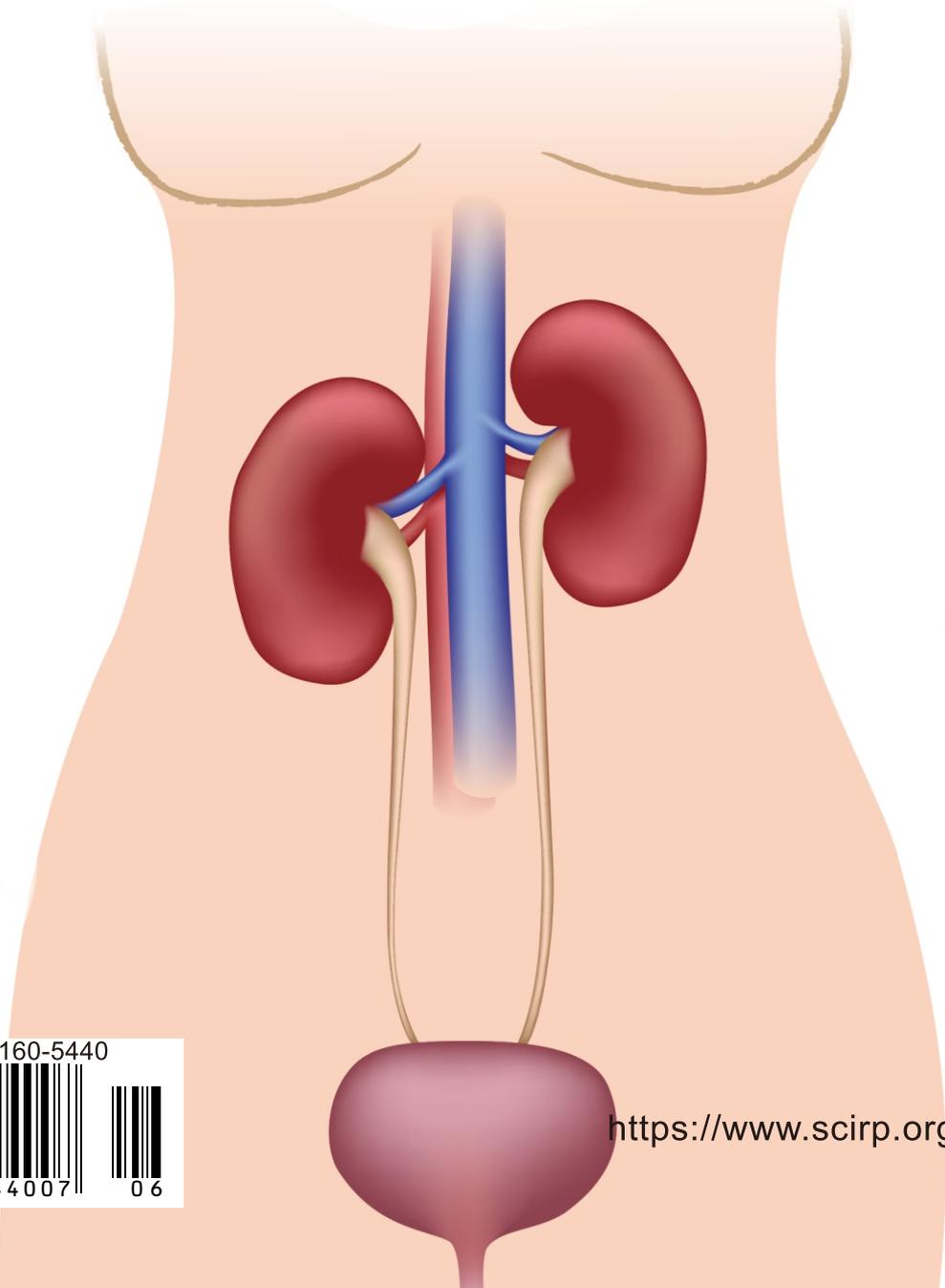


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# Table of Contents

**Volume 13    Number 6**

**June 2023**

## **A New Device for Intermittent Emptying of the Bladder in Children and Adults:**

### **A Long-Term Follow-Up**

S. V. C. Lima, F. C. F. S. Calisto, F. C. M. Pinto, D. C. C. Aragão, E. S. Lustosa, H. O. Schots, P. A. A. Alves,  
F. O. Vilar.....161

## **Mucinous Carcinoma of the Scrotum about a Case in Yaounde**

B. Amougou, F. D. Dikongue, D. Eyongeta, T. M. O. Diallo, D. D. B. Nkomo, D. Cisse, A. Dongmo,  
A. G. N. Afouba, J. Fondop, T. S. Beyeme, F. Atemkeng, Y. Sow, A. B. Diallo, F. Angwafor.....173

## **Adult Kidney Cancer in Mauritania: Clinical and Therapeutic Aspects**

M. M. Beya, Y. Tfeil, A. Traore, M. Diagana, M. B. Essalem.....178

## **Survival Outcome of Wilms Tumor with Multi-Modality Treatment at Jimma Hospital, Southwest Ethiopia**

M. Birara, G. Messele, G. Abera, D. Fufa.....185

## **Severe Coital Accident: A Rare Case of Simultaneous Fracture of the Penis and a Complete Urethral Rupture at the University Hospital of Bouake**

A. K. Patrice, A. N'diamoi, O. Fatoumata, A. Brice, Z. Freddy, A. Venance, K. Sadia, S. D. Kouadio, M. Soro,  
K. Nykan, A. Kacou, D. Koffi.....194

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# A New Device for Intermittent Emptying of the Bladder in Children and Adults: A Long-Term Follow-Up

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## Abstract

**Contextualization:** Emptying the bladder is a challenging problem for the urological community. Intermittent catheterization is the most widely used method to restore bladder emptying mechanism. However, this procedure can have a negative impact on self-image and result in a decline in the quality of life of patients. In this context, the use of a bladder emptying device (SVCATH3D) proposes to be effective and have a positive impact on the quality of life of different patients. **Objective:** The objective of the study was to evaluate the functionality of a new device for both intermittent and controlled emptying of the bladder in both sexes and ages. **Materials and methods:** A randomized clinical trial was conducted with 251 patients, with different bladder problems, from March 2013 to January 2023. After randomization, the patients were divided into two groups: Group I (SVCATH3D) and Group II (Clean Intermittent Catheterization). The primary outcome was defined as the impact on quality of life. Data on episodes of urinary tract infection, adverse effects, number of diaper use and treatment costs were analyzed. **Results:** The apposition of the SVCATH3D was performed on an outpatient basis, with no complications during the procedures. The patients were followed up for 10 years. There was a significant improvement in quality of life when comparing the moments before and after the use of SVCATH3D ( $p < 0.001$ ), as well as there was a significant reduction in the number of episodes of urinary tract infection ( $p < 0.001$ ), absent serious adverse effects and a reduction in the number of diapers or daily protectors. **Conclusion:** The study using SVCATH3D showed promising results in relation to functionality, showing improvement in quality of life with a reduction in episodes of urinary in-

fection and amount of diapers/day. This allows us to conclude that SVCATH3D can represent an important step in the treatment of patients suffering from various bladder problems both incontinence and affecting emptying mechanism.

## Keywords

Clean Intermittent Catheterization, Neurogenic Bladder, New Device, Quality of Life

---

## 1. Introduction

Previous studies [1] about this new bladder-emptying device have been presented in different places and periods, showing the continued evolution of the results (Figure 1).

Neurogenic bladder is characterized by lower urinary tract dysfunction due to neurological impairment [2]. One of the available treatment options is clean intermittent catheterization (CIC), which aims to maintain bladder function as similar as possible to the physiological state in relation to filling and emptying phases [3] [4]. CIC is done at regular intervals that vary according to age, bladder capacity, residual urine volume, and time free from involuntary urine leakage as well as finding a suitable place to perform it. The purpose is to restrain postvoid residual volume by mimicking normal voiding. These measures result in the reduction of risk of urinary tract infection (UTI) [5] [6]. However, to be effective, CIC requires regularity, therefore impacting on daily life activities and generating fixed costs to patients and caregivers [7] [8]. Adherence rate is influenced by negative aspects such as the need of preserved cognition, the presence of pain, and the possibility of urethral injury. For this reason, CIC could impact daily life activities in some patients [9] [10]. To solve these problems, the present study aimed to evaluate the performance of a new intraurethral self-retaining device (SVCATH3D) in both male and female patients with neurogenic bladder or other emptying-impairing diseases, as a possible alternative to CIC. New data shows how well-adjusted the patients were after a long-term follow-up of 10 years.

## 2. Materials and Methods

### 2.1. Design and Sample Selection

A prospective, single institution with the same team of researchers, randomized clinical study was performed, including female and male subjects aged from 5 to 30 years, with neurogenic bladder diagnosis and currently in use of CIC. From March 2013 to January 2023, all patients admitted to our urologic outpatient clinic who met inclusion criteria were enrolled. Exclusion criteria included symptomatic UTI and history of urothelial tumors. Subjects were randomized to two groups, either to use the SVCATH3D (experimental group [GI]) or to continue



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### A NEW SELF RETAINING INTRAURETHRAL DEVICE TO TREAT URINARY INCONTINENCE IN CHILDREN AND YOUNG ADULTS: A PILOT STUDY

Salvador Lima\*, Fabio Vilar, Eugenio Lustosa, Daniel Aragão, Flavia Pinto, Fernanda Calisto.



