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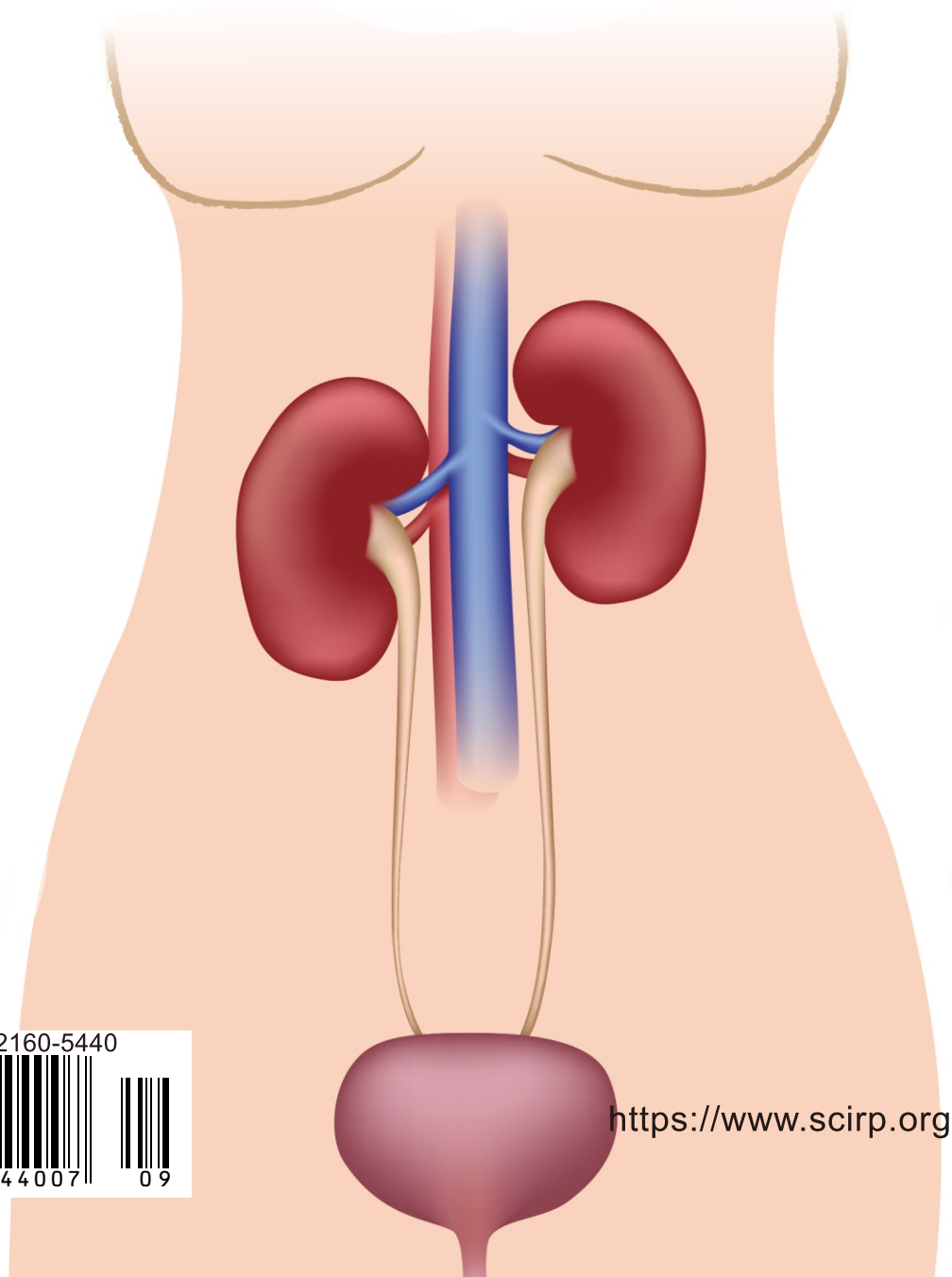

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Testicular Burkitt's Lymphoma: A Case Report and Literature Review

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Abstract

Background: Burkitt's lymphoma of the testis (TBL) is a rare and extremely aggressive malignant usually diagnosed in front of a testicular mass. We describe an interesting single case of TBL managed by a combined multimodal approach with a review of the literature. **Case Report**: A patient aged 69-year-old male, newly hypertensive, who presented with a twelve-month history of right testis progressive painful scrotal swelling, which worsens following a motorbike accident. Clinical examination revealed a large tender mass in an erythematous right scrotal bursa. A scrotal ultrasound showed a right heterogenous intra-testicular mass. The patient underwent unilateral (right) radical orchiectomy. Histopathological examination revealed presence of monomorphic lymphoid cells, with moderate to increased size, dissociated inconstantly by macrophages consistent with a Burkitt's-like non-Hodgkin Lymphoma. After surgery, the patient was transferred to oncologist for adjuvant chemotherapy. **Conclusion**: A testicular mass is a usual circumstance for the discovery of a primary tumour of the testicle. Burkitt's testicular lymphoma is a rare tumour whose diagnosis is based on histological findings. There are non-consensual etiological or predisposing factors. The treatment depends imperatively on the stage of the disease. Therapeutic modalities relay on in surgical excision, chemotherapy and radiation therapy but the accurate procedures are not standardized.

Keywords

Burkitt's Lymphoma, Orchidectomy, Testis

1. Introduction

Testicular lymphoma was first reported by Malassez and Curling in 1866 [1]. Burkitt's lymphoma is an uncommon form of non-Hodgkin lymphoma (NHL) in adults and represents less than 5% of lymphoma cases [2]. Burkitt's Lymphoma (BL) is a highly aggressive, rapidly growing B cell non-Hodgkin's Lymphoma, which manifests in several subtypes including: Epstein-Barr virus endemic, sporadic, and immunodeficiency-associated types [2]. These clinical variants are recognised with different epidemiology, risk factors, and clinical presentations. The endemic subtype is found in equatorial Africa and New Guinea with a near 50-fold higher incidence than that seen in the US [3], the distribution corresponds to areas where malaria and Epstein Barr virus are prevalent.

Primary testicular lymphoma is a rare tumour accounting for 1% of all testicular non-Hodgkin lymphoma [4]. It is defined by the primary localization of the tumour in the testis at presentation. Diffuse large B-cell lymphoma is the most common histological variety [5]. Testicular lymphoma is the most common testicular tumour in men aged over 50 (26% to 44% of testicular tumours) [6]. It is the most frequent testicular malignancy in men over 60 years of age. Its prognosis is usually poor, characterized by spreading to non-contiguous extranodal sites, especially in central nervous system and high recurrence [7].

In Cameroon, between 1999-2008, 20 cases of primitive urogenital lymphoma were found in the urology and andrology unit of Yaoundé Central Hospital, with a remarkable predominance for Burkitt's Lymphoma [8]. The management of this tumour is a multidisciplinary purpose, and relies mainly on a radical upper inguinal orchidectomy mostly associated with chemotherapy.

We hereby present a case report of Burkitt's Lymphoma, of the right testicle of a 69-year-old patient who presented following an external genitalia trauma, as well as our results on: local literature review, the socio-demographic study, means of diagnosis, means of treatment and the prognosis of this uncommon pathology.

2. Case Report

We report a case of a 69-year-old black male with a medical history of hypertension noncompliant to treatment. He presented with an eighteen-month history progressive increase in right testicle initially without associated pain until his motorbike accident, all evolving in the context of a slight decline in general condition. He was the middle passenger on a motorbike with 3 passengers hooked between the driver and the third passenger, which had a head-on collision with a touristic car three-day prior to consultation. The sweeling increase along with pain onset prompted consultation in our unit. The clinical examination revealed an ulcerative and necrotic right scrotal skin lesion measuring 3 × 4 cm of diameter with an underlying large tender irreducible nonfluctuating testicular mass in the right scrotal bursa extending to the inguinal region, the lymph nodes were free. There was no splenomegaly or hepatomegaly. A scrotal ultrasound

showed an enlarged, heterogenous testis with multiple hypoechoic masses, discretely polylobed, hypervascularized right intra-testicular mass suggestive of a seminoma. The ultra-sound examination showed an enlarged, heterogeneous testis with diffusely hypoechoic parenchyma and irregular edge measuring 66 × 67 mm, the contralateral testis was increased in size too without a particular architectural change. There were also multiple lymphadenopathies in the inguinal and iliac regions, raising our suspicion for a malignant tumour of the right testis. A Kidney-Ureter-Bladder (KUB) Ultrasonography and transrectal prostate Ultrasonography (TRUS) showed bilateral uretero-hydronephrosis, a significant post-residual volume (PRV) of 175 ml and a normal prostate with a volume of 28.6 ml (**Figure 1**).

Tumour markers assay showed normal levels of serum alpha-fetoprotein (αFP), serum lactate dehydrogenase (LDH), and serum beta human chorionic gonadotropin (βHCG). Laboratory tests, especially, serum testosterone, Prothrombin ratio, urine culture, activated partial thromboplastin time were all normal except for the renal function which was altered, with a plasma urea of 52 mg/dl, and a creatinaemia of 3.03 mg/l. He has also had a microcytic hypochromic moderate anaemia with a haemoglobin level at 6.7 g/dl (Normal value (NV): 14.1 - 18.1 g/dL), which was corrected with a transfusion of 03 units of group O positive whole blood. HIV serology was negative.

Following a multidisciplinary team meeting including urologists, oncologist, pathologist, anaesthesiologist, radiologist, a treatment strategy was adopted. The patient then underwent a unilateral (right) inguinal orchidectomy under spinal anaesthesia with complete excision of the testis. Intraoperatively, the right testicle was found to be completely replaced by tumour, with extension into the gubernaculum and epididymis. The specimen was sent for histopathology studies (**Figure 2**).

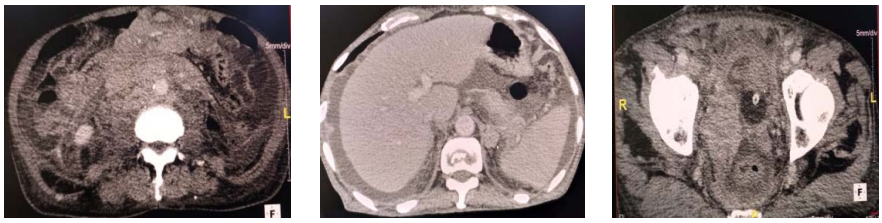
Figure 1. Macroscopic view of the inguino-scrotal swelling and the necrotic layer.

Thoracic abdomen pelvic scan performed after the surgery due to financial constraints found a diffused retroperitoneal infiltration, suggesting an important lymph node invasion consider as probable secondary locations, a diffuse condense peritoneal fat tissues alongside with a residual ascites and the presence of a bladder tumoral mass of 37 mm diameter to sought out. (**Figures 3(a)-(c)**)

Using Ann Arbor Staging System The patient was staged stage IVA.

Histopathology revealed extensive involvement and replacement of testicular parenchyma by a tumour composed of large discohesive sheets of cells with pleomorphic, hyperchromatic nuclei and prominent nucleoli suggestive of a Burkitt's-like lymphoma (**Figure 4** and **Figure 5**).

Figure 2. Macroscopic view of the excised right testis.



(a) (b) (c)

Figure 3. (a)-(c): Intra-abdominal leak of lymphadenopathies (a), diffused condensation of the peritoneal fat tissue (b), bladder tumoral mass (c).

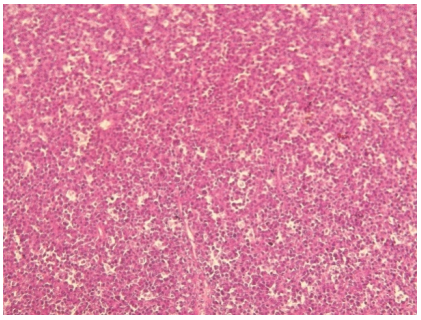


Figure 4. Microscopic view of the Burkitt's-like non-Hodgkin Lymphoma (HE ×10). (Note the presence of monomorphic lymphoid cells, with moderate to increased size, dissociated inconstantly by macrophages).

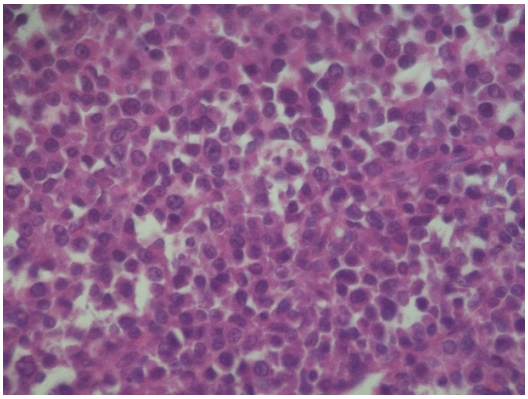


Figure 5. Microscopic view of the Burkitt's-like non-Hodgkin Lymphoma (HE ×40). (Note the presence of monomorphic lymphoid cells, with moderate to increased size, dissociated inconstantly by macrophages).

The patient was referred for further management to the oncology unit of the Yaoundé General Hospital on the third day post-operative, and was subsequently scheduled for adjuvant chemotherapy. Unfortunately, he died on the 32nd post-operative day.

3. Discussion

Burkitt's lymphoma is a highly aggressive B-cell NHL, with a doubling time of 24 hours [9]. While the sporadic BL is observed in North America, Europe, and East Asia with an annual incidence of 2 per 1 million, endemic type of BL is usually seen in the African subcontinent and is more commonly associated with Epstein-Barr virus and malaria [10]. In endemic region, Burkitt's lymphoma represents 10% of all testicular lymphoma [11]. There are non-consensual etiological or predisposing factors. Various reports have implicated prior trauma, chronic orchitis, cryptorchidism and filariasis of the spermatic cord as risk factors [12].

Testicular lymphoma may be the primary and only manifestation of malignant lymphoma, the initial sign of generalized disease, or it may occur during the clinical course of a patient with established lymphoma. Primary Testicular Lymphoma (PTL) concerns mainly men over 50 years of age as shown by most prospective and retrospective studies [13] with a median age of 65 years [14]. Secondary involvement of the testis in patients with lymphoma is far more common than primary testicular lymphoma [15].

These highly aggressive tumours are rare, this can be illustrated by the diagnosis of this case in our unit more than 20 years after Mamadou Sow *et al.* work in the same unit [8].

Even if our patient was HIV negative, international literature suggest that the incidence of this tumour is favoured by a state of immunodepression (HIV etc.), tuberculosis, and EBV infections [11].

