PUJ narrowing or external compression, is extremely rare. [18] This warranted a novel procedure that incorporated the two collecting systems into a single channel before anastomosis with the dilated pelvis. Although most procedures previously performed for CFRE were due to stone, a few, such as those by Goyal et al. [20], have involved pyeloplasty. [14,21] Anderson-Hynes dismembered pyeloplasty is the surgical intervention of choice for PUJO in an anomalous kidney, but this procedure was originally described in a single collecting system kidney. [21,22] Our novel technique combines the separate systems into a single channel through side-to-side anastomosis, forming a neo-renal pelvis before connecting it to the single ureter as part of a common sheath pyeloplasty. This modification of the original Anderson-Hynes dismembered pyeloplasty, which we found to be effective and rewarding, is presented here.

CONCLUSION

Cross-fused renal ectopia with a duplex collecting system is a rare anomaly that can present with

hydronephrosis caused by functional pelvi-ureteric junction obstruction. Diagnosis can be difficult and often requires advanced imaging. Modified Anderson–Hynes dismembered common sheath pyeloplasty, even in cases with complex separate anatomy, remains an effective surgical option with excellent outcomes.

Study Limitations: Radionuclide study was not done as it was not available in our facility, and the parents could not afford it, where it was available.

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Informed Consent: Patient's parent has consented to this publication

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Primary Megaureter Unmasked by Imaging for Trivial Abdominal Trauma: A Case Report.

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ABSTRACT

Background: Occult preexisting renal lesions are often discovered incidentally during evaluation of patients for unrelated conditions. This case report aims to highlight how imaging for trauma can expose a silent organ-threatening congenital anomaly of the urinary tract. **Case Presentation:** A 13-year-old boy presented to the emergency department a week after being hit on his abdomen with a plywood during play. He reported left flank pain that has worsened over time. His past medical and surgical history was unremarkable. He was hemodynamically stable, and abdominal examination revealed mild left flank tenderness. An initial abdominal ultrasound scan revealed severe left hydroureteronephrosis. Dipstick urinalysis showed 3+ blood, while CT urogram revealed a markedly enlarged left kidney, measuring 18cm in its bipolar length, with cortical thinning and an ipsilateral tortuous hydroureter that tapered distally. Severe hydroureteronephrosis secondary to a primary obstructive megaureter was diagnosed. He underwent left distal ureteric exploration and ureteric reimplantation with intraoperative findings of a severely dilated and redundant left ureter with an area of narrowing at the distal end. He recovered uneventfully. **Conclusion:** The incidental discovery of a primary megaureter during trauma imaging is a reminder that acute presentations can unmask chronic, organ-threatening conditions. Therefore, this case report underscores the need for clinicians to comprehensively review trauma imaging beyond the immediate context of injury.

Key Words: Case report, Hydronephrosis, Hydroureteronephrosis, Megaureter, Renal Trauma, Ureteroneocystostomy.

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INTRODUCTION

Congenital defects of the urinary tract and the kidney are the leading cause of end-stage renal disease in children.¹ One such defect is the primary obstructive megaureter, caused by an intrinsic congenital defect of the lower ureteric segment at the ureterovesical junction.² This intrinsic congenital obstruction usually affects the lower 1 to 2 cm of the ureter before it enters the urinary bladder.³ Consequently, there is impairment of urine drainage into the bladder due to ineffective peristalsis, leading to progressive dilatation of the ureter proximally. The disease was first described by Caulk in 1923.^{3,4} It is commoner among males and often unilateral. However, it can be bilateral in 15 – 25% of cases.² The term megaureter is non-specific and includes a spectrum of abnormalities characterized by excessive ureteral diameter.⁵ Primary obstructive megaureter may remain asymptomatic and be detected incidentally during imaging evaluation for unrelated pathology. Most of the reported incidentally detected preexisting renal lesion during CT imaging for trauma is pelviureteric junction obstruction.⁶⁻⁸ Reports of primary obstructive megaureter detected following a CT imaging for trauma are rare. Therefore, this case report aims to highlight how imaging for trauma can expose a silent organ-threatening congenital anomaly of the urinary tract.

CASE PRESENTATION

A 13-year-old boy presented to the emergency department a week after being hit on his abdomen with a plywood during play. He reported left flank pain that was initially mild but worsened over time. There was no frank hematuria or lower urinary tract symptoms. His past medical and surgical history was unremarkable. On physical examination, he was hemodynamically stable, while abdominal examination revealed mild left flank tenderness with no obvious palpable swelling. An initial abdominal and pelvic ultrasonography revealed left severe hydroureteronephrosis with marked cortical thinning

corresponding to Onen's grade 4 hydronephrosis. The right kidney showed good corticomedullary

differentiation with no pelvicalyceal dilation. The urinary bladder contained clear urine with a bladder wall thickness of 4mm. Dipstick urinalysis showed 3+ blood, while his complete blood count and serum electrolytes, urea, and creatinine were within normal range. In view of the ultrasound scan and dipstick urinalysis findings, a CT urogram (Fig. 1) was performed, which showed a markedly enlarged left kidney, measuring 18cm in its bipolar length, with marked cortical thinning. The entire ipsilateral ureter was significantly dilated and tortuous, consistent with hydroureter, which extended to the distal end, tapering off. The right kidney and ureter were essentially normal. A tentative diagnosis of severe left hydroureteronephrosis secondary to primary obstructive megaureter was entertained with a differential of congenital distal ureteric stricture. He underwent left distal ureteric exploration through a Gibson's incision. The intraoperative findings, as shown in Fig. 2 were a severely dilated and redundant left ureter with a diameter of approximately 4cm. The distal end of the ureter, just before it inserts into the bladder, was narrow but patent. This diseased segment, together with the excess ureteral length, was excised, followed by ureteral reimplantation and DJ stenting using the modified Politano-Leadbetter technique. The Politano-Leadbetter was approached by extending Gibson's incision medially to have good access to the bladder. Two stay sutures were placed on the anterior bladder wall for traction. A vertical cystotomy was made and extended inferiorly towards the bladder neck, but stopping about 4cm before the bladder neck. A new muscular hiatus was created supero-laterally and proximally from the left ureteric orifice. This was done by the surgeon placing his finger at the intended site of the new hiatus, and from inside the bladder, a right-angle clamp was pushed through the bladder wall directly onto the guiding fingertip to ensure precise puncture. Using a right-angle Mixter clamp, a submucosal tunnel was created from the new hiatus towards the