---

**ABSTRACT**

**Introduction and Objectives:** Clean Intermittent Catheterization (CIC) is the only alternative left to patients suffering from neurogenic bladder and other anomalies. The decrease or absence of urethral resistance leads to a defunctionalized bladder that in some cases requires the increase in outlet resistance and many times needs to be associated to bladder augmentation. We present the results with the use of a removable device which intends to minimize the inconvenience of bladder emptying through intermittent catheterization. **Methods:** The intraurethral device is built up with 2 disks mounted over silicone catheters that are available in different sizes. The total length is 7cm including the intravesical portion. The proximal disk which is fix closes the bladder neck and the sliding distal one is gently adjusted to the urethral meatus to reinforce the continence mechanism and prevent displacement. An occluding mechanism is attached to the tip of the device that opened allowing bladder emptying. This device is supposed to be replaced every 6 months. It is introduced transurethrally using a specific pusher. Twenty five patients with ages ranging from 3 to 21 years (mean 11.2) were included in the present study. Inclusion criteria were being already in CIC program or having reduced or absent urethral resistance with bladder capacity below 50ml. Seven patients had bladder augmentation (2 simultaneously) and 2 had the device applied in incontinent abdominal urethra. Two boys had the device applied through a perineal urethrostomy. The device should be open to empty the bladder by the patient or care giver at the time that scheduled to perform CIC. Results were evaluated by occurrence of complications such as infection, bleeding and patient and parents satisfaction which was measured by a simplified quality of life score (ICIQ-SF). **Results:** Followup ranges from 1 to 16 months (mean 6.6). No symptomatic infection or significant bleeding were observed during this period. The main problem was some difficulty in handling the device during the first few days after implantation. Patients and parents satisfaction was considered outstanding in all cases and the fact of being off pants is reported as one of the main advantages. **Conclusion:** The improvement in quality of life with reduction or elimination of pads and frequent catheterization may represent a step forward with the use of this device in the management of children and young adults suffering from neurogenic disease.

**OBJECTIVES**

To present the results with the use of a removable device which intends to minimize the inconvenience of bladder emptying through intermittent catheterization. Procedures related to the manipulation of the probe, and patients' quality of life were also addressed.

**METHODS**

The intraurethral device (Figure 1) is built up with two disks mounted over silicone catheters that are available in different sizes. The proximal disk which is fix closes the bladder neck and the sliding distal one is gently adjusted to the urethral meatus to reinforce the continence mechanism and prevent displacement. Inclusion criteria were patients being already in CIC program or having reduced or absent urethral resistance with bladder capacity below 50ml. The sample consisted of 25 patients aged 3 to 21 years.

**RESULTS**

There were 23 girls and 2 boys who were followed up for a median of 6.6 months. Seven patients had bladder augmentation (2 simultaneously) and 2 had the device applied in incontinent abdominal urethra. Two boys had the device inserted through a perineal urethrostomy. The device should be opened to empty the bladder by the patient or care giver at the time that scheduled to perform CIC. Results were evaluated by occurrence of complications such as infection, bleeding and patient and parents satisfaction which was measured by a simplified quality of life score (ICIQ-SF).

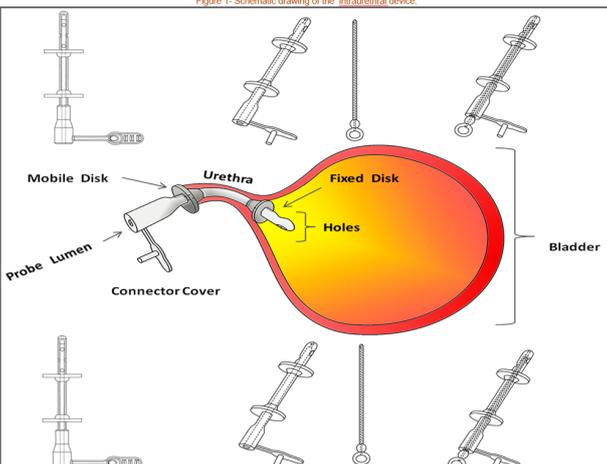


Figure 1- Schematic drawing of the intraurethral device.

**Table 1- Percentage of responses of patients for loss of urine before and after use of the device.**

| BEFORE              | AFTER           |
|---------------------|-----------------|
| ALL THE TIME        | WHEN THEY SLEEP |
| 72%                 | 12%             |
| NO URINARY RESPONSE | NEVER           |
| 28%                 | 88%             |

Regarding the use of diapers per day was reduced after using the device (Figure 3).

Figure 3- Use of diapers a day before and after of the intraurethral device.

| OFF PANTS/DAY | BEFORE | AFTER |
|---------------|--------|-------|
| 0             | 0      | 0     |
| 1             | 0      | 0     |
| 2             | 0      | 0     |
| 3             | 0      | 0     |
| 4             | 0      | 0     |
| 5             | 0      | 0     |
| 6             | 0      | 0     |
| 7             | 0      | 0     |
| 8             | 0      | 0     |
| 9             | 0      | 0     |
| 10            | 0      | 0     |
| 11            | 0      | 0     |
| 12            | 0      | 0     |
| 13            | 0      | 0     |
| 14            | 0      | 0     |
| 15            | 0      | 0     |
| 16            | 0      | 0     |
| 17            | 0      | 0     |
| 18            | 0      | 0     |
| 19            | 0      | 0     |
| 20            | 0      | 0     |
| 21            | 0      | 0     |
| 22            | 0      | 0     |
| 23            | 0      | 0     |
| 24            | 0      | 0     |
| 25            | 0      | 0     |

**Table 2- Mean ratio of ICIQ-SF scores related to the impact of urinary incontinence in quality of life.**



Figure 2- Mean ratio of ICIQ-SF scores related to the impact of urinary incontinence in quality of life.

**CONCLUSION**

The improvement in quality of life with reduction or elimination of pads and frequent catheterization may represent a step forward with the use of this device in the management of children and young adults suffering from neurogenic disease. However, other studies are needed with a larger number of patients to demonstrate the effectiveness of the device.



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**A NEW DEVICE FOR INTERMITTENT EMPTYING OF THE NEUROGENIC BLADDER IN FEMALE: A PHASE II, RANDOMIZED TRIAL**

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**A NEW DEVICE FOR INTERMITTENT EMPTYING OF THE BLADDER**

**SALVADOR V. C. LIMA, MD, PhD**

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 Health Science Center – Department of Surgery/Urology  
 Recife, PE - Brazil




Figure 1. The continued evolution of this new bladder-emptying device has been shown in different places and periods [1].

using CIC (control group [GII]). The participants were separated into the groups using a list of random numbers that had been generated using Random Allocation Software, version 1.0. The list was drawn up by a member of the team who was not involved in collecting the data. One researcher determined the group to which the participants would be allocated by consulting the randomization list. The analysis was conducted by protocol and baseline and posttreatment assessments were compared between (SVCATH3D vs CIC) and within groups (pre-post analysis) according to the trial profile. The institutional review board approved the study protocol (number: 728.793) and all patients provided written informed consent. The sample size followed determinations of National

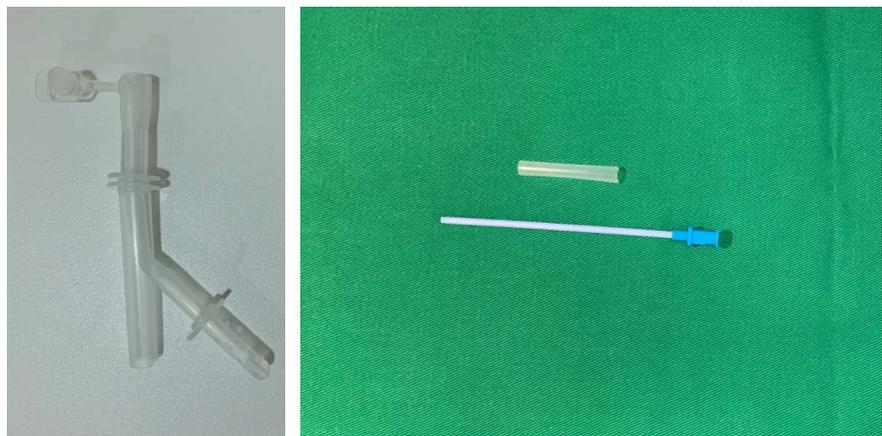
Agency of Sanitary Surveillance (ANVISA) directed to the type of clinical research phase II: “First controlled studies in patients to demonstrate the potential effectiveness of the medical device (100 to 200 volunteers).” In addition to ANVISA determination, the sample size formula was used to describe the population represented by a quantitative variable, comparing two groups. To satisfy all dimensions, the minimum sample estimated was 94 patients (47 individuals per group). In both groups, all patients had been using oral anticholinergics and this regimen was maintained all the period. None has submitted to botulinum toxin application or another way to control detrusor overactivity.

## 2.2. Materials

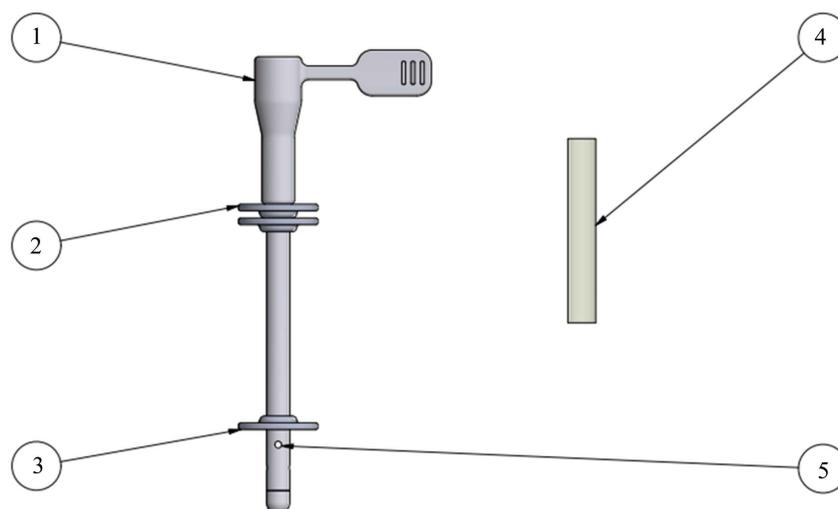
The SVCATH3D was made with medical grade silicone and is available from 13 to 23 Fr in diameter with two different sizes (7 cm, used for children, and 8 cm for adults). Details on manufactured, structure and insertion have been published in previous pilot study [11]. The device structure was formed by three disks (1 proximal, fixed and 2 others mobile, used to accommodate the device to the patient’s urethra), and a cover connected to the lumen of the catheter (**Figure 2** and **Figure 3**). This new device structure, changed from the 2-disk model of 2018, proved to be better at reducing periurethral leakage. The fixed disk was positioned at the bladder neck from the inside. The mobile one is positioned at the level of the external urethral meatus and can be adjusted to completely occlude the bladder neck. The urinary catheter used in CIC was typically made of plastic (PVC). The sizes variations were between 8 and 12 Fr, in accordance with the age and urethral size.

