

Urological Emergencies at the University Hospital of Brazzaville: Epidemiological, Clinical, and Therapeutic Aspects

Roland Bertile Banga-Mouss, Yannick Dimi Nyanga, Irène Ondima, Armel Melvin Atipo Ondongo, Steve Aristide Ondziel-Opara, Joseph Junior Damba, Nick Arnaud Monabeka, Christ Ondzé, Daniella Gloire Ngassiele, Gidmard Onguele, Henock Songa, Jetsvy Mayala, Anani Wensels Severin Odzebe*, Prosper Alain Bouya

Departement of Urology and Andrology, University Hospital of Brazzaville, Brazzaville, Republic of the Congo
Email: *odzebe_s@yahoo.fr

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Abstract

Introduction: Urological emergencies play a significant role in the medical and surgical activity of a urology department. The objective of this study was to determine the hospital prevalence of urological emergencies at the University Hospital of Brazzaville (CHUB), identify the different pathologies requiring urgent care, and list the various therapeutic methods. **Patients and methods:** A retrospective study of patients admitted to the medical and surgical emergencies department of CHUB over a 5-year period. Patient records admitted and treated for a urological emergency were included. The variables studied were the frequency of urological emergencies, patient age at admission, gender, nature of the emergency, and various therapeutic options. **Results:** Urological emergencies accounted for 4.3% of all medical and surgical emergencies. The mean age was 57 ± 28 years with a range of 3 to 93 years. The male-to-female ratio was 7.1. The most common conditions were urinary retention (54.67%), hematuria (17.20%), and renal colic (8.13%). Therapeutically, surgical urinary drainage was dominated by cystostomy. **Conclusion:** Urological emergencies are infrequent at the University Hospital of Brazzaville. Their management is often delayed.

Keywords

Urological Emergencies, Urinary Retention, Hematuria, Renal Colic

1. Introduction

Urological emergencies encompass a range of multiple and varied pathologies

[1], all of which require prioritizing emergency measures to provide rapid relief. Etiological research and complementary treatment aimed at the etiology are proposed after the acute episode [2] [3] [4] to prevent serious functional sequelae, or even the patient's death [5]. Effective management of these emergencies, besides the need for qualified personnel, also requires appropriate organization and technical facilities. The hospital prevalence of urological emergencies varies from one study to another [3] [5]. Some authors have estimated this frequency in hospital settings at 2.64% and 6.52% respectively [5] [6]. However, data on the epidemiology of urological emergencies are not known in our center. This study, which is the first to address the subject of emergencies in our department allowed us to take stock of the epidemiology of urological emergencies at the University Hospital Center of Brazzaville. The objectives of this study were to determine the hospital prevalence of urological emergencies, identify the different pathologies warranting urgent management, and list the various emergency therapeutic methods.

2. Patients and Methods

We conducted a retrospective study using medical records of all patients admitted to the medical-surgical emergencies department of the University Hospital of Brazzaville (CHUB) from January 1, 2019, to December 31, 2023. The general population of our study consisted of all patients who consulted the emergency room for a urological pathology during the study period. Included in this study were all patient records admitted and managed for a urological emergency, for which data could be extracted. In addition to medical records, we also utilized patient registers in the medical-surgical emergencies, urology-andrology, pediatric surgery departments, and in the operating room. The variables studied were the frequency of urological emergencies, patient age, gender, nature of the emergency, and various therapeutic options. Data were entered and analyzed using Epi Info version 7 software. Microsoft Excel 2010 was used for the design of tables and figures. Quantitative variables were expressed as mean (\pm standard deviation), and qualitative variables as number or percentage.

3. Ethical Consideration

This work was carried out as part of scientific research. As a result, it was approved by the Health Science Research Ethics Committee (CERSSA). Approval from the hospital ethical review board was sought prior to data collection.