Diagnosis of testicular lymphoma begins with a thorough medical history and physical exam of the entire body. Additional diagnostic tests include imaging,

blood tests, and tests performed on cancer tissue. The usual presentation is a unilateral painless progressive increase in size testicular mass over several months [13] [14] [15] [16]. However, at presentation, a bilateral involvement is noticed in up to 10% of the cases [16]. Constitutional symptoms such as fever, weight loss, anorexia, night sweating and fatigue are seen in 25% to 40% of the patients [4]-[16]. The presence of these systemic signs is predictive of tumour aggressiveness and is observed in 25% to 41% of patients with advanced disease [13] [14]. The classic physical sign in the localized stage is a solid testicular mass of variable size. This mass can be unilateral or bilateral. It is synchronous in 10% and asynchronous in 30% - 35% [17]. Our patient initially had a painless unilateral scrotal swollen which became painful following an external genitalia trauma but general signs were absent. Complementary paraclinical investigations help to determine the unilateral or bilateral nature and the extent of the disease. Scrotal ultrasonography often coupled with Doppler is the first-line investigation for an enlarged scrotum which demonstrates focal or diffuse areas of hypoechogenicity with hypervascularity in an enlarged testis [18]. LDH levels have been correlated with tumor aggressiveness, whereas other tumor markers such as βHCG and αFP are rarely elevated in TNHL cases [19]. In our case, LDH, βHCG and αFP levels were normal.

Due to the differences between early and advanced stages of testicular lymphoma, a complete lymphoma workup should be performed including bone marrow biopsy and CT scan of the thorax, abdomen and pelvis. In recent years, CT or magnetic resonance imaging (MRI) has also played an important role in the diagnosis of primary testicular tumors by simultaneously evaluating the structure of the testis and epididymis [20]. At the same time, there is growing interest in using fluorescence in situ hybridization (FISH) as the gold standard for diagnosis [20]; however, this method is rarely employed because of availability, patient preference and economic conditions in our case. CT remains the modality of choice for assessing retroperitoneal lymph nodes [21].

Our first line imaging study was a doppler scrotal ultrasonography associated with an abdominopelvic ultrasonography which confirm our suspicions of a testicular tumour. Subsequently, after the surgery we could carry out a CT scan of the chest, abdomen and pelvis, which the family could only afford by that time. Whereas, the diagnosis was confirmed by an anatomopathological examination of the surgical biopsy specimen. Unfortunately, the diagnosis remains late in our context due to various reasons contributing to a poor prognosis for the patient, as illustrated by our case where the patient consulted because of the posttraumatic testicular pain while his testis has been swollen for several months.

In case of PTL suspicion, inguinal orchiectomy is required to achieve optimal disease control and adequacy of a pathologic specimen which has both diagnostic and therapeutic purposes [13]. It removes the so-called sanctuary site [13]. When the blood-testicular barrier is present, it's difficult for drugs to penetrate the testes, therefore chemotherapy effect is not ideal [22]. On the other hand, testicular tumoral cells may express high levels of drug-resistant proteins, such

as P-glycoprotein (PGP) and breast cancer drug-resistant protein (BCRP), resulting in resistance to chemotherapy [22].

Given the rarity of this tumour, the treatment is not standardised. A multimodal therapeutic approach is needed. The multidisciplinary team includes urologists, haematologists and radiation oncologists [23]. Histological examination is the only means of diagnosis. It can be made on biopsy or surgical specimen. Until to 1995, a combined modality therapy was recommended to PTL, which consists of orchiectomy, systemic chemotherapy, scrotal radiotherapy, and prophylaxis intrathecal chemotherapy [24]. Treatment regimens vary widely, as many studies on testicular lymphoma were done retrospectively, most advocates a phased-management approach for testicular lymphoma with all patients receiving multi-agent chemotherapy (doxorubicin, cyclophosphamide, vincrisitine and a corticosteroid) [14]. Patients treated with orchiectomy followed by chemotherapy without scrotal radiotherapy have a significant risk of relapse, especially in the contralateral testis, estimated at 25% [23]. Indeed, chemotherapy drugs have a low penetration in the healthy testis [13]. However, the results of numerous studies attest that scrotal irradiation is associated with a better survival [13].

We did a multidisciplinary team review of this case to propose an adequate and feasible therapeutic plan, we then opted for an inguinal orchidectomy under spinal anaesthesia and the surgical specimen was send for histopathology studies for determination of tumour type and diagnosis confirmation. Immunochemistry studies were not done in this case because his family couldn't afford sending his sample abroad for complementary analysis. Base on histopathology result, we opted for adjuvant chemotherapy with cyclophosphamide, hydroxydaunorubicin, oncovin, and prednisone regimen (CHOP), which is done in another centre leading to his transfer for follow-up by the oncologist. This therapeutic attitude is consistent with that proposed by a large number of authors in the literature. [1]-[20]. The most important factors determining the prognosis are stage and histological grade. Testicular lymphoma carries a poor prognosis compared to other NHL and extranodal lymphomas and may require a more prolonged course of chemotherapy compared to other extranodal lymphomas [14]. Stage and pathologic grading are the most important predictive factors for outcome [14]. Insufficient organ functions due to advanced age, presence of the constitutional symptoms, tumour burden higher than 9 cm, spermatic chord and bilateral testicular involvement, vascular invasion, degree of sclerosis and high level of LDH affects the prognosis negatively [25]. Of the known poor prognostic factors, our patient had involvement of the epididymis and spermatic chord, advance age, delay presentation and advanced diseases. Unfortunately, our patient short nor long term outcome can't be assessed since he died in the course of treatment at the 32nd postoperatively day during chemotherapy. This is consistent with data from the literature, which highlights the fact that the prognosis depends on early diagnosis and the presence or absence of secondary locations [26].

4. Conclusion

Burkitt's Lymphoma is a rare aggressive testicular tumour which should be considered as a diagnosis for elderly male over 60 years presenting with a progressive painless testicular mass whether constitutional signs are present or absent. Presence of normal testicular tumour markers should not be an exclusion criterion of testicular tumour. Doppler scrotal ultrasound is the first line imaging study for exploration of testicular mass. The definitive diagnosis is base on histopathology results from the surgical specimen. Management is multidisciplinary, mainly through an inguinal radical orchiectomy the earlier as possible and associated with chemotherapy. The prognosis remains poor and depends on early diagnosis and management.

Conflicts of Interest

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

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Vaginal Cystocele Cure at Bouake University Hospital (Chu): Anatomical and Functional Results

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Abstract

Background: Cystocele is an anatomical form of pelvic organ prolapse. It involves herniation of the bladder through the anterior wall of the vagina. **Objectives:** To report the anatomical and functional results of vaginal cure of cystocele in five cases. **Patients and methods:** A cross-sectional descriptive study of five patients presenting with a cystocele between January 2021 and December 2022 at the Urology Department of the Bouaké University Hospital (Côte d'Ivoire). All patients underwent vaginal cure of cystocele. The results of the operation were assessed on the basis of judgment criteria. The parameters studied were: age, marital status, profession, history, reason for consultation and outcome of the operation. **Results:** During the study period, five patients underwent vaginal cystocele surgery. The mean age was 46.6 years with extremes of 32 and 63 years. Three patients were married. All patients had a history of obstructed labour due to fetal macrosomia. 4 patients had grade II cystocele and one patient had grade III cystocele. All patients underwent anterior colpo-perineorrhaphy. The average operating time was 56 minutes (45 - 65 minutes). There was no morbidity. The average hospital stay was 3.6 days. The average duration of the urinary catheter was 2.2 days. At three months post-op, 4 patients had a good anatomical and functional result with a very good degree of satisfaction, compared with one patient who was moderately satisfied and had an average anatomical and functional result. At six months, all five patients had a good anatomical and functional result with a very good degree of satisfaction. **Conclusion**: Cure of cystoceles by the vaginal route is a technique that offers several advantages, especially the significant reduction in patient morbidity. Its anatomical and functional results demonstrate its reliability.

Keywords

Cystocele, Colpo-Perineorrhaphy, Genital Prolapse

1. Introduction

Cystocele is a hernia of the anatomical form of pelvic-genital prolapse, defined as: bladder through the anterior wall of the vagina [1]. This hernia reflects the failure of the support and suspension systems of the female pelvic organs [1] [2]. It is a truly functional pathology, resulting in a loss of confidence in the woman, a feeling of being less attractive physically and sexually, and an altered self-image [3]. Its clinical expression can be summed up as dysuria, urinary incontinence, pollakiuria, sexual problems, discomfort and a feeling of organ loss. The treatment of cystocele involves two groups of surgical techniques which differ in their approach. The upper approach involves promontory fixation and the vaginal approach, which offers the choice of autologous or prosthetic surgery [4]. This study finds its originality insofar as this way of approach is not in our current practice. Also we wish to draw the attention of the urologists of the Ivory Coast and those elsewhere of the interest and especially the elegance for both the patient and the surgeon. We report the results of the cure of cystocele by the vaginal route in 5 cases at the University Hospital of Bouaké.

2. Patients and Methods

2.1. Study Design and Approval

After obtaining approval from the ethics committee of the university hospital of Bouaké (Côte d'Ivoire). We conducted a descriptive cross-sectional study of five patients presenting with cystocele between January 2021 and December 2021, *i.e.* one year in the Urology Department of the Bouaké University Hospital.

2.2. Inclusion and Non-Inclusion Criteria

All patients with cystocele and having been operated vaginally were included in the present series. Patients with cystocele operated by high approach or by prosthesis were excluded from our series. The diagnosis of cystocele was made on the basis of clinical examination and confirmed by UCR retrograde urethrocystography. Patients underwent vaginal cure of cystocele. All vaginal cystocele cure were performed after a preoperative work-up including blood count, partial thromboplastin time (PTT), prothrombin rate (PRT), uremia, creatinemia, blood grouping and electrocardiogram. All patients underwent a pre-anaesthetic consultation to determine the route of anaesthesie. The procedure consisted of anterior colpo-perineorrhaphy, which involved a median vaginal incision, vesico-vaginal cleavage, resection of the excess vaginal wall (anterior colpectomy) and suturing of the anterior vaginal wall to the midline. Data were collected using a survey form containing the parameters studied. Data were entered using

Word software. Epi-info 7 software was used to analyse the data. The following parameters were studied. The results of the cystocele cure were evaluated on the basis of the following judgement criteria:

2.3. Anatomical Results

- **Good:** if there is a reduction in all the elements of the cystocele after the operation.
- **Fair:** if recurrence of one element of the cystocele (slight unrolling of the vaginal walls on exertion).
- **Bad:** if cystocele recurs.

➢ **Functional results**

- **Good:** absence of functional signs, no complaints.
- **Fair:** improvement in functional complaint (minor urinary problems).
- **Bad:** no improvement in complaint.

➢ **Level of patient satisfaction**

- Very satisfied: no complaints.
- Fairly satisfied: functional complaint.
- Not satisfied: no relief of complaints after vaginal cure of cystocele.

The parameters studied were:

- Age, marital status, profession, previous surgical history and results after the operation (duration of the operation, hospital stay, complications, post-operation). Anatomical result, functional result and patient satisfaction were assessed at 3 and 6 months post colpo perineorrhaphy.

3. Results

3.1. Socio-Demographic Characteristics

▪ **Age**

The mean age of our patients was 46.6 years, with extremes of 32 and 63 years.

▪ **Marital status**

3/5 patients were married.

1/5 patients were widowed.

1/5 were single.

▪ **Profession**

All the patients in our series were housewives.

3.2. Clinical Characteristics

▪ **Reason for consultation**

4/5 consulted for swelling.

1/5 consulted for pollakiuria.

▪ **History: aetiology**

4/5 patients had a history of obstructed labour due to foetal macrosomia and multiparous women.

1/5 patients were menopausal.

▪ **Physical signs**

4 patients had vaginal swelling and vulval swelling on physical examination.

- **Grade of cystocele**

The majority of patients (4/5) presented with a grade II cystocele. Grade III was observed in one patient.

3.3. Treatment

- **Type of surgery**

4 patients underwent anterior colpo perineorrhaphy. This was combined with a posterior plasty in one patient (Table 1).

- **Average operative time**

The average duration was 56.2 minutes (45 - 65 min).

- **Complications**

No complications were observed in our study.

- **Length of hospital stay**

The patients' hospital stay was 3.6 days, with extremes of 3 and 4 days.

- **Urinary catheterisation time**

The average duration of the urinary catheter was 2.2 days, ranging from 1 to 3 days.

3.4. Treatment Results

- **Results at 3 months**

At 3 months, 4/5 patients had a good anatomical and functional result. 4/5 patients were very satisfied after the operation, while one patient had an average result and was moderately satisfied (Table 2).

- **Results at 6 months**

At 6 months, all our patients had a good anatomical and functional result. They were all satisfied after the operation (Table 3).

Table 1. Overview of patients.

N°	AGE in (Years)	Marital Status	Occupation	Reason for Consultation	History	Physical Signs	Grade of cystocele	Duration of Operation (in Minutes)	Complications	Length of hospital stay (Days)	Bladder catheterization time (Days)
1	32	Married	Housewife	Pollakiuria	Dystocial childbirth	Vaginal swelling	Grade II	45	00	3	2
2	45	Married	Housewife	Vaginal swelling	Dystocial childbirth	Vulval Swelling	Grade II	56	00	4	2
3	63	Married	Housewife	Vaginal swelling	Dystocial childbirth	Vaginal swelling	Grade III	58	00	3	3
4	46	Divorced	Housewife	Vaginal swelling	Dystocial childbirth	Vaginal swelling	Grade II	65	00	4	1
5	47	Single	Housewife	Vaginal swelling	Menopause	Vaginal swelling	Grade II	57	00	4	3

Table 2. Distribution of patients according to result at 3 months' follow-up.

Results in 3 months	Numbers	Frequency
Anatomical Results		
Good	4	4/5
Fair	1	1/5
Bad	0	
Operational Results		
Good	4	4/5
Fair	1	1/5
Bad	0	
Patient Satisfaction Level		
Very satisfied	4	4/5
Fairly satisfied	1	1/5
Not satisfied	0	

Table 3. Distribution of patients according to result at 6 months' follow-up.

Results in 3 months	Numbers	Frequency
Anatomical Results		
Good	5/5	5/5
Fair	0	0
Bad	0	0
Operational Results		
Good	5/5	5/5
Fair	0	
Bad	0	
Patient Satisfaction Level		
Very satisfied	5	5/5
Fairly satisfied	0	
Not satisfied	0	

4. Discussion

Cystocele can affect women of all ages. However, physiological ageing and the menopause are considered to be major factors associated with genital prolapse in general and cystocele in particular [5] [6]. In their respective studies, Cosson, Bader and Jin Long reported a mean age of 69, 63 and 61.7 years [5] [6] [7]. In our study, the mean age of patients was 46 years, with extremes of 32 and 63 years. This result is similar to that of Diabaté in Senegal and Coulibaly in Mali,

who reported an average age of 42 and 48 years respectively [4] [8]. Our result could be explained by the social demographic factors in our country (dystocial delivery, early childbearing and multiparity). Vaginal swelling (4/5) was the most common reason for consultation in our study, with stress urinary incontinence the most common [8] [9] [10]. Our result could be explained by the long evolution of cystocele, which accounts for the delay in consultation by patients. Cystocele is an anatomical form of pelviogenital prolapse in which the anterior wall of the vagina is herniated as a result of varying degrees of failure of the pelvioperineal support structures. The literature describes congenital risk factors, multiparity, dystocial delivery and trophic changes during the menopause [4] [8] [9] [10]. In our study, 4 patients had a history of dystocial delivery for fetal macrosomia and one patient was postmenopausal. We can explain the occurrence of cystoceles in our patients by ligament elongation on the one hand and muscle tear on the other during vaginal delivery of macrosomia. The clinical and physical symptoms of cystocele are well known in the literature. In our study, 4 patients presented with vaginal swelling and another with vulvar swelling. Cystocele was classified grade II in 4 patients and grade III in one patient. This finding could be explained by the delay in consultation. From a therapeutic point of view, the surgical treatment of cystocele involves several techniques which differ in their approach [4]. We have the upper approach via promontory fixation and the vaginal or lower approach with several variations. These are anterior perineal plasty or anterior colpo-perineorrhaphy by support [5], *i.e.* re-tensioning of Halban's fascia, support, suture of the entire fascia or vagina in a paletot, paletot suspended from the tendon arches, "paravaginal repair" or para-vaginal suspension, bladder support by prosthesis or Campbell's device [11] [12] [13] [14]. In our study, anterior colpo perineorrhaphy was combined with a posterior plasty in one patient. This variant of vaginal cystocele cure was used because it is more controlled and is customary in our practice. A review of the literature shows that vaginal surgery is often associated with complications, most commonly haemorrhage and iatrogenic rectal and bladder lesions [6] [7] [9] [15] [16]. In our study, there was no morbidity. This absence of perioperative complications demonstrates the surgeon's good mastery of the surgical technique. The average length of hospital stay was 36 days and the average length of time the bladder catheter was inserted was 2.2 days. Our results corroborate those reported in the literature [4] [9] [10]. These different results show that vaginal cure of cystocele offers a reduction in the length of hospital stay and a short period for wearing the urinary catheter. Evaluation of the results of our surgical treatment after three months showed that four out of five patients had a good functional anatomical result and a good degree of satisfaction. Our results are similar to those of Diabaté in Mali [4], who reported 53.85% good anatomical results and 46.15% functional results, compared with 46.15% average anatomical results and 53.85% functional results. All patients were reviewed after 6 months. The evaluation showed a good anatomical and functional result and a good degree of satisfaction in all five patients. The strength of our study lies in its rigorous methodolo-

gy, the first to our knowledge to be carried out in Bouaké in central Côte d'Ivoire. However, it does have its limitations. It is a cross-sectional and descriptive study, and the results therefore merit external validation with a larger, independent sample. It would be useful for future studies with a more significant sample to be carried out in order to assess the substance of our results. However, we believe that these results are clinically relevant because of their strong characterisation in a real-life context.

5. Conclusion

This study shows that cystocele is pathology of young women. The main cause is dystocial delivery. The diagnosis is most often made late, usually grade II. In view of our results, vaginal cure of cystocele should be the preferred approach. It has a number of advantages (short hospital stay, reduced time to bladder catheterisation, virtually no morbidity or mortality) and above all offers good anatomical and functional results in the medium and long term.

Authors' Contributions

AVION Kouassi Patrice, AKASSIMADOU N'diamoi, AGUIA Brice: statistical analysis and re-reading of the article as well as its drafting.

ZOUAN Freddy, ALLOKA Venance, KAMARA Sadia, DJE Koffi: documentary research and editing of the work.

Ethical Considerations

We have protected the confidentiality of the information gathered during the survey. Thus, an anonymity number was assigned to each survey form with authorisation obtained from the administrative and health authorities.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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Post-Operative Complications of Transvesical Prostatic Adenomectomy at Bouake Teaching Hospital: Epidemiological, Diagnostic and Therapeutic Aspects

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Abstract

Introduction: The treatment of benign prostatic hyperplasia (BPH) responds to a medical aspect at first, the effectiveness of which is indisputable. However, the curative treatment is surgery. Trans-urethral resection of the prostate (TURP) represents the reference surgical technique when the technical platform is correct. In Bouaké, the FREYER HRYNTCHACK trans vesical approach is the technique used in our department. It sometimes leads to complications that can be life-threatening. The general objective of this work was to describe the morbidity and mortality of trans-bladder adenomectomy and their management at the Bouaké University Hospital. **Material and Methods:** This is a retrospective descriptive study carried out at the Bouaké Teaching Hospital over a period of 5 years from January 2016 to December 2022. It involved 150 patients operated on for BPH by the trans vesical route and who experienced postoperative complications. The parameters studied were age, postoperative complications, treatment, and mortality. **Results:** The mean age of the patients was 67.2 ± 7.37 years. Hemorrhage was the main immediate complication. Parietal suppuration, in 48% of cases, was the most common secondary complication, followed by vesicocutaneous fistula (18%), orchiepididymitis (15.33%) and urinary leakage (3.33). Late complications were: retrograde ejaculation in 73.33%, urethral stricture (10.66%) and sclerosis of the compartment (6.66%). Mortality was 1.33%. **Conclusion:** Post-operative complications of adenomectomies according to Freyer Hrynstchak remain dominated by infections. However, postoperative hemorrhage remains the surgeon's fear because it can cause the death of the patient.

Keywords

Adenomectomy, Complication, Freyer, Hemorrhage, Vesicocutaneous Fistula

1. Introduction

Benign prostatic hyperplasia (BPH) is the leading cause of bladder obstruction in men aged 50 and over. His treatment is twofold. The first is medical treatment, the effectiveness of which is indisputable. However, the second part, which is the curative treatment, is based on surgery. Trans-urethral resection of the prostate (TURP) represents the reference surgical technique when the technical platform is correct. In Bouaké, we still resort to open surgery due to the lack of endoscopic equipment. FREYER HRYNTCHACK's transvesical approach is the most common technique in our department. It sometimes leads to complications that can be life-threatening. Few studies have been carried out in our work context in Côte d'Ivoire and particularly in Bouaké. This is how we decided to carry out this work, the general objective of which was to describe the morbidity and mortality linked to this surgical technique and their management at the Bouaké Teaching Hospital.

2. Material and Methods

This was a retrospective descriptive study, covering a period of five years from January 2016 to December 2022. This study took place in the Urology department of the Bouaké Teaching Hospital. It focused on the postoperative complications of trans-bladder prostatic adenomectomy. Included in our study were all patients operated on at the Teaching Hospital of Bouaké for BPH and who had postoperative complications or who were operated on and subsequently transferred to our department for complicated postoperative course. In total, over the study period, we collected 150 patients corresponding to the inclusion criteria and who had complete medical records. The parameters studied were age, postoperative complications, treatment, and mortality.

The results were analyzed by the logiciel Ep-info 2007.

3. Results

The average age was 67.2 ± 7.37 years with extremes of 54 and 84 years (**Figure 1**).

Immediate complications were dominated by postoperative hemorrhage of prostatic compartment in 7.33% of cases (**Table 1**).

Secondary complications were dominated by postoperative suppuration (**Table 2**).

Late complications were mainly represented by retrograde ejaculation in 73.33% of cases (**Table 3**).

Treatment of immediate and secondary complications (**Table 4**).

Concerning the late complication such as sclerosis of the prostate compartment, all our patients were treated endoscopically (Table 5).

All late complications such as urethral stricture were treated by endoscopic internal urethrotomy. Scrotomy a liquid reaction which was translucent in 76.08% of cases and squint in 23.90% of cases.

We observed 1.33% of deaths in the immediate postoperative period in our work.

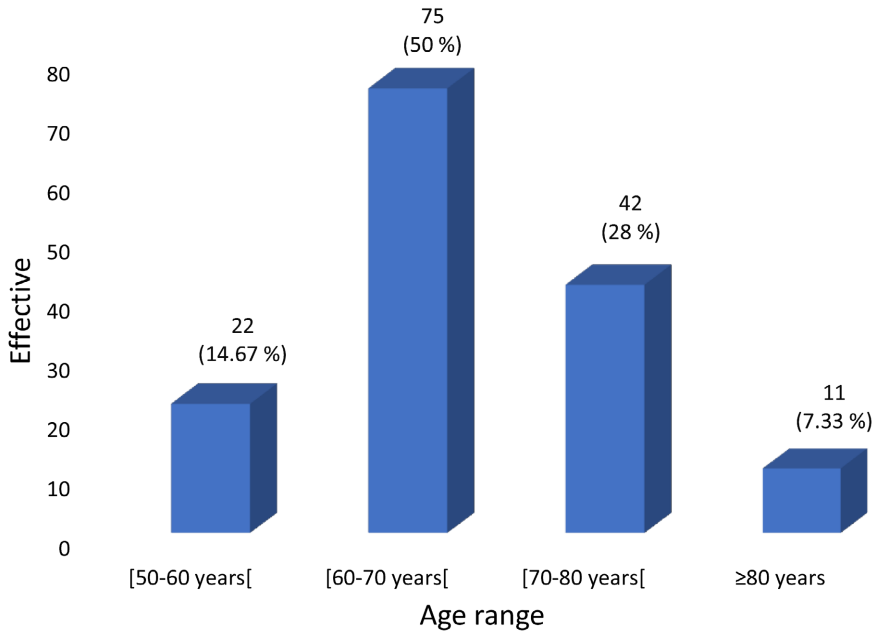

Figure 1. Distribution of the 150 patients by age.

Table 1. Distribution of patients according to immediate follow-up.

Immediate post-operative follow-up	Number	Percentage
Hemorrhage	**11**	**7.33**
Deaths	02	1.33
Simples	137	91.33
TOTAL	150	100.00

Table 2. Distribution of patients according to secondary consequences.

Secondary post-operative follow-up	Number	Percentage
Parietal suppuration	**72**	**48**
Vesicocutaneous fistula	27	18
Epididymitis orchi	23	15.33
Urinary leakage after removal of the catheter	02	3.33
Simples	26	17.33
Total	150	100.00

Table 3. Distribution of patients according to late postoperative course.

Late sequences	Numbers	Percentages
Retrograde ejaculation	**110**	**73.33**
Urethral stricture	16	10.66
Compartment sclerosis	10	6.66
Simples	14	9.33
Total	150	100.00

Table 4. Management of immediate and secondary complications.

Complications	Number	Percentage	Treatment
Hemorrhage	11	7.33	**Blood transfusion + hemostatic**
Parietal suppuration	72	48	**Daily dressing with Dakin + Antibiotherapy adapted to the antibiogram**
Vesicocutaneous fistula	27	18	Catheterization of the fistula + daily dressing with Dakin
Orchiepididymitis	23	11	Antibiotherapy + anti-inflammatory
Urinary leakage	2	3.33	Anticholinergics

Table 5. Distribution of patients according to type of sclerosis treatment.

Types of treatment	Number	Percentage
Endoscopic incision of sclerosis	**07**	**70**
Endoscopic incision of sclerosis	03	30
Total	10	100

4. Discussion

In our study, the patients who presented postoperative complications after transvesical prostatic adenomectomy had an average age of 67 years plus or minus 7.37 years. This result can be superimposed on those of Kambou *et al.* in Burkina Faso [1] and Torésanni *et al.* in Benin [2] and Luhirirind *et al.* [3] which were respectively 68, 68.4 and 69.5 years. These results could be explained by age, but also by the presence of comorbidities.

Considered the main immediate complication of prostate surgery at a time when adenomectomy did not involve any haemostasis, postoperative haemorrhage currently seems to be better controlled [4]. Eleven patients or 7.33% presented postoperative hemorrhage in our study, this rate is slightly lower than that of Fourcade [5] and Guissé [6] who in their study found 9% and 11% respectively. Among the 11 patients, 5 presented with hemorrhagic shock during immediate postoperative monitoring. Their management was essentially done by blood transfusion, as in the study by Fourcade [5] and Ndemanga Kamoune *et*

al. [7]. The 6 other patients had their hemorrhage subsided by administration of tranexamic acid and traction of the probe.

In our study, infectious complications constituted the major contingent of secondary complications encountered post-operatively with a rate of 81.33%. These infectious complications were dominated by parietal suppuration resulting in vesicocutaneous fistulas and orchiepididymitis. 72 patients or 48% presented parietal suppuration in our study, this rate is much higher than that of Guissé [6] who in his study was 21%. This excessive rate in our series could be explained by the presence of co-morbidity factors (diabetes) in some patients, by prolonged wearing of the urinary catheter preoperatively, as deplored by Fall *et al.* [8] in the Senegal, but also by the lack of asepsis during dressings. For these patients a cyto-bacteriological examination of the pus associated with an antibiotic therapy adapted to the antibiogram, as well as a daily dressing with Dakin were carried out, which allowed us to curb the infection.

According to Coulange [9], vesicocutaneous fistula (VCF) is the specific complication of open adenomectomy using the Freyer Hrynstchak technique. In our study, 27 patients or 18% presented with VCF. This rate is slightly higher than that of GUEYE [10] which was 15% in his study. These vesicocutaneous fistulas encountered are the consequence of a release of thread linked to a local infection. The management was done by bladder drainage (catheterization of the fistula) associated with a daily dressing in twenty of them, *i.e.* 74.07%, until complete closure of the bladder, and a secondary suture was made in the other seven patients, *i.e.* 25.92%.

In our study, 23 patients presented with orchiepididymitis, *i.e.* 15.33%. In the study by Fourcade [5], 3.4% was noted. Our result is superior to that of Fourcarde and this could be explained by the duration of wearing the preoperative urinary catheter as also deplored by other authors, such as Fall *et al.* [8] in Senegal, the reflux of urine infected in the vas deferens [11]. For these patients, antibiotic therapy adapted to the antibiogram associated with nonsteroidal anti-inflammatory drugs allowed us to overcome the infection.

In our study, we found transient urinary incontinence in 3.33% of our patients. It was urinary leakage occurring immediately after the removal of the catheter which improved after a few weeks. Anyanwu [12] reported a transient urinary incontinence rate of 7% with normalization of signs after about two months. We did not observe true urinary incontinence in our study. It could be explained by an anatomical impairment of the intrinsic part of the external sphincter which can be injured to a greater or lesser extent intraoperatively, responsible for an inability to maintain sufficient closing pressure in all circumstances to obtain a continence.

Retrograde ejaculation is the commonly accepted "almost constant" consequence of BPH surgery. It is linked to the disappearance of smooth muscle fibers and alpha adrenergic receptors from the bladder neck, which is necessarily severed during enucleation. This French Urological Association report in 1993 pointed out that the rate of retrograde ejaculation affects more than two out of

three cases among patients who had sex before surgery [13]. In our study, 105 patients showed retrograde ejaculation, *i.e.* 70%. This rate can be superimposed on that of Conquy [14].

5. Conclusion

Trans-bladder prostatic adenomectomy is a surgical technique for the management of BPH in our practice. It remains enamelled with several post-operative complications dominated by hemorrhage and infections. The control of haemostasis, the application of hygiene measures, rigorous asepsis associated with appropriate antibiotic therapy and the introduction of minimally invasive methods such as endoscopy, will considerably reduce the occurrence of these complications.

Conflicts of Interest

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

Ethical Committee Approval

The study was ethically approval from the local ethical committee of our University.

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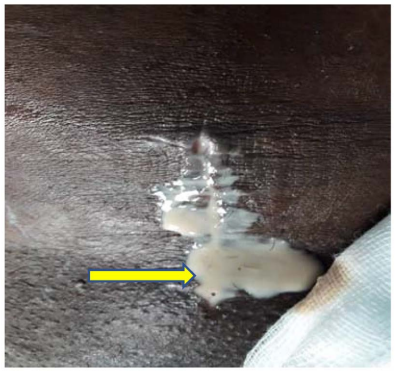
Annex



Picture 1. Suppuration of operating site.

Picture 2. Loosening of suture threads.

Picture 3. Loosening of suture threads.

Picture 4. Vesico-cutaneous fistula.

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Management of Non-Traumatic Urological Emergencies at Souro Sanou University Teaching Hospital of Bobo-Dioulasso (Burkina Faso)

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Abstract

Background: Generally, urological emergencies are assumed not to be very common, however, recent reports showed that they constitute an important aspect of the day-to-day urological practice. If not well and promptly managed, they may lead to serious morbidity or mortality. **Objectives:** To study the pattern of presentation, diagnosis and outcome of management of non-traumatic urological emergencies seen at the Emergency Department of Souro Sanou University Hospital in Bobo-Dioulasso. **Patients and Methods:** This was a retrospective and descriptive study over four years. It included patients of all ages and both sexes, admitted for non-traumatic urological emergencies in the surgical emergency department of Souro Sanou University Hospital. It took place from January 1, 2017 to December 31, 2020. **Results:** A total of 584 patients were reviewed in our study. Non-traumatic urological emergencies account for 6.3% of all surgical emergencies seen during the study period. The male-to-female ratio was 9.2 to 1. The mean age of the patients was 51.9 ± 23.9 years. Forty-five per cent of the patients presented within 48 hours of symptoms. The vast majority of the patients presented with difficulties with passing urine (41.6%), followed by cases of hematuria (18.4%). On admission, 154 patients (26.4%) presented with severe conditions such as anemia as seen in 40.9% of the cases and deterioration in the general health condition as seen in 34.4% of the patients. Leukocytosis was noted in 18.7% of the patients and anemia in 17.9%. Urine culture was posi-

tive in 15.4% of the patients and *Escherichia coli* was the most common pathogen found (40.6%). Ultrasound was the most requested examination (81.2%), followed by a computerized tomography (CT) scan (22%). The most frequent diagnoses were urine retention (42.9%), hematuria (16.9%) and renal colic (10.1%). Emergency interventions were carried out in 525 patients (89.9%) who include bladder catheterization (46.1%), bladder lavage and/or bladder irrigation (20.9%) and suprapubic cystocatheterization (10.1%). Most of the patients (61.3%) were discharged after a mean stay in the hospital of about 5.1 ± 7.5 days. A mortality rate of 3.8% was also recorded among the patients studied. **Conclusion:** Non-traumatic urological emergencies are common and are an important aspect of daily urological practice. The majority of the patient presents late with usually a severe form of the disease, which adversely affects the outcome even after treatment.

Keywords

Non-Traumatic, Urological Emergency, Acute Urine Retention, Renal Colic, Hematuria

1. Introduction

A urological emergency is a critical clinical situation in the urological system that requires an urgent therapeutic intervention [1]. There are several non-traumatic pathologies of the urinary tract in both sexes that can affect the normal functioning of the urinary system. These may require urgent intervention to alleviate symptoms, restore normal anatomy and physiology or prevent further damage to the system. Urological emergencies can be traumatic or not. Kesler and Bauml [2] in a clinical review found priapism, paraphimosis, testicular torsion and fournier's gangrene to be the four most common non traumatic urologic emergencies. In France, at the Pitié-Salpêtrière Hospital in Paris, 15.6% of hospital admissions were for non-traumatic urological emergencies [1]. In Spain Muntaner *et al.*, [3] reported 1504 urological emergencies in one-year retrospective study; they found that the most common diagnosis in both males and females was renal colic, urinary retention, cystitis and hematuria. In Africa, Avakoudjo [4] in Benin found that non-traumatic urological emergencies account for 92.7% of all urological emergencies. Likewise, Halidou in Niger [5] found 89.7% of all urological emergencies and Fall [6] in Dakar reported 94.6%. In Burkina Faso, a study conducted by Zango *et al.* [7] in 2010 found that non-traumatic urological emergencies accounted for 93.3% of all emergency surgical admissions at the University Hospital Yalgado Ouedraogo in Ouagadougou. The purpose of this study is to retrospectively study the pattern of presentation and management of non-traumatic urological emergencies at the Souro Sanou University Hospital in Bobo Dioulasso with the view to improve the management of such cases in the future.

2. Patients and Methods

This was a cross-sectional retrospective study of medical records of all the patients who were managed for non-traumatic urological emergencies in Souro Sanou Teaching Hospital from January 1, 2017, to December 31, 2020. The data were retrieved from case notes, registers in accident and emergency, theatre, out-patient unit, and wards and were transferred to a proforma form. Detailed information about the patients was retrieved such as biodata, presenting complaints, clinical evaluation findings, diagnoses and treatment outcomes. Case notes with incomplete information and duplicates were excluded. Descriptive statistics were presented in the form of frequencies, percentages, and proportions for categorical variables. Data analysis was carried out using Epi info 7.2.2.2 French version 2017. The study has been performed with the approval of a medical ethics committee.

3. Results

During the 4 year study period, 584 patients were admitted to the surgical emergency department for non-traumatic urological emergencies accounting for 6.3% of all surgical emergencies seen. Non-traumatic urological emergencies accounted for 90.8% of all urological emergencies with an annual frequency of 146 cases per year. The male-to-female ratio was 9.2:1. The mean age of the patients was 51.9 ± 23.9 years with the ages ranging from 1 year to 107 years. The modal age group was 61 - 80 years (37.5%) and most of the patients (52.6%) were farmers or breeders, followed by those working in the informal sector (10.6%) and students (10.3%). Slightly more than half (52%) of the patients came from urban areas. The majority of the patients (69.5%) were referred from other healthcare facilities.

Forty-five per cent of the patients presented within 48 hours of symptoms. The symptoms were sudden in onset in 26% of the patients, and many of them (41.6%) presented with difficulties with micturition followed by hematuria (18.4%). **Table 1** gives the distribution of patients according to clinical data.

Background history of prostate tumors (22.1%), urinary schistosomiasis (4.3%) and recurrent urinary tract infections (2.6%) has been reported in our patients; in addition, 2.4% of patients had sickle cell disease.

On admission, 154 patients (26.4%) showed signs of disease progression with the majority having clinical anemia (40.9%) and deterioration of the general clinical condition (34.4%) (**Figure 1**).

Laboratory investigations were performed on 369 patients (63.2%). Leukocytosis was found in 109 patients (18.7%) and anaemia in 105 patients (17.9%). The HIV serology came back positive in 8 patients (1.4%). ECBU was deranged in 59 patients (15.4%) and *Escherichia coli* was the most commonly found pathogen during urine culture (40.6%) followed by *Klebsiella pneumoniae* (17%). Radiological examinations were carried out in 52.9% of the patients and ultrasound was the most commonly requested examination (81.2%), followed by CT scan (22%).

Table 1. Distribution of patients according to clinical aspects.

Variables	Frequency (n = 584)	Percentage (%)
Mode of admission		
Self-directed	135	23.1
Brought by his parents	16	2.8
Refferal	406	69.5
Transferred	27	4.6
Consultation delay		
<6 h	7	1.2
6 h - 12 h	80	13.7
12 h - 24 h	142	24.3
24 h - 48 h	91	15.6
>48 h	264	45.2
Presentation		
Acute	164	28.1
Chronic	420	71.9
Presenting complaint		
Anuria/Oliguria	2	0.4
Urinary burning micturition/Pollakiuria/Fever	9	1.5
Flank pain with fever	23	3.9
Flank pain without fever	59	10.1
Testicular pain	66	11.3
Painful erection	20	3.4
Haematuria	99	16.9
Urinary retention	224	38.4
Urinary incontinence	27	4.6
Fournier's gangene	52	8.9
Painful swelling of the glans	1	0.2
Painful perineal swelling	2	0.3

The most common diagnosis was urine retention (42.9%), followed by urinary tract infections (22.5) and hematuria (16.9%). Table 2 gives the distribution of the different diagnoses.

Intensive care admission was necessary for 4.9% of the patients for resuscitation and intensive monitoring. Blood was transfused for 12.7% of the patients. Antibiotic therapy was given based on the diagnosis made, the associated

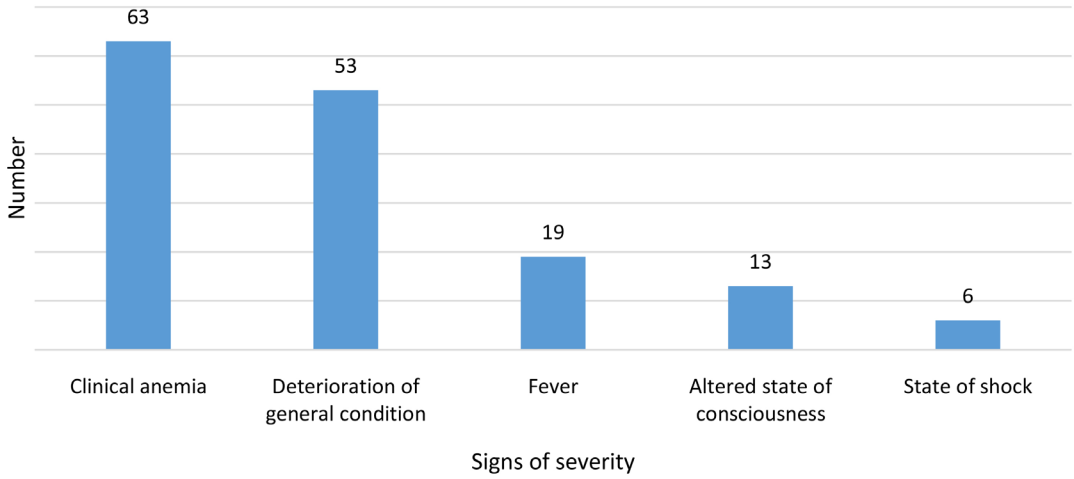

Figure 1. Distribution of patients according to signs of severity observed on admission.

Table 2. Distribution of patients according to the different diagnosis.

Diagnosis retained	Frequency (n = 584)	Percentage (%)
Obstructive anuria	2	0.3
Acute prostatitis	9	1.5
Renal and peri renal abscesses	24	4.1
Renal colic	59	10.1
Epididymoorchitis	45	7.7
Testicular Torsion	21	3.6
Priapism	19	3.3
Haematuria	99	16.9
Urinary retention	251	42.9
Fournier's gangrene	52	8.9
Paraphimosis	1	0.1
Peri urethral abscess	2	0.3
Total	**584**	**100**

complications and the culture and sensitivity results. It was prescribed in 25.5% of the patients for curative purposes and in 9.6% of the patients for prophylactic purposes.

The surgical intervention offered depends on the diagnosis and the severity of the patient condition. Five hundred and twenty-five (89.9%) of the patients had one surgical intervention or the other as depicted in Table 3.

The outcome was favorable in the majority of patients (95.5%). However, complications were noted in 5.5% of patients which include hemorrhagic shock (1.5% of cases), septic shock (1.4% of cases), gross hematuria (0.8%) and renal failure (0.8% of cases).

Table 3. Distribution of patients according to the different procedures performed.

Therapeutic procedure	Frequency (n = 525)	Percentage (%)
Nephrostomy	11	2.1
Ureterostomy	1	0.2
Double J stenting	3	0.6
Cystolithotomy	33	6.3
Cystostomy	40	7.6
Supra pubic bladder catheterization	53	10.1
Bladder irrigation	110	20.9
Urethral catheterization	242	46.1
Orchidectomy	19	3.6
Orchidopexy	11	2.1
Cavernosal aspiration	3	0.6
Caverno-spongiosum shunt	10	1.9
Testicular abscess incision and drainage	13	2.5
Debridement of necrotic tissues	62	11.8
Emergency Circumcision	2	0.4

Most of the patients (61.3%) were managed and discharged from the hospital however, 22 patients (3.8%) died, 32.9% were transferred to other units and 1% left against medical advice. The average length of hospital stay was 5.1 ± 7.5 days with a range of 3 hours and 71 days.

4. Discussion

In our study, non-traumatic urological emergencies accounted for 90.8% of all urological emergencies, which underscores the importance of this entity; this same observation has been made by other authors in Africa [4] [6] [7]. The average age of our patients was 51.9 ± 23.9 years and the modal age group was 61 to 80 years. This could be due to the fact that the commonest presentation was urine retention and prostatic hyperplasia was the commonest background pathology which is commonly seen among men above 50 years. Avakoudjo [4] in Benin, Fall [6] in Senegal and Kambou [8] in Burkina found the average ages of their patients to be 61, 59 and 58.8 years respectively in their series. Almost half of the patients (45%) presented 48 hours after the onset of symptoms. This could be probably due to difficulties in getting access to health services, lack of knowledge of the early symptoms and signs of some of these emergency conditions, waste of time by patronage to traditional health practitioners and self-medication.

The male sex was predominant in our series as reported by many studies [6] [7] [9]. This could be explained by the high incidence of urethro-prostatic pa-

thologies in males on the one hand and the fact that pathologies of the female urinary tract are generally seen and taken care of in the gynaecology department.

The commonest reason for the presentation was acute retention of urine. It is the most common urological emergency due to the extreme pain caused by the inability to empty the bladder. Several authors in their series have made the same reports [4] [7] [10] [11]. Gross hematuria was the second emergency presentation because of the high level of fear and concern the patient and their relative usually have on the sight of blood in the urine. Referrals were also prompt in patients with hematuria because of what the fear that the rapid loss of blood may cause to the hemodynamic stability of the patients.

Radiological evaluation plays a significant role in the diagnosis and treatment of these patients. In our study, 52.9% of the patients had one radiological evaluation or the other. Ultrasound, a quick, easily accessible and inexpensive examination, was the most commonly performed (81.2%) radiological investigation. This may be due to the fact that the majority of patients are farmers/breeders who are poor and cannot afford more sophisticated radiological examinations. Moreover, most of the diagnoses can be reached with USS hence there may be no need for costly radiological evaluation especially when all investigations are paid by the patient out-of-pocket.

The commonest diagnosis was retention of urine (42.9%) followed by urogenital infections (22.5). These results are similar to those of several authors. Tfeil *et al.* [12] in Mauritania found 60.5% of their patients presented with urine retention and 16.75% urogenital infection. For Owon'Abessolo *et al.* in Cameroon, Diabate *et al.* in Senegal and Bobo Diallo *et al.* in Guinea, hematuria was the commonest diagnosis followed by urine retention [13] [14] [15]. On the other hand, for Mondet *et al.* in France, urinary retention was the second most common cause of urological emergencies behind low back pain [4]. This could be explained by the rather early presentation to hospitals in France at the slightest symptoms of dysuria, whereas African patients because of socio-economic, cultural and poor access to health services often present late with complications such as urine retention and sepsis.

The management of the patients depends on the working diagnosis. Thus, patients with urine retention were relieved by urethral catheterization or suprapubic cystostomy if urethral catheterization failed or was contraindicated. Therefore, urethral was the most frequently performed emergency procedure in several African series [6] [14] [15].