## 2.3. Insertion Technique

The size of SVCATH3D was chosen according to the anatomy of each patient, urethra size, and age. SVCATH3D was inserted by simple technique and with local anesthesia, in an outpatient setting and without the need for optical instruments or sedation. The technique of routine asepsis of the genital and perineal



**Figure 2.** SVCATH3D with insertion guides, which can be done in an outpatient setting.



**Figure 3.** External portion of the catheter, sealed by a plastic lid. (2) Outer discs; (3) Inner disc, which occludes the bladder neck; (4) Insertion device; (5) Inner portion of the catheter, with holes for urine drainage.

region, then urethral lubrication with lidocaine 1% in the form of gel and direct introduction of SVCATH3D coupled in the rigid pusher. After that, the pusher was removed sequentially, and the distal discs were adjusted to the size of the urethra [11].

In the male candidates, the SVCATH3D can be inserted either through a small perineal urethrostomy or through a suprapubic incision (Figure 4 and Figure 5).

## 2.4. Follow-Up

Patient follow-up was performed through presential visits in the third and sixth months previously scheduled, in addition to extra evaluation in cases of inter-currences or during the device exchanges which is recommended after 2 months [12].

## 3. Results

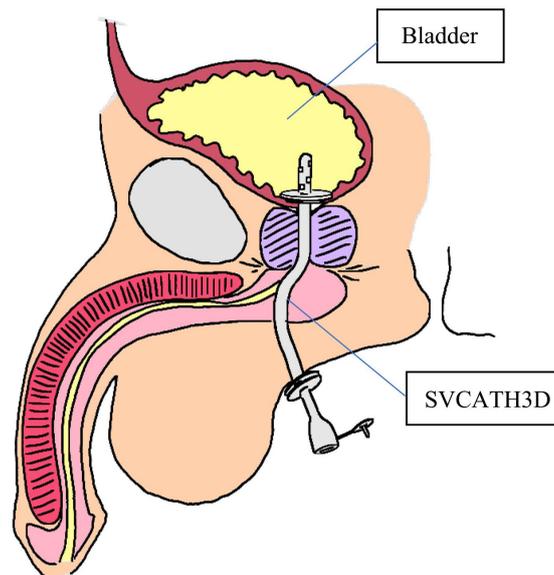
The results have been previously disclosed in a previous study [1]: a total of 177 subjects were included, 91 children ( $11 \pm 6$  years) and 86 adults ( $41 \pm 17$  years). The most prevalent conditions at baseline evaluation and demographic characteristics were shown in the previous study. Preliminary studies with a larger patient base and longer follow-up are being held.

### 3.1. Quality of Life Analysis

QOL data was homogeneous between groups at baseline evaluation. In the intergroup analysis at 6 months, the following mean values and standard deviation of the scores were observed for each domain: limitation G1 =  $2 \pm 0.7$  and GII =  $7 \pm 0.67$ ; fear G1 =  $2.5 \pm 1$  and GII =  $8 \pm 0.61$ ; feeling G1 =  $2 \pm 0.71$  and GII =  $6 \pm 0.98$ ; impact on daily life G1 =  $2.5 \pm 0.89$  and G2 =  $8 \pm 0.4$ .



**Figure 4.** (1) Perineal Insertion of the Catheter; (2) Insertion through Suprapubic incision, both in males.



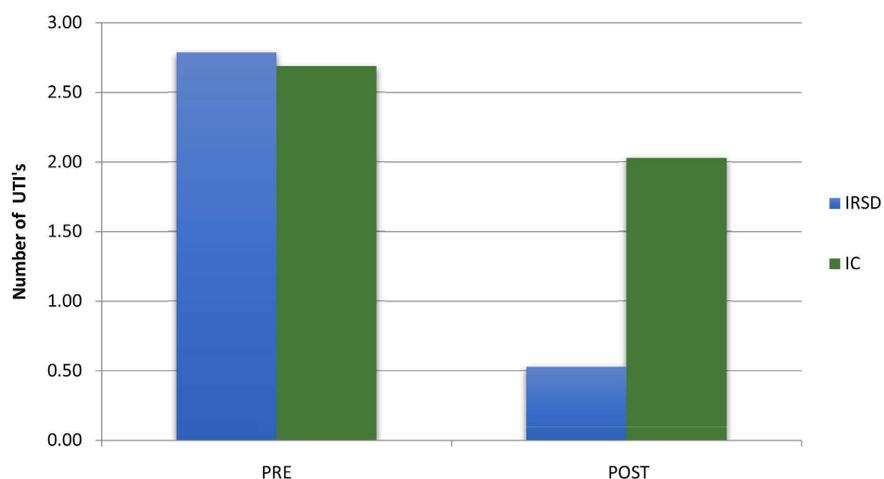
**Figure 5.** Perineal positioning of the SVCATH3D.

### 3.2. Number of Catheters Used

The SVCATH3D showed a clear advantage against CIC when taking the number of catheters used into consideration. One single SVCATH3D can be exchanged after 2 months of usage, while CIC used a mean of 6 catheters per day, representing 360 urethral catheters used in the same period as a single SVCath3D.

### 3.3. Urinary Tract Infection Episodes

The number of UTI episodes was compared between groups (GI and GII) at 6 months, with a significant statistical difference between groups. We found that the SVCATH3D group presented a significant reduction (rate of reduction of two episodes) in the number of episodes after the use of the device (intragroup analysis; **Figure 6**). Infection reduction was also found in CIC, but less significant than in the other group. The most frequently described pathogen was *Escherichia coli* in both groups.



**Figure 6.** Analysis of the number of UTI episodes. IC, intermittent catheterization; IRSD, intraurethral self-retaining device; UTI, urinary tract infection.

### 3.4. Urodynamic Parameters

Bladder capacity and compliance were assessed. In the intragroup analysis (SVCATH3D group) there was a statistically significant increase in bladder capacity when comparing the mean values of baseline evaluation (202 mL) with the post-intervention evaluation (282 mL); representing a mean difference of 80 mL or a 40% increase in relation to the initial bladder capacity. No difference was observed in the intragroup analysis of the CIC group. In the intergroup analysis, at 6 months post-intervention, the SVCATH3D group presented higher bladder capacity and compliance as compared with those who followed the CIC protocol, with  $p = 0.001$  and  $p < 0.001$ , respectively.

### 3.5. Adverse Effects

According to the previous categorization, the intergroup analysis of adverse effects was performed. Among all adverse effects, the SVCATH3D group presented an incidence of 41%, while the CIC group presented with 83% ( $p < 0.01$ ).

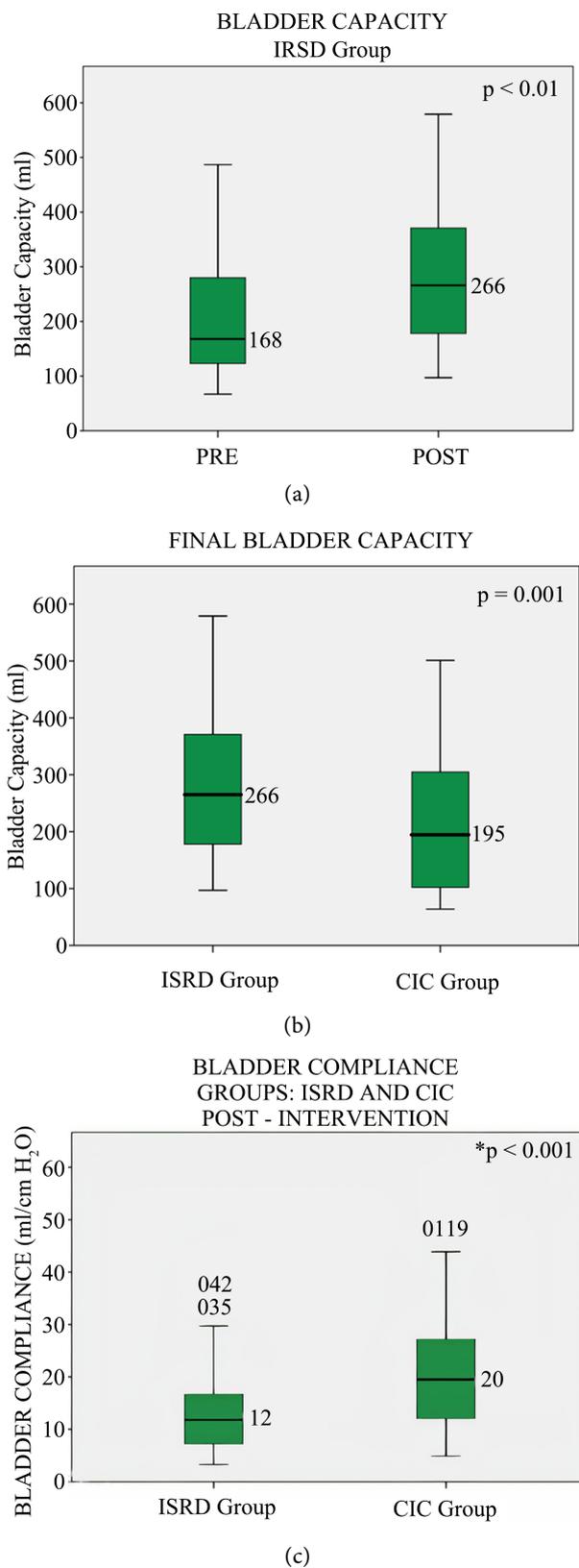
### 3.6. Number of Daily Diapers or Daily Protectors

Both groups presented a mean use of  $7 \pm 2$  diapers per day at baseline evaluation. At 6 months (intergroup analysis), the SVCATH3D group presented a significant reduction of diaper use with 2 units per day, while CIC group maintained the use of 6 units/day ( $p < 0.01$ ).