trigone in the direction of the original orifice site. Before mobilizing the ureter through the submucosal tunnel, a suture was placed by taking a bite of the detrusor muscle at the edge of the new hiatus and a bite of the ureteral adventitia just as it enters the bladder. This is to prevent the ureter from retracting and ensure a smooth curve into the tunnel. The ureter was then brought through the muscular hiatus and threaded down through the submucosal tunnel. The

distal end of the ureter was spatulated and anastomosed to the newly created opening at the end of the tunnel using Vicryl 4-0 over a double-J stent. The bladder was closed in layers with a Foley urethral catheter in place. He recovered uneventfully and was discharged home to continue with follow-up visits. He reported no complaint during subsequent short-term follow-up visits.

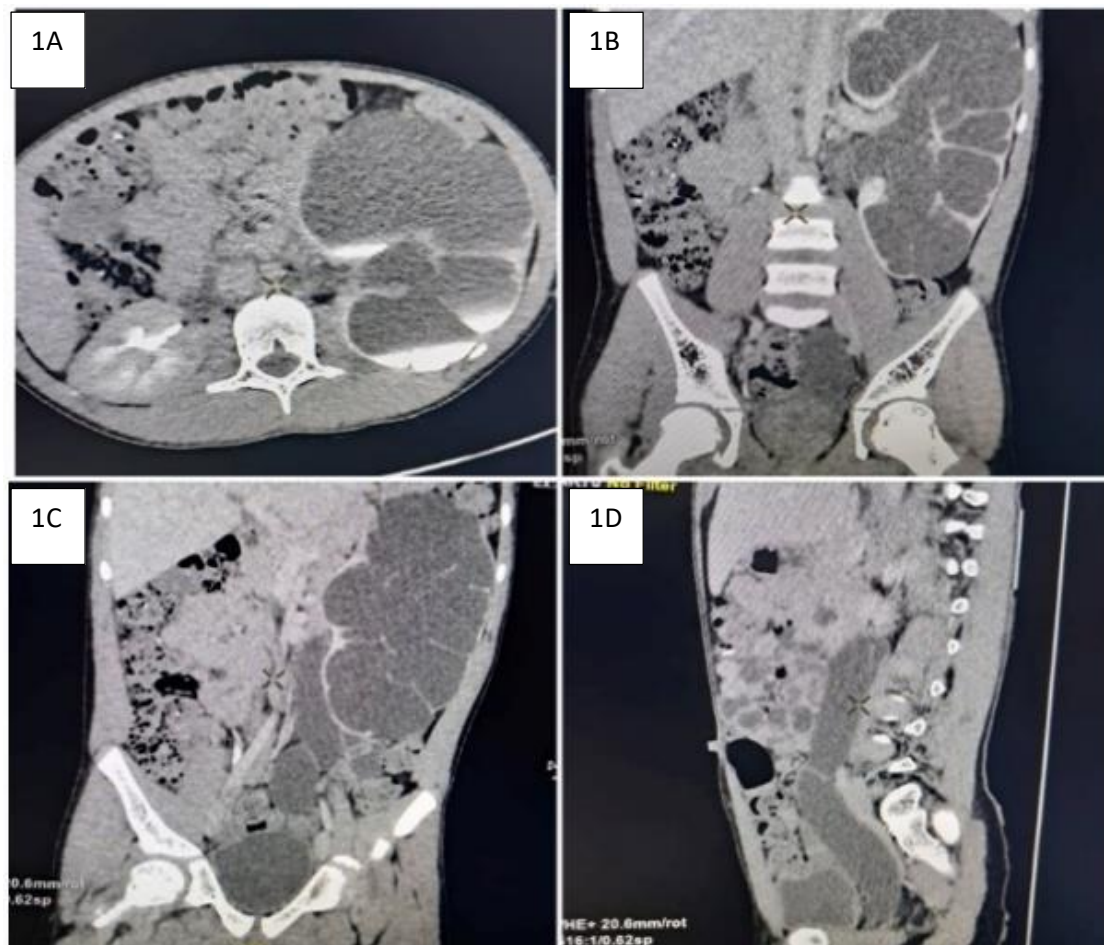


Figure 1: (A) Axial view showing left severe hydronephrosis with cortical thinning and an apparently normal right kidney (B) Coronal view showing marked hydronephrosis and cortical thinning of the left kidney (C) Coronal view showing severe hydroureteronephrosis with tortuous ureter. (D) Sagittal view showing the megaureter with a distal tapered segment (red arrow).