Urogenital infections (22.5%) were the second most frequent presentation in our study usually in the form of gangrene of the external genitalia and epididymoorchitis as in the studies by Tfeil *et al.* and Tengue *et al.* [12] [16]. The majority of gangrene of the external genitalia occurs in elderly patients with numerous comorbidities (arterial hypertension, diabetes and severe acute malnutrition) or sexually transmitted infections (human immunodeficiency virus). The treatment is based on bi- or tri-antibiotic therapy associated with surgical debridement and

systematic treatment against tetanus (anti-tetanus serum and anti-tetanus vaccine). This treatment approach has been reported in several studies [17] [18].

Hematuria was the third most common presentation of non-traumatic urological emergencies in our study. This could be explained by the fact that Burkina Faso is a schistosomiasis endemic country. The management of these patients requires the placement of a three-way urinary catheter and the initiation of continuous bladder irrigation with normal saline to wash out any clots in the bladder. If the haemorrhage affects the haemodynamic stability of the patients, a blood transfusion may be indicated. In our series, a blood transfusion was necessary in 12.5% of our patients.

The short-term outcome was satisfactory in 95.5% of patients. The mortality rate was 3.8%. This could be due to the fact that most of the patients seen were elderly with many comorbidities. In addition, delayed presentation; poor referral system; and poor overall healthcare services associated with many logistic issues that prevent prompt and adequate resuscitation and proper treatment may be responsible for this high mortality rate.

Retrospective nature of the study with it inherent shortcomings was one of the key limitations of the study. Incomplete records and missing records are other well-known limitations of retrospective study which we also observed in our study. Finally, failure to come back for follow-up makes it difficult to ascertain treatment outcomes.

5. Conclusion

Non-traumatic urological emergencies constitute a significant portion of all emergency surgical presentations in our setting. Urinary retention was the most common urological emergency. Delays in presentation, poor logistic protocol causing a delay in resuscitation and background comorbidities were responsible for the high mortality rate recorded. However, for patients who were seen and treated early in the course of the disease, the management outcome used to be satisfactory.

Conflicts of Interest

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

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Simultaneous Management of Inguinal Hernia and Benign Prostatic Hypertrophy in a Single Operation at the Chu D'abeche/Chad

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Abstract

Introduction: Benign prostatic hypertrophy and inguinal hernia are related and frequent pathologies in people over 50 years old. Their incidence is 15% to 25% according to the literature. The occurrence of hernia during benign prostatic hyperplasia is favored by disorders of the lower urinary tract. Simultaneous single-stage treatment of these two pathologies makes it possible to obtain satisfactory results that can reduce the cost of hospital stay and the multiple risk of anesthesia. The aim of our study was to: 1) Report the epidemiological, anatomo-clinical and para-clinical aspects of hernias during benign prostatic hypertrophy; 2) Evaluate the feasibility and the results of the combined treatment of inguinal hernia and prostatic adenectomy in a single operation. **Patients and Method:** This was a retrospective descriptive study over a period of 7 years from March 2014 to February 2021, including patients operated on simultaneously at the University Hospital of Abeche for inguinal hernia and benign prostatic hypertrophy. The variables studied were: age, antecedents, favouring factors, clinical symptomatology, para-clinical elements, treatments and results: **Results:** 356 patients underwent surgery for benign prostatic hyperplasia, 36 of whom had an associated inguinal hernia. The mean age was 65.5 years, ranging from 50 to 93 years. The main reason for consultation was chronic urinary retention. The average consultation time was 10.2 months. The inguinal hernia was located on the right in 51% of cases and on the left in 18.4%. The mean prostatic volume measured by suprapubic ultrasound was 60.5 ± 25 cc. 14% and 10.2% of patients respectively were found to have struggle bladder and bilateral ureterohydronephrosis. Trans-

vesical suprapubic adenectomy of the prostate was performed in all patients. The Bassini technique was the most commonly used (91%) for hernia repair. The average hospital stay was 7.5 days. **Conclusion:** Simultaneous treatment of benign prostatic hypertrophy and inguinal hernia reduces the number of hospital admissions in elderly patients, as well as the length of hospital stay.

Keywords

Benign Prostatic Hyperplasia, Herniography Adenectomy, Inguinal Hernia

1. Introduction

Benign prostatic hyperplasia and inguinal hernia are a public health problem in men over the age of 50. Some patients consult a specialist for prostatic disease, and inguinal hernia may be discovered incidentally during clinical examination [1]. According to the literature, the incidence of inguinal hernia ranges from 15% to 25% [2]. The occurrence of a hernia during benign prostatic hyperplasia is favoured by disorders of the lower urinary tract and by acquired parietal weakness in the elderly [3]. Abdominal tension associated with dysfunction has traditionally been associated with the development of abdominal wall hernias [4].

The combination of prostatic hypertrophy and inguinal hernia also poses the problem of the timing of their repair. The management of benign prostatic hyperplasia has been revolutionized by the advent. Trans urethral resection of the prostate is the second most common surgical procedure in France and the United States after cataract surgery [5] [6]. Despite its convincing results, it remains a luxury in underdeveloped countries with a limited technical platform where open surgery retains its place and remains common practice [7]. In Africa, according to some studies, prostatic adenomectomy ranks first among the surgical activities of urology departments [7] [8].

A first hernia repair without treatment of the cervicoprostatic obstruction exposes the patient to a high rate of recurrence due to dysuria [9].

The anatomical proximity and pathophysiological relationship between an inguinal hernia and benign prostatic hyperplasia raise the question as to why these two disorders should be treated simultaneously [10].

The aim of our study was to:

- Report the epidemiological, anatomo-clinical and para-clinical aspects of hernias during benign prostatic hyperplasia;
- Evaluate the feasibility and results of combined treatment of inguinal hernia and benign prostatic hyperplasia.

2. Patients and Method

This was a retrospective descriptive study covering a period of 7 years from March 2014 to February 2021, based on the records of patients operated on si-

multaneously at the University Hospital of Abéché for inguinal hernia and benign prostatic hypertrophy.

Patients with complete medical records were included. Patients with incomplete records, hernias or isolated benign prostatic hyperplasia were excluded. The following variables were studied: age, history, precipitating factors, clinical symptoms, paraclinical features, treatment and results. Data were collected and analyzed using SPSS 19.0 software

Calculations were performed using proportions and mean, and statistical significance was considered with $\alpha = 5\%$. The authorization of the research was approved by the Faculty of Health Sciences of UNABA and CHU of Abeche.

3. Results

During the study period, 356 patients underwent surgery for benign prostatic hypertrophy, 36 of whom had an associated inguinal hernia. Patients ranged in age from 50 to 93 years, with an average age of 68.5 years. The age distribution in Table 1 shows that the 60 to 69 age group predominated (n = 15).

55.5% of patients were from rural areas and 44.5% from urban areas. The reason for consultation was dominated by chronic urinary retention (n = 13), followed by dysuria (n = 9), as shown in Table 2.

The average consultation time was 10.2 months, ranging from 2 to 24 months. Urinary tract infection was reported in 32.7% of cases, urinary lithiasis in 6%, and 61% had no previous urological history. A hernia repair was reported in 10.2% of cases. Two cases of urethral stricture were associated (5.5%). The inguinal hernia was located on the right in 50% of cases and on the left in 22.2% (Table 3).

The TR was painless in all patients, with a smooth surface and regular contour in 98% and a firm consistency in 96%. The total PSA level was between 4.1 and 10 ng/ml in 45%, less than or equal to 4ng/ml in 40.7% and greater than 10 ng/ml in 14.3% of cases. A prostate biopsy was performed in 14.3% of patients with a PSA level greater than 10 ng/ml. The results were in favour of benign prostatic hypertrophy. Histological analysis of the surgical specimens in 85.7% of cases revealed adenomatous hyperplasia. Blood glucose was elevated in 4% of cases and creatinine in 25%. Cytobacteriological examination of urine in all patients found *E. coli* in 14.3% and *Klepsiella pneumoniae* in 8.2% of cases. The mean volume measured by suprapubic ultrasound was 60.5 cc, ranging from 28 to 130 cc. The median lobe was found in 20% of cases.

Struggling bladder and bilateral ureterohydronephrosis were found in 14% and 10.2% of cases respectively. The mean post-void residual was 240 ml, with extremes of 100 and 300 ml, and three cases of bladder lithiasis.

The most common emergency treatment was trans-urethral catheterisation in 20.4% of cases (Table 4).

Spinal anaesthesia was used in 98% of cases and general anaesthesia in 2%. The pfannenstiel incision and a separate inguinal approach were used in 69% of cases, and the extended pfannenstiel incision was used in 30.6%. Transvesical

Table 1. Distribution of patients by age group.

Age group	Number	Percentage (%)
50 - 59	3	8.3
60 - 69	15	41.6
70 - 79	9	25
80 - 89	7	19.5
90 and above	2	5.6
Total	36	100

Table 2. Distribution by reason for consultation.

Clinical signs	Number	Percentage (%)
Dysuria	9	25
Urinary urgency	2	5.5
Pollakiuria	5	13.8
Urine retention	13	36.2
Hoematuria	1	2.8
Unilateral inguinal hernia	4	11.2
Bilateral inguinal hernia	2	5.5
Total	36	100

Table 3. Distribution by site of hernia.

Seat of hernia	Workforce	Percentage (%)
Right inguinal	18	50
Left Inguinal	8	22.2
Inguino-scrotal left	3	8.3
Inguino-scrotal right	5	13.9
Bilateral inguino-scrotal	2	5.6
Total	30	100

Table 4. Distribution of patients by emergency treatment.

Emergency treatment	Workforce	Percentage (%)
Trans-urethral catheterisation	17	47.2
Derivation cystostom	2	5.6
Antibiotherapy	7	19.4
None	10	27.8
Total	36	100

suprapubic adenomectomy of the prostate was performed in all patients. The Bassini technique was used in 91% of cases and the Shouldice technique in 9% of cases for hernia repair.

The associated treatment was cystolithotomy (8.3%) and urethral dilatation (5.5%). All patients had received postoperative antibiotic therapy to prevent the risk of infection.

The mean duration of bladder catheterisation was 6.4 days, with extremes of 5 and 25 days. The average hospital stay was 7.5 days, ranging from 5 to 15 days. Two complications were noted: one case of haemorrhage and two cases of parietal suppuration.

4. Discussion

The incidence of inguinal hernia is 5% in the general population [2]. The incidence of hernia associated with benign prostatic hypertrophy was 9.6% in our study. Bah I in Guinea Conakry which performs 73.89% of prostatic adenomectomy, 10% of which is associated with a hernia repair [11].

This increase in frequency can be explained by the prostatism generated by benign prostatic hypertrophy on the one hand, and age-related weakness of the parietal wall on the other. The mean age of patients in our series was 69.9 years. This is comparable to the series by Bagayogo and Davoud, who both reported 70.9 years [12] [13].

Urinary retention accounted for 30.6% of consultations. The occurrence of urinary retention during the course of benign prostatic hyperplasia constitutes a turning point in the course of the disease and is what prompts the patient to consult a doctor. This result is similar to that reported in the literature [9] [12] [13].

Urological history was dominated by urinary tract infections in 32.7% of cases. These results are higher than those of Gonzalez [14] and Dahimi [2], who found 11% and 7.7% of cases respectively. This high rate of urinary tract infection may be explained by the patients' poor lifestyle and also by complications of the disease. The inguinal hernia was unilateral in 95.9% of cases. This result is similar to those of Cimentepe [15] and Filliadis [16], who reported 91% and 86.4% respectively. A digital rectal examination (DRE) in favour of benign prostatic hyperplasia was found in 95.9% of cases in our study. This result corroborates those of Dahami [2] and Bah [11] who reported 96.4% and 100% respectively.

PSA levels were normal in 34.7% and elevated in 65.3% of cases. This result differed from that of Bah, who found a normal PSA level in 92% of cases [11]. This increase in PSA levels in our series is thought to be due to urinary tract infections, which are frequent in our exercise setting.

Histopathological analysis of the biopsy cores revealed benign prostatic hypertrophy in all cases. This result is similar to that of Bagayogo [12].

E. coli was found in 14.3% of cases. Urinary retention is a factor in the development of urinary tract infections. Escherichia coli is the germ most responsible

for urinary tract infections [17]. The mean volume of the prostate on ultrasound was 61.6%.

Cimentepe found a similar result in his series, 58.6% [15].

Struggle bladder and ureterohydronephrosis represented the impact on the upper apparatus in 14.3% and 10.2% respectively. The post-micturition residual was 240 ml. The same complications have been reported in the literature [2] [12].

Spinal anaesthesia was used in 98% of cases and general anaesthesia in 2%. Our results are similar to those of Gueye [4] and Dahimi [2] who found in their series respectively 96.8% and 80% of cases. These results show that spinal anaesthesia is increasingly preferred because of its advantages.

In our series, the pfannenstiel incision and a separate inguinal approach were used in 69.4% of cases. The extended Pfannenstiel incision was used in 30.6% of cases.

On the other hand, the series by Gueye in Senegal and Filladis in Greece reported an enlarged pfannenstiel incision in 64.1% and 22.7% respectively, and a median incision in 35.9% and 77.3% respectively [9] [14]. Transverse suprapubic adenectomy was performed in all our patients. Gueye [9] and Granados [1] used the same technique in all cases in their series. However, our results differed from those of Ramzi Khiari [18] who reported transvesical suprapubic adenectomy in 53% of cases and transurethral resection of the prostate in 47%.

This difference can be explained by the lack of minimally invasive surgery facilities in our regions.

In our study, the Bassini technique was used in 91.8% of cases for hernia repair. These results are comparable to those of Gueye [9] and Dahimi, [2] who reported 80.6% and 74.2% respectively.

Treatments associated with the procedure were dominated by cystolithotomy and urethral dilatation, performed in 8.2% and 6.1% of cases respectively. These conditions were related to mictional disorders and urinary tract infections. Prophylactic antibiotic therapy was systematic in all cases to prevent the risk of infection, as recommended by several authors [2] [16] [19].

The mean duration of catheter use was 8.2 days. Our result is better than that of Dahami [2], in whom the bladder catheter was removed on the third postoperative day. This difference can be explained by the technique used by Dahami, which is minimally invasive compared with the traditional open surgery used in our series [2].

The average hospital stay in our study was 7.6 days. Our results are similar to those of Filladis who reported 6.7 days [16] and lower than those of Bah who reported isolated adenomectomies 12 days in his series [11]. However, our results were higher than those of some authors [2] [15] [20]. This difference can be explained by the open surgical technique used in our series on the one hand, and the infectious context and associated pathologies on the other.

We noted two cases of parietal suppuration and one case of intraoperative haemorrhage. Complications have been reported by some authors [2] [16] [20].

Simultaneous cure of the inguinal hernia and open prostatic adenectomy gives satisfactory results. However, the wound infection rate is 6% - 15% when open adenectomy is combined with unilateral inguinal hernia repair, and 25% when combined with bilateral inguinal hernia repair [20].

5. Conclusion

Benign prostatic hypertrophy and inguinal hernia are common in people over the age of 50 in our practice setting. Simultaneous prostatic adenectomy and herniorrhaphy is a safe procedure that can be performed easily by urologists. The procedure is effective and produces satisfactory results that can reduce the cost of hospital stay and the multiple risk of anaesthesia.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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Surgical Complications of Kidney Transplantation in a Resource Limited Country: Retrospective Study of the First Five Years

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Abstract

Background: Kidney transplantation is the most efficient treatment for renal failure but may be ruined by complications. **Objective:** To report the surgical complications of renal transplantation and the therapeutic means applied. **Method:** It was a retrospective study including 42 files of kidney transplantation in Côte d'Ivoire. We report 11 cases of surgical complications of the recipient's intervention during the first five years. **Results:** The mean age was 42.64 years (±15.04). In 90.9% of the cases, there was a comorbidity factor. Lymphocele and stenosis of the uretero vesical anastomosis were the most frequent complications. One death was observed. **Conclusion:** Kidney transplantation is an effective way of managing chronic renal failure. Postoperative complications are polymorphic and unpredictable.

Keywords

Renal Transplantation, Post Operative Complication, Ureterovesical Stenosis, Lymphocele

1. Introduction

Chronic renal failure is a public health issue worldwide. In Cote d'Ivoire, most of the patients are young people. Less than half of the patients are able to resume professional or educational activities [1] [2].

Kidney transplantation was unavailable in our context until September 2012.

Following the firsts cases we noted some complications after a few years. Surgical complications of the recipient procedure are iatrogenic situations related to the renal transplant grafting. Added to that, there is a psychological trauma regarding the hope provoked by the procedure.

The aim of this paper was to share our experience in the management of the surgical complications of the recipient operation in kidney transplantation (KT). Specific objectives were to identify the surgical complications, to precise their treatment and describe the progression after treatment.

2. Material and Method

It was a descriptive study from September 2012 to February 2017. During this period 42 patients had a living donor kidney transplantation. We included all files of patients presenting a complication after kidney transplantation. Data were collected using a standardized file then entered in a MS Excel 2021 spreadsheet. The numeric variables were described using means and standard-deviation. Qualitative variables were expressed in percentage. We admitted as major complications life threatening ones or those requiring surgical cure, others were considered as minor.

3. Results

Among the 42 kidney recipient there was 36 men and 6 women. Mean age was 42.64 years (sd 15.04). Six kidney transplantations were made in the left iliac fossa (6/11). In 90.9% there was a comorbidity (high blood pressure or diabetes mellitus). We recorded eleven (26.2%) complications (Table 1). Lymphocele and uretero vesical stenosis were the most frequent (Figure 1).

Complications were severe in 15.4% of all complications. Management depended of the cause (Table 2).

Figure 1. Lymphocele in left side renal transplantation.

Table 1. Complications of living donor kidney transplantation.

	Frequency	Percentage (%)
Anemia	1	9.1
Adenovirus hemorragic cystitis	1	9.1
Hematoma	1	9.1
Hematuria	1	9.1
Lymphocele	2	18.2
Lymphocele + delayed healing	1	9.1
Urinary retention	1	9.1
Delayed healing	1	9.1
Uretero vésical stenosis	2	18.2
Total	**11**	**100.0**

Table 2. Management of the different complications.

Complications	Treatment
Anemia	Blood transfusion
Adenovirus hemorragic cystitis	Medical treatment
Hematoma	Surveillance
Hematuria	Bladder irrigation
Lymphocele	Laparoscopic treatment
Lymphocele +delayed healing	Suture
Urinary retention	Bladder catheter
Delayed healing	Suture
Uretero vesical stenosis	Boari-Kuss reimplantation

Mean hospital stay was 9.18 days (±3.48). One death occured. It was a 43 years old male with high blood pressure. He had a right side living kidney donor transplantation complicated by a stenosis of the ureterovesical anastomosis. This stenosis was treated by a Boari flap. The death occurred due to septicemia and renal failure 5 months after the procedure.

4. Discussion

Our patients were young. That may be linked to the frequency of renal failure in that population. It was assessed in our context by Diallo and Lagou [1] [2].

As young team in the world of KT, complications were stressful. Removing a kidney to a healthy human to cure another makes our team uncomfortable when complications start to occur. During this early period we observed different type of unexpected events.

Surgical complications observed during kidney transplantation are generally vascular, urologic and parietal. The most frequent are vascular, dominated by thrombosis and bleeding.

Ben Fatma [3] stated that surgical complications are more frequent in case of hemodialysis and bleeding during surgery. She observed 14% of complications and vascular complications were the most frequent with 25.6% of the cases. Tisserand [4] noted a high prevalence of complications (38.3%). Most of these complications were urologic (26.2%). Graft survival was impacted only by vascular complications which accounted for 14.9% of all complications. Other complications had no influence on graft survival.

In Bessede serie [5] they were estimated to 13%. No vascular stenosis occurred in our series probably due to the little number of our cases. One hematoma was observed. Hemorrhage following KT has various etiologies. Vascular anastomosis, hilar vessels of the transplant hilum, renal capsule, renal parenchyma or retroperitoneal dissection may be concerned. This risk is enhanced by the usage of heparin before and after the procedure [6]. The decision of conservative management was selected because it was non expansive and the transplant vessels permeable at doppler ultrasound. One rare case of hemorrhagic cystitis was observed and reported in the literature [7].

Following vascular complications, urologic ones were the most frequent. They were dominated by ureterovesical stenosis. It was the major urologic complication. Haddiya [8] found vesico ureteral reflux (4.8%) and rupture of the graft (3.2%). We had no vesico ureteral reflux as we used Lich Gregoir technique to avoid this issue.

Most of parietal complications were lymphocele. It is a lymphatic collection in a cavity consequent to a surgical procedure. Its occurrence follows dissection of lymphatics without tying them. Following that, the usage of silk sutures permitted to prevent them. Laparoscopic access is the rule in the cure of lymphocele for it minimally access advantages. It also avoids recurrence compared to ponction. Four factors were identified by Derouiche [9] as predictors of lymphocele. These factors were age above 35 years, origin of the kidney, length of ischemia and the type of immunosuppressor treatment. None of these factors seems to apply to our cases.

Limitations of the study

This study provides low level of evidence due to the little number of cases. The retrospective plan of this study is also another point of weakness.

5. Conclusion

KT is the reference treatment for renal failure. Complications are unpredictable and cannot be avoided. Diagnosis must be precise and fast. They lead to an emergency for the transplant team and can compromise the procedure results.

Conflicts of Interest

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

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Spontaneous Rupture of Urinary Bladder (SRUB): An Exceptional Presentation

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Abstract

Background: Spontaneous rupture of urinary bladder (SRUB) without trauma is an extremely rare pathology. The incidence is estimated to about 1/126,000. It is difficult to diagnose. **Aim:** To present an exceptional case report and emphasize on the difficulty of diagnosis. **Case Presentation:** We report the case of a 63-year-old man. The initial diagnosis of SRUB was obscured by a urinary retention. The pelvic ultrasound finally led to the diagnosis. We will pay particular attention to the circumstances of the diagnosis and the therapeutic measures applied. **Conclusion:** SRUB is exceptional and misdiagnosis is usual. Management is most of the time surgical.

Keywords

Bladder Rupture, Spontaneous Rupture, Treatment

1. Introduction

Spontaneous rupture of urinary bladder (SRUB) is a rare clinical condition. It is a situation where the urinary bladder breaks without trauma. Few cases are reported in the literature [1] [2]. Risk factors have been identified and presented in several studies.

This rupture can occur in the peritoneal cavity or in a bowel [3]. The unusual nature of this clinical presentation can be misleading. We report the case of a patient admitted for acute urine retention and abdominal pain. The diagnosis was difficult due to the presentation. The worsening of the pain after bladder indwelling catheterization led to an abdominal and pelvic ultrasound examination. It concluded to an intraperitoneal rupture of the bladder.

Informed consent was obtained from the patient to present the case.

The manuscript was presented and approved by the Medical and Scientific Direction of CHU de Treichville.

2. Case

A 63-year-old patient was admitted with acute urine retention associated with abdominal pain. The symptoms started 72 hours before admission. He was unable to pass urinate despite an important urge. There were several unsuccessful urination attempts. During the last attempt, he heard an intra-abdominal clicking noise. He felt a decrease of the urge to urinate associated with hypogastric pain. He went to a primary care center where a transurethral catheter was placed. About 30 mL of haematic urine were collected. He was then referred to our department.

The history revealed Lower Urinary Tract Symptoms (LUTS) going on for approximately 3 years. It was marked by dysuria with a feeling of incomplete emptying of the bladder and pollakiuria. In addition, he had bilateral inguinal hernia repair 10 years ago.

At admission, the Glasgow score was 15 and the WHO performance status was 1. The hemodynamic status was satisfactory with a blood pressure of 130/80 mmHg and a pulse rate of 84/min. The patient had a latex urinary Fr18 catheter that did not drain urine. There was active urethrorrhagia exteriorized to the urethral meatus around the urinary catheter.

Examination of the hypogastrium found a globe reaching the umbilicus. Palpation of the abdomen was tender and defenseless overall. The digital rectal examination found an enlarged prostate, smooth, firm and painless. Moreover, Douglas cul-de-sac was slightly domed and not sensitive. We supposed a complete urinary retention following a possible iatrogenic trauma of the urethra associated to a benign prostatic hypertro phy. A Fr 20, two-way silicone catheter was placed and collected 1200 ml of hematic urine. The worsening of abdominal pain and appearance of peritoneal irritation required abdominopelvic ultrasound. It showed intraperitoneal fluid collection with the tip of the urinary catheter inside the peritoneal cavity. In addition there was a prostatic hypertrophy estimated to 65 ml with a median lobe. There was no dilatation of the renal cavities (**Figure 1**).

Biological values were disrupted with urea = 1.07 g/L and creatinine = 76 mg/L associated to hyperleukocytosis at 10.130 elements/mm^3.

A laparotomy for abdominal exploration was decided. Through a midline incision, examination found 500 ml of urine into the peritoneum and a wound at the bottom of the bladder (**Figure 2**). The length of the wound was about 5 cm and a portion of the ileum was incarcerated into it. We performed ileal extrication, excision of the wound edges and a two layer bladder suture (**Figure 3**). A peritoneal toilet was performed with 2000 ml of saline. The rectovesical excavation and the right parietocolic groove were drained by 2 drains. The excised margins were sent to the pathologist. No malignancy was found at pathology.

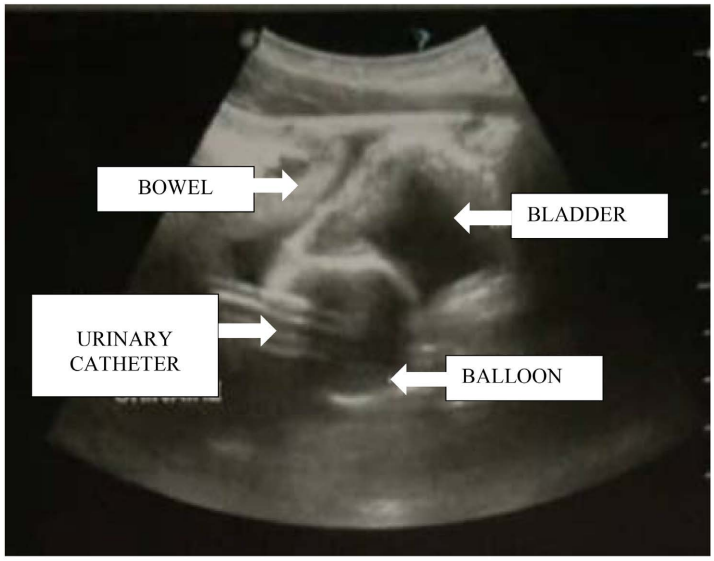

Figure 1. Abdominal and pelvic ultrasound.

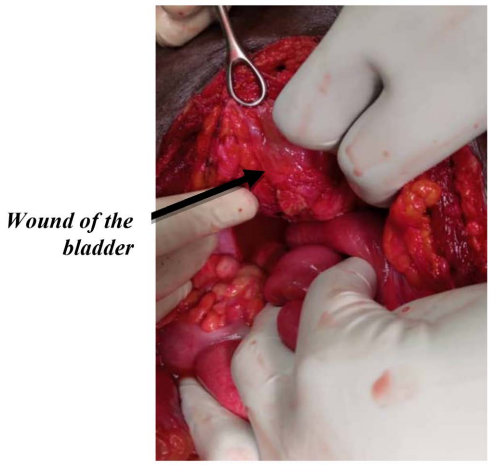

Figure 2. Wound on the posterior wall of the bladder.

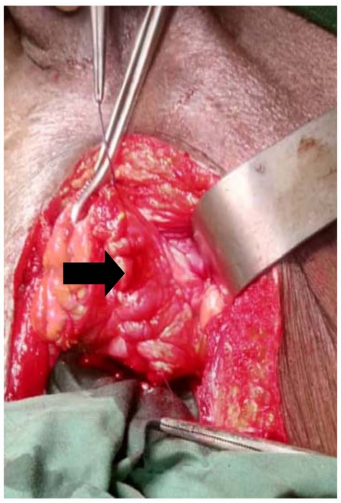

Figure 3. Two-layer bladder suture.

Postoperative management consisted of a double antibiotherapy and a pain killer treatment with monitoring of diuresis.

Follow up care was uneventful. The patient recovered fully and was discharged ten days after surgery. The prognosis was good after 6 months of follow up.

3. Comments

SRUB is a rare clinical situation. It is said to be spontaneous when it occurs without any trauma. In most of the cases, a double mechanism is involved associating a bladder outlet obstruction and a decrease in bladder compliance [4] [5].

The risk factors identified are alcohol intoxication, lower urinary tract obstruction, bladder tumor or inflammation, pregnancy,-bladder dysfunction, pelvic radiotherapy, history of bladder surgery and bladder diverticulum [6] [7] [8] [9].

Most of the cases reported concerns men, but women are also concerned [6].

In our case, the history of LUTS suggested the existence of an unexplored bladder outlet obstruction. Bladder retention on admission obscured the clinical presentation. The retention may be due to the ileum stucked in the wound, thus partially blocking the breach and promoting the filling of the bladder.

Clinical signs of a bladder rupture are polymorphic. Abdominal pain, hematuria as well as oliguria can be found. The presence of peritonitis can help in the diagnosis assessment. But in these cases, bladder perforation is not the first hypothesis to be mentioned [3] [10]. Keeler and Benchekroun, noted that the bladder dome was the preferred site of rupture [4].

In our daily practice, the discharge of a patient seen in emergency for bladder retention is performed after urinary catheterization. Etiological explorations are carried out on outpatient. In this case, the abdominal pain required surveillance. Worsening of the pain and the onset of peritoneal irritation led us to the diagnosis. Abdominal and pelvic ultrasound was useful for that purpose.

High serum creatinine values are due to urine reabsorption through the peritoneum but are not due to renal failure [8]. In Benchekroun and Keeler cases, bladder dome was the site of perforation [11] [12].

The treatment is most of time surgical. It consists of peritoneal toilet, closure and drainage of the bladder by urinary catheter, and perivesical drainage [3].