## 4. Discussion

CIC represents the main treatment alternative for patients with neurogenic bladder who are unable to perform bladder emptying adequately [6]. However, the practicality of this technique is influenced by a negative impact on QOL, compromising patients' self-esteem [11]. In this context, SVCATH3D presents advantages as an alternative to CIC, such as the possibility of management as an

outpatient procedure both for initial insertion and replacement. Such advantages result in greater autonomy of patients that perform bladder emptying, which significantly affects social interaction. One of the most relevant reports by patients and caregivers was the fact that they could empty their bladders at the precise moment they wanted without having to look for an adequate place to do so. Adults reported how pleasant was the sensation of emptying their bladders at the toilet without anyone's help. This improvement in QOL was reflected by a significant score reduction on the SF-QUALIVEEN questionnaire, both in the intergroup comparison (post-SVCATH3D vs post-CIC moment) and intragroup temporal comparison. Among the reported benefits, adult patients have mentioned resumption of active sexual life without constraints, reduction of social isolation, and increase of autonomy. Child patients have reported reintroduction in school dynamics and the freedom to participate in social activities. The possible placebo effect could not be assessed by the study method. In relation to the incidence of UTIs, SVCATH3D promoted a reduction in the number of episodes in 6 months. Previous reports have shown that CIC-related UTIs are frequent, with the incidence of 70% to 80% [13] [14] [15] [16]. It is important to emphasize that the practicality in the handling of the device also interferes in this outcome, because patients can open the device anywhere, while intermittent catheterization requires specific setting and conditions. Our hypothesis is that by reproducing the physiological voiding reducing the accumulation of residue plus raising the frequency of emptying (therefore improving bacterial elimination), the device has promoted this improvement. This benefit may be explained by the directions given for patients how to execute the catheterization. Regarding urodynamic data, the SVCATH3D presented an expressive gain in bladder capacity and compliance (**Figure 7**). This can be attributed to mechanisms of distension and contention of the bladder, which are enabled by the attainment of maximum cystometric capacity. This can be explained by the fact that by emptying the bladder at a more appropriate time and not depending on availability of a new catheter and adequate place to perform CIC the bladder tends to behave closer to a normal pattern. Risks of deterioration of upper tracts should not exist because by doing bladder emptying at shorter intervals for the same reasons upper and lower tract tend to behave more physiologically. These results are in agreement with data from the previous reports that showed bladder capacity gain due to the reduction of urinary loss [17] [18]. Experimental studies have also presented an improvement of bladder compliance after detrusor musculature distension [19] [20] [21]. The proportion of total adverse events in the SVCATH3D group was approximately half of those found in the CIC group, while more than 50% of the patients in the SVCATH3D group did not present any side effects. This result agrees with the data obtained in the pilot study [12] and with previous studies that idealized alternative devices to CIC [22]. Regarding the number of diapers used daily by subjects, both the SVCATH3D and CIC groups used an average of 7 units per day at baseline evaluation, but only the SVCATH3D



**Figure 7.** (a) Intragroup analysis (ISRD) of bladder capacity; (b) Intergroup analysis of the bladder capacity; (c) Intergroup analysis of the bladder compliance. ISRD, intraurethral self-retaining device.

promoted a significant reduction after 6 months (2 units per day). This reduction is in disagreement with two recent reports by Jeong *et al.* [23] and Renard *et al.* [24], in which authors reported no difference in urine leakage and diaper use after the intervention. In the pilot study conducted by our group [12], the SVCATH3D demonstrated safety and handling suitability. The present study provides new data that reinforces the SVCATH3D as a viable alternative to intermittent catheterization with significant advantages concerning all analyzed parameters. Currently, studies with larger population and longer follow-up are being held.

## 5. Conclusion

The new bladder-draining device (SVCATH3D) has previously been shown to be a safe and promising alternative for adequate bladder emptying in both male and female patients. The present studies reinforced the safety and ease of handling of the device as well as demonstrated a positive impact on the clinical and psychosocial parameters of the subjects involved.

## Conflicts of Interest

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

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# Mucinous Carcinoma of the Scrotum about a Case in Yaounde

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## Abstract

**Aim:** This paper aims to report the second case of mucinous carcinoma of the scrotum revealed by scrotal fistulas listed in the literature and highlight the difficulties in the search and difficulties encountered in the management of urogenital cancers in developing countries. **Case presentation:** This was a 62-year-old patient who had consulted for fistulized lesions of the scrotum associated with urinary disorders. Physical examination found budding lesions in the scrotum from which mucus was leaking. The diagnostic assessment carried out consisted of a biopsy sample of the scrotal lesions, a blood analysis and medical imaging, which led to the diagnosis. The mutilating nature of the surgery proposed to the patient after multidisciplinary consultation meeting and the expensive cost of chemotherapy drugs constituted the limits of the patient's therapeutic management. **Conclusion:** Mucinous carcinoma of the scrotum is rare and primary lesion should always be sought. The presence of budding lesions of the scrotum with discharge of mucus should suggest the diagnosis.

## Keywords

Scrotal Cancer, Mucinous Carcinoma, Scrotal Fistulas

## 1. Introduction

Malignant tumors of the scrotum are rare and constitute a heterogeneous group

of tumors whose histological types derive from the different constituents of the scrotum [1]. The most frequent histological types are squamous cell carcinoma, extra-mammary Paget's disease, basal cell carcinoma and sarcoma [1]. The mucinous type is very rare and has only been described once before this case [2]. Most often it is a digestive tumor (ano-rectal) that extends secondarily to the scrotum. Clinically, the symptomatology is not specific and the presence of scrotal and perineal fistulas can lead the diagnosis to wander towards a tuberculous etiology, thus delaying its management especially if there are associated urinary disorders. We report the second case of malignant mucinous tumor of the scrotum revealed by scrotal and perineal fistulas while highlighting the difficulties in diagnosing this tumour.

## 2. Observation

Mr. M. retired police officer, aged 62, had consulted for budding and fistulized lesions of the purse and perineum evolving for several years associated with dysuria, a feeling of incomplete bladder emptying and nocturia with 3 nocturnal lifts without urgency nor involuntary loss of urine through the anus. The past medical history had revealed nothing. The patient had a stage 2 WHO performance score, an enlarged bursa with the presence of 2 budding lesions through which malodorous urine was leaking, there was also a budding lesion in the perineum (Figure 1). The two testicles were palpated at the bottom of the purses without any anomaly, the digital rectal examination was normal. The general examination had not objectified superficial lymph nodes. The diagnosis of urethral stricture associated with scrotal tuberculosis was mentioned. The patient had a cystostomy associated with a biopsy of the scrotal lesion. The blood test performed revealed mild anemia at 11.3 g/dl, normal kidney function, normal tuberculin IDR, CRP at 96 mg/l, ECBU had revealed an ofloxacin-sensitive *Pseudomonas aeruginosa* urinary tract infection, and urine and sputum were negative for BK. The radiological assessment carried out had revealed the retrograde cystography: vesico-rectal and vesico-perineal fistulas (fistula between the right edge of the anal canal which communicates with the anal margin) with a permeable urethra and the CT scan which had confirmed this fistula showing a translevatorian fistulous path along the anal wall at 6 o'clock and 12 o'clock associated with an infiltration and a mass of the perineum without affecting the rectum and with preservation of the fatty cleavage. The thoracic and abdominal levels did not reveal any secondary-looking lesion or adenomegaly. The histological examination of the biopsy sample concluded to a malignant mucinous tumor of the scrotum or extended to the scrotum. The immunohistochemistry of the sample could not be performed due to financial problems. A radical scrotoectomy associated with an abdomino-perineal amputation and systemic chemotherapy had been proposed to him at the end of the multidisciplinary consultation, but the patient refused because of the mutilating nature of the procedure and the potential side effects of the chemotherapy despite the information provided on the prognosis of his disease.



**Figure 1.** Initial appearance of scrotal lesions.

### 3. Comments

First described by Sir Percival Pott, scrotal carcinoma was the first cancer linked to occupational exposure [3]. It is a rare tumor with an overall annual incidence of approximately 1.5/1,000,000 people in Western countries [4]. Currently, most cases are due to poor hygiene and chronic inflammation [4]. Wright and al had listed, on 471 patients, the different histological types of scrotal carcinoma and had not found any mucinous carcinoma [1]. To our knowledge, this is the second case of mucinous carcinoma of the scrotum described; only one study has reported the case of a mucinous carcinoma of the scrotum in the literature before ours [2].

In our case, the diagnosis of mucinous carcinoma of the scrotum was made on the occasion of the assessment of fistulized lesions of the scrotum and perineum in search of BK or tubercle bacilli and the secondary appearance of lower digestive fistulas objectified by the UCRM and CT suggested a primary digestive origin (rectal/anal) which could not be confirmed by colonoscopy because the patient refused for fear of sedation. Mucinous carcinomas of the anal canal are rare tumors that pose diagnostic problems, especially when associated with scrotal fistulas. Their non-specific symptomatology is often the cause of misdiagnosis which delays treatment. The diagnosis can be evoked in front of rectalgia and proctalgia although these signs are not specific. However, mucus coming out of the fistulous orifices is an important sign that could be suggestive [1]. However, the diagnosis of certainty is based on the histological analysis of the fistulous paths, as was the case in our case. Because of their rarity, there are no recommendations or expert opinion concerning assessment as well as the management of these cancers. Nevertheless, pelvic MRI seems to be the examination of choice

for the local evaluation of these cancers by precisely highlighting the anatomical relationships between the various fistulous tracts and the anal sphincter as well as the posterior wall of the bladder and the urethra [5]. Cystoscopy and colonoscopy are also indicated, particularly in the event of associated symptoms of the lower urinary tract and proctalgia. In our case, these examinations were offered to the patient who did not give his consent despite the information given to him on their diagnostic and therapeutic interest. The patient said he was financially exhausted. Therapeutically, the rarity of this cancer also means that there is no consensus in the literature. In our patient, after a multidisciplinary consultation meeting, we opted for a radical scrotoectomy associated with abdomino-perineal amputation then adjuvant systemic chemotherapy. But the patient refused the surgery judging the top gestures to be mutilating.

#### 4. Conclusion

Scrotal carcinoma is a rare tumor; it is most often primary and is usually due to occupational exposure or poor hygiene with chronic inflammation of the scrotum. Mucinous carcinoma of the scrotum represents a rare entity of this cancer. The presence of scrotal fistulas should lead to evoke the diagnosis and perform a histological analysis of the lesions, especially if there is a discharge of mucus. The search for a primary lesion must be vigorous in order to propose an adequate treatment guaranteeing a satisfactory survival for this cancer whose evolution and prognosis are serious.

#### Contribution of the Authors

Boris AMOUGOU examined the patient and wrote the manuscript.

All the other authors participated in the discussions on the diagnostic and therapeutic management of the patient and participated in the drafting of the manuscript, read it and approved the final version of the manuscript.

#### Patient Consent

The patient gave his consent after we clearly explained to him the interest for the scientific community to publish his case.

#### Conflicts of Interest

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

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# Adult Kidney Cancer in Mauritania: Clinical and Therapeutic Aspects

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## Abstract

**Introduction:** since its creation, our urology department has taken care of tumor pathologies in particular kidney cancer in adults; our goal is to study the clinical and therapeutic epidemiological profiles of adult kidney cancer in Mauritania. **Materials and Methods:** We carried out a retrospective study over a period of six years, from January 1, 2012 to December 31, 2017, including all cases of adult kidney cancer registered in the urology-andrology departments of the Cheikh Zayed Hospital and Pathological Anatomy of the National Hospital of Nouakchott (Mauritania). **Results:** we collected 50 cases of kidney cancer. The average annual incidence was 8.3 cases. The average age of the patients was 52.98 years with extremes of 18 and 84 years. There was a female predominance (52%) or 29 women for 21 men. Lumbar pain was the most frequent clinical expression, more than half of the patients had symptoms over a period of at least 12 months before the first consultation. The left kidney was the most frequently affected. The right localization was demonstrated in 23 patients, the extension assessment was made with thoraco-abdomino-pelvic CT in 40 patients. Twelve patients had a tumor localized in the kidney. The extension assessment had made it possible to objectify the existence of metastases in 17 of our patients (37%). The preferred locations of these metastases were pulmonary and hepatic. Surgical intervention was performed in 44 patients (88%), of whom 36 underwent radical nephrectomy (72%), and two patients underwent partial nephrectomy (4.5%). Surgical abstinence was decided from the outset in 6 patients (13.6%). None of our patients had received treatment with anti-angiogenics. The histological type most observed in our patients was renal cell carcinoma, observed in 34 patients, or 77.72%. At the time of the study, more than a third of the patients had died. The mortality rate in our series had reached 24%. A specific survival rate could not be assessed due to lack of information in the files and signifi-

cant numbers of patients lost to follow-up at the time of the study. **Conclusion:** adult kidney cancer in Mauritania is characterized by its low incidence, its occurrence in a relatively young population, its female predominance, its often late diagnosis at locally advanced and metastatic stages, and the treatment is the most often surgical.

## Keywords

Adult Kidney Cancer, Mauritania, Clinical and Therapeutic Epidemiological Profiles

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## 1. Introduction

Kidney cancer is a primary malignant tumor developed at the expense of the renal parenchyma. It represents 3% of all malignant tumors in adults and ranks 3rd among urological cancers after prostate and bladder cancer [1]. The sex ratio is approximately two men to a woman. The median age at diagnosis is 67 years in men and 70 years in women [2] [3].

Kidney cancer in adults has a variable incidence depending on the geographical region. In Mauritania, it is found in 16th place for all types of cancer combined according to data from the register of the anatomopathology department of the National Hospital of Nouakchott [4]. A progressive increase in the incidence of kidney cancer has been observed in industrialized countries, due to the improvement of diagnostic techniques, but probably also due to changes in lifestyle [5], the diagnosis is evoked in the face of clinical and radiological arguments but only the anatomopathological examination can confirm the diagnosis with certainty. Knowledge of the histological type makes it possible to make the histo-prognostic classification of patients and consequently to promote better management and follow-up of patients. Therapeutically, radical nephrectomy remains the reference treatment for adult kidney cancer at the localized stage, hence the importance of early diagnosis. As for the advanced forms, they are increasingly treated with anti-angiogenics. The aim of this study was to study the current epidemiological and clinical profiles of kidney cancer in Mauritania.

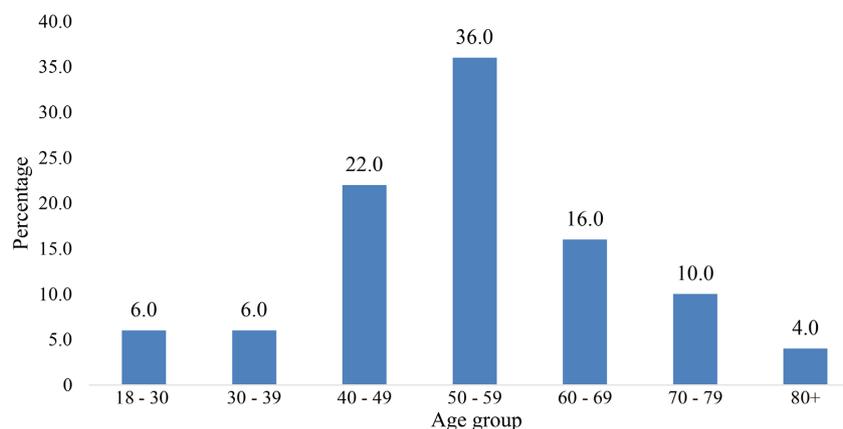
## 2. Patients and Methods

We carried out a descriptive and analytical retrospective study in the urology department of the Cheikh Zayed hospital in Nouakchott over a six-year period from January 2012 to December 2017. This study collected all cases of kidney cancer from the adult (from 18 years old). The different parameters studied were: epidemiological aspects (age, sex, risk factors), clinical aspects, circumstances of discoveries the general signs, the physical signs, the general state of the patients were evaluated according to the WHO classification, the consultation time, the biological assessments, the results of the medical imaging (ultrasound, CT scan) The anatomopathology results of the operating room, location of the

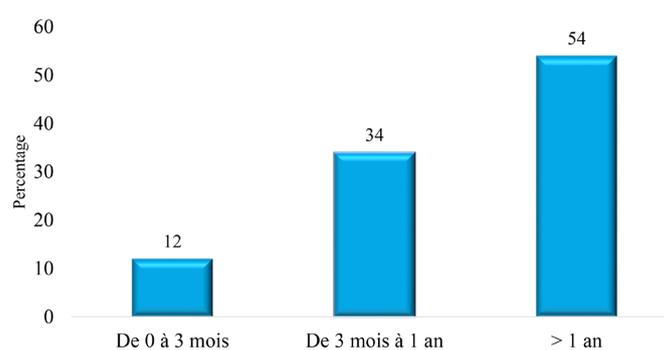
tumour, Fuhrman grade and pTNM classification, the analysis of the collected data was carried out by the Epi info 6 software.

### 3. Results

During the duration of the study, we collected 50 cases of kidney cancer. So the average annual incidence was 8 cases. Peaks were noted in 2012 and 2013 with 23 new cases diagnosed, *i.e.* 46% of the patients in the series. Outside this period, the number of new cases was on average 6. The average age of patients was 52.98 years with extremes of 18 and 84 years. The most affected age groups were between 50 and 59 (**Figure 1**). There was a female predominance (52%) or 29 women for 21 men with a sex ratio of 1.5. Eighteen (36%) patients had at least one risk factor for kidney cancer. These were high blood pressure (61.11%), smoking (33.3%) and obesity (33.3%). Lumbar pain was the most common clinical expression in fact low back pain was noted in 46 of our patients in 92% of cases. Haematuria was demonstrated in 29 patients (58%). Furthermore, only one patient (2%) had had an incidental discovery. The average duration of evolution was 15 months (**Figure 2**). More than half of the patients had symptoms over a period of at least 12 months before the first consultation. Ultrasound was performed in 44 patients and revealed the renal tumor in 38 of the cases, or 86%. Computed tomography performed in all patients confirmed the diagnosis in all cases. MRI and UIV imaging examinations were not performed in any of our patients. The complete blood count carried out in all our patients objectified: anemia in 21 patients, or 42%. Evaluation of renal function by measuring blood urea and serum creatinine revealed renal failure in 5 patients. The left kidney was the most frequently affected with 27 patients or 54% of our patients. The right location was objectified in 23 patients, 46% of the series. The extremes were 2.8 cm and 24.6 cm. In the majority of cases the long axis of the tumor exceeded 7 cm, 04 patients had a tumor with a long axis not exceeding 4 cm. The extension assessment was made with thoraco-abdomino-pelvic CT in 40 patients. No patient had a bone scan or an MRI of the axial skeleton. The TNM classification of the tumor was specified in 40 patients. Twelve patients had a tumor localized in the kidney (**Table 1**). The extension assessment had made it possible to objectify the existence of metastases in 17 of our patients (37%). The preferred locations of these metastases were pulmonary and hepatic. Surgical intervention was performed in 44 patients (88%), of whom 36 had radical nephrectomy (72%), two patients had partial nephrectomy (4.5%). Surgical abstention was decided from the outset in 6 patients (13.6%). None of our patients had received treatment with anti-angiogenics. Histological examination was performed in 44 patients (86%). The histological study was performed on the nephrectomy specimen in all patients. The anatomopathological study objectified a predominance of clear cell adenocarcinoma of the kidney found in 34 patients 77.72%. Tubulo-papillary carcinoma is a histological variant present in 9 patients 20.45%, one case of chromophobe renal cells 2.2%.



**Figure 1.** Distribution of patients by age group.



**Figure 2.** Distribution of patients according to duration of symptom evolution.

**Table 1.** Distribution of patients according to the evolutionary stage.

| Evolutionary stage      | Number | Percent |
|-------------------------|--------|---------|
| Localized cancer        | 12     | 30%     |
| Locally advanced cancer | 20     | 50%     |
| Metastasized cancer     | 8      | 20%     |

## 4. Discussion

Renal cell carcinoma (RCC) represents 2% to 3% of all cancers [6], the highest incidence has been observed in Western countries especially in recent decades. The number of cases recorded in our series during the periods 2012-2017 is 55 cases but only 50 files were retained, several files were unusable. This incidence is comparable to that reported in Senegal by Fall *et al.* [7] who had found 8.5 But much lower than that reported in Algeria by Harira *et al.* [3] or 14.3. The increase in frequency and incidence could be explained with the development of medical imaging methods which made the diagnosis of kidney cancer easier. In our series, the average age of patients was 52.98 years with extremes of 18 and 84 years. The most affected age groups were: those between 50 and 59 years (36%). The average age of our patients shows that patients with kidney cancer and treated in our service constitute a relatively young population, this average age is

close to that reported in Benin by Ouattara *et al.* [8], which was  $53.21 \pm 15.55$  years. The difference in mean age between the patients in the series reported in Africa and the patients in the Western series should prompt investigation of environmental risk factors. The breakdown by gender shows a female predominance with a sex ratio of 1.5. This predominance may be due to the widespread obesity among Mauritanian women. The same trend was reported in Senegal for the period 2000-2009 by Fall *et al.* [7] and in Morocco Benjelloun [9] the trend was rather male with a sex ratio of 3.7. This male predominance is reported by several American and European studies [10]. Lumbar pain was the most frequent clinical expression. In kidney cancer, the existence of pain reflects an already advanced disease. Moreover, only one patient (2%) had had an incidental discovery of cancer in our series. Contrary, the series reported in Western countries show that kidney cancer is often discovered by chance thanks to the contribution of medical imaging which allows the detection of small tumors. The average duration of symptom evolution in our patients was 15.4 months. This long period of consultation could be explained by the fact that on the one hand the clinical manifestations of kidney cancer are often late but on the other hand, because of the low level of education and the lack of awareness. In addition, other factors are also involved, in particular poverty, the lack of specialized health structures and their remoteness when they exist, the absence of social cover, the consideration given to traditional medicine in our regions, which is sometimes the cause of delay in consultation in a health structure. In Western countries, discovery occurs earlier and earlier due to the development of imaging methods. More than half of our patients (24/41) had cancers whose long axis exceeded 7 cm. This observation is consistent with the long delay in consultation. The long axis of the tumor is also one of the parameters to be taken into account in the surgical indications. The extension assessment was done with thoraco-abdominopelvic CT, in the majority of patients (40/50). It is known that CT is the reference examination in the absence of contraindications to iodinated contrast products. Moreover, 90% of pulmonary or hepatic metastases are asymptomatic, hence the need to carry out this extension assessment. In our study, MRI was not carried out in any of our patients. This examination should be carried out in principle in patients with renal insufficiency (MDRD clearance < 60 ml/min), or presenting a proven contraindication to iodinated contrast products. MRI also appears particularly useful in the exploration of cystic tumors and small tumors poorly characterized by other imaging examinations [8]. The TNM classification of the tumor was specified in 40 patients. 12 patients had a localized tumor in the kidney 30%. The tumor was locally advanced or metastasized in most cases. This high percentage was found in Harira *et al.* [9]. In Algeria but contrasting with that observed in Western countries where nearly 60% of cases are now discovered fortuitously at an early stage. Hepatic metastases were present in 6% of patients while secondary pulmonary localizations were present in 8 patients (30%) and 6 patients had metastases involving at least two sites. The two predictive prognostic systems of the response to immunotherapy which have been

widely used are the model of the French Group of Immunotherapy and the model of Motzer [11], recently that of MSKCC. That of MSKCC could not be applied in our retrospective series because of the risk of missing data. Surgical intervention was performed in 44 patients (88%), among them two patients had a partial nephrectomy (4.5%). None of our patients had received treatment with anti-angiogenics. These results are consistent with those of the previous decade in Dakar Fall *et al.* [7]. Since the work of Robson in 1969 [12], radical nephrectomy has been the reference treatment. In metastasized cancers, it is said to be cyto-reductive. Retrospective studies have also shown an improvement in survival when nephrectomy was performed in patients but The data from the CARMENA study demonstrate in patients with metastatic kidney cancer that the antitumor efficacy of targeted therapy with sunitinib alone is not inferior to that of a treatment combining surgery and sunitinib [13]. All our interventions were performed in conventional surgery; the Laparoscopy and robot are not available in our practice. In our study, surgical abstention was decided from the outset in 06 patients (13.6%) who had metastasized tumors with deterioration in general condition. Anti-angiogenic treatment is still not available in Mauritania; no patient has been able to obtain it. The cost of these anti-angiogenics is the real obstacle to their use in our poor countries. In our series, a specific survival rate could not be assessed due to lack of information in the records and significant numbers of patients lost to follow-up at the time of the study.

## 5. Conclusion

Adult kidney cancer in Mauritania is characterized by its low incidence, its occurrence in a relatively young population, its female predominance, its often late diagnosis at locally advanced and metastatic stages, and the treatment is the most often surgical.

## Conflicts of Interest

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

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# Survival Outcome of Wilms Tumor with Multi-Modality Treatment at Jimma Hospital, Southwest Ethiopia

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## Abstract

**Background:** Wilms' tumor (WT), the most common malignant neoplasm of the urinary tract of children [1], accounts for 5.9% of childhood cancers and affects one in every 10,000 children worldwide before the age of 15 years. The care of children with Wilm's tumor in sub-Saharan Africa is compromised due to resource deficiencies that range from inadequate healthcare budgets to paucity of appropriately trained personnel. Childhood Wilms tumor is surgically an important paediatric problem in developing and sub-Saharan Africa countries. The objective of the study is to establish an understanding on the treatment challenges and outcomes of Wilm's tumor in South West Ethiopia. **Results:** Forty-three Wilm's tumor patients who were admitted from January 2017 to December 2021 were included in the study. The most frequent presentation was painless abdominal swelling in 40 (93%) patients. Fourteen patients (32.6%) were hypertensive at the time of diagnosis and the other 13 (30.2%) were normal. In abdominal examination, 31 (72.1%) patients had abdominal mass not crossing the midline and 12 (27.9%) had mass crossing the midline. After multimodal treatment, 37.5% had improvement, 11.6% came back with relapse. Most patients (41.7%) abandoned treatment and 9.3% of the cohort died in the course of treatment. **Conclusion:** The outcomes in the treatment of Wilms Tumor have been found to be poor in this review. The main reason for poor outcome has been not receiving adequate chemotherapy after surgery. Doses of chemotherapy received after surgery significantly affected treatment outcomes ( $p = 0.026$ ).

## Keywords

Wilms, Survival, Treatment, Childhood Tumor

## 1. Background

Wilms' tumor (WT), the most common malignant neoplasm of the urinary tract of children [1], accounts for 5.9% of childhood cancers and affects one in every 10,000 children worldwide before the age of 15 years. [2] It is an embryonal neoplasm of the kidney in which blastemal, stromal and epithelial cell types are present in variable proportions [3].

In most pediatric malignancies, the survival rate of Nephroblastoma Wilms' tumor (WT) patient has noticeably improved with modern multidisciplinary cancer management [4]. The care of children with Wilm's tumor in sub-Saharan Africa is compromised due to resource deficiencies that range from inadequate healthcare budgets to paucity of appropriately trained personnel. It is also crippled by scarce laboratory facilities and inconsistent drug supplies making the outcome of this tumor in this setting still poor. All these factors contribute to less than 50% survival at 5 years as most studies report [5].

Patients face difficulties accessing healthcare, affording investigational and treatment protocols, and attending follow-ups. Children routinely present with advanced local and metastatic disease because of which many children cannot be offered any effective treatment. Multiple comorbidities, such as malaria, tuberculosis, and HIV in malnourished patients raise the chance of treatment-related toxicities. Survival rates are invariably poor [5] [6].

Pediatric surgical oncology is not yet regarded as a health care priority by many governments in the region and they are still struggling to achieve the millennium goals [6] Delayed diagnosis, poor compliance to treatment, and lack of multidisciplinary team for selection and stratification of patients prior to the commencement of management also contribute to the poor outcome [7].

Childhood Wilms tumor is surging as an important paediatric problem in developing and sub-Saharan Africa countries [8]. Besides these, there is a great burden of it with the disease being detected in its locally and distally advanced stages when appropriate chemotherapeutic drugs and surgical interventions will be neither available nor effective at all. Childhood solid tumors are becoming responsible for most deaths occurring in the first fifteen years of life [7]. Additionally, comorbidities that coexist along with the malignancy will compound treatment-related toxicities which directly impairs their adherence and effectiveness of the regimen provided with its attending risk of poor survival [5] [9].

The objective of the study is to establish an understanding on the treatment challenges and outcomes of Wilm's tumor in Southwest Ethiopia. It also lays the ground to possibly develop our own protocol or at least adopt protocols from developed countries for the proper and consistent management of Wilm's tumor.

## 2. Methods

The study was conducted at Jimma University Medical Centre (JUMC) South west Ethiopia, which is one of the oldest public hospitals in the country with a

bed capacity of 800. Geographically, it is located in the city of Jimma, 352 km southwest of Addis Ababa. It was facility based retrospective cross-sectional study; the study was conducted from January 2017

### **2.1. Study Design and Period**

Facility based retrospective cross-sectional study; the study will be conducted from January 2017 through December 2021.

### **2.2. Source Population**

All children admitted to JUMC, pediatric oncology unit, from January 2017 through December 2021 will be the source population

### **2.3. Study Population with Eligibility Criteria**

All 43 patients with Wilm's tumour who were admitted to JUMC from January 2017 to December 2021 were included.

SPSS version 26 was used for data entry and analysis.

Permission and approval letter from the Ethical Review Committee of the College of Medicine and Health Science was obtained prior to the study.