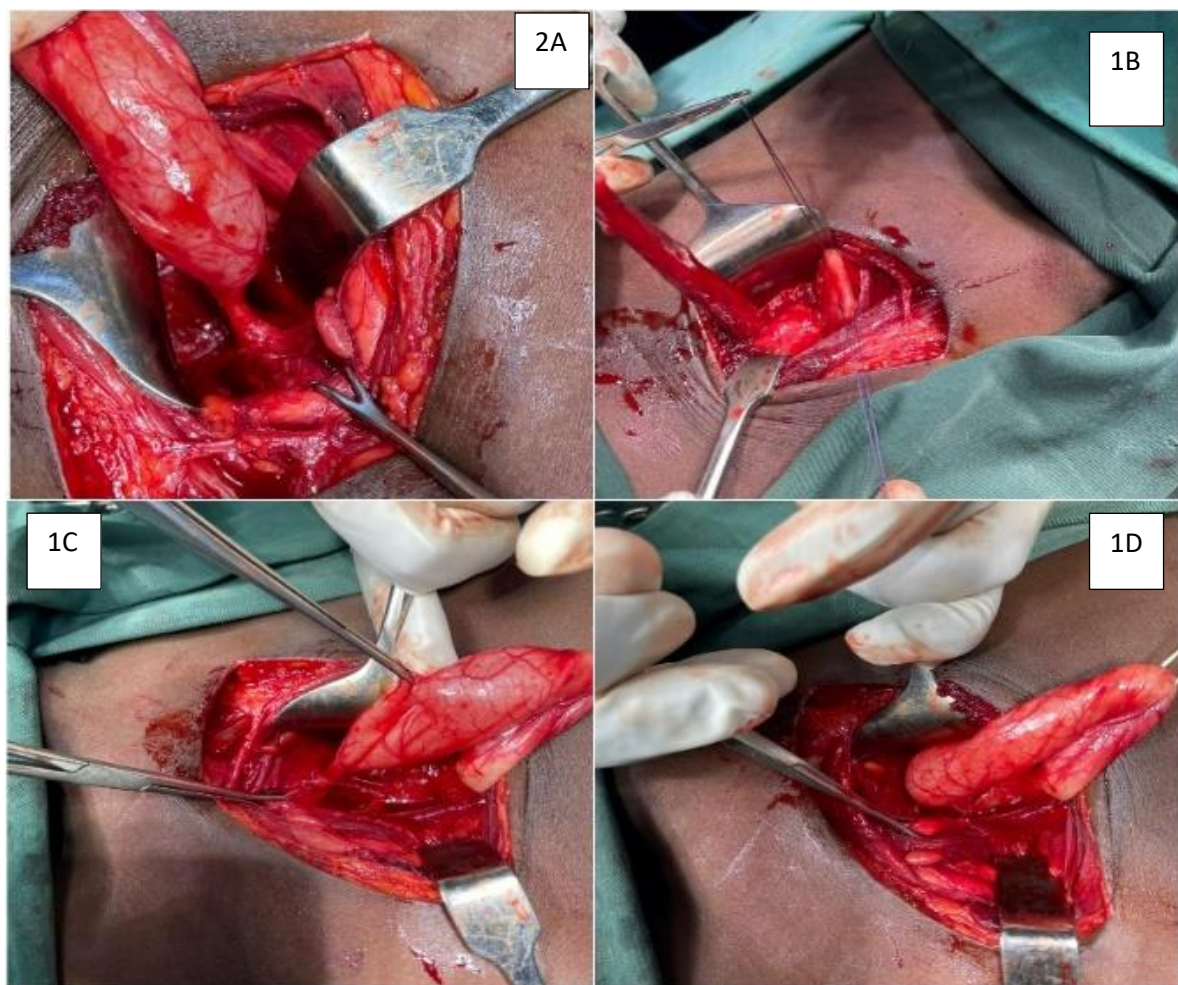


Figure 2: (A) Distal narrowed end of the ureter (yellow arrow). (B) Dilated ureter that tapers distally. (C) The redundant ureter (blue arrow) after resecting the diseased segment and the bladder (green arrow) with 2 stay sutures before ureteric reimplantation. (D) The excess dilated ureter.

DISCUSSION

The diameter of a normal ureter is often not more than 5mm, and when it exceeds 7mm, a diagnosis of megaureter is established.^{4,9} The condition can be primary (idiopathic) or secondary to several conditions, such as neurogenic bladder, vesicoureteral reflux (VUR), posterior urethral valves (PUVs), and other forms of bladder outlet obstruction, among others.⁹ It is important to distinguish a primary megaureter from a congenital ureteral stricture, which is a mechanical obstruction resulting from a structural defect in the wall of the ureter.¹

Primary obstructive megaureter is commonly diagnosed in children, and the majority can be seen in utero through prenatal ultrasonography.³ More than half of the megaureters resolve with time, perhaps due to the maturation of the vesicoureteral junction.³ Clinical presentation of patients with primary obstructive megaureter includes abdominal pain, urinary tract infections, pyuria, fever, and hematuria. Hematuria is often microscopic and can occur in the absence of infection. It is thought to be caused by disruptions of ureteral mucosal vessels due to ureteric distention, but it may also be a pointer to the presence of a calculus secondary to urinary stasis.⁵ However, about half of patients with primary obstructive megaureter are asymptomatic. Some of

these asymptomatic cases are diagnosed much later in life, incidentally through imaging while evaluating for an unrelated complaint, such as seen in our index patient.⁵

Our index patient presented a week after sustaining blunt abdominal trauma. He had no past history of abdominal or renal complaints and no history of lower urinary tract symptoms. Being the first imaging modality for the evaluation of abdominal trauma, an abdominal ultrasonography was performed, which revealed a severe Onen's grade 4 hydronephrosis. Ultrasound scan is an investigation that is readily available, non-invasive, inexpensive, fast, and with no exposure to ionizing radiation. It is reliable in assessing the size of the kidneys, thickness, corticomedullary differentiation, and severity of hydronephrosis. It can also identify cystic renal lesions, ureteral dilation, and bladder anatomy.¹⁰ The presence of hydronephrosis suggests a significant pathology, warranting a more precise diagnosis and estimation of severity. A significant correlation exists between the severity of hydronephrosis on ultrasound scan and prognosis.¹¹ Onen grading system was introduced in 2006 to grade the severity of hydronephrosis on ultrasound scan. In grade 0, there is no hydronephrosis, while in grade 1, the dilatation is limited to the renal pelvis. In grade 2, there is dilatation of the renal pelvis and calyces. In grade 3, the dilatation is associated with <50% parenchymal loss, while in grade 4, there is more than 50% renal parenchymal loss.¹¹ Our index patient had grade 4 hydronephrosis based on the Onen grading system.