4. Results

During the study period, 17,250 patients were admitted to the medical-surgical emergencies department of the University Hospital of Brazzaville (CHUB). We recorded a total of 750 patient who consulted for a urological emergency, representing a prevalence of 4.3%. The age of our patients ranged from 3 to 93 years with a mean of 57 ± 28 years. The sex ratio was 7.1. **Table 1** presents the

distribution of patients according to age groups, socio-economic level and occupation. Patients came from their homes (64%), another health center (34%), or another department of CHUB (2%). Unemployed patients accounted for 45% of all patients. **Table 2** reports the various urological emergencies observed. It follows that patients admitted for urinary retention were aged 60 years or older in 86.1% of cases (n = 353). Four patients (0.98%) were female. Bladder drainage by urethral catheterization was performed in 79.76% (n = 327) and suprapubic route in 20.24%. Two hundred four patients (49.76%) were hospitalized after bladder catheterization. Regarding hematuria, 66.67% of patients were aged 60 years or older. Men were accounted for 94.57% of cases (n = 122 men). Initial management involved bladder catheterization with clot removal. Sixty-seven patients (51.94%) underwent blood transfusion for severe anemia. The various etiologies of hematuria and urinary retention are reported in **Table 3**.

Table 1. Distribution of patients by age groups, socioeconomic level and origin.

	Frequency	Percentage
<10 years	26	03.5
10 - 20 years	78	10.4
20 - 30 years	53	07.0
30 - 40 years	107	14.3
40 - 50 years	48	06.4
50 - 60 years	78	10.4
>60 years	360	48.0
Patients without profession	338	45.0
Socioeconomic level	moderate	62,5
	Weak	28,75
Patients coming from	Home	64.0
	Transferred	36.0

Table 2. Distribution according to the nature of urological emergencies.

		Frequency	%	
Urinary retention		410	54.67	
Hematuria		129	17.20	
Renal colic		61	8.13	
Priapism		44	5.87	
Urological traumas	Urethral trauma	26	39	5.20
	Scrotal trauma	7		
	Intraperitoneal bladder rupture	1		
	Penile section	2		

Continued

	Pelvic ureteral injury	2		
	Renal trauma*	1		
Obstructive anuria		8		1.07
Torsion of the spermatic cord		11		1.47
Complications of circumcision	Amputation of the gland penis	1	6	0.80
	Denudation of the penis	1		
	Hemorrhagic complications	3		
	Urinary retention	1		
Penile fracture		3		0.40
Paraphimosis		1		0.13
Orchid-epididymitis		13		1.73
Suppurations of the external genital organs and perineum	Suppurative periurethritis	5	9	1.20
	Fournier's gangrene	3		
	Dry gangrene of the penis	1		
Acute prostatitis		10		1.33
Renal and perirenal suppurations	Pyonephrosis	5	6	0.80
	Perirenal phlegmon	1		
Total		750		100.00

*following a fall from the top of a tree with landing on the right side (Figure 1).

Table 3. Etiological diagnosis of patients admitted for urinary retention (UR) and hematuria.

	UR** Frequency	Hematuria Frequency	Total	%
Prostatic tumor	362	83	445	82.56
Urethral stricture	38	-	38	7.05
Urethral lithiasis	02	-	02	0.37
Bladder lithiasis	-	01	01	0.19
Bladder tumor	-	37	37	6.86
Upper urinary tract tumor*	-	07	07	1.30
Neurogenic bladder	04	-	4	0.74
Hematometria	1	-	1	0.19
Fecaloma	1	-	1	0.19
Posterior urethral valves	03	-	03	0.55
Total	411	128	539	100.00

*Upper urinary tract tumor = kidney and ureter. **UR: Urinary Retention.