## **3. Result**

### **3.1. Clinical Characteristics of the Patients**

A total of 46 patients were diagnosed with Wilms' tumor between January 2017 and December 2021. Three cases were excluded from the study because three of them didn't receive any form of therapy. The most frequent presentation was painless abdominal swelling in 40 (93%) patients. Painful abdominal swelling occurred in 3 (7%) patients. Gross hematuria, weight loss and cough were the other less frequent additional symptoms, constituting as chief complaint, in only 3 (6.9%). The median duration of presenting complaints was 1 month (range 0.06 - 30 months). Seventy-five percent of patients presented within 2 months of their symptoms and 8 (18%) patients presented after 3 months of their illness (**Table 1**).

The nutritional status was judged with anthropometry, 13 (30.2%) patients were malnourished and 30 (69.8%) were having normal anthropometry.

Fourteen patients (32.6%) were hypertensive at the time of diagnosis and the other 13 (30.2%) were normal. On abdominal examination 31 (72.1%) patients had abdominal mass not crossing the midline whereas 12 (27.9%) had mass crossing the midline.

### **3.2. Laboratory and Imaging Findings**

Hemoglobin, platelet count and renal function were assessed at admission, 27 (62.8%) were anemic and 21 (48.8%) had thrombocytosis and all had normal renal function testing. All patients had undergone imaging with either US or CT scan of the abdomen. Among this ultrasound alone was done for 16 (37.2%)

**Table 1.** Clinical characteristics of patients with WT.

| Variables                  | Frequency | Percentage |
|----------------------------|-----------|------------|
| <b>Presenting Symptoms</b> |           |            |
| Abdominal Swelling         | 40        | 93         |
| Abdominal Pain             | 3         | 7          |
| <b>Additional Symptoms</b> |           |            |
| Haematuria                 | 1         | 2.3        |
| Weight Loss                | 1         | 2.3        |
| Cough                      | 1         | 2.3        |
| <b>Blood Pressure</b>      |           |            |
| Normal                     | 13        | 30.2       |
| Hypertensive               | 14        | 32.6       |
| Not Documented             | 16        | 37.2       |
| <b>Abdominal Findings</b>  |           |            |
| <b>Palpable Mass</b>       |           |            |
| Not Crossing the Midline   | 31        | 72.1       |
| Crossing the Midline       | 12        | 27.9       |
| <b>Anthropometry</b>       |           |            |
| MAM                        | 2         | 4.6        |
| SAM                        | 10        | 23.3       |
| Normal                     | 31        | 72.1       |

patients and CT alone for 4 (9.3%) patients and both US and CT scan for 23 (53.5%) patients. Sixteen (37.2%) patients had right sided tumor and 27 (62.8%) patients had left side tumor and no cases of bilateral disease or WT in a solitary kidney. The mean size was 13.8 cm (Range 7.4 - 21 cm) and two (4.3%) patients were diagnosed to have liver metastasis. Chest x-ray was performed for all patients before the commencement of the treatment and lung metastasis was diagnosed in one (2.3%) patient. Seventeen patients (39.5%) had localized disease (Stage I) and 23 (53.5%) had locally advanced tumor (Stage II & III) with the rest 3 (7%) having metastatic disease to liver and lungs (Stage IV) (**Table 2**).

### 3.3. Follow-Up and Outcomes

Length of follow-up varied from 0.5 to 40 months with a mean of 8.4 months. Totally, of 43 patients 16 (37.2%) patients had clinical improvement, 18 (41.8%) patients abandoned their treatment. Five (11.6%) tumor recurrences and 4 (9.3%) deaths occurred. One patient died while being operated due to cardiac arrest and the other 3 died due to the tumor itself (**Table 3**).

**Table 2.** Laboratory and radiologic characteristics of patients with WT.

| Variables               | Frequency | Percentage |
|-------------------------|-----------|------------|
| CBC: Normal Haemoglobin | 16        | 37.2       |
| Anaemic                 | 27        | 62.8       |
| Normal Platelet Count   | 22        | 51.2       |
| Thrombocytosis          | 21        | 48.8       |
| <b>U/A: Haematuria</b>  |           |            |
| Positive                | 4         | 9.3        |
| Negative                | 19        | 44.2       |
| Not Documented          | 20        | 46.5       |
| <b>U/A: Proteinuria</b> |           |            |
| Positive                | 5         | 11.6       |
| Negative                | 18        | 41.9       |
| Not Documented          | 20        | 46.5       |
| Creatinine: Normal      | 43        | 100        |
| Abdominal US            | 16        | 37.2       |
| Abdominal CECT          | 4         | 9.3        |
| Abdominal US + CECT     | 23        | 53.5       |
| CXR                     | 43        | 100        |
| Chest CT                | 0         | 0          |
| <b>Tumor Size</b>       |           |            |
| 5 - 10 cm               | 8         | 18.6       |
| 10 - 15 cm              | 20        | 46.5       |
| 15 - 20 cm              | 14        | 32.6       |
| >20                     | 1         | 2.3        |

**Table 3.** Outcomes of WT management at JUMC, Jimma (2017-2021).

| Outcomes              | Frequency | Percentage |
|-----------------------|-----------|------------|
| Clinically Improved   | 16        | 37.2       |
| Relapses              | 5         | 11.6       |
| Treatment Abandonment | 18        | 41.8       |
| Death                 | 4         | 9.3        |

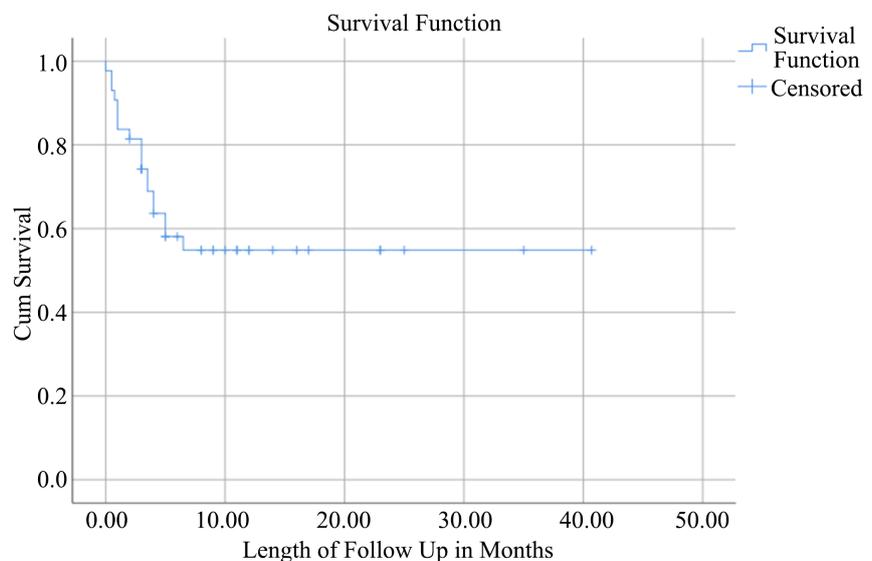
From those who were clinically improved, 50% of them were on follow up for more than 6 months from diagnosis. All deaths occurred within 4 months of diagnosis. The treatment abandonment rate is 41.8% but no reason was found.

Events that were used to measure survival were death, recurrence and lost to follow-up. The 1-year event free and overall survival in those who took more than average cycles of chemotherapy were between 35% and 50% and between 20% and 40% respectively (Figure 1).

#### 4. Discussion

There are no data on the incidence of WT and other solid tumors in Ethiopia. The frequency of childhood cancer is alarmingly increasing over years. It could be due to the increased public awareness and the health seeking behavior of the community. Wilms tumor is the second most common solid tumor of childhood [6]. The mean age at diagnosis was 45.2-months (median 36-month, range 5 to 156-months), 75% of the patients were younger than 60-months old, then after the incidence steadily decrease with age. These findings were close to the findings of a study in Nicaragua, where the median age at diagnosis was 36 months (range 9.6 - 96 months) and in Malawi, where the mean age at diagnosis was 50.4 months (range 10 - 158.4 months). [8] This was a tumor of younger age and other studies conducted in Taiwan had shown similar results. [9] Another study, conducted in Rwanda, where a different result was found, and the median age at diagnosis was 96 months (range 12 - 120 months) [10].

Histologic report after nephrectomy was documented for 17 patients. Most of the patients had favorable histology in 16 (94%) patients and unfavorable histology with diffuse anaplasia in 1 (6%) patient. This finding was comparable to the findings of a study conducted in Tanzania where 90% and 10% distribution of favorable and unfavorable histologies were reported respectively [11]. But in case of Egypt, the unfavorable histology was a bit higher (33%) as compared to our finding and that of Tanzania [11].



**Figure 1.** Kaplan Meier survival curve of patients with Wilms tumour after treatment in JUMC, Jimma Southwest Ethiopia ( $p = 0.026$ ) NB. Crosses (+) indicate censored patients.

No statistically significant relationship with outcome was found for gender ( $p = 0.581$ ), duration of illness ( $p = 0.208$ ), tumor size ( $p = 0.49$ ), nodal status ( $p = 0.521$ ), stage at presentation ( $p = 0.764$ ) and the protocol used ( $p = 0.476$ ). The statistically significant variable which positively influenced the outcome was the number of post-operative chemotherapy doses received ( $p = 0.026$ ). This finding was in contrary to the findings of other studies conducted in majority of African countries, in which disease stage at presentation and tumor volume were prognostically more important. The type of protocol used didn't affect the EFS or the OS of patients with Wilms' tumor but the postoperative dose of chemotherapy did ( $p = 0.026$ ). Kaplan-Meier method was applied to estimate the probability of cumulative survival, EFS and OS. No patient had reached the median survival. EFS were measured from date of diagnosis of treatment failure or last follow-up and OS was measured from date of diagnosis to death and lost to follow-up. The 1-year event free and overall survival in those who took more than average cycles of chemotherapy were between and between 20% and 40% and 35% and 50% respectively. Findings were similar to other African studies where the 8-months overall survival was nearly 40%, [12] except in Sudan where their OS was 11% [13]. However, it has still been less than that of western countries where survival is greater than 90%. [8] [14] [15]. Survival in Europe during 1930s, when only nephrectomy was available as a treatment option for WT, was approximately 30% [13] [16].

## 5. Conclusion

The outcomes in the treatment of Wilms Tumor have been found to be poor in this review. The main reason for poor outcome has been not receiving adequate chemotherapy after surgery. Doses of chemotherapy received after surgery significantly affected treatment outcomes ( $p = 0.026$ ). However, age at diagnosis, gender, and duration of symptoms, stage at diagnosis, and the protocol used did not predict survival. We therefore recommend that awareness creation on use of preoperative and postoperative chemotherapy could bring about better changes in mortality and morbidity of Wilms tumor patients. Other factors such as age, duration of symptoms and stage diagnosis were not related to better outcome significantly. Further large studies are needed to establish the factors affecting treatment outcome in developing center like ours, especially giving an emphasis to reduce treatment abandonment.

## Conflicts of Interest

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

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# Severe Coital Accident: A Rare Case of Simultaneous Fracture of the Penis and a Complete Urethral Rupture at the University Hospital of Bouake

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## Abstract

Cavernous body fracture is a rare urological emergency. Its association with complete rupture of the urethra remains exceptional. This is a report of simultaneous penile fracture and complete rupture of the urethra following a misstep in coitus. It is about a 41-year-old young adult, admitted to the surgical emergency department of the University Hospital of Bouaké on March 2, 2020 for penile pain associated with acute retention of urine. The clinical examination confirmed the diagnosis of a corpus cavernosa fracture associated with a ruptured urethra. The patient underwent cystostomy, right cavernorraphy and urethrorrhaphy. The postoperative follow-up was straightforward and the patient was discharged from the hospital on D3 postoperatively. The urethral catheter was removed on D21 postoperatively. With a follow-up of 1 year, the patient presents a good erection and does not report any voiding disorder.

## Keywords

Fracture, Penis, Urethral Rupture, Cavernorrhaphy, Urethrorrhaphy

## 1. Introduction

Penile fracture is a tear in the albuginea of the corpora cavernosa of varying

depth and extent [1]. It is a urological emergency par excellence and its main aetiology is coital malpractice during sexual intercourse. The diagnosis is clinical and is evoked by a coital cracking, penile pain, immediate detumescence, swelling and deviation of the penis. It is a rare condition and its association with a complete rupture of the urethra is an exceptional event. Complications of penile fracture are severe, ranging from erectile dysfunction, fibrosis of the corpora cavernosa and penile discolouration to permanent sexual impotence [1] [2]. Conservative non-operative treatment limited to uncomplicated cases has led to an equally good outcome as surgical treatment [3]. Other authors advocate surgical repair from the outset as the outcome was clearly superior to the non-operative method in the management of penile fractures [4]. While surgical treatment is controversial, for penile fractures with complete urethral injury, the literature provides very little detail. We present a rare case of simultaneous fracture of the penis and complete urethral rupture with the aim of assessing the effects of immediate surgery on the patient's sexual and voiding prognosis.

## 2. Observation

Mr. K. A, 41 years old, married and father of three children, was referred to the surgical emergency room of the University Hospital of Bouaké on March 2, 2020, for penile swelling following a coital misstep. The erect penis would have bumped against the perineum of his wife. This was followed by a cracking sound, pain and immediate detumescence of the penis. One hour after the trauma, the patient presented with urethrorrhagia followed by acute retention of urine with a high urinary diversion. On examination, the patient was anxious and in good general condition with stable haemodynamic constants. Examination of the urogenital system showed a patient with a cystostomy tube (CH20) draining clear urine. On inspection, there was deformity, deviation of the penis to the right and swelling from the crown to the root of the penis. The glans was unremarkable but there was a large swelling of the scrotum (**Figure 1** and **Figure 2**).



**Figure 1.** Tumefaction associated with penile deviation.



**Figure 2.** Voluminous oedema of the scrotum.

Palpation revealed a sharp pain at the fractured level at the base of the penis and in the path of the distal urethra. Examination of the other apparatus was normal. The clinical diagnosis of a simultaneous fracture of the penis and urethral rupture was made. The pre-operative emergency work-up consisting mainly of a blood count and blood grouping in the ABO and rhesus systems was normal and allowed for immediate surgical intervention seven hours after the trauma. The patient was under loco-regional anaesthesia. The procedure consisted of a circumferential incision of the penile skin 3 cm from the balano-preputial groove. It was rolled up to the root of the penis, respecting Buck's fascia. A haematoma with clots was discovered and evacuated. The fracture involved the base of the right corpus cavernosum and a tear in the albuginea opposite the lesion. There was a complete rupture of the distal urethra (**Figure 3** and **Figure 4**).

We sutured the lesion with a 3% absorbable suture in separate stitches at the level of the corpora cavernosa and the albuginea. A seal test was performed using saline. At the same time, we performed an urethrorrhaphy on a guardian catheter after excision of the edges (**Figure 5**).

Postoperatively, anti-erection treatment with diazepam 10 mg (1 cp/day), and analgesics (paracetamol 500 g  $\times$  3/day) were instituted. The postoperative course was simple. The patient was discharged from hospital on day 3 postoperatively.

The cystostomy tube was removed on day 3 postoperatively.

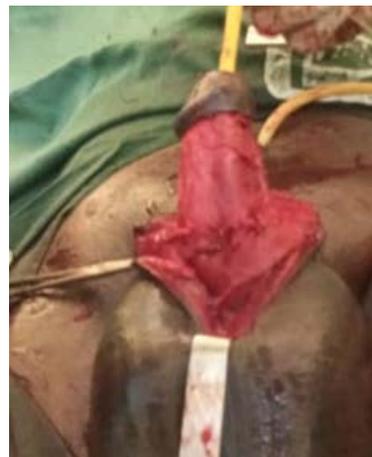
- Healing was obtained after 13 days
- Removal of the trans-ureteral bladder catheter was done after 21 days
- After 1 year, the patient reported satisfactory nocturnal erections and no urinary disorders.
- The patient reports normal sexual intercourse six months after the erection. The penis is soft, non-indurated and free of any discoloration. Retrograde urethrocytography was normal. (UCR)



**Figure 3.** Haematoma opposite the fracture site.



**Figure 4.** Total rupture of the penile urethra intubated with a follet probe.



**Figure 5.** Intraoperative view after cavernorrhaphy and uretorraphy.

### 3. Discussion

Corpus cavernosum fracture is a condition that occurs in the context of trauma to the erect penis during sexual intercourse, following a coital misstep. The diagnosis is based on the clinical symptoms which are most often evocative. This

symptomatology is summarised by a cracking sound, acute pain of the erect penis, followed by rapid detumescence, swelling with deviation of the penis on the opposite side to the fracture [5] [6]. Cavernous body fracture with urethral rupture is a rare urological emergency. Urethral rupture may be partial or complete and the incidence varies from 1% to 38% [3] [7]. However, in 50% of cases, the urethral lesion is asymptomatic and is discovered incidentally intraoperatively or even preoperatively by ultrasound. Although the ultrasound is director dependent, it is a tool that allows confirmation of the precise location of the tear in the albuginea of the corpus cavernosum and to identify the presence of concomitant urethral injury that can guide the surgeon in his therapeutic decision [2] [8]. In our case, the patient presented with typical signs of corpora cavernosa fracture and acute retention of urine and urethral bleeding. These signs allowed us to retain the diagnosis of fracture of the corpora cavernosa associated with a rupture of the urethra. In order to avoid delays in management and the cohort of complications, we made the operative indication without the performance of ultrasound. Our attitude is similar to that of several authors who support the thesis that no paraclinical examination should delay management [2] [3] [4] [6]. The treatment of corpora cavernosa fractures has always been a controversial issue. In the past, patients were recommended to undergo non-operative treatment. However, Bennani et al, in a study of traumatic ruptures of the corpora cavernosa put an end to this controversy by reporting a complication rate of 40.7% and 8.2% for non-operative and surgical treatment respectively [9]. Nowadays, several authors recommend emergency surgical repair of urethral injury associated with corpora cavernosa fracture as the only way to prevent serious complications [4] [5] [6]. Several authors report that most patients had achieved an adequate erection after emergency surgery [2] [4] [8]. Other authors go even further to say that even when seen late, surgery has also shown a satisfactory result [8] [10]. For fractured corpora cavernosa with urethral injury, bilateral rupture should also be sought intraoperatively [11]. In long-term follow-up, most patients maintained normal erectile and micturition function without complications after bilateral cavernorrhaphy and urethral repair [12] [13]. In our case, surgical treatment was adopted on an emergency basis. We performed a cavernous suture with an absorbable thread coupled in the same operation time with the repair of the urethra by a uretrorrhaphy on a guardian catheter. The postoperative result was satisfactory. Our result is in line with those of authors who have advocated emergency surgical treatment [12] [14]. Our observation also supports the evidence that emergency surgery for the treatment of corpora cavernosa fracture associated with complete rupture of the urethra is the appropriate treatment.

#### 4. Conclusion

Corpus cavernosum fracture is a rare urological condition. Its association with a total rupture of the urethra is an exceptional event. In the presence of acute re-

tention of urine and post-coital misstep urethrorrhage, the diagnosis of urethral rupture must be evoked. Emergency surgery remains an effective therapeutic means of preserving the patient's sexual and urinary function.

### Conflicts of Interest

The authors declare no conflict of interest.

### Authors' Contributions

All authors contributed to the writing of this work. They also declare that they have read and approved the final version of this work.

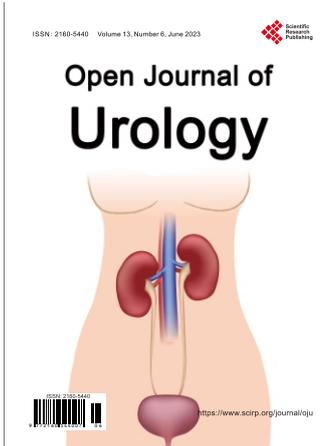
### Ethical Clearance

The patient were informed and agreed to participate in the study, their anonymity was preserved.

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