Due to the presence of severe hydroureteronephrosis and microscopic hematuria, a CT urogram of the abdomen and pelvis was performed to make a precise diagnosis. The megaureter and severe hydronephrosis that threatened the left kidney were confirmed. Based on the CT findings, the child's parents were counselled on the need for left ureteric exploration with definitive treatment options based on the intraoperative findings. Upon open exploration of the ureter through a Gibson's incision, we found a markedly dilated and redundant ureter resembling a bowel loop with an area of narrowing

of about 3cm long in the juxtavesical ureter. Over 1 litre of amber coloured urine was drained at the first instance. The narrowed ureteral segment was patent and could be probed. Because the kidney has some residual function and due to the non-availability of renal scintigraphy to assess the differential renal function, we opted to reimplant the ureter using the modified Politano-lead better technique rather than perform a simple nephrectomy.

The post-operative recovery was satisfactory, and the patient was discharged home in good condition to continue with follow-up visits. The DJ stent was removed 3 weeks post-surgery, and the patient reported no urological complaints in subsequent follow-up visits.

CONCLUSION

Incidental discovery of primary megaureter during trauma imaging is a powerful reminder that chronic, organ-threatening conditions can be unmasked by acute presentations. Clinicians must be adept at recognizing the distinct radiological signs of congenital uropathy and initiate appropriate urological work-up to prevent progressive renal damage. This case report underscores the need for clinicians to comprehensively review trauma imaging beyond the immediate context of injury.

Declarations

Study Limitation

There is no long-term follow-up to assess for renal recovery following the surgery. Similarly, the histology of the resected specimen could not be obtained as the parents discarded the specimen.

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Conflict of Interest: We declare no conflict of interest.

Ethical Approval: Ethical approval was waived as it is not required for publishing a case report in our institution.

Informed Consent: Written informed consent was obtained from the subject's guardian to publish the case report.

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Retrograde Intra-Renal Surgery Using Thulium Fibre Laser as an Alternative to Percutaneous Nephrolithotomy in the Management of Multiple Renal Stones: A Case Report and Literature Review.

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ABSTRACT

RIRS has increased by 164% in the last decade. RIRS utilizes flexible ureteroscopy while PCNL create a direct access to the kidney via the skin. TFL has been found to be effective for stone lasing. RIRS with TFL avoids skin puncture, nephrostomy tube placement, reduce complications and radiation exposure, enhances recovery and outcome for high-risk patients compared to PCNL. We present a 45-year-old woman with recurrent right flank pain and CT imaging confirmed right renal stones in the lower and middle calyces measuring 2.9cm, 1cm, 0.7cm, 0.6cm and 0.4cm with mild hydronephrosis. She was obese (BMI=35.6kg/m²) and has had multiple previous abdominal surgeries. She declined PCNL on account of skin puncture and opted for RIRS. She had RIRS using thulium fiber with successful stone lasing and ureteric stenting. Patient was discharged 24hours later and 6weeks post-operative imaging showed complete stone clearance. RIRS with TFL is feasible for obese patients, those declining PCNL or wish to avoid skin puncture including those with multiple renal stones.

Keywords: Percutaneous Nephrolithotomy, Retrograde Intrarenal Surgery, Thulium Fiber Laser

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INTRODUCTION

There is a recent global rise in the number of retrograde intra-renal surgery (RIRS) and percutaneous nephrolithotomy (PCNL) performed for renal stone due to technological advancement and the need to minimize tissue trauma.^[1] RIRS is estimated to have increased by 164% in the last decade. RIRS is a minimally invasive technique that utilizes flexible ureteroscopy to access the renal pelvis and calyces, allowing for fragmentation, dusting or popcorning of kidney stones which are then removed.^[1,5] RIRS is suitable for stones <2 cm, failed extra-corporal shock wave lithotripsy (ESWL), certain stone locations, body habitus (obesity) and coagulopathy and it is performed mostly under general, spinal or local anesthesia while PCNL is a surgical technique in which a puncture is made on the lumbar skin to create a direct access point to the renal pelvis and calyces under image guidance through which kidney stones are fragmented and evacuated usually under general anesthesia.^[1] PCNL is indicated in stones >2cm, staghorn calculi, failed RIRS and high renal stone burden (multiple). Common sources of energy for stone breaking include laser (Holmium or

thulium), ultrasonic or pneumatic.^[2] Preliminary studies showed that thulium fiber laser (TFL) have excellent stone free rates, shorter operating time and less stone migration compared to other energy sources. TFL also have higher water absorption coefficient, smaller optical penetration depth, lower stone ablation threshold, transmit high-power laser beams, have smaller more flexible optical fibers with conducive portable device, better dusting and low retropulsion compared to holmium laser and other energy sources in respect to urinary tract stones even though further studies are needed to elucidate these findings.^[3] Thus, thulium fiber laser when used for RIRS effectively competes with PCNL to a reasonable extent.^[3,11] RIRS especially with thulium fiber is currently being used as an alternative to PCNL with same and sometimes better outcome because it avoids skin puncture, percutaneous nephrostomy tube placement, ensure faster recovery, less complications, less exposure to radiations, best for high-risk surgical patient and largely cost effective. We present a case with the use of TLF for multiple right renal stone in an obese patient with multiple previous abdominal surgeries.

stones and these were confirmed on CT scan which showed multiple right renal stones in the middle and lower calyces measuring 2.9cm, 1cm, 0.7cm, 0.6cm and 0.4cm (fig. 1-3). Urea, electrolyte and creatinine were normal, Urine culture was negative. Other investigations including; full blood count was normal with a PCV of 42%, Coagulation profile, ECG, echocardiogram and chest x-ray were normal.