Renal colic was observed in third position with 8.13% of cases (n = 61). Female subjects were affected in 52.46% of cases (n = 32). The mean age was 40.9 years. Etiologies were represented by urinary lithiasis in 95% of cases (n = 58) and pyeloureteral junction syndrome in three cases. Urinary lithiasis was ureteral localization in 24 patients (41.38%). Fifty-six patients (92%) were hospitalized; the reasons for hospitalization were fever (n = 28), persistent pain (n = 25), and pregnancy (n = 3). Patients were managed in emergencies for symptomatic treatment. Relief of obstruction by placement of a double-J ureteral stent was performed in three patients (5%) and by nephrostomy in thirty-six patients (59%). Etiological treatment was surgical in 83.61% (51 patients) including 42 lithotomy, two pyeloplasty, five nephrectomy, and two flexible ureterorenoscopy with laser lithotripsy. Expulsive treatment with alpha-blockers was effective in four patients with pelvic ureteral lithiasis.

Patients admitted for priapism had a mean age of 23.9 ± 10 years with extremes of 5 and 49 years. Homozygous sickle cell disease was the identified cause in 61.36% of patients (n = 27). Thirty-five patients, or 79.54%, came from home. The mean consultation delay was 21 hours (extremes of 4 and 96 hours). Medical treatment (Etilefrine, cavernous body lavage puncture) led to detumescence in 20 patients admitted before the 12th hour. Surgical treatment by cavernous-spongy shunt was performed in 24 patients.

Urological traumas were observed in patients with a mean age of 29.5 years (15 to 67 years). The woman was affected in two cases. The various urological traumas observed are reported in **Table 4**. The mechanism of occurrence of traumatic injuries was mainly by road accident in 66.7% of cases followed by

Table 4. Mechanisms of occurrence and different surgical treatments of urological injuries.

	N	%
Mechanisms of occurrence:		
-accidents on public roads	26	66.66
-street fights	2	5.13
-sports accidents	2	5.13
-urethral injury during urethrocytic catheterization	5	12.82
-ureteral injury during pelvic surgery	2	5.13
Surgical treatment:		
-suturing scrotal wound,	3	
-suturing bladder wound,	1	
-hemostatic surgery,	2	
-cystostomy	26	
-ureterovesicale reimplantation	1	
-end-to-end anastomosis of the pelvic ureter	1	
-double J ureteral catheter	1	

iatrogenic trauma in 18% of cases. Iatrogenic trauma to the urethra was observed in male subjects. They occurred during transurethral catheterization of the bladder. Their treatment required the emergency installation of a cystostomy. Penile section occurred in the context of self-mutilation as both patients had psychiatric pathology. Their emergency treatment was mainly focused on hemostatic surgery and urethral meatus plasty. Obstructive anuria (n = 8) occurred following pelvic surgery in three patients, including two cases of bilateral ureteral ligation during hysterectomy and one case of bilateral ureteral meatus ligation during prostatic adenomectomy via a transvesical high approach. Anuria was secondary to compression or invasion of the ureters by a pelvic tumor in five patients. Cases of post-surgical obstructive anuria required emergency bilateral ureterovesical reimplantation (n = 3). **Figure 2** shows the intraoperative appearance of a dilated ureter following ligation of its pelvic portion during pelvic surgery. Percutaneous



Figure 1. Right peri-renal urinoma post trauma.



Figure 2. Intraoperative image of a dilated ureter after ligation, of its pelvic portion, during a hysterectomy.

nephrostomy was performed in patients with neoplastic causes ($n = 5$). Two patients underwent hemodialysis sessions before nephrostomy.

Testicular torsion was observed in 11 patients during the study period. Seven patients were aged 20 years or younger. The average time to surgical intervention was 42 hours, with extremes of 2 and 192 hours. Two patients underwent orchidectomy for non-viable testicle. **Figure 3** highlights a neglected right testicular torsion.

The different complications of circumcision observed are reported in **Table 2**. Hemorrhagic complications were observed in three patients, including two hemophiliac patients. Both patients required emergency blood transfusion. Hemophiliac patient care was provided in the hematology department.