The presence of prostatic hypertrophy causing LUTS does not mean that we can formally rule out a pre-existing bladder lesion. There are several etiologies of spontaneous rupture of the bladder, the most frequent of which are: acute cystitis, urogenital tuberculosis or urolithiasis [13] [14].

The excision of the wound margins for pathologic examination was therefore mandatory before any suture. Benign prostatic hyperplasia will be treated latter.

4. Conclusion

Spontaneous rupture of urinary bladder is a rare condition difficult to diagnose. It was the first case of this entity managed by our team. Its presentation looks

like peritoneal irritation, with hematuria and oliguria. Medical imaging helps to assess the diagnosis. Treatment is surgical most of the time. The prognosis depends on the time to treatment and the etiology of the perforation.

Conflicts of Interest

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

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Torsion of the Spermatic Cord in Adults: Epidemiological, Diagnostic and Therapeutic Aspects Observed in 46 Patients at the Bouake Teaching Hospital

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Abstract

Introduction: Torsion of the spermatic cord (TSC) is a serious surgical emergency because it is responsible for acute ischemia that can lead to the loss of the testicle. Very few studies have been carried out in Côte d'Ivoire and particularly in Bouaké, on torsion of the testicle. The general objective of this work was to describe the epidemiological, diagnostic and therapeutic aspects of testicular torsion in our context. **Materials and Methods:** This is a retrospective study on 46 patients received urgently at the Teaching Hospital of Bouaké over a period of nine (9) years from December 01, 2010 to November 30, 2019 for torsion of the spermatic cord in adults. **Results:** The mean age of patients was 26.6 years with extremes of 17 to 41 years. 33 patients were seen before the sixth hour and 13 beyond. Scrotal pain, swelling of the hemibursa and testicular ascent were the dominant physical signs. Orchiectomy + contralateral testicular fixation was performed in 11 patients (23.9%). The average length of hospital stay was three (3) days. The immediate post-operative follow-up was simple. Late complications were marked by two testicular atrophy. **Conclusion:** Our series was marked by a high rate of orchiectomy. Actions to raise caregivers' awareness of the population must be carried out so that they consult quickly in front of any painful stock market board to avoid the delay in diagnosis and management detrimental to the vitality of the torsional testicle.

Keywords

Torsion, Testicular Cord, Orchiectomy, Ochidopexy, Atrophy

1. Introduction

Torsion of the spermatic cord (TSC) is a serious surgical emergency because it is responsible for acute ischemia of the testicle leading to the loss of its vitality in the absence of urgent restoration of vascular circulation and also alteration of the contralateral testicle compromising the fertility of the patient. TCS constitutes some 20% of scrotal emergencies [1]. Its classic clinical presentation is that of a large painful acute bursa. Its diagnosis is clinical and the time factor remains the main element. Thus, early diagnosis and treatment before the first 6 hours after torsion of the spermatic cord can prevent the destruction of the testicle.

Thus, as the assertion says, "opening the scrotum unnecessarily for epididymitis is only a small error of diagnosis without consequence. Letting a torsion of the testicle evolve is a serious mistake: it results in the loss of the testicle"; justifying that "any large painful non-febrile acute bursa in adolescents must be considered as a torsion of the testicle".

In Côte d'Ivoire, and particularly at the Bouaké Teaching Hospital, very few studies have been carried out on testicular torsion. Thus, we decided to conduct this study whose general objective was to describe the epidemiological, clinical and therapeutic aspects of spermatic cord torsion (TSC) at the urology department of the Bouaké Teaching Hospital.

2. Materials and Methods

This was a retrospective cross-sectional study for descriptive and analytical purposes, covering a nine-year period from 1 December 2010 to 30 November 2019. This study took place at the Bouaké Hospital and University Center. During this period, 46 cases of torsion of the spermatic cord were collected. All patients who had been hospitalised and operated on for testicular torsion and had complete records were included in the study. The parameters studied were age, occupation, reason for consultation, consultation time, seat, physical signs, time for surgical management, surgical findings, gestures performed and postoperative follow-up. The data were collected on a survey sheet and processed using EPI INFO 3.5.1. Qualitative variables were presented as proportions. The quantitative variables were entered in the form of averages with standard deviations and extremes values. The comparison of the proportions (relationship between the time to consultation and the condition of the testicle; the relationship between the time to treatment and the condition of the testicle) was made using the Khi^2 test or the Khi^2 test with yates' correction or Fischer's exact test when the application conditions of chi^2 test were met. The explained variable was the non-viability of the testicle and the explanatory variables were the time to consultation and the time to treatment. The significance threshold was set for a value of $p < 0.05$.

3. Results

The mean age of patients was 26.6 years with extremes of 17 and 41 years (**Figure 1**).

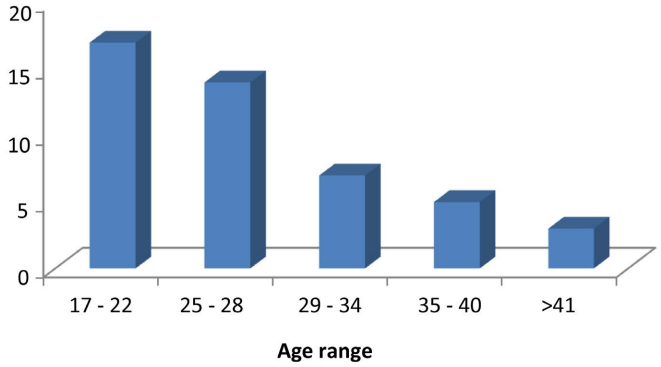

Figure 1. Distribution of patients by age groups.

The majority of people affected were students (**Figure 2**).

All our patients consulted for unilateral testicular pain.

The majority of patients (71.74%) consulted less than 6 hours after torsion of the spermatic cord (**Table 1**).

Painful swelling of the testicle was the most observed physical sign in 95.65% of cases (**Table 2**).

Torsion of the spermatic cord sat on the left testicle in 80.43% of cases.

The majority of patients were operated on less than one hour after diagnosis of spermatic cord torsion (69.57); n = 32 (**Table 3**).

Regarding intraoperative findings:

- 35 patients presented to scrototomy a reaction fluid that was translucent in 76.08% of cases and ladle in 23.90% of cases.
- Twenty-nine (29) patients had two (2) turns of whorls or 63.04% or in 29 patients.
- In 95.65% of cases *i.e.* n = 44, the torsion was counterclockwise.
- Before the distortion, the epididymo-testicular block had a normal color in 71.74% of cases (**Table 4**).
- Appearance of the epididymo-testicular block after distortion and saline bathing: (**Table 5**).

Testicular epididymis block retained its normal color in 71.74% of cases. The two cases with purplish colour reverted to normal colour and 11 cases retained blackish colouration.

- The testis was viable in 35 patients in 76.09% versus 23.91% in 11 patients who had a necrotic testicle.

The distortion associated with homo and contralateral orchidopexy was the most performed operative procedure in 65.21% of cases (**Table 6**).

The postoperative period was punctuated by the occurrence of two testicular atrophies on twisted and fixed testicles.

The majority of testicular necrosis was found in patients who consulted after the twelfth hour. The time frame is a risk factor for testicular necrosis (**Table 7**).

The postoperative period was punctuated by the occurrence of two testicular atrophies on twisted and fixed testicles.

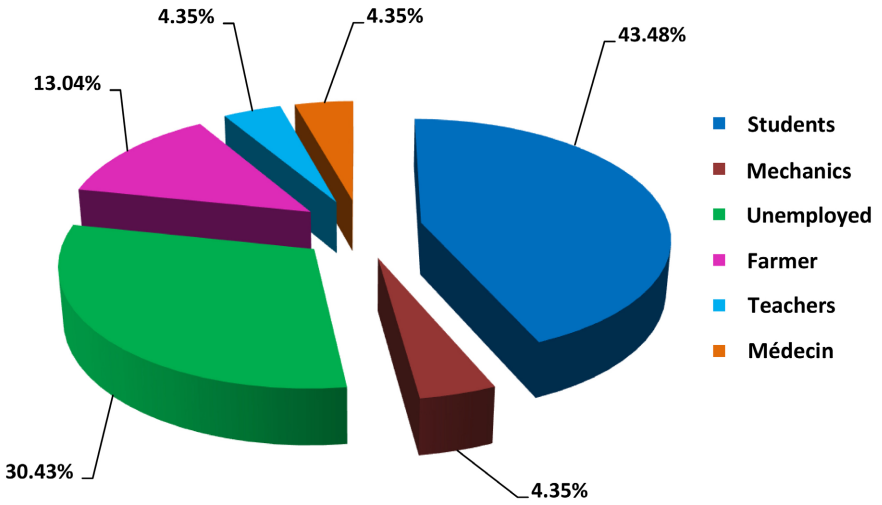

Figure 2. Distribution of patients by professional activity.

Table 1. Distribution of patients by time to consultation.

Consultation period in Hours	Effective	Percentage
0 - 6 h	**33**	**71.74**
7 - 12 h	5	10.67
13 - 18 h	4	8.7
19 - 24 h	2	4.35
More than 24 h	2	4.35
Total	46	100.00

Table 2. Frequency of physical signs of TSC.

Physical sign	Frequency	Percentage
Sign of Governor	40	86.95
Sign of PREHN	37	80.43
Painful swelling testicle	**44**	**95.65**
Abolution of the reflex Cremasterian	10	21.73

Table 3. Distribution of patients by time to management surgical.

Pick-up time in hours (H)	Workforce	Percentage
<1 H	**32**	**69.57**
1 - 4 H	10	21.74
2 - 4 H	3	6.52
>4 H	1	2.1
Total	46	100.00

Table 4. Color of the epididymo-testicular block before distortion.

Colour	Effective	Percentage
Normal	**33**	**71.74**
Purplish or bluish	2	4.34
Blackish	11	23.91
Total	46	100.00

Table 5. Colour of epididymo-testicular block after distortion associated with saline bath.

Recoloration	Effective	Percentage
Positive	35	76.09
Negative	11	23.91
Total	46	100.00

Table 6. Distribution of patients by surgical procedure.

Surgical procedures	Effective	Percentage
Homo and contralateral distortion + orchidopexy	**30**	**65.21**
Orchiectomy + Contralateral Orchidopexy	9	19.56
Detorsion + Homolateral Orchidopexy	5	10.86
Orchiectomy + contralateral orchidopexy	2	4.34
Total	**46**	**100.00**

Table 7. Distribution of patients by surgical procedure.

Surgical Procedures	Number of staff	Percentage
Homo and contralateral distortion + orchidopexy	**30**	**65.21**
Orchiectomy + Contralateral Orchidopexy	9	19.56
Detorsion + Homolateral Orchidopexy	5	10.86
Orchiectomy + contralateral orchidopexy	2	4.34
Total	**46**	**100.00**

The majority of testicular necrosis was found in patients who consulted after the twelfth hour. The time frame is a risk factor for testicular necrosis (Table 8).

- A consultation time ≤ 6 hours was statistically associated with testicular viability ($p = 0.0007$).
- A consultation time of between 13 and 18 hours was statistically associated with testicular non-viability ($p = 0.002$).

The majority of testicular necrosis has been observed in patients with a management time greater than 7 hours (Table 9).

Table 8. Relationship between consultation time and testicular condition.

Counselling time	Non-viable Testicle %	Viable Testicle %	p
0 - 6 H	3 (9.09)	30 (90.91)	0.0007
07 H - 12 H	0 (0.00)	5 (100)	0.317
13 H - 18 H	**4 (100)**	**0 (0)**	**0.002**
19 H - 24 H	**2 (100)**	**0 (0.0)**	**0.0833**
<24 H	**2 (100)**	**0 (0.0)**	**0.0833**

Table 9. Relationship between management and testicular condition.

Counselling time	Non-viable Testicle (%)	Viable Testicle (%)	p
<1 H	5 (15.63)	27 (84.38)	0.159
1 - 2 H	2 (20)	8 (80)	1
7 - 8 H	**3 (100)**	**0 (0.0)**	**0.108**
>8 H	1 (100)	0 (0.0)	0.5363

4. Discussion

In our study, patients who experienced spermatic cord torsion had an average age of 26.6 years with extremes of 17 and 41 years. This result is superimposed on those found in the study by Kaboré *et al.* in Burkina Faso [2], and Fahad et al, in Saudi Arabia [3] which was respectively 26 and 26.4 years. The occurrence of TSC in these young people could be explained by the practice of intense sports activity.

Pupils and students accounted for 43.48% of the torsions of the spermatic cord in our series, followed secondarily by the unemployed who accounted for 30.43%. This result is identical to that of Kaboré *et al.* in Burkina Faso which was 43.50%, followed by the unemployed which was 30.40%. This result could be explained by the organization of many sports activities in schools and universities.

In our work, all patients consulted for testicular pain. This result is superimposed on that of Audenet et al. in France, and Bah et al. in Guinea Conakry [4], which were respectively 90% and 100%. In Kaboré *et al.* painful swelling of the testicle was present in all patients. This result could be explained by the non-tolerance of scrotal pain.

33 of our patients among the 46 or 71.74% consulted less than 6 hours after the onset of symptomatology. Zinil *et al.* found a result superimposed on ours in his work [5]. This could be explained by the fact that young people in this age group do not tolerate pain and prefer to consult early. 28.26% of patients consulted more than 6 hours after the onset of symptomatology.

In our series, unilateral scrotal swelling was the most common physical sign in 95.65% of cases. This result is contrary to that of Zinil *et al.* [5] and Kaboré *et al.* which were respectively 95% and 100%, in favor of the governor's sign. This result could be explained by the non-specificity of the physical signs in front of the

TCS.

In our series, TSC predominated on the left with 80.40% of patients. This result is contrary to that of Sarr *et al.* in Dakar [6], where the predominance was right. No explanation could be found for this variability in topography.

Torsion of the spermatic cord is a surgical emergency because it is responsible for acute ischemia of the testicle beyond 6 hours of time. It can lead to a loss of vitality in the absence of an urgent restoration of vascular circulation. Thus, the time factor remains a crucial element in the vital prognosis of the testicle. In our study, 32 of the 46 patients received were treated in less than an hour. This result is consistent with those of Sarr *et al.* in Dakar and Artus *et al.* [7] who received 30 and 34 patients respectively. This result could be explained by the application of the predictive clinical score (TWIST) to the usefulness of performing an exploratory scrototomy quoted from 1 to 7 [8]. This score uses urological history and physical examination to assess the risk of the twisted testicle. Parameters include swelling of the testicle (2 points), hard testicles (2 points), absence of the cremasteric reflex (1 point) nausea/vomiting (1 point) Governor's sign (1 point). Of the 46 patients received, 14 received care for more than one (1) hour. This result could be explained by the taboo related to sex in our societies on the one hand and on the other hand, the delay in surgical care, due to the limited financial means of patients, difficulties in accessing health centers.

In 35 patients or 76.09%, the reaction fluid was translucent, while in the other 11 patients, the reaction fluid was blackish. These results are superimposed on those of Odzébé *et al.* [9], in Brazzaville, which was 70.09% for the translucent liquid. In general, all serous people react to inflammation by producing fluid.

In our series, 33 patients have had more than two (2) turns of whorl on scrotomy and 13 patients have one (1) turn of whorl. Ten (10) patients out of the thirty-three (33) who had more than two (2) turns of whorl had their testicles necrotic while only one patient out of the thirteen (13) who had one (1) round of whorl had his testicle necrotic. These results are comparable to those of Ndang *et al.* [10] in Libreville and Vamina *et al.* [11] in Switzerland who also observed that patients with a non-viable testicle had a whorl turn count greater than or equal to two. This result could be explained by a more significant strangulation of the vascular pedicle resulting in ischemia, hypoxia and rapid necrosis of the testicle.

In our series, systematic contralateral orchiectomy + orchidopexy accounted for 23.9% compared to 76.1% for homo and contralateral distortion + orchidopexy. This result is similar to that of Bah *et al.* in Senegal, which was 23.01% against 76.99%. This result could be explained by the delay in consultation and management in our study, which seems to be the main predictor of testicular loss.

In our series, the postoperative follow-up was punctuated by two testicular atrophy. This result is lower than that of Sarr *et al.* in Senegal. This atrophy could be explained by the presence of micro lesion passed unnoticed responsible for ischemia postoperatively.

In our series, the majority of testicular necrosis occurred in patients who consulted after the twelfth hour. Consultation time greater than or equal to twelve (12) hours was a significantly high-risk factor for testicular necrosis. This result is comparable to that of Kaboré *et al.* in Burkina Faso. This finding may be due to the fact that the risk of testicular necrosis is high when the consultation time is longer than 6 hours of time.

In our series, the majority of testicular necrosis was found in patients with a management time greater than 7 hours. Time to management beyond 7 hours was a significantly elevated risk factor for testicular necrosis. This result is comparable to that of Sarr *et al.* in Dakar. This may be because the later the management, the more imminent the risk of necrosis.

5. Conclusion

Torsion of the spermatic cord is a surgical emergency that involves an exploration of the testicle under anesthesia. This exploration must be carried out at the slightest doubt in order to avoid the permanent loss of the testicle. Actions to raise caregivers' awareness of the population must be carried out so that they consult quickly in front of any painful stock market chart to avoid the delay in diagnosis and management detrimental to the vitality of the torsional testicle.

Ethical Committee Approval

The study was ethical approval from the local ethical committee of our University.

Conflicts of Interest

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

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Urinary Lithiasis in Children at the Abeche Chu

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Abstract

Introduction: Urinary calculosis is the presence of stones in the urinary tract. It is more common in adults than in children. The aetiologies are multiple and depend on age. The management of calculi in children requires an active aetiological search because of the frequency of hereditary abnormalities which are at the origin of recurrences. The aim of our study was to report the epidemiological, clinical and therapeutic aspects of urinary lithiasis in children in the context of our practice. **Aim:** To report the epidemiological, clinical and therapeutic aspects of urinary lithiasis in children in our practice context. **Patients and Method:** This was a retrospective descriptive study carried out in the Urology Department of the University Hospital of Abeche from January 2013 to December 2019. Thirty files of patients aged 0 to 15 years operated on for urinary lithiasis were retained. The variables studied for each patient were: age, sex, clinical, para-clinical and therapeutic aspects. **Results:** We selected 30 cases. Patients ranged in age from 0 to 15 years, with an average age of 5.5 years. There were 26 boys and 4 girls. 62% of the patients were from rural areas. The antecedents were bilharziasis, urinary tract infections, congenital malformation, trauma and bladder lithiasis. Clinical symptoms were dominated by acute urinary retention (n = 16) and dysuria (n = 14). Urine cytobacteriological tests were positive in 16 cases. The diagnosis was made in the majority of cases by ultrasound and/or unprepared abdomen (UA). The location of lithiasis was mainly the bladder (n = 16). Treatment was surgical in 96.7% of cases, with cystolithotomy predominating. Therapeutic results were satisfactory in 90% of cases. **Conclusion:** Urinary calculi in children are less common than in adults. In our region, stones are most often found in the bladder. Open surgery is still the preferred method of treatment in our practice.

Keywords

Abeche, Surgery, Child, Etiology, Urinary Lithiasis

1. Introduction

Urinary lithiasis is the presence of one or more stones in the urinary tract. It is more common in adults than in children [1]. The incidence of urinary calculi is higher in tropical, arid and mountainous regions [2]. In developed countries, lithiasis affects 13% of the male population and 6% of the female population [3]. The incidence of lithiasis has been rising in industrialised countries in recent years [4]. In developing countries, since the end of the Second World War, the incidence of lithiasis seems to have increased in parallel with rising living standards [5].

There are many different causes of urinary lithiasis, depending on age, dietary habits and geographical location. In children, the most frequent causes are related to malformative uropathies, urinary tract infections and hereditary diseases, infections and hereditary diseases [6]. Urinary lithiasis in children is characterised by a higher rate of recurrence than in adults [7] [8]. The first step in the management of calculus in children is an active search for the cause, as hereditary abnormalities are frequently the cause of recurrences [9]. The aim of our study was to report on the epidemiological, clinical and therapeutic aspects of urolithiasis in children in our practice context.

2. Patients and Method

We conducted a retrospective descriptive study of the records of patients operated on at the University Hospital of Abéché for urinary lithiasis. We collected 30 records of patients aged 0 to 15 years operated on for urinary lithiasis during the period from January 2013 to December 2019. Patients with complete medical records were included. Patients with incomplete records and those lost to follow-up were excluded. The variables studied were: patient age, sex, region of origin, history of lithiasis, clinical symptoms, paraclinical features, site of stone, factors contributing to lithiasis, treatments instituted and results. Data were collected and analysed using SPSS 11.0 software. We calculated the mean frequency, and the values were statistically significant for $\alpha = 5\%$. The research was authorised by the Faculty of Health Sciences of the UNABA and the University Hospital of Abeche.

3. Results

During the study period, 30 cases were selected. Patients ranged in age from 0 to 15 years, with an average age of 5.5 years. There were 26 boys and 4 girls. The age distribution shown in **Figure 1** reveals a predominance of the 0 - 5 age group.

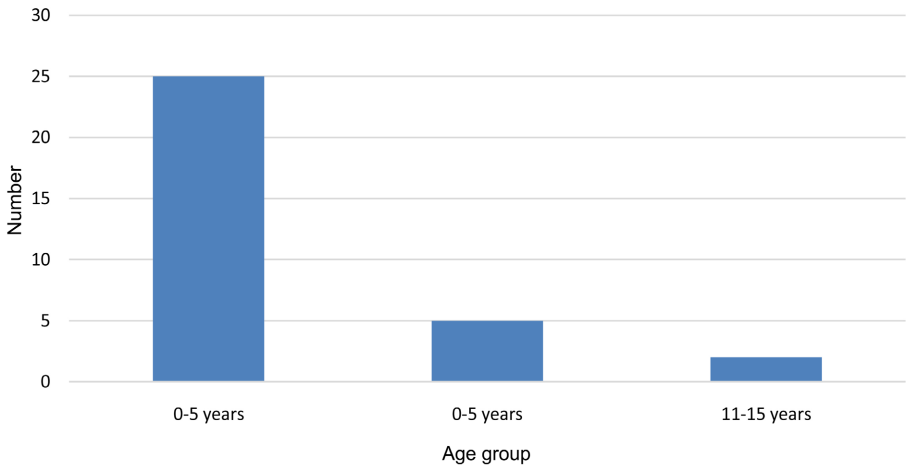

Figure 1. Distribution of patients by age group.

62% of patients came from rural areas with a low socio-economic level and 38% from urban areas. The dietary habits of our patients consisted mainly of milk and milk derivatives (54% of cases). 5 patients had no particular history (n = 5). The histories found were bilharziasis, urinary tract infections, congenital malformation, trauma and bladder lithiasis (**Table 1**).

Clinical symptoms were dominated by acute retention of urine (n = 16) and dysuria (n = 15), as shown in **Table 2**.

The cytobacteriological study of the urine of 20 patients was positive in 16 cases. The germs most frequently encountered were *E. coli*, *Proteus mirabilis* and *Klebsiela.* Tests for bilharzia eggs in urine were positive in 10 cases. Creatinine and blood urea levels were normal in 7 patients. The unprepared abdomen performed in 17 patients allowed the diagnosis of urinary lithiasis to be made in all cases. Ultrasonography was performed in 15 patients and was diagnostic in all cases, with hydronephrosis identified in 3 cases. Intravenous urography was performed in 3 patients, identifying the exact location and number of stones and pyelocaval dilatation in all cases. The different locations of urinary lithiasis are shown in **Table 3**.

A contributing cause was identified in 6 patients. These were valves of the posterior urethra in 4 cases and post-traumatic narrowing of the urethra in 2 cases. Treatment was surgical in 96.7% of cases. The most common procedure was cystolithotomy. It was preceded by urethral flushing in 2 cases. Instrumental extraction was used in 1 case of a stone lodged in the penile urethra. The different procedures performed according to the site of the stone are shown in **Table 4**.

In our study population, the outcome was favourable, with simple post-operative follow-up in 27 cases (90%). However, we noted complications in 3 cases (10%). The complications observed in our study were parietal suppuration in 2 cases cases (6.7%) and vesico-cutaneous fistula in 1 case (3.3%). Postoperative follow-up was 3 months. The average hospital stay was 18 days (extremes: 9 and 30 days).

Table 1. Distribution of patients by medical history.

History	Number	Percentage (%)
Urinary tract infection	10	33.3
Bilharzia	7	23.3
Congenital malformation	4	13.3
Trauma	2	6.7
Bladder lithiasis	2	6.7
None	5	16.7
Total	30	100

Table 2. Distribution by symptomatology.

Clinical signs	Number	Percentage (%)
Dysuria	15	26.8
Burning urine	10	17.8
Lumbar pain	4	7.1
Pollakiuria	5	9
Urine retention	16	28.6
Haematuria	6	10.7
Total	56	100

Table 3. Distribution by location.

Location	Workfore	Percentage (%)
Kidney	2	6.6
Ureter	1	3.4
Bladder	24	80
Urethra	3	10
Total	30	100

Table 4. Distribution according to gesture.

Gestures performed	Workforce	Percentage (%)
Neprolithotomy	2	6.6
Ureterolithotomy	1	3.4
Cystolithomy	24	80
Flush + Cystolithomy	2	6.7
Instrumental extraction	1	3.3
Total	30	100

4. Discussion

The frequency of urinary lithiasis is assessed in different ways and varies according to geographical area and age [10]. The mean age of patients in our series was 5.5 years, with extremes of 1 and 15 years. This is comparable to the series by Alaya in Tunisia, who reported 6.5 [11]. The age group most affected was children aged 0 to 5 years, who accounted for more than half the patients in our series (76.7%). This can be explained by the fact that this age group is a vulnerable group in our regions, exposed to chronic diarrhoea which leads to malnutrition. The number of cases decreases as age increases. Nowadays, the diet in Chad is richer in animal proteins, milk and dairy products, which are thought to be responsible for endemic lithiasis.

Our results are similar to those in the literature, according to which the younger the child, the more frequent urinary lithiasis is [12]. The sex ratio in our series was 6.4. This predominance may be explained by the length of the urethra in boys, whereas the shortness of the urethra and its relatively large diameter in girls allows a small stone to be expelled easily. This result corroborates the literature, which reports that boys are more affected by urinary lithiasis than girls [7] [8] [11] [13]. Clinically, symptoms depend on the location of the stone.

Urinary retention accounted for 28.6% of all cases. This rate can be explained by the predominance of men with a very long urethra, which is a factor in urinary retention, and by the higher frequency of bladder lithiasis in our series. This result is comparable to that of Ouedraogo in Burkina Faso, who found 29.85% in his series [14]. Low back pain was the least frequent sign in our series (7.1%). This corroborates data from the literature, which reports that the symptoms of urinary lithiasis are less typical than in adults, and true nephritic colic is rare [15]. Dysuria and acute retention were the most frequently encountered signs relating to the high frequency of urinary lithiasis of the lower urinary tract in our series.

In our study, urinary tract infection accounted for 33.3% and bilharzia infestation for 23.3% of patients, which were considered to be the main factor in lithogenesis. Several studies have reported that urinary tract infection plays a key role in the development of lithiasis, particularly phosphate and urea lithiasis [16] [17].

Bilharzian lesions constitute a favourable terrain for lithogenesis provided that climatic and nutritional factors are present [18] [19]. Congenital malformation in our study was 13.3%. This is comparable to the Alaya series in Tunisia [11]. Some studies have linked lithiasis in children with congenital malformations of the urinary tract [20] [21]. Several lithogenesis factors have been cited in children [15]:

- Infections with ureasic germs, especially proteus.
- Urinary malformations (pyeloureteral junction anomalies, vesicoureteral reflux, posterior urethral valves, etc.).
- Recurrent episodes of diarrhoea and/or dehydration.

- Metabolic and genetic abnormalities.

However, in a certain number of cases no cause is found [7].

Diagnosis was most often made by an unprepared abdomen/ultrasound combination. The bladder was the most common site in our series (76.7%). This corroborates data from the literature, which reports that bladder lithiasis is frequent in developing countries and rare in industrialised countries [6] [22] [23].

The treatment of urinary lithiasis has undergone real progress in recent years in developed countries, where this pathology is more common in developed countries where this condition is very common [24] [25] [26] [27]. Extracorporeal lithotripsy is currently described as the reference technique for the treatment of urinary lithiasis in children [22].

In our series, open surgery was the only curative surgical treatment used, due to the lack of minimally invasive techniques. Most of our patients (96.7%) underwent conventional surgery for their urinary calculi. Our results are in line with those of Sow [20] in Senegal and Zoung-Kany [18] in Cameroon.

Cystolithotomy was the most commonly used surgical procedure for treating large bladder stones. It accounted for 86.7% of surgical procedures, 6.7% of which were urethral calculi that were pushed back into the bladder by the benicus before cystolithotomy. We noted 2 cases (5%) of urethral lithiasis not far from the meatus which was based on Kelly's forceps. This same procedure was used by Ouedraogo in Burkina in his series [14]. We recorded 10% complications, including 2 cases of parietal suppuration and 1 case of vesico-cutaneous fistula. Ouattara in Mali reported 12.5% of complications [28]. Despite the postoperative complications and the long hospital stay, open surgery gives better results. However, due to a lack of technical resources, open surgery is still the most commonly used method of treating urinary lithiasis in our regions.

5. Conclusion

Urinary calculosis in children is less common than in adults. Upper urinary tract calculi are common in children in developed countries, often linked to hereditary metabolic factors. In developing countries, the most common site of stone formation is the bladder, secondary to dehydration and malnutrition. In our regions, open surgery is still the main method of treating urinary lithiasis due to the lack of minimally invasive techniques.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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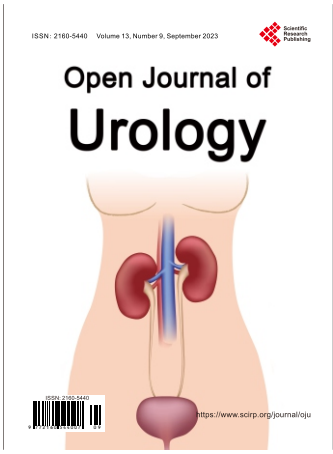

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