CASE SUMMARY

The patient is a 45-year-old woman who presented with recurrent right flank pain of five months' duration described as colicky and has been increasing in severity and frequency since onset. It was bothersome and interfered with her activities. There were associated occasional storage lower urinary tract symptoms, nausea and vomiting. She had previous appendicectomy and four caesarean sections. She was neither hypertensive nor diabetic. Examination revealed a well-preserved obese woman with a BMI of 35.6kg/m². Abdominal examination revealed a gridiron and a broad midline infraumbilical scar. No renal angle tenderness and kidneys were not ballotable.

She had abdominal ultrasound scan done which showed multiple right mid and lower renal calyceal



Figure 1: A Coronal CT View Showing a Right Renal Mid Calyceal Stone measuring 1cm

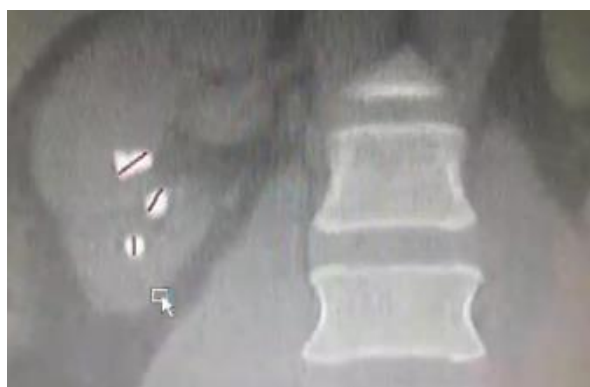


Figure 2: A Coronal CT View Showing Right Renal Mid and Lower Calyceal Stones Measuring 0.7cm, 0.6cm and 0.4cm



Figure 3: A Coronal CT Scan View Showing Right Renal Lower Calyceal Stone Measuring 2.9cm
Patient was counseled for PCNL for which she declined on account of percutaneous access and

requested for a RIRS. She was then counseled on the pros and cons of RIRS and the procedure was planned. Prophylactic intravenous ciprofloxacin 200mg at induction of anesthesia was given and she had RIRS using a TFL with successful dusting and popcorning of the stones in the right, mid and lower renal calyceal moieties (fig. 4). Using a 200uM thulium fibre, lasing parameters for dusting were 12W power, 0.5J energy and 20HZ frequency while popcorning parameters were 12W power, 1.2J energy 10HZ frequency with slight modifications during the procedure. The total lasing time was 2hours 30minutes while total operation time was 3hours. This was followed by double J stent insertion and patient was placed on antibiotics, analgesics, high fluid intake and smooth muscle relaxant (Tamsulosin). She was discharged 24hrs later following normal urea, electrolyte, creatinine and full blood count. Few stone fragments retrieved were sent for stone analysis. 6weeks post-surgery, repeat CT urography done showed complete stone clearance (fig. 5).

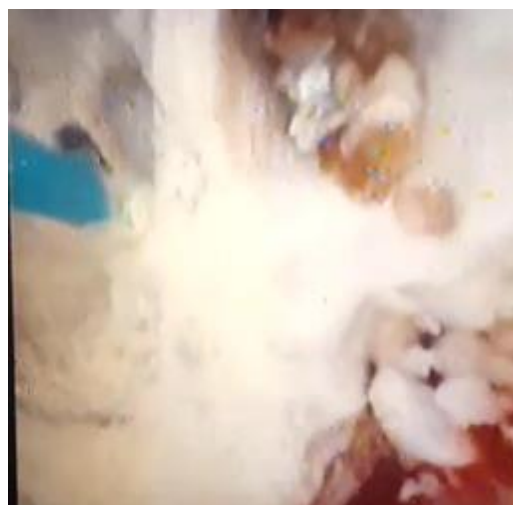


Figure 4: Intraoperative Image Showing the Thulium Laser Fibre and One of the Partially Dusted Stone

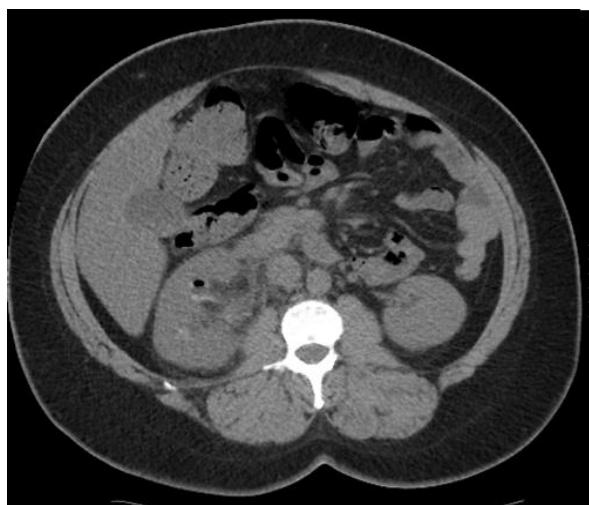


Figure 5: Post-Operative Axial CT View Showing Complete Right Renal Stone Clearance.

DISCUSSION AND LITERATURE REVIEW

RIRS is a minimally invasive technique that utilizes flexible ureteroscopy to access the renal pelvis and calyces, allowing for fragmentation, dusting or popcorning of kidney stones which are then removed. It is particularly suitable for stones <2 cm, failed ESWL, certain stone locations, obesity and coagulopathy. It may be performed under general, spinal or local anesthesia while PCNL is a surgical technique in which a small incision is made on the lumbar skin to create a direct access point to the renal pelvis and calyces under image guidance through which kidney stones are broken and evacuated usually under general anesthesia. [1] PCNL is indicated in stones >2cm, staghorn calculi, failed RIRS and multiple renal stones. Common sources of energy for stone breaking include laser (Holmium or Thulium), ultrasonic or pneumatic. [2] Although Holmium laser is currently the gold standard for stone fragmentation, preliminary studies have shown that thulium fiber laser have better stone free rates, shorter operating time and less stone migration compared to holmium laser and other energy sources in respect to urinary tract stones, thus, thulium fiber laser when used for RIRS effectively competes with PCNL to a reasonable extent. [3]

RIRS has emerged as a viable alternative to PCNL for the management of renal stones, particularly in certain patients and stone profiles with good surgeon experience. [4] RIRS avoids the need for a puncture and nephrostomy tube placement, ensure faster recovery, less complications, suitable for challenging stone locations, certain anatomic variation and best for high surgical risk patient and largely cost effective as opposed to PCNL. [5] Huang et al compares the efficacy of RIRS versus PCNL. The results indicate that both methods are effective and may be used interchangeably but RIRS has been associated with lower complication rates, particularly in patients with smaller stones. [5] While PCNL has traditionally been the preferred method for larger stones (>2 cm). An article by Giusti et al in 2021 highlighted that advancements in RIRS techniques and technologies (such as thulium laser lithotripsy) makes RIRS a feasible option for larger stones, with outcomes that may be comparable to PCNL. [6] This finding was also demonstrated in this case report where despite some of the stones being larger than 2cm, retrograde intrarenal surgery with thulium fibre laser was effective in clearing them.

Breda et al conducted a systematic review and meta-analysis of RIRS for kidney stones larger than 2.5cm and found that the stone-free rate was 89.3% with minimal complication rate of 1.9% and concluded that RIRS for stones >2.5cm offer an acceptable efficacy with low morbidity. [7] Srougi et al found that RIRS ensures a better patient satisfaction and quality of life compared to PCNL due to less invasiveness of the procedure. [8] RIRS is currently challenging PCNL for the treatment of renal stones >2cm, becoming a safe and effective alternative with a comparable stone free rate, lower complication rate and lower hospitalization time. However, patient should be counselled on the possibility of additional procedures to clear residual stones. [9] In this report, the patient was counseled on the possibility of additional procedure to clear residual stones but there was eventually no need for such. RIRS is also an alternative to PCNL for multiple renal stones in well selected patients as seen in this report. [10]

Mahmoud et al (2025) found that treatment of lower calyceal renal stones can be effectively and safely accomplished with RIRS. Even though stone clearance with PCNL was better in this location base on the study, the difference was not statistically significant.^[11] This report confirms this possibility. RIRS with thulium or holmium laser is an option for treating renal stones in calyceal diverticulum compared to more traumatic PCNL. However, Success is influenced by stone size, nature and length of the diverticular neck with smaller stones, wider and shorter neck having better outcome.^[10] The choice between RIRS and PCNL for managing lower calyceal renal stones should be determined by surgeon experience, proficiency with each technique, and patient-specific factors. It is crucial to counsel patients on the benefits, risks, and potential outcomes of both procedures to ensure informed decision making that aligns with their best interests.^[11] While RIRS presents several advantages, it also has limitations in terms of stone size, composition and technical skills. Very large calculi (staghorn and partial staghorn) and hard stones may still require PCNL for effective removal. RIRS requires a surgeon skilled in ureteroscopy and familiar with advanced tools. Where stone clearance is the ultimate goal in patients with high stone burden RIRS may be less useful.^[9]

CONCLUSION

RIRS with thulium fiber laser is a viable alternative to PCNL as it gives same result and sometimes better surgical outcome. RIRS is feasible for obese patients, those declining or wish to avoid skin puncture for PCNL including >2cm, multiple and lower calyceal renal stones. Using TFL, RIRS can treat some PCNL indicated stones. With advancement in RIRS armamentarium, PCNL indication is diminishing. Adequate patient selection is however required for either procedure.

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Giant Benign Prostate Hyperplasia: A Case Report from Northern Nigeria

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ABSTRACT

Benign Prostatic Hyperplasia (BPH) is a common problem that affects the quality of life in approximately one third of men older than 50 years. BPH is histologically evident in up to 90% of men by age 85 years. Giant BPH is a very rare entity, which is defined as a prostate gland weight of over 500g. To the best of our knowledge, only three cases of a giant prostate has been reported in Nigeria. We report a case of a giant benign prostatic enlargement from an open simple transvesical prostatectomy in a 70-year-old man. He presented with a history of lower urinary tract symptoms, intractable haematuria and generalized body swelling. Transabdominal ultrasound scan revealed a markedly enlarged prostate measuring 540 ml. Prostate-specific antigen level was 147ng/ml. Had a successful transvesical simple prostatectomy for complete enucleation of the adenoma. Haematuria resolved post-operatively. Specimen weighed 527.8g. Histological examination showed prostatic fibromuscular hyperplasia.

Keyword: Benign prostatic hyperplasia, giant prostatic hyperplasia, prostatectomy.

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INTRODUCTION

BPH is a common problem that affects the quality of life in approximately one third of men older than 50 years¹. BPH is histologically evident in up to 90% of men by age 85 years. As many as 14 million men in the United States have symptoms of BPH².

Giant benign prostatic hyperplasia (GBPH) has been defined as benign prostate hyperplasia weighing more than 500g³. Up until 2020, the total number of GBPH reported worldwide in medical literature is < 30. To the best of our knowledge, only three cases of a GBPH have been reported in Nigeria^{4,5,6}.

CASE REPORT

A 70-year-old male presented at the Accident and Emergency Unit of Ibrahim Badamasi Babangida Specialist Hospital, Minna, Niger State, with complaints of Lower urinary tract symptoms of 3years duration and recurrent haematuria of 2years duration. There is associated progressive body weakness, early morning facial puffiness and lower limbs swelling. He also complaint of lower abdominal mass. He had easy urethral catheterization, but the gross haematuria persisted, necessitating referral to our centre. He was transfused with 3units of blood at the referring hospital prior to presentation.