Infectious urological emergencies were observed in 38 cases, representing 5.07% of all emergencies observed during the study period. Epididymo-orchitis was the most observed pathology at 39.47%. The mean age of patients admitted for acute epididymo-orchitis, acute prostatitis, and perineoscrotal suppuration was 52.5 years, 52.3 years, and 34.4 years, respectively. The most identified organism in urine or pus cultures was *Escherichia coli* in 77% of cases. Three cases of acute prostatitis were iatrogenic, resulting from prostate biopsy in two cases and retrograde urethro-cystography in one case. Initial medical treatment, in emergencies, consisted of a bi-antibiotic therapy combining a beta-lactam and an aminoglycoside. Cases of perineoscrotal suppuration underwent necrosectomy to healthy tissue. **Figure 4** shows the image of dry gangrene of the penis, and **Figure 5(a)** and **Figure 5(b)** show images of perineoscrotal suppuration before and after necrosectomy in a 31-year-old patient. Renal and perirenal suppurations were observed in 4 women and two men. The cause was lithiasic in 4 patients and related to upper urinary tract malformation in two cases (**Figure 6**).



Figure 3. Image of neglected spermatic cord twisting.



Figure 4. Image of dry gangrene of the penis.

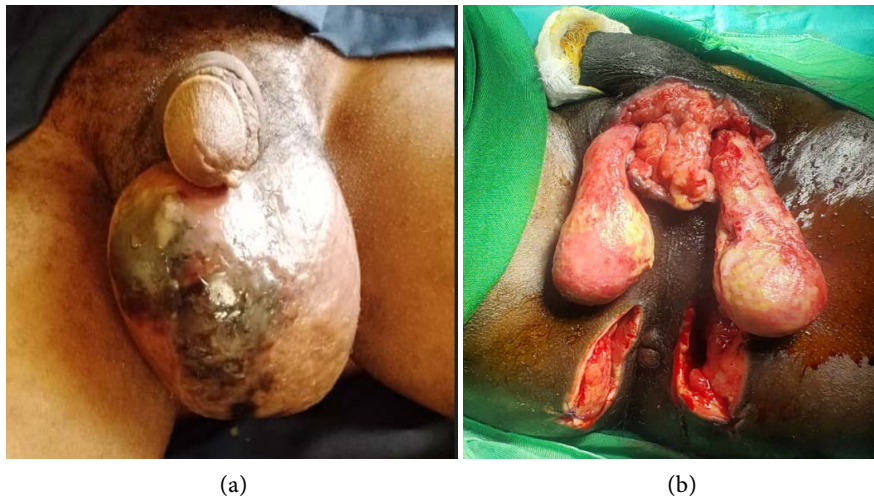


Figure 5. (a) Image of bursae gangrene; (b) Post-necrosectomy image of bursae gangrene on day 4.

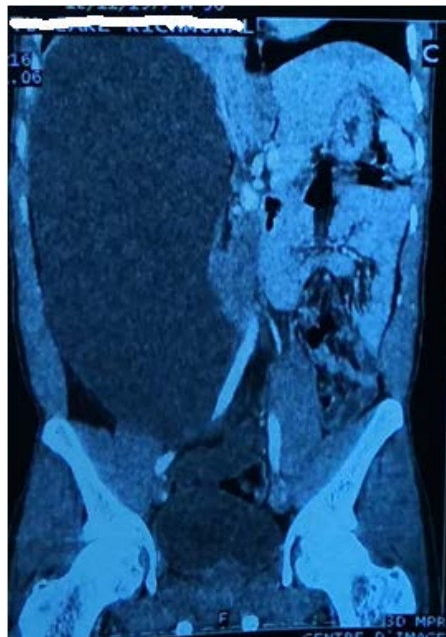


Figure 6. Pyo nephrosis on right mega ureter.

5. Discussion

Urology encounters a significant number of situations requiring urgent management, risking the functional or even vital prognosis of the patient [5]. These situations represent a significant portion of clinical practice in urology [6]. The frequency of urological emergencies varies in the literature [3]. Out of a total of 17,250 patients admitted to medical-surgical emergencies during the study period at our hospital, we recorded 750 cases of patients admitted for urological emergencies, representing a hospital prevalence of 4.3%. This demonstrates that urological emergencies are infrequent. They account for 4.2% of all emergency department visits in France [7] and 7.7% of medical-surgical emergencies in Guinea [8]. The fact that data collection was conducted in a medical-surgical emergency department, which handles all emergencies except gynecological obstetric emergencies, justifies this low frequency.

There was a predominance of males, with the average age of our patients being 57 years \pm 28, and 48% of them were over 60 years old. The predominance of elderly individuals over 60 years old and males among urological emergencies is reported in numerous studies [1] [2] [3] [6] [9] [10] [11] [12]. The high frequency of emergencies related to complications of urethroprostatic pathologies in this age group justifies this predominance.

Patients came from home in 63.86% of cases. This rate of direct admission to the emergency department is high for a tertiary care facility. This observation of self-admission of patients to the emergency department is also noted by Bobo Diallo *et al.* in Guinea, who found a percentage of direct admissions of 59% [3]. Lack of awareness of the country's healthcare system organization by the population, as well as lack of confidence and absence of specialists on duty in peripheral healthcare facilities, are the main reasons.

Urinary retention and hematuria were the most frequent urological emergencies, which is consistent with data from African series [3] [6]. In contrast to studies in Western countries where renal colic are the most frequent emergency [7] [5]. In our regions, urogenital conditions are often discovered late, mostly associated with other complications. It appears that half of the patients (49.76%) admitted for urinary retention were hospitalized after managing the emergency. This hospitalization rate is quite high compared to what is reported in the literature [5]. Mistrust and reluctance to seek healthcare for urogenital conditions, coupled with financial constraints, are significant barriers to early management of urogenital pathologies [9] [11] [13]. Patients who consult late often present with other complications that require monitoring in a hospital setting.

The majority of patients admitted for urinary retention and hematuria were over 60 years old. Indeed, prostatic, vesical, and upper urinary tract tumors, which are common in this age group, are a frequent cause of hematuria. These tumor pathologies were the main etiological diagnosis of urinary retention and hematuria in our series. Prostate tumors were the etiological diagnosis of hematuria in 65% of cases and of bladder retention in 88% of cases.

Patients admitted for acute febrile or non-febrile obstruction of the upper urinary tract were subjected to emergency percutaneous nephrostomy drainage in the majority of cases. Placement of a double-J ureteral stent was rarely performed due to lack of equipment. Acute obstructions of the upper urinary tract were dominated by renal colic, which were the third most observed urological emergency in our study, regardless of sex. With a female predominance (52.46%) and occurring in young subjects, renal colic were the first urological emergency observed in female patients. Fifty-six patients (92%) were hospitalized; this high hospitalization rate is a consequence of late consultations.

Iatrogenic ureteral trauma was observed during cesarean sections or during surgical management of pelvic tumors, consistent with literature data [14] [15] [16] [17]. The increased practice of cesarean sections, often performed in extreme emergency situations, increases the risk of iatrogenic injuries.

Circumcision accidents are infrequent in our study (0.8%). Traditional circumcision practices are no longer common in major cities in Congo Brazzaville. Circumcision is the most commonly performed surgical intervention worldwide. This procedure continues to be performed by operators with varying qualifications and exposes to numerous complications. This encourages us to no longer consider circumcision as “minor surgery” [18]. Several studies on circumcision complications [9] [19] have shown that hemorrhage is at the forefront, followed by other complications such as wound infection, total or partial amputation of the glans, or urinary retention. Hemorrhagic complications are most often related to hemostatic defects or simply to individual predisposition. In our series, three patients had presented with hemorrhagic complications post-circumcision, among them two patients were hemophiliacs. It was minor but persistent bleeding that caused severe anemia in both patients. Collaboration with the hematology service helped better manage hemophilic patients. This collaboration also occurred during the management of sickle cell patients admitted for priapism. Priapism, which is a very common pathology among sickle cell patients in Africa, still poses management problems due to the long delay in consultation due to socio-cultural and financial realities. In Congo, sickle cell disease is the leading cause of priapism [20].

Non-iatrogenic urological traumas were most often observed in road traffic accidents in our series. Tfeil *et al.* in Mauritania had observed the same result [9].

The discovery of an acutely painful scrotum is a frequent clinical emergency situation with multiple and varied etiologies. While most diagnoses do not require immediate management, the possibility of testicular torsion requires a coherent and rapid diagnostic approach to prevent the loss of a testicle with its medicolegal implications [21]. The frequency of spermatic cord torsion was 1.5% in our study, a result similar to that reported in the series by Fall *et al.* in Senegal, which reported 2.8% of cases of spermatic cord torsion [6]. Perineoscrotal suppurations are characterized by unpredictable and rapidly extensive evolution [22]. The management of perineoscrotal suppuration cases was multi-

disciplinary, involving resuscitation, dual or triple antibiotic therapy, and surgical debridement of all necrotic tissues [23]. A cystostomy was performed when there was urethral injury.

This retrospective study allowed us to identify certain operational shortcomings in our hospital. Indeed, the lack of adequate equipment necessary for the proper functioning of a urological emergency department, delayed patient management due to socio-economic and cultural factors, and the lack of specialty services in peripheral centers are significant barriers to improving the quality of patient care.

6. Conclusion

Urological emergencies are relatively infrequent at the University Hospital of Brazzaville. They predominantly affect elderly male patients and are mainly characterized by urinary retention, hematuria, renal colic, and priapism. Diagnosis was often based on clinical signs. Therapeutic management requires initial emergency palliative treatment followed by etiological treatment after the acute phase.

Conflicts of Interest

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

References

- [1] Halidou, M., Adamou, H., Ibrahim, A.M., Roua, A., Habou, O., Magagi, A., Mansour, A., *et al.* (2017) Les urgences urologiques à l'Hôpital National de Zinder: Aspects épidémiologiques, étiologiques et thérapeutiques. *Annales de l'Université Abdou Moumouni*, **22**, 136-143.
- [2] Diabate, I., Ondo, C.Z., Sow, I., Ba, A. and Mboup, C. (2015) Les urgences urologiques au centre hospitalier de Louga, Sénégal: Aspects épidémiologiques et évaluation de la prise en charge. *African Journal of Urology*, **21**, 181-186
<https://doi.org/10.1016/j.afju.2015.04.004>
- [3] Diallo, A.B., Bah, I., Diallo, T.M.O., Bah, O.R., Amougou, B., Bah, M.D., *et al.* (2010) Le profil des urgences urologiques au CHU de Conakry, Guinée. *Progrès en Urologie*, **20**, 214-218. <https://doi.org/10.1016/j.purol.2009.10.008>
- [4] Novaković, Z.S. and Librenjak, D. (2014) Only a Minority of Patients in the Urological Emergency Unit Need Urgent Urology Care. *Acta Medica Academica*, **43**, 155-159. <https://doi.org/10.5644/ama2006-124.114>
- [5] Mondet, F., Chartier-Kastler, E., Yonneau, L., Bohin, D., Barrou, B. and Richard, F. (2002) Epidémiologie des urgences urologiques en Centre Hospitalier Universitaire. *Progrès en Urologie*, **12**, 437-442.
- [6] Fall, B., Diao, B., Fall, P.A., Diallo, Y., Sow, Y., Ondongo, A.A.M., Diagana, M., Ndoye, A.K., Ba, M. and Diagne, B.A. (2008) Les urgences urologiques en milieu hospitalier universitaire à Dakar: Aspects épidémiologiques, cliniques et thérapeutiques. *Progrès en Urologie*, **18**, 650-653.
<https://doi.org/10.1016/j.purol.2008.04.004>
- [7] Boissier, R., Savoie, P.H. and Long, J.-A. (2021) Épidémiologie des urgences

- urologiques en France. *Progrès en Urologie*, **31**, 945-955.
<https://doi.org/10.1016/j.purol.2021.07.004>
- [8] Diallo, M.B., Bah, I. and Baldé, I. (1996) Les urgences urologiques au CHU Ignace Deen étude rétrospective. *Guin Medical*, **10**, 9-14.
- [9] Tfeil, Y.O., Elmoctar, C.A.O., Ca, M.O. and Jdoud, C.O. (2010) Les urgences urologiques au centre hospitalier national de Nouakchott: Aspects épidémiologiques, cliniques et thérapeutiques. *Basic and Clinical Andrology*, **20**, 144-147.
<https://doi.org/10.1007/s12610-010-0077-4>
- [10] Muntaner, L., Pacios, J.C.L., *et al.* (2001) [Urologic Disease Emergency: Clinico-Epidemiologic Analysis at a District Hospital]. *Archivos Españoles de Urología*, **54**, 411-415.
- [11] Avakoudjo, J.D.G., Ouake, H. and Mensah, A.D.E. (2016) Les urgences andrologiques dans un service de chirurgie générale à Parakou (Bénin). *Revue Africaine d'Urologie et d'Andrologie*, **1**, 301-304.
- [12] Ludvigson, A.E. and Beaulé, L.T. (2016) Urologic Emergencies. *Surgical Clinics of North America*, **96**, 407-424. <https://doi.org/10.1016/j.suc.2016.02.001>
- [13] Mpah, E.H.M., Fouda, P.J., Sala-Beyeme, T., Moukoko, E.C.E., Njimah, A.N., Tsiagadigui, J.G., *et al.* (2012) Les urgences andrologiques en milieu urbain au Cameroun: Aspects cliniques et thérapeutiques. *Basic and Clinical Andrology*, **22**, 223-226. <https://doi.org/10.1007/s12610-012-0190-3>
- [14] Kambou, T. and Ouattara, A. (2017) Prise en charge urgente et différée des traumatismes urogénitaux au chu Souro Sanon de Bobo-Dioulasso. *African Journal of Urology*, **23**, 306-310. <https://doi.org/10.1016/j.afju.2016.11.001>
- [15] Sanda, G., Chipkao, R., Harissou, A., Soumana, A. and Tassiou, E.M. (2016) Les fistules uro-génitales iatrogènes: À propos de 62 cas et revue de la littérature. *African Journal of Urology*, **22**, 55-60. <https://doi.org/10.1016/j.afju.2015.09.007>
- [16] Odzébé, A.W.S., Bouya, P.A., Itoua, C., Otiobanda, G.F., Mahoungou-Guimbi, K.C., Banga M.R., Ondongo Atipo, M.A. and Ondziel, S. (2011) Les traumatismes urétéraux au cours de la chirurgie pelvienne chez la femme congolaise. *Revue Africaine d'Anesthésiologie et de Médecine d'Urgence*, **16**, 44-47.
- [17] Bouya, P.A., Odzébé, A.W.S., Otiobanda, F.G., Itoua, C., Mahoungou-Guimbi, K., Banga, M.R., Andzin, M., Ondongo-Atipo, M., Ondziel, S. and Avala, P. (2011) Les complications urologiques de la chirurgie gynécologique. *Progrès en Urologie*, **21**, 875-878. <https://doi.org/10.1016/j.purol.2011.03.008>
- [18] Aloui Arabi, S., Hidouri, S., Yaakoubi, H., Belhassan, S., Laamiri, R., Ksaa, A., Laasad, S., Krichène, I., Mekki, M., Belghuith, M. and Nouri, A. (2014) Les accidents de circoncision: A propos de 29 cas. *Archives de Pédiatrie*, **21**, 566.
[https://doi.org/10.1016/S0929-693X\(14\)71826-3](https://doi.org/10.1016/S0929-693X(14)71826-3)
- [19] Chaim, J.B., Livne, P.M., Binyamini, J., Hardak, B., Ben-Meir, D. and Mor, Y. (2005) Complications of Circumcision in Israel: A One Year Multicenter Survey. *The Israel Medical Association Journal*, **7**, