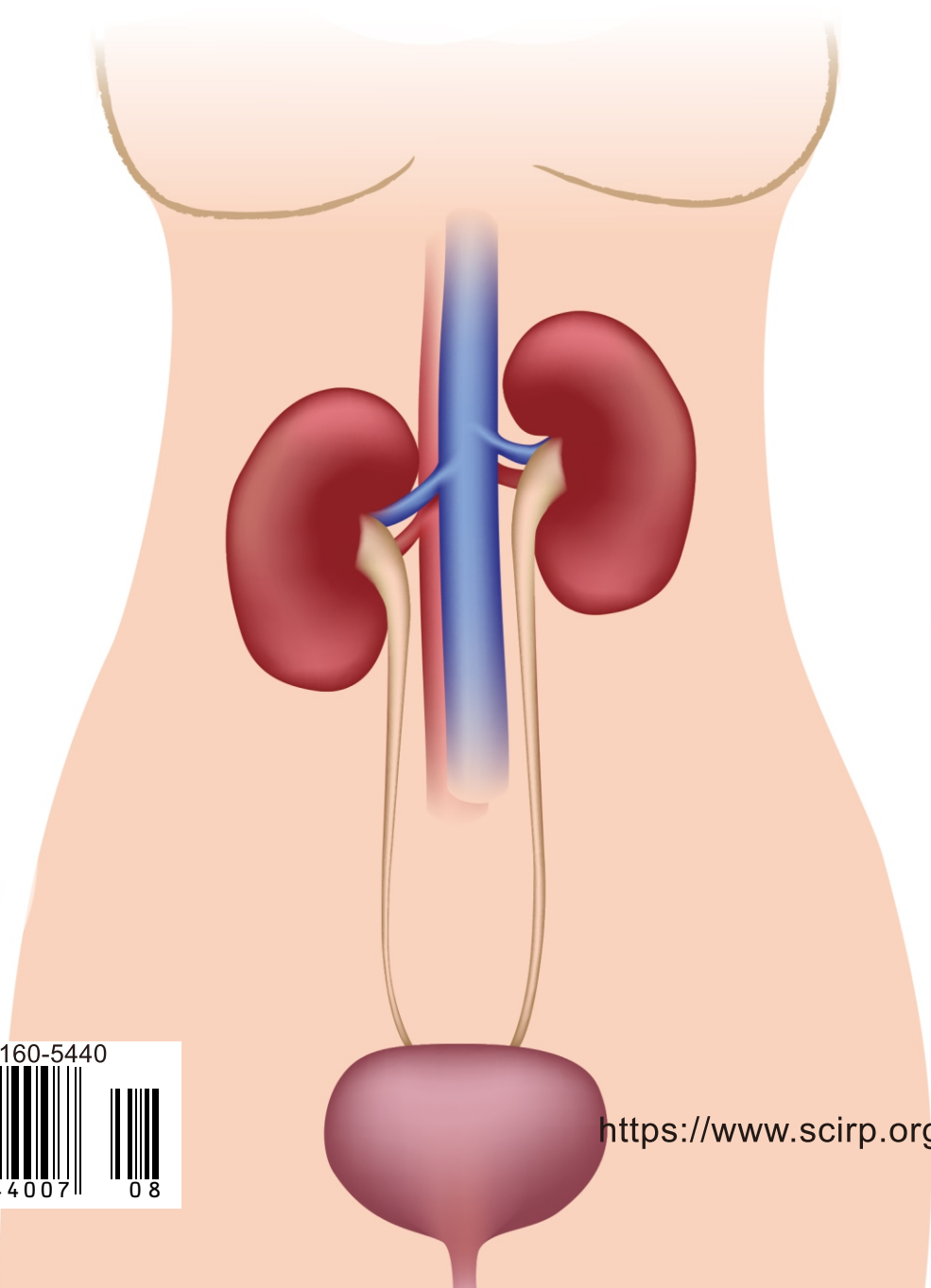


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Table of Contents

Volume 12 Number 8**August 2022****Management of Meatal Stenosis in Port Harcourt: A Ten-Year Retrospective Study**

G. I. Francis, A. Victor.....411

Dual-Energy Computed Tomography for the Diagnosis of Urethral Foreign Body: A Case Study

K. Murakami, I. Kuroda, G. Nagao, K. Fukushima, N. Kamoda, G. Arai, T. Aoyagi.....421

Benign Prostatic Enlargement, the International Prostate Symptoms Score and a Review of Other Symptom Scores

A. Victor, D. Okigbeye.....427

Outcomes of Ureterorenoscopy for Lower Pole Kidney Stones (≤ 3 cm) to the Omar Bongo Ondimba Army Instruction Hospital

S. G. Olagui, M. N. Bidzo, C. Olende, J. P. O. Bouengou.....440

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Management of Meatal Stenosis in Port Harcourt: A Ten-Year Retrospective Study

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Abstract

Background: Circumcision is the removal of the fore skin of the penis. It is one of the commonest operations performed worldwide. Meatal stenosis is an uncommon long-term complication of circumcision that can lead to problems voiding. **Aim:** To identify the clinical presentations and management of meatal stenosis in Port Harcourt. **Materials and Methods:** This was a retrospective study of patients who presented with features of meatal stenosis between January 2012 and December 2021. The patients' history, physical examination findings, investigations and treatment received were analysed. **Results:** A total of 52 patients with features of meatal stenosis were recruited for the study. The number of patients less than a year old, between a year and 5 years, between 6 and 10 years and greater than 11 years were 8, 12, 28 and 4 respectively. Only 8 patients presented within 6 months of onset of symptoms. The most common symptom was poor urine stream, followed by straining. Meatotomy was the most commonly performed procedure for meatal stenosis 24 (46.15%). The patients were followed up for at least 6 months. Six patients had recurrence after treatment of meatal stenosis. Three patients each had a recurrence following dilatation and meatotomy. No patient had recurrence after meatoplasty. **Conclusion:** Meatal stenosis is an uncommon complication post circumcision. Patients usually present late to the hospital in our study. Meatoplasty had the best outcome. After treatment of meatal stenosis patients should be followed up for 6 months.

Keywords

Circumcision, Meatal Stenosis, Poor Urine Stream

1. Introduction

Circumcision has a long history and is a ritual for such religions as Judaism,

Christianity, and Islam, and it is probably no accident that all of these arose in the Middle East.

Circumcision is one of the commonest surgical operations performed worldwide and it is a subject of considerable debate [1] [2]. Circumcision is carried out for religious reasons, hygienic reasons, control of Human Immunodeficiency Virus (HIV) [3] [4], recurrent urinary tract infection [5], recurrent balanitis [5], phimosis, paraphimosis [5] and prevent penile cancers [6].

Circumcision in newborns almost entirely eliminates the risk of penile cancer [5] [6]. Circumcision before puberty may reduce the risk of penile squamous cell carcinoma but men circumcised after puberty has the same risk of penile SCC as uncircumcised men [6]. Therefore, circumcision during the neonatal period is very important and also more cost effective [7].

Circumcision is largely free of complications in majority of patients, but can result in mild complications such as excessive or inadequate skin removal, pain, haemorrhage, wound infections, skin bridge, meatal stenosis, meatal ulcers and loss of penile sensitivity [8]. Severe complications such as urethrocutaneous fistula, sexual dysfunction and penile amputation may also occur [8].

Meatal stenosis is believed to be a complication of circumcision [1]. Meatal stenosis is defined to be a change in the appearance of the delicate lips of the urinary meatus, with loss of the elliptical shape to circular shape because of fibrosis or scarring, with visually apparent narrowing [1] [9]. Injury to the frenular artery is largely believed to be the culprit of post circumcision meatal stenosis [1]. Meatal stenosis is almost never seen in uncircumcised men [10]. This study aims to identify the clinical presentations and management of meatal stenosis in Port Harcourt.

2. Materials and Methods

This was a retrospective study. All patients who presented with features of meatal stenosis between January 2012 and December 2021 were included in the study. Port Harcourt is a major capital city in the Niger Delta, the oil and gas zone in Nigeria. Data was obtained from ward admission registers, theatre, and discharge records. The information gotten included history, duration of symptoms, examination findings and treatment received. Patients who were circumcised outside the neonatal period were excluded from the study. All patients with incomplete records were also excluded from the study.

All the boys were circumcised using an appropriately sized plastibel. Urine microscopy culture and sensitivity were done and an appropriate antibiotic given to the boys before repair of meatal stenosis. Patients who had dilatation and meatotomy had a penile block with plain lidocaine for anaesthesia with sedation using diazepam. Dilatation is done to the size appropriate for the child's age (10 French for 6 months to 3 years and 12 French for 4 to 10 years. Patients who had meatotomy had a hemostat applied to the ventral aspect of the stenosed orifice for about 5 mins before a ventral slit was made with sharp scissors to widen the

meatus. Meatoplasty involved suturing the slit meatus after a meatotomy to prevent restenosis using fine delayed absorbable sutures (vicryl 4 0). All patients who had meatoplasty were admitted before surgery, evaluated by an anaesthetist and all had general anaesthesia and were discharged a day after surgery. After the treatment all patients were instructed to apply a lubricating gel (vaselin) and had paracetamol for pain relief. Patients were followed up weekly for 6 months after treatment to assess for possible restenosis.

The data from the folders were collated and entered using Microsoft Excel 2016 version and transferred into the statistical package for social sciences (SPSS) for windows (version 20) (IBM SPSS Inc. Chicago, IL) for analysis. Categorical data was presented in the form of frequencies and percentages using tables. Continuous variables were presented in means and standard deviation. Results were presented in tables and charts.

3. Results (Tables 1-5)

The total number of boys delivered in the hospital during the study period was 8095. Thirty-four were uncircumcised for religious reasons and 42 were not circumcised for health reasons. A total of 8019 boys were circumcised during the study period. Fifty-two of the boys circumcised had meatal stenosis and this puts the incidence of meatal stenosis in University of Port Harcourt Teaching Hospital (UPTH) as 6.48 per 1000.

4. Discussion

The diagnosis of meatal stenosis is clinical. With changes to the urethral meatus

Table 1. Age range of respondents who presented with features of meatal stenosis, the 6 to 10 years old group had the highest frequency.

Age range	Frequency (n)	Percentage %
Less than 1 year	8	15.38
1 year to 5 years	12	23.08
6 to 10 years	28	53.84
11 to 15 years	4	7.70
Total	52	100

Table 2. Duration of symptoms before presentation at the hospital, only 8 (15.38%) respondents presented within 6months of onset of symptoms.

Duration of symptoms	Frequency (n)	Percentage %
Less than 6 months	8	15.38
6 to 12 months	32	61.54
13 to 18 months	12	23.08
Total	52	100

Table 3. Clinical features of patients presenting with meatal stenosis, most patients presented with poor stream.

Clinical features	Frequency (n)	Percentage %
Straining	32	32
Poor stream	40	40
Post micturition dribbling	12	12
Incidental at catheterization	16	16
Total	100	100

Table 4. (a) Treatment received by patients with meatal stenosis, 24 (46.15) patients had meatotomy. (b) Table showing treatment received and patients with restenosis following treatment. Meatoplasty had the lowest percentage of re-stenosis (0%), followed by meatotomy (12.5%) and dilatation had the highest percentage of re-stenosis. (c) Table showing the hospital stay after the different procedures.

(a)

Treatment received	Frequency (n)	Percentage %
Dilatation	16	30.77
Meatotomy	24	46.15
Meatoplasty	12	23.08
Total	52	100

(b)

Treatment received	Restenosis	Percentage
Dilatation 16	3	18.75%
Meatotomy 24	3	12.5%
Meatoplasty 12	Nil	0%
No restenosis	46	88.46%
Total	52	

(c)

Procedure performed	Hospital stay
Dilatation	Day case
Meatotomy	Day case
Meatoplasty	3 days

Table 5. Associated anomalies in the respondents with meatal stenosis. Most patients had no associated anomaly.

Associated anomalies	Frequency (n)	Percentage (%)
Hernia	12	23.08
Undescended testes	8	15.38
No associated anomaly	32	61.54
Total	52	100

from scarring patients may present with symptoms or may remain asymptomatic. In our study an incidence of 6.48 per 1000 was noticed. This is low compared to studies carried out in Iran by Joudi *et al.* [11] who had an incidence of 27 out of 132 boys between five and 10 years. Another author in sacramento, California had an incidence rate of 3 to 8 percent [12]. Sometimes it takes a while for symptoms to develop. In our study, the six to ten-year-old patients had the highest frequency with 53.84% of patients with meatal stenosis presenting within that age group and an age range of 10 months to 14 years. In a study carried out in New Zealand by Upadhyay *et al.* [9] the mean age of presentation was 48 months, with a range of 3 months to 13 years. Our study had a similar age range with the New Zealand study but however the mean age at presentation was different. The difference in age of presentation may be because of the poor health seeking behavior in many developing countries. In Africa, many people who are ill present to patent medical vendors, herbalists, churches or mosques over a health care professional because of lack of money for adequate healthcare [12] [13] [14] [15] [16]. So many patients may have presented early elsewhere with their symptoms before coming to the hospital. Also, young boys with meatal stenosis wear diaper and so parents and caregivers may not notice the characteristic urine stream.

In our study 32 (61.54%) patients presented to the hospital after enduring their symptoms for about 6 to 12 months. Only 8 (15.38%) of patients presented within 6 months of onset of symptoms. The health seeking behavior can also explain the reason for the late presentation. Some authors have explained that the symptoms of meatal stenosis may be unnoticed in boys who are not toilet trained, since they use diapers these symptoms may not be picked up [9] [12].

Boys with meatal stenosis present with lower urinary tract symptoms which are classified based on the phase of urination into storage, voiding and post micturition symptoms [17]. The storage symptoms prevent adequate storage of urine and they include frequency, urgency, nocturia, urgency incontinence and nocturnal enuresis. The voiding symptoms occur during voiding phase and include hesitancy, poor stream, straining, intermittency and post micturition symptoms include feeling of incomplete emptying and post micturition dribbling.

Poor stream or weak stream is a reduced urine flow compared to previous performance or to others [17]. Poor stream is due to reduced stream of urine secondary to the outlet obstruction [18]. Straining is the use of the muscles of the abdomen to initiate, maintain or improve urine stream thereby overcoming the bladder outlet obstruction [17]. The most common symptom in our study was poor stream which was followed closely by straining. Another author also noted that patients with meatal stenosis present with an upward, thin, poor urine stream [19]. With the scarring at the urethral meatus leading to fibrosis and narrowing of the meatus the urine stream becomes progressively poorer. The bladder initially compensates and hypertrophies to enable it empty ade-

quately but later the bladder muscle decompensates and can no longer empty its contents completely [20] [21]. This leads to significant post void residual urine. The bladder continues to decompensate till its contraction can no longer completely empty the bladder [18] [20]. This can lead to changes in the upper tract such as hydronephrosis, urinary tract infection, urosepsis and renal failure and even death [22]. In boys with an obstruction at the urethra, at the end of micturition the urine between the sphincters and the obstruction trickles out as post micturition dribbling [18]. In our study, post micturition dribbling was the least prevalent symptom. We also noted that some patients presented without symptoms and were only diagnosed during examination before catheterization.

Adequate preoperative investigation is very important. Due to obstruction in the flow of urine some patients may present with features of urinary tract infection. The flow of urine helps to prevent stasis and colonization of urine by microorganisms [20] [23]. Adequate culture directed preoperative antibiotics are important in preventing and treating Urinary Tract Infection (UTI) in patients with meatal stenosis. We avoided the use of fluroquinolones in children because of premature closure of the epiphyseal plates.

Treatment for patients with meatal stenosis include any form of treatment that will make the meatus elliptical, prevent further narrowing and allow better flow of urine from the urethra. In our study, the three-treatment employed were dilatation (30.77%), meatotomy (46.15%) and meatoplasty (23.38%) as shown in **Table 4(a)**.

Dilatation is the use of serial dilators to widen the meatus and aid better egress of urine. However, it may result in minor tears in the mucosa and lead to restenosis of the urethra. In our study three patients out of 16 (18.75% restenosis) who had urethral dilatation had restenosis following urethral dilatation. Meatotomy involves making an incision on the ventral surface of the urethral meatus. This helps widen the stenosis and was done as an office procedure. Re-stenosis following meatotomy is also possible [23]. In our study three patients out of 24 (12.5% restenosis) who had meatotomy had restenosis. We carried out meatal dilatation and meatotomy as office procedures using penile block and without general anaesthesia as seen in **Table 4(c)**. This considerably reduced the hospital stay and cost of treatment. Another author also noted low cost of treatment with meatotomy without general anaesthesia [12]. The drawback is that some patients may have a restenosis which may require a meatoplasty [24]. Meatotomy with local anaesthesia is believed to be 10 times cheaper than a meatoplasty or meatotomy with general anesthesia [25], it is also a good form of treatment if the child cooperates and the anatomy is appropriate [12].

Patients who had meatoplasty needed general anaesthesia in theatre and this made treatment more expensive [12]. Patients who had meatoplasty had a low re operation rate [12]. In this study no patient who had meatoplasty developed a restenosis as shown in **Table 4(b)**.

After treatment for meatal stenosis, patients were advised to use a lubricating gel to prevent adhesion of the edges. They were also followed up for 6 months.

Some authors have acknowledged the need for follow up genital examination even after circumcision to identify meatal stenosis [11]. Follow up should also be instituted after treatment of meatal stenosis to identify re-stenosis.

The prognosis seemed to be better for patients who had meatoplasty, than meatotomy and worse for patients with meatal dilatation as shown in the study in **Table 4(b)**. The suturing of the mucosa to the skin tends to prevent re-stenosis since healing will be by primary intention with minimal scarring. In meatotomy the healing is by secondary intention and can cause excessive scarring and hence re-stenosis.

Most patients who presented with meatal stenosis had no other associated anomaly as shown in **Table 5**. However, 12 had hernia and 8 had undescended testes. A hernia may have resulted from the increased intraabdominal pressure used to aid voiding in these patients with meatal stenosis. No association was found between the patients with undescended testes and meatal stenosis.

In medical practice prevention is always better than cure. Post circumcision meatal stenosis can be avoided by application of petroleum jelly after circumcision [26] [27] [28]. Some authors have advocated the use of steroid based agents but this has been controversial. Some say it is not successful [29] while others believe that it can be useful [30]. In our study steroid based creams were not used because of the potential complications of steroid use such as weight gain, roundness of the face, mood changes, slower growth rate, osteoporosis and cataracts. Human amniotic membrane is believed to prevent meatal stenosis [31]. Human amniotic membrane is unavailable for use in our centre. Its use may be associated with a number of ethical issues. Some authors have argued that meatal stenosis is rarely present in uncircumcised boys but others have reported the fact that meatal stenosis following circumcision is low [26]. The advantages of circumcision seem to outweigh the disadvantages. The authors tend to favor circumcision because of its numerous advantages. A recent study carried out in Algeria found out that meatal stenosis is more common when circumcision is carried out in the first week, there is use of healing agents and when there is prior adhesion of the foreskin to the glans [32]. In our hospital we used petroleum jelly after circumcision and also after surgery for meatal stenosis. This is believed to prevent the edges from sticking back together thereby, preventing meatal stenosis after circumcision or restenosis after repair of meatal stenosis.

5. Limitations of the Study

This was a retrospective study and we could not get some of the information sought. Different cadres of health professionals carried out the circumcision, meatal dilatation, meatotomy and meatoplasty. These included junior residents, senior residents and consultants. The skill and experience of more qualified doctors will lead to a better outcome compared to the less experienced doctors.

6. Conclusion

Meatal stenosis is an uncommon complication post circumcision. Patients usually

present late to the hospital. Voiding symptoms were the most common form of presentation. Treatment was either by dilatation, meatotomy or meatoplasty. Meatoplasty even though more expensive had a better prognosis. After treatment of meatal stenosis patients should be followed up for 6 months.

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This study was self-funded by the authors.

Conflicts of Interest

The authors declare there was no conflict of interest in this study.

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Dual-Energy Computed Tomography for the Diagnosis of Urethral Foreign Body: A Case Study

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Abstract

Foreign body insertion in the urethra and bladder is not uncommon and has been reported in many studies to date. However, since foreign bodies are often accidentally introduced into the urethra and bladder during masturbation, they take a variety of shapes and sizes. Furthermore, patient self-reports are typically unreliable as many patients feel ashamed; thus, appropriate preoperative diagnosis is critical. Diagnosis of foreign body insertion in the urethra and bladder is performed using imaging modalities such as abdominal X-ray and computed tomography (CT). However, single-energy CT (SECT) is not sufficient in detecting foreign bodies in some cases. In the present study, we report a successful preoperative identification of urethral foreign body in a patient using dual-energy CT (DECT).

Keywords

Dual-Energy CT, Urethral Foreign Body

1. Introduction

Foreign body insertion in the urethra and bladder is not uncommon and has been reported in many studies to date [1]. However, since foreign bodies are often accidentally introduced into the urethra and bladder during masturbation [2], they take a variety of shapes and sizes [3]. Furthermore, patient self-reports are typically unreliable as many patients feel ashamed [4]; thus, appropriate preoperative diagnosis is critical [5]. Diagnosis of foreign body insertion in the

urethra and bladder is performed using imaging modalities such as abdominal X-ray and computed tomography (CT). However, single-energy CT (SECT) is not sufficient in detecting foreign bodies in some cases. In the present study, we report a successful preoperative identification of urethral foreign body in a patient using dual-energy CT (DECT).

2. Case

Patient: 67-year-old man;

Chief complaint: Difficulty urinating;

Family history, medical history: None.

History of present illness: The patient inserted a foreign object for an unknown reason two years prior to the visit to our hospital. He had previously visited his local clinic since he was unable to remove the object by himself. Although an attempt was made to remove the object endoscopically, the procedure was not successful. The patient stopped visiting the clinic for follow-ups; however, he revisited the clinic when he started developing difficulty urinating.

Clinical findings at the initial visit: None to note

Imaging findings: A kidney, ureter, and bladder (KUB) X-ray showed the presence of a metal object (**Figure 1**). Since the object could have been a radiolucent material, we subsequently performed DECT to confirm the nature of the object. DECT revealed the presence of three foreign objects; these included two soft objects that could not be detected with SECT due to metallic artifact (**Figure 2**), as well as a metal object (**Figure 3**).

Treatment course: The patient reported that he could not remember exactly what the objects were as they were inserted two years ago. After obtaining the



Figure 1. KUB.

patient's consent, we planned to remove the objects via a transurethral approach. The procedure was performed under spinal anesthesia. An incision was made in the urinary meatus, and a metal stick was removed. Next, a cap and grip portion of a ballpoint pen were removed. A thin stick was identified further into the urethra and bladder, and was subsequently removed (**Figure 4**). At the end of the procedure, cystoscopy was performed to confirm that there were no remaining objects in the urethra or bladder and that there was no significant damage to the urethra. The patient had a smooth postoperative recovery and was discharged with a urinary catheter. The catheter was removed 2 weeks later, and the patient did not develop urinary difficulties after the procedure.



Figure 2. SECT.

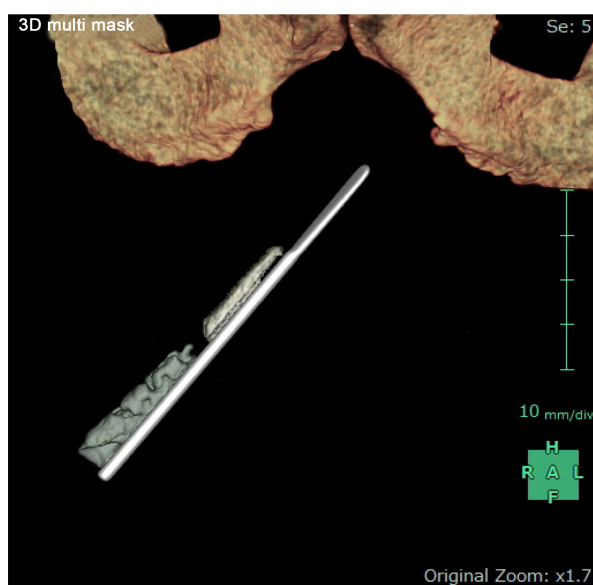


Figure 3. DECT.

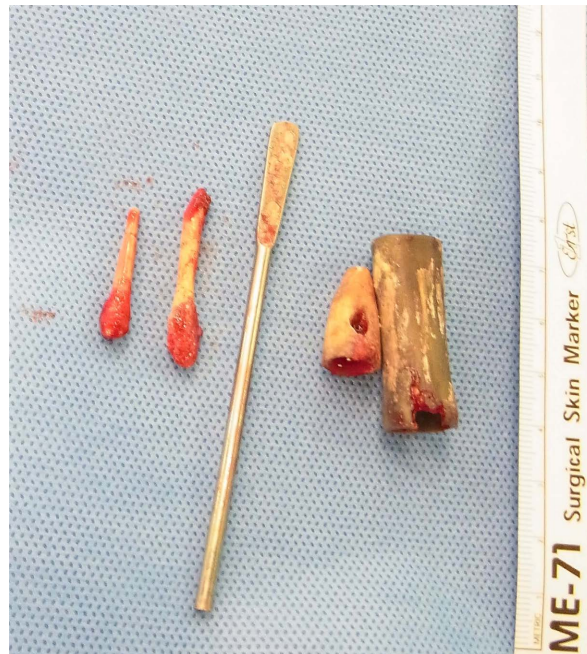


Figure 4. Removed foreign objects.

3. Discussion

Finding of a foreign body in the urethra is not uncommon in routine clinical practice, and many cases have been reported to date [1]. Foreign bodies can have various shapes and sizes [3], and patient self-reports are typically unreliable as many patients feel ashamed [4]; thus, appropriate preoperative diagnosis is critical [5]. Preoperative diagnosis is often made based on imaging findings on ultrasonography, abdominal X-ray and conventional abdominal CT. Given that foreign body insertion is habitual, accurate diagnosis becomes critical in some cases. In particular, conventional imaging examinations may not be sufficient if a patient has more than one foreign object. Ultrasonography is simple and solves the problems of exposure and cost, but there are variations depending on the operator's procedure. In addition, spatial resolution and qualitative diagnostic ability are inferior to CT, so it may not be a necessary test. As far as we examined, no literature was found on ultrasound in foreign bodies of the urethra. For this reason, we have been evaluating foreign substances by abdominal X-ray examination and SECT for some time, but if there are multiple foreign substances like this time, the information is insufficient with conventional imaging tests. In this case, preoperative imaging was performed using DECT. As a result, we were able to identify soft foreign objects that could not be detected by SECT due to metallic artifact caused by the presence of metallic object. Thus, DECT was useful in the diagnosis of foreign body insertion and preoperative simulation of foreign body removal has become easier.

DECT is a technique that uses two separate X-ray energy spectra, allowing objects that have different attenuation properties at different energies to display specific patterns to be detected on imaging [6]. The principle of DECT was first

described in 1976 [7], and a prototype CT system based on this principle was developed in 1986; however, the system was not used in clinical practice due to technical artifacts. More recently, it has regained attention as a result of technical developments such as helical CT and multi-slice CT. DECT can be used to differentiate objects by enhancing or suppressing a specific object, as well as to image arbitrary X-ray energies in low-high ranges in a technique called virtual monochromatic imaging [8]. At our hospital, we use an application called Aquilion ONE Prism Edition from Canon.

In the present study, multiple foreign objects were left in the urethra for a long period of time. When comparing the abdominal X-ray images with SECT, a radiolucent object was identified on SECT. However, the image was not sufficient in identifying the details of the object due to metallic artifact. Additional image processing with DECT revealed that there were three objects in the urethra. This technique resulted in highly accurate preoperative diagnosis, allowing us to reduce the operative time and improve the safety and reliability of the procedure.

The ability of DECT to differentiate various materials has been applied in the components analysis of urinary stones in the field of urology, with a reported diagnostic accuracy of over 80% [9]. We anticipate that DECT will become widely applicable in various cases in the future.

4. Conclusion

In the present study, we discuss the literature and report the case of successful urethral foreign objects removal in a 67-year-old man as a result of DECT-based preoperative diagnosis.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Benign Prostatic Enlargement, the International Prostate Symptoms Score and a Review of Other Symptom Scores

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Abstract

Benign prostatic hyperplasia (BPH) is the most common benign prostate disease in elderly men, and its incidence increases with age and is associated with lower urinary tract symptoms (LUTS). The international prostate symptoms score (IPSS) is the most common symptom score used to assess LUTS even though other symptom scores exist. This study aims to evaluate the LUTS of patients secondary to BPH presenting to the urology clinic of UPTH using the IPSS and to review other scoring systems. **Materials and Methods:** This was a prospective hospital based descriptive cross-sectional study carried out in University of Port Harcourt Teaching Hospital (UPTH). All adult male patients with LUTS secondary to BPE were given an IPSS questionnaire to fill. Another IPSS questionnaire was filled by the patient assisted by the researcher. The data were collated using Microsoft Excel 2016 version and they were analyzed using SPSS version 20. Results were presented in tables. **Results:** Sixty-nine (69%) patients had at least secondary level of education. Sixty-four (64%) could complete their questionnaire without any aid. The mean IPSS was 22.13 ± 6.34 as most patients presented with severe symptoms. The mean Quality of Life score was 4.60 ± 1.38 . There was a significant positive correlation between Quality of Life and IPSS. **Conclusion:** A level of literacy is needed to complete the questionnaire. Most patients in our study presented late with severe symptoms and significant level of bother. Nocturia was the worst symptom.

Keywords

Benign Prostatic Enlargement BPE, International Prostate Symptoms Score IPSS

1. Introduction

Benign prostatic hyperplasia (BPH) is the most common benign prostate disease in elderly men, and its incidence increases with age and is associated with lower urinary tract symptoms (LUTS) [1]. The lower urinary tract symptoms are classified into storage, voiding and post micturition symptoms. The storage symptoms include frequency, urgency, nocturia, urgency incontinence and nocturnal enuresis. The storage symptoms include hesitancy, poor stream, straining, intermittency. The post micturition symptoms include feeling of incomplete emptying and post micturition dribbling.

The International Prostate Symptom Score (IPSS) was adopted as a basic questionnaire standard at the International Council of BPH organized by the World Health Organization in 1993, and recommended for assessing treatment of patients with BPH [2]. The IPSS consists of three storage symptoms (frequency, urgency and nocturia), four voiding symptoms (poor stream, intermittency, straining and feeling of incomplete voiding) and, a question relating to the Health-Related Quality of Life (HRQOL). The quality of life is scored from 0 to 6. Each symptom is scored on a scale of 0 - 5. The IPSS score is between 0 - 35. IPSS is subjective. The uroflowmetry is also a simple noninvasive and valuable tool used in assessing patients with BPH [3]. The uroflowmetry is more objective.

A good symptom score assessment scale should be responsive to change, valid and reliable [4]. There are other symptom scores used in analyzing patients with BPH and other cause of lower urinary tract obstruction that are not as popular as the IPSS but are quite useful. They include the Danish Prostate symptom Score (DPSS) [5], Visual prostate Symptom Score (VPSS) [6], Core Lower Urinary Tract Symptom (CLUTS), [7] and BPH Impact Index (BII) [8].

A study correlating uroflowmetry and IPSS in adult male patients with lower urinary tract symptoms in Port Harcourt has been carried out [9]. No study has been carried out to evaluate lower urinary tract symptoms in patients with lower urinary tract obstruction in Port Harcourt. Ogwuche *et al.* [10] carried out a study to evaluate the problems with administration of international prostate symptom score in a developing community in Northern Nigeria.

This study was carried out to evaluate the lower urinary tract symptoms of patients with BPE presenting to the Urology clinic of University of Port Harcourt Teaching Hospital using the IPSS, and also the quality of life of these patients. It also assesses the correlation between IPSS and quality of life of these patients and reviews other scoring systems. This will enable us identify the symptoms that are most disturbing or more common in patients who present in our clinic.

2. Materials and Methods

This was a prospective hospital based descriptive cross-sectional study carried out in the urology clinic of the University of Port Harcourt Teaching Hospital (UPTH), Choba, Port Harcourt from January 1st 2017 to December 31st 2017.

Adult male patients with LUTS secondary to BPE attending urology clinic at

UPTH were included in the study. Inclusion criteria included normal digital rectal examination (DRE) findings, normal PSA levels and normal PSA density and normal TRUS findings.

Exclusion criteria were patients with BPE on catheter, patients who had had previous surgery, patients with features suggestive of prostate cancer, abnormal DRE findings, abnormal PSA, patients with neurogenic bladder.

The sample size was determined, using the formula 66:

$$n = (Z^2 pq / e^2) \quad [11]$$

where;

n = the minimum sample size.

Z = the standard normal deviation corresponding to the level of significance of 95%.

p = the proportion of the sample population presenting to UPTH Urology clinic from 1st January 2015 to 31st December 2015, which is 86 patients of the 1425 patients seen within that year.

$$q = (1 - p)$$

e = level of precision or maximum error of estimate at 95% confidence level, with $e = 0.05$ $p = 0.06$.

$Z = 1.96$, $q = 0.94$.

Therefore,

$$\begin{aligned} n &= Z^2 pq / e^2 \\ &= 1.96^2 \times 0.06(0.94) / 0.05^2 \\ &= 3.84 \times 0.056 / 0.0025 \\ &= 86 \end{aligned}$$

For reliability or non-response, therefore; increase by 10%.

$86 + 9 = 95$.

Consecutive patients who met the inclusion criteria and gave consent were selected for the study till the sample size was completed. In this study the IPSS was the only symptom score reviewed.

The study questionnaire (**Appendix 3**) and IPSS forms (**Appendix 1**) were administered to the patient alone. The authors then assisted the patients in filling another IPSS questionnaire. The physician assisted IPSS questionnaire was evaluated. Patients who could complete their IPSS on their own were noted. The data from the questionnaire were collated and entered using Microsoft Excel 2016 version and transferred into the statistical package for social sciences (SPSS) for windows (version 20) (IBM SPSS Inc. Chicago, IL) for analysis. Categorical data was presented in the form of frequencies and percentages using tables. Continuous variables were presented in means and standard deviation. Results were presented in tables (**Tables 1-6**) and charts.

3. Results

The level of education of the respondents is as shown below:

Table 1. Educational level of respondents. Many patients had some form of formal education.

Educational Status	Number	Percentage
Primary	30	30.0
Secondary	31	31.0
Tertiary	38	38.0
None	1	1.0

Table 2. Number of respondents who could complete IPSS questionnaire on their own. Thirty-six patients could not complete their IPSS form.

	Number of patients (n)	Percentage (%)
Completed forms	64	64
Uncompleted forms	36	36
Total	100	100

4. Discussion

The IPSS is the most utilized symptom score assessment used for patients with BPH. The IPSS has a significant negative correlation with maximum and average flow rate and so it may be used in place of uroflowmetry when the latter is unavailable [9]. Despite its international status, the IPSS has a number of drawbacks.

There is a high level of illiteracy in Nigeria. A study by Ogwuche *et al.*, revealed that 74.3% of patients could not understand English [10]. The authors recommended that IPSS be translated into local languages [10]. A reasonable level of literacy and numeracy is needed to accurately fill the IPSS forms [12]. In Nigeria, there are over 250 local languages. Translating the IPSS into these languages may be difficult. A multimedia version of the IPSS may aid the less educated in completing the form [10]. In our study 68% of respondents completed the forms on their own without assistance as shown in Table 2. The reason may be due to fact that 69% of the respondents had at least a secondary level of education as seen in Table 1. Rivers state is an oil producing state in Nigeria. Many educated individuals reside in Rivers state. A study revealed that Rivers state is the fifth most educated Nigerian State with a literacy level set at 92.11% [13]. Physicians could also assist patients who are not literate in English to complete the IPSS form but this may be more time consuming and apportion more work for the already overworked doctors, it may also introduce bias. A number of doctors have left Nigeria for greener pastures in abroad. To eliminate bias in this study every respondent had their questionnaire completed with the assistance of the authors.

For patients that are blind the IPSS would have to be read out to them and completed by a physician [14]. The IPSS does not address urgency incontinence

Table 3. IPSS of respondents. Nocturia and incomplete emptying had the most severe symptoms. Fifty-one respondents had 5 or more sleep waking voids, while 43% of respondents almost always had the feeling of incomplete emptying after voiding. Straining and intermittency had the least severe symptoms.

Characteristics	Frequency (n = 100)	Percentage (%)
Incomplete emptying		
Not at all	6	6.0
Less than 1 time in Almost always	5	5.0
Less than half of the time	12	12.0
About half the time	18	18.0
More than half the time	16	16.0
Almost always	43	43.0
Frequency		
Not at all	1	1.0
Less than 1 time in Almost always	7	7.0
Less than half of the time	20	20.0
About half the time	28	28.0
More than half the time	30	30.0
Almost always	14	14.0
Intermittency		
Not at all	5	5.0
Less than 1 time in Almost always	17	17.0
Less than half of the time	18	18.0
About half the time	34	34.0
More than half the time	19	19.0
Almost always	7	7.00
Urgency		
Not at all	7	7.0
Less than 1 time in Almost always	13	13.0
Less than half of the time	20	20.0
About half the time	20	20.0
More than half the time	23	23.0
Almost always	17	17.0
Weak stream		
Not at all	3	3.0
Less than 1 time in Almost always	12	12.0
Less than half of the time	19	19.0
About half the time	23	23.0

Continued

More than half the time	28	28.0
Almost always	15	15.0
straining		
Not at all	6	6.0
Less than 1 time in Almost always	14	14.0
Less than half of the time	23	23.0
About half the time	25	25.0
More than half the time	20	20.0
Almost always	12	12.0
Nocturia		
None	2	2.0
1) time	3	3.0
2) times	11	11.0
3) times	19	19.0
4) times	14	14.0
5) or more times	51	51.0

Table 4. Total IPSS of respondents. IPSS is grouped into mild, moderate and severe symptoms. Sixty five percent of patients presented with severe symptoms and this was statistically significant.

Total IPSS	Frequency (n = 10)	Percentage (%)	Chi-square (χ^2), p-value
Mild symptom (1 - 7)	0	0.0	18.0 (0.001)*
Moderate symptom (8 - 19)	35	35.0	
Severe symptom (20 - 35)	65	65.0	
Mean IPSS		22.13 \pm 6.34	

*Statistically significant ($p < 0.05$).

Table 5. Quality of life (QoL) of respondents. Many patients were unhappy (36%) or felt terrible (30%) about their symptoms before presenting to the hospital.

QoL	Frequency (n = 100)	Percentage (%)	Chi-square (χ^2), p-value
Pleased (1)	1	1.00	(0.001)*
Mostly satisfied (2)	13	13.00	
Mixed about equally satisfied and dissatisfied (3)	7	7.00	13.00
Mostly dissatisfied (4)	13	13.00	
Unhappy (5)	36	36.00	30.00
Terrible (6)	30	30.00	
QoL mean score		4.60 \pm 1.38	

*Statistically significant ($p < 0.05$).

Table 6. Correlation between Quality of Life (QoL) and IPSS. There was a weak statistically significant positive correlation between patients with high IPSS scores and quality of life. Patients with high IPSS scores had a poor quality of life and patients with low IPSS scores had a better quality of life.

Quality of Life (QoL)	IPSS	
	The Pearson correlation coefficient, r	0.227
	R-Square (r^2)	0.051
	<i>p-value</i>	0.023*
	95% CI	0.026 - 0.348

*Statistically significant ($p < 0.05$).

and hesitancy, the authors feel this is a drawback of the IPSS as urgency incontinence can be very embarrassing.

The worst symptom in the study was nocturia with 51 respondents have 5 or more sleep waking voids as shown in **Table 3**. Nocturia would disturb sleep and affect a patient's QoL. Studies by Oranusi *et al.* [15] in Nnewi, South Eastern Nigeria also noticed that nocturia was the most prevalent symptom. Patients are also more likely to remember waking up from sleep to void. Nocturia was followed closely with incomplete emptying with 43% of respondents almost always had the feeling of incomplete emptying after voiding. Intermittency and straining had the least prevalent symptom.

Straining is usually a symptom in structural obstruction such as urethral stricture or meatal stenosis where the abdominal musculature would be used to initiate or maintain voiding but in BPE the obstruction is more functional than structural.

Most patients presented with severe symptoms as seen in **Table 4**, the mean IPSS in this study was 22.13 ± 6.34 . The findings in this study are similar to that carried out by Agrawal *et al.* [12] with a mean IPSS 23.5 ± 2.8 in Nepal. Ogwuche noted that black patients are more likely to present with severe symptoms and sometimes with complications of BPE [10]. This late presentation occurred despite the seemingly better level of education as compared to Ogwuche's study.

The mean quality of life score in this study was 4.6 ± 1.38 , showing that patients present to the hospital when they have significant level of bother. Most patients (66%) presented with a QoL score of 5 or 6. This is in agreement with the study by Oranusi and colleagues [15] who had a QoL of 4.3 ± 1.13 . There was also a significant positive correlation between IPSS and QoL, as the IPSS increased patients were more bothered about their symptoms and vice versa. Patients in developing economies tend to present to herbalist, church, mosque or patent medicine dealer over a qualified medical professional because of lack of finance [16] [17] [18]. They usually seek healthcare late and sometimes with complications.

The visual prostate symptom score is a type of symptom score assessment developed by Vander Walt *et al.* [19]. It uses pictograms to represent four symp-

toms of the IPSS [19]. These symptoms are frequency, nocturia, weak urine stream and quality of life [19] [20]. VPSS is simple and easy to comprehend [20]. The VPSS can be used with men with limited level of education [19].

The drawbacks of the VPSS include the fact that four symptoms are left out of the IPSS in creation of VPSS (urgency, intermittency, straining and incomplete emptying). These omitted symptoms are important in the evaluation of subjects. The VPSS cannot be used for the visually impaired or blind.

The DAN-PSS-1 is actually similar to the IPSS. It has hesitancy, dysuria, urge incontinence, stress incontinence and overflow incontinence in addition to the symptoms of IPSS. Each symptom is divided into 12 (A and B). The A question assesses the symptom while the B question assesses the quality of life. Each question frame contains 4 ordered categories scored from 0 to 3 [21]. For each question, frequency of the symptom is multiplied by the quality of life score yielding a total of 108 [21].

The DAN-PSS-1 is internally consistent (Cronbach's $\alpha = 0.73$), has a high degree of construct validity, and is sensitive to changes following therapy [22].

However, IPSS has a higher internal consistency of 0.86 compared to DAN-PSS-1 of 0.73, so it may be more reliable. IPSS has 8 questions and some authors claim that it is difficult to understand [11]. However, DAN-PSS-1 has 24 questions and the subject needs to multiply the frequency of symptoms and degree of bother. These calculations may be difficult for some respondents.

The International Continence Society Male Short Form (ICSmaleSF) questionnaire is an abridged version of the 22-item International Continence Society (ICS) male questionnaire developed by Donovan *et al.* [23]. The ICSmaleSF has 14 symptoms and an item on the degree of bother. Response frames for the scale items have 5 ordered categories, scored 0 to 4. The ICSmale questionnaire is valid and reliable [23]. However it has more symptoms than IPSS and may be more difficult to complete.

Core Lower urinary tract symptoms include a comprehensive questionnaire that covered 25 LUTS defined by a standardization report [24]. CLUTS is responsive and provides a good assessment of new patients and patients with multiple diseases [25]. However; this scoring system contains 10 symptoms unlike IPSS that contains 7, so it may be more cumbersome and difficult to complete.

BPH Impact Index (BII) is a questionnaire that measures the impact of BPH on a patient's life. It consists of 4 questions. The questions include: how much physical discomfort did any urinary problems cause you, how much did you worry about your health because of any urinary problems, how bothersome has any trouble with urination been overall, how much of the time has any urinary problem kept you from doing things you would usually do. The first three questions are scored from 0 - 3 and while the last is scored from 0 - 4, hence scores on the scale range 0 - 13. Higher scores mean greater impact. The BII is easy to understand and captures clinically relevant BPH impact related LUTS [26]. The BII is also reliable, responsive to change and has good construct validity [27].

However, while the BII measures the impact on a patient's quality of life, the IPSS assesses the symptoms and also quality of life. So, the IPSS may be more reliable.

Boyarsky Symptom Score is scoring system for patients with LUTS developed in 1977. It consists of 10 items of equal weight, each with a score 0 - 3. Scores range from 0 to 30. The symptoms include frequency, urgency, nocturia, hesitancy, poor stream, straining, intermittency, incomplete emptying of the bladder, dysuria and post micturition dribbling [26]. This scoring system has no item assessing quality of life and so it does not assess quality of life like in the IPSS.

The Madsen-Iverson Scoring System was developed in 1983 [26]. It is one of the oldest known scoring systems [26]. It consists of 9 items which include frequency, urgency, nocturia, hesitancy, poor stream, straining, intermittency, incomplete emptying and post micturition dribbling (it contains the same items as the Boyarsky scoring system without dysuria). The items are not of equal weight. Frequency, urgency and nocturia have equal weights of 0 - 3, poor stream and incomplete emptying carry weights of 0 - 4, while hesitancy and intermittency carry weights of 0 or 3 each. Straining and post micturition dribbling carry weights of 0 - 2 each [26]. This scoring system (just like Boyarsky) does not assess quality of life because there is no item addressing that domain like in the IPSS.

5. Limitations of the Study

The sample size in the study was 100 subjects, a larger sample size may have given a different outcome.

6. Conclusion

A level of literacy and numeracy is needed to complete the questionnaire. Most patients in our study presented late with severe symptoms and significant level of bother. Nocturia and incomplete emptying were the most common symptom. Straining and intermittency were the least prevalent symptoms. There was a statistically significant positive correlation between IPSS and QoL.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1

International Prostate Symptom Score

NAME: DATE: Date of Birth:

In the past month:	None at all	Less than 1 in 5 times	Less than half the time	About Half the Time	More than Half the time	Almost Always	Your score
1) Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2) Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3) Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4) Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5) Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6) Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	1 Time	2 Times	3 Times	4 Times	5 Times	
7) Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS score							

Score: 1-7: Mild 8-19: Moderate 20-35: Severe

Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Appendix 2

Statement of the Person Giving Consent

I have read the description of the research, and/or it has been translated to my understanding. I have discussed it with the doctor to my satisfaction. I understand that my participation is voluntary. I know a lot about the study and its risks, and I want to participate. I understand that I may freely opt out of the study at any time. I have received a copy of the consent form and additional information sheet to keep for myself.

Date

Name

Signature

Witness name

Witness signature

Appendix 3

Study on Benign Prostatic Enlargement and International Prostate Symptom Score

QUESTIONNAIRE

A. Biodata:

Folder No.....

Date of birth.....

Address.....

Level of Education.....

Marital status.....

Occupation.....

Religion.....

Ethnic group.....

Phone No.....

B. Condition:

Duration of symptoms.....

Total prostate volume.....

IPSS and QoL.....

Outcomes of Ureterorenoscopy for Lower Pole Kidney Stones (≤ 3 cm) to the Omar Bongo Ondimba Army Instruction Hospital

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Abstract

Introduction: The management of kidney stones has benefited from endoscopic techniques, in particular the development of flexible ureteroscopy (ureterorenoscopy). This endoscopic treatment has made it possible to treat many upper urinary tract stones, with satisfactory results and less morbidity. This innovative minimally invasive technique was introduced in our country in 2018. It is not practiced in all health structures. We report our experience. **Objectives:** The aim of our study was to evaluate the place of flexible ureteroscopy laser, its feasibility, and the results on stones up to 30 mm in size only in the lower calicinal group, while assessing the postoperative quality of life. **Patients and Methods:** We conducted a monocentric observational retrospective study at the Omar Bongo Ondimba Army Training Hospital (OBO ATH) on 22 patients with symptomatic inferior calicel stones, over a period of January 2019 and December 2020 treated by flexible ureteroscopy laser (FUR-L), once or twice depending on the size of the residual fragments. **Results:** All the patients had symptomatic urolithiasis, diagnosed on the clinical elements, and confirmed in 77% by urinary computed tomography. The average age was $35.47 \text{ years} \pm 12$, with a clear female predominance (64%). All the stones sat in the lower calice. 66.5% of stones were larger than 10 mm. 75% of patients were “stones free” after one FUR-L session, and 100% after the second session. 10% of patients still had residual pain at 01 month which was absent at 03 month. 18% of postoperative urinary tract infections were treated with antibiotics. 90% of the patients had resumed an activity prior to 1 month. At 1 month and 3 months, 82% and 100% respectively were satisfied with the mode of treatment according to self-questioning. **Conclusion:** FUR-L

remains a therapeutic modality for stones in the lower calicial group, for stones whose diameter is close to 30 mm. A sequential approach should be considered for diameter stone up to 30 mm.

Keywords

Renal Stone, Lower Calyx Group, Flexible Ureteroscopy (FUR), Laser (L)

1. Introduction

Flexible laser ureteroscopy (FUR-L) has become the essential treatment in the management of kidney stones measuring less than 2 cm [1] [2]. Its indication in stones larger than 2 cm is increasingly popular today, and its place is better defined within the therapeutic arsenal of this class of stones [3] [4].

The aim of our study was to evaluate through a retrospective analysis of 22 patients with lower calyx stones treated by flexible laser ureteroscopy, the feasibility and results of this technique on stones of size between 3 and 30 mm. And as a secondary objective, to assess the overall rate of patient satisfaction through postoperative self-questioning.

2. Patients and Methods

We have carried out a single-center retrospective study in the urological surgery department of the OBO ATH. We included 22 patients between 2019 and 2020, presenting kidney stones of the lower calicial group treated by reusable URS, with a regular follow-up over 1 year.

We included all patients who presented with simple or complicated renal colic due to urolithiasis, the size of which is between 3 and 30 mm. The diagnosis of nephrolithiasis had been strongly suggested clinically and confirmed on imaging. The biological assessment had served as a standard preoperative assessment and an infectious assessment according to the clinical situations, supplemented by an CBUE, and Ds. All the patients had been operated under prophylactic antibiotic therapy, with a negative CBUE, and under spinal anesthesia. The treatment modalities were either a one stage treatment by ureteroscopy on a ureter not previously prepared by a JJ stent probe, or in two stages (JJ then ureteroscopy). A postoperative evaluation by CT scan without injection of fine sections was carried out 1 month after removal of the JJ stent probe, to assess the existence of residual fragments and their size. The decision to re-treat with ureteroscopy was based on the size of the residual fragments, their location, the impact on the kidney and whether they were symptomatic. The material used was JJ stents, a rigid ureteroscope (R-URS), and a flexible ureteroscope (FLEX-X2). The laser device used was the MEGA Pulse from 1.6 to 20 W of power with a fiber of 230 μm . We used Re-Trace access sheaths (12/14Ch, Coloplast). The laser was used in Dusting or Fragmentation mode. A Dormia-type forceps made it possible to

recover the residual fragments.

The patients had been clearly informed about the possibility of one or more FUR-L sessions when choosing the treatment and developing the therapeutic plan.

The monitoring was only clinical and especially radiological by performing a CT scan without injection of the urinary tract at 03 months. The absence of residual stone conferred on the patient the status of “stone free”. Success was defined by the absence of fragments or the presence of fragments less than 2 mm asymptomatic at the time of the control. The duration of the Total Temporary Incapacity (TTI = sick leave), the quality of life was assessed based on a questionnaire drawn up at 1, 3 and 6 months. The calculations were analyzed by spectrophotometry. A remote metabolic assessment was systematic. All patients had health insurance that covered the cost of the intervention at 90% or even 100%. A First FUR-L session costs on average 875,000 FCFA (1335.54 euros) without health coverage, the second session was calculated based on the first session, 437,500 FCFA (667.77 euros). The database had been introduced and analyzed in the Numbers software update 2021 ([Table 1](#)).

3. Result

All patients had symptomatic urolithiasis, diagnosed on clinical grounds, and confirmed in 77% by urinary computed tomography. The mean age was 35.47 ± 12 years, with a clear female predominance (64%). All the stones were seated in the lower calice. 66.5% of stones were larger than 10 mm, with 8% representing two patients had stones larger than 20 mm. Most stones were unilateral, only two patients had symptomatic bilateral stones, which had been treated at the same time. 86% of our patients had a JJ endoprosthesis at the end of the procedure. In total, there were 24 FUR-L procedures initially with a stone free rate of 75%, and 25% residual stones with an average size of 7 mm.

6 (25%) second look FUR-L had been performed at 1 month on residual stones, with a result rate of 100% stone-free in all patients. Postoperative self-assessment ([Table 2](#)) showed 10% of patients who still had residual pain at 1 month but absent at 3 months and 6 months. 18% of postoperative urinary tract infections had been treated with antibiotics. 90% of patients had resumed activity before 1 month. At 1 month and 3 months, respectively 82% and 100% were satisfied with the mode of treatment according to the self-question.

4. Discussion

Urinary lithiasis disease represents a management issue in our country, with a poorly assessed incidence. Urolithiasis represents 30% of the consultation in our department each month, and half of them will be operated on.

The diagnosis remains clinical in most cases, and morphological imaging by Uroscan (gold standard) will make it possible to make an overall assessment of the disease, by confirming the positive diagnosis, but above all by specifying the

Table 1. Sample analysis data.

Settings	Effective (n)	%
Clinical		
Fever	17	77
Low back pain	20	90
hematuria	3	14
Additional tests		
ECBU	20	90
TDM without PC	17	77
Ultrasound – AWP	10	45
Size of stone		
≤3 mm	2	8
[3 - 6]	6	25
[6 - 10]	5	21
[10 - 20]	9	38
>20 mm	2	8
Stone number		
Unilateral	22	92
Bilateral	2	8
All Ureterorenoscopy Treatment: 24		
Without stent JJ	3	14
With stent JJ before	19	86
Number of interventions		
single ureterorenoscopy session	24	100
Two ureterorenoscopy (second look)	6	25
Results: stone free rate		
After the first FUR	18	75
After the second FUR	6	100
Size of residual stones	18	75
≤2 mm		
[6 - 7]	3	12.5
[7 - 8]	3	12.5
Infectious complications	4	18

Table 2. Post opérative evaluation questionnaire.

Questions?	01 month	03 month	06 month
Presence rate of residual pain at	10%	0%	0%
Rate of return to normal activity at	90%	100%	100%
Rate of acceptability of treatment by FUR-L in the future	100%	100%	100%
Overall satisfaction rate at	82%	100%	100%

number of calculations, their location, the size, the impact on the upper apparatus, their density, the anatomy of the calyx stems and calyces, that of the lower calyx [5] [6].

It is since Dretler in 1994 [1], that the flexible ureteroscopy technique has been described, this one has known enormous technological advances in particular the use of active deflection at 270° which has allowed an exploration of the of the renal cavities [4] [7], thus making it possible to treat all upper tract stones, since no stone is resistant to the laser [7] [8]. The indications for FUR-L are becoming more and more precise, in first intention in the renal stone of the upper device and take a particular place in the stones of the lower calice group [8] [9] [10]. Some authors make it a matter of course, compared to other procedures such as the mini PCNL, PCNL [9]. The international guidelines provide a high level of evidence for this indication [4] [5] [7].

We treated our patients with FUR-L, in one session for stones less than 15 mm. And in two sessions for the rest, often combined with a R-URS in 42% of cases if the fragments were found along the ureter.

Our patients were relatively young with an average age of 35, with no real comorbidities noted. Young age is often the one found in many series, although lithiasis disease affects all age groups. The existence of the metabolic syndrome is currently incriminated in the lithogenesis of another stone [3] [4]. 17 of our patients had obstructive pyelonephritis, whose management, in addition to probabilistic antibiotic therapy with quinolones, was emergency JJ stenting and treatment with FUR-L, 10 - 15 days later. Of these obstructive pyelonephritis, 15 patients had ureteric stones initially, and 2 patients presented with directly enclosed stones of the lower calyx group, with dilation of the calyx and perirenal infiltration on imaging. Paradoxically, a ureteral calculus can be relocated in the kidney (as in our series), especially in the lower calyx (most sloping area) when the initial JJ stent is raised. The risk of stone migration after ureteroscopy is estimated at 7% [1]. The whole question is that of the therapeutic approach, knowing that all infectious stones must be removed regardless of their location and size [11] [12]. Our infected patients had been treated by Dusting effect, reassuring themselves to be the closest to stone free, a JJ endoprosthesis was in place at the end of the procedure.

4% or 18% of these patients presented an infectious syndrome made of persistent fever over 72 hours, the identification of the germ on the intraoperative urine samples made it possible to modify the antibiotic therapy. Urinary tract infection remains a frequent complication in case of endoscopic procedure on the urinary tree despite sterile preoperative CBUE and intraoperative antibiotic prophylaxis, it represents 2% - 18% [1] [4], it is increased in case of infected stone [2].

The rest of the patients had hyperalgesic renal colic, including 3 on ureteral stone treated with JJ stent first, then a week later with R-URS + lithoclast, supplemented by FUR for compression of the residual fragments lodged in the low-

er calyx, the largest of which was 7 mm and was symptomatic.

FUR-L made it possible to process all our stones, the re-localization at the level of the renal pelvis in 91% made it possible to reduce the angulation constraints imposed on the ureteroscopy, this recommendation is widely described in the series, and is an integral part different times of the learning curve widely detailed by many experts including O. Traxer [2]. The optical fibers of the ureteroscopy (FLEX-X2) are very fragile, the very acute angles of the lower chalice often impose significant deflections, relocating the calculation in the axis of the light and the strike angle makes it possible to protect our devices, including maintains it at a cost [10] [13].

Six stones benefited from a two-stage treatment, these were some residual stones with a diameter between 6 and 8 mm, all symptomatic and obstructive. The contribution of the R-URS lies in the treatment or re-treatment in several sessions of these residual stones which are either infectious or obstructive depending on their size. We have deliberately chosen to re-treat all symptomatic and/or infectious stones with a diameter > 6 mm. Performing one or more FUR-L sessions must be integrated into the overall therapeutic project, and clearly explained to patients [12] [13]. Bilateral calculus treatment at the same time confirms the less morbid nature of the ureteroscopy [2] [14].

We had noticed that the size of stone was not necessarily an obstacle to the use of the FUR-L from the outset [15] [16]. A calculation of more than 20 mm, can be vaporized in a single FUR-L, with insignificant residual fragments, the work and numerous publications of Olivier Traxer and his team show this well [16] [17]. Even if very clearly the calculations of more than 20 mm, must make consider the possibility of a reprocessing, which is integrated into a project explained to the patient. We used 17 access sheaths, without increasing the morbidity at the time of the realization of the FUR-L, on the other hand the Re-Trace access sheaths offer an additional safety gain [2] [14] [18]. The ureteroscopy without an access shaft is possible provided you are a trained user because the rate of material damage is often very high [13] [14] [19]. The average duration of our interventions was 56 mn \pm 15 mn, this reflects the constant learning curve. We were below the standards which are 60 min on average for a stone of 10 mm [11] [13].

The JJ stent probe made it possible to manage the first operation in 86% of cases, but almost half (53%) had discomfort secondarily, these patients were put on alpha blocker, anti-spasmodic, associated with level 1 analgesic, no JJ stent probe was removed before FUR-L [12]. A JJ stent probe was left postoperatively depending on local conditions, 68% for 7 to 10 days maximum. No major complication was noted [11] [20] [21]. The average length of hospitalization was 15 days \pm 4 days, clearly due to the numerous pyelonephritis requiring intra venous antibiotic therapy 5 or 10 days [20] [22]. Endoscopic treatments on urinary stones are increasingly performed on an outpatient basis [5] [22].

Postoperative follow-up was organized at 1 month, 3 months and 6 months.

We developed a postoperative evaluation questionnaire at each consultation. At 1 month, 10% had no residual pain at 3 and 6 months. Many patients resumed almost normal activity from the first month, and all were generally satisfied and ready for a future FUR-L if the indication lent itself to it. All patients were stone free at 3 months, with a FUR-L success rate of 75% after a first ureteroscopy and 100% the second, which matches the literature success rate of nearly 90% [1] [2] [22]. No recurrence at 1 year, all patients had metabolic assessments to adapt hygienic-dietetical measures with the aim of preventing recurrence [2] [5].

In our countries where the surgical intervention equals bloodshed, abdominal scar, the FUR-L is a technique which remains less morbid and easily acceptable, with short recovery and unavailability times (TTI) of 15 days \pm 4 days). Overall morbidity is estimated at 5% - 10%, the risk of major complications (avulsion, perforation) is 1%, with a conversion rate of 0.2% [2] [13]. Other minimally invasive techniques are being learned here, but do not currently constitute an alternative to the ureteroscopy in the management of stones of the lower calyx [4] [7] [9]. In terms of cost, FUR-L is not within the reach of all patients, where the minimum wage is around 229 euros, the choice of the operating technique must take this into account.

The limitations of this study are its retrospective and non-comparative nature, involving a small sample. Prospective studies would be desirable to confirm the place of FUR-L in large kidney stones.

5. Conclusion

Our study clarifies the place of the FUR-L in our countries where these endoscopic techniques are practiced more and more. In the absence of other minimally invasive techniques, FUR-L remains today the treatment of choice for these stones of the upper appliance and of the lower calyx, as recommended by international guidelines. Size calculations between 20 mm and 30 mm, remain a possible indication if this is integrated into a therapeutic project clearly explained to patients, health insurance facilitating this therapeutic approach.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Abbreviations

CBUE: Cytobacteriological Urine Exam

Ds: Dipstick

PCR: Protein C Reactive

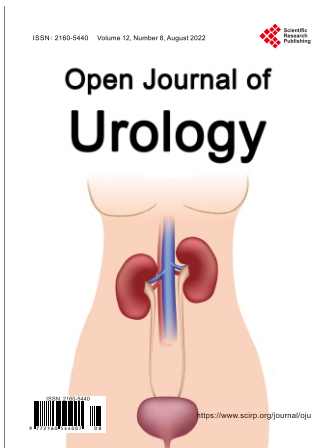
R-URS: Rigid Ureteroscopy

PCNL: Percutaneous Nephrolithotomy

TTI: Total Temporary Incapacity

FAFC: Franc of the African Financial Community

AWP: Abdomen without Preparation



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