General physical examination showed an elderly man, who was conscious but lethargic and pale. His pulse rate was 94 bpm with blood pressure of 140/100 mmHg, respiratory rate of 20cpm and oxygen saturation of 94% on room air. Abdominal examination revealed a non-tender huge suprapubic mass which measured 20cm above the pubic symphysis. The liver and spleen were not palpably enlarged and the kidneys were not ballotable. He had an indwelling size 16Fr urethral Foley catheter which was draining bloody urine. Digital rectal examination revealed a markedly enlarged prostate with benign features. An initial diagnosis n of bleeding BPH with symptomatic anaemia was made. The differential diagnoses were bladder cancer and prostate cancer.

Admitting Urea and Creatinine were 24.7mmo/L and 646μmol/L respectively, and he was co-managed with Nephrologist. Transabdominal ultrasound scan revealed a markedly enlarged prostate measuring 540 ml. Prostate-specific antigen level was 147ng/ml. He had a digitally guided prostatic biopsy which showed benign prostatic hyperplasia. The gross haematuria persisted necessitating an urgent open transvesical simple prostatectomy with complete enucleation of the adenoma. Intraoperative findings showed the median lobe of the prostate occupying the entire bladder cavity (Fig 1). Surgical specimen measured 18cm x 13cm (Fig 2 A & B) and weighed 527.8g.

Haematuria resolved post-operatively. Histological examination of the enucleated specimen showed prostatic fibromuscular hyperplasia.

DISCUSSION

BPH is a histologic diagnosis that refers to the proliferation of glandular epithelial tissue, smooth muscle, and connective tissue within the prostatic transition zone, hence the term “stromo-glandular hyperplasia⁷. BPH is nearly ubiquitous in the aging male with worldwide autopsy proven histological prevalence increases starting at age 40-45 years to reach 60% at age 60 and 80% at age 80⁸.

The onset of the enlargement is highly variable as well as the growth rate. The prostate gland may eventually cause obstruction at the level of the bladder neck, which in turn is termed benign prostatic obstruction (BPO). It is important to realize that not all men with BPH will develop obstruction or BPO⁹.

Giant benign prostatic hyperplasia is defined as a prostate weighing more than 500g³.

GBPH is an extremely rare entity. The first reported case was in 1908 by Freyer who removed an adenoma that weighed more than 500g⁴.

Surgical treatment of symptomatic BPH may be classified into three general types: 1. MIST (minimally invasive surgical therapy); 2. Simple

prostatectomy; and 3. Transurethral surgery. Transurethral resection of the prostate (TURP) involves removal of the obstructing adenomatous tissue via the transurethral route, it is the gold standard for removing prostate size of 30 to 80g. Open, laparoscopic, or robotic assisted prostatectomy are considered as treatment options for prostate size >80g⁹.

CONCLUSION

Giant benign prostatic hyperplasia is a rare entity. Open transvesical prostatectomy is a safe and effective method of treatment.

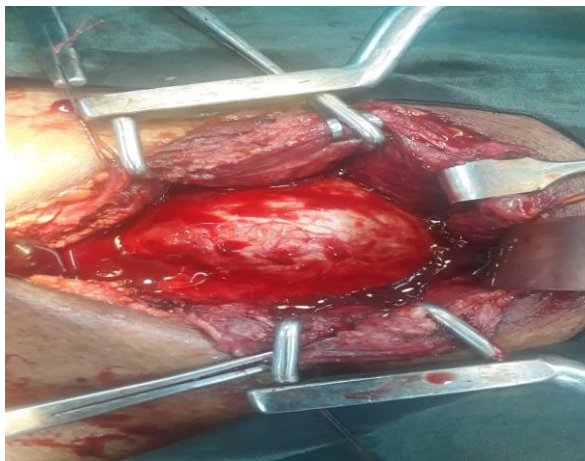


Fig 1. Intraoperative image showing the median lobe of the prostate occupying the entire bladder cavity



Fig 2. Showing completely enucleated prostate **A.** Right lobe **B.** left and median Lobe

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A Rare Case: Submucosal Stone Formation after 20-Years of Dextranomer Hyaluronic Copolymer Endoscopic Sub ureteric Injection for Vesicoureteral Reflux

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ABSTRACT

Dextranomer hyaluronic copolymer (Deflux®) endoscopic subureteric implantation is considered to be safe and effective for vesicoureteral reflux (VUR) treatment. The deflux implantation is popular for its high success rate and minimal complications. A 24-years-old female who underwent prior subureteric endoscopic therapy with deflux for VUR 20-years ago, was investigated for dysuria and mild right renal colic pain. Computed tomography confirmed the presence stones that was retrieved by cystolithotripsy and enucleation of the residue deflux or calcification of it. Although endoscopic subureteric implantation with deflux has a high success rate for VUR resolution, caution during the follow-up period in order to prevent potential long-term complications is required.

Keywords: Laser, Enucleation, Vesicoureteral reflux, deflux

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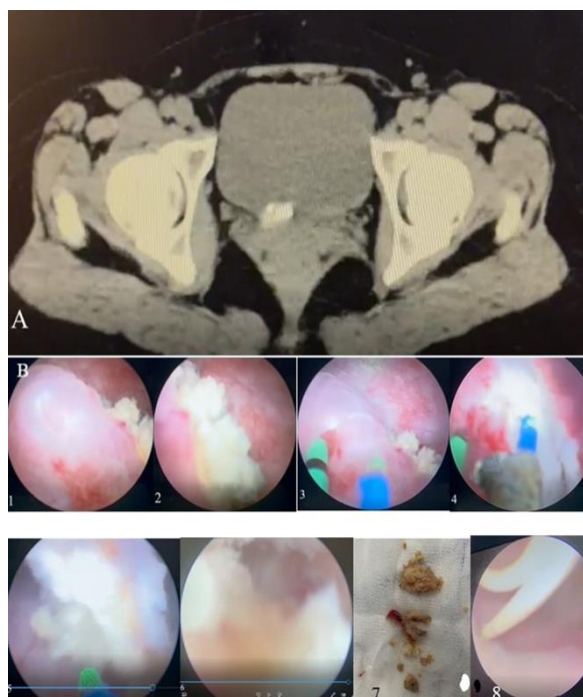
Aydemir Asdemir, Esat Korgali, Huseyin Saygin, Fatih F. Arisoy. A Rare Case: Submucosal stone formation after 20-years of dextranomer hyaluronic copolymer endoscopic sub ureteric injection for vesicoureteral reflux. Nig J Uro, 2026;11(1). 131-134.

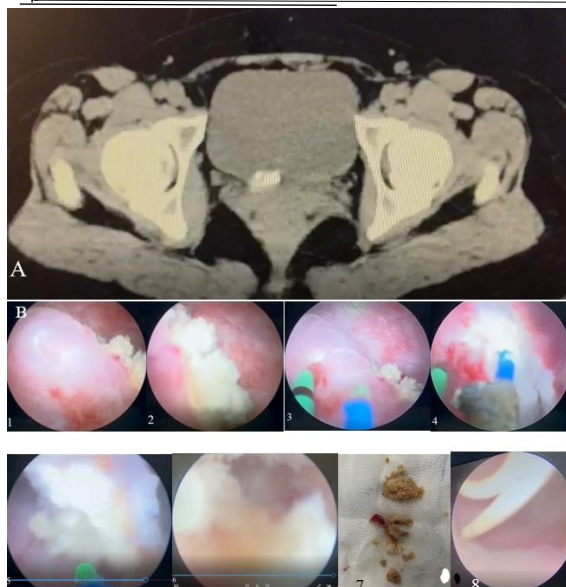
INTRODUCTION

Vesicoureteral reflux (VUR), a common paediatric anomaly with an estimated prevalence of 10%, can cause infection, scarring and end-stage renal disease (1). EAU guidelines suggest us to offer open surgical correction to patients with persistent high-grade reflux and endoscopic correction for lower grades of reflux, and to offer surgical correction, if parents prefer definitive therapy to conservative management and also for in high-risk patients who already have renal impairment, a more aggressive, multidisciplinary approach is needed (2). In AUA (American Urological Association) guidelines high-grade reflux, older age at initial presentation, low probability of spontaneous resolution, breakthrough febrile urinary tract infections despite antibiotic prophylaxis, renal scarring, and parental preference are relative indications for surgical intervention (3). Current surgical treatments of VUR include hydrodistension implantation, endoscopic injection of the bulking agent and open, laparoscopic or robot-assisted ureteroneocystostomy. The aim of subureteric injection is to lengthen the submucosal ureteric tunnel to an adequate length in order to prevent urine reflux (3). Matouschek introduced endoscopic injection with polytetrafluoroethylene (PTFE) paste for VUR treatment in 1981 (3). O'Donnell and Puri described the classic subureteric Teflon injection (STING) technique first in 1984. Different materials are available for subureteric implantation (1, 3, 4). At present, non-animal stabilized hyaluronic acid/dextranomer gel (NASHA/Dx) represents the mainstay bulking agent and is regarded as the safest and most biocompatible material with the least potential for migration from the injection site (5). In this study, we report a case of unusual delayed presentation in the form of dysuria caused by calcified bulking agent dextranomer hyaluronic copolymer (Deflux®) after 20 years.

CASE REPORT

A 24 years-old female presented with dysuria and mild right renal colic pain over the last 2 months. She had a history of right subureteric injection by dextranomer hyaluronic copolymer (Deflux®) at the age of four years. Her computed tomography showed a few bladder stones (A). Cystoscopy showed normal urethra and bladder neck; however, we found a fixed, and partly submucosal bladder stone located medial to the right ureteric orifice (B1-2). Ureter is catheterized with 5fr ureteral catheter. Then for the fixed stone and calcified sub ureteric injection material we did holmium laser enucleation by using a 550µ fiber with settings of 10W 1J and 10Hz (B3-7). Then 4.8fr 24cm JJ stent was inserted. Urethral catheter was taken postop on the fifth day. The patient's condition was good, and she was discharged on the sixth day. She was seen four weeks later and had a normal abdominal ultrasonography (B8).





DISCUSSION

Several materials are available that are used in the endoscopic subureteric injection for VUR treatment. Agents can be autologous, such as fat or collagen, or non-autologous such as polytetrafluoroethylene (PTFE), dextranomer hyaluronic copolymer (Deflux®), and polydimethylsiloxane (Macroplastique®) (4). The ideal injectable agent should be non-toxic, non-migratory, non-antigenic and biocompatible (4). STING with dextranomer hyaluronic copolymer (Deflux®) has acquired acceptance and popularity due to the material's effectiveness and safety. Post-operative complications following endoscopic administration of dextranomer hyaluronic copolymer (Deflux®) are very limited. Complications were found to be urinary tract infection (UTI), ureteric obstruction and stone formations or calcifications of the material (5). Also as long-term complications stone formation and ureteric obstruction may appear (7, 8). Few cases reported stones at the prior STING site several years after dextranomer hyaluronic copolymer (Deflux®) implantation. In our case, we report the longest late presentation (after 20 years) found in the literature of such a complication. The recent guidelines by American Urological Association (AUA) for VUR management recommend a voiding cystography following intervention to ensure resolution (6).

However, recommendations in terms of duration of post-intervention follow-up are still undefined.

CONCLUSION

A vigilant follow-up program for monitoring patients postendoscopic subureteric injection with dextranomer hyaluronic copolymer (Deflux®) need to be defined as long-term complications can appear after several years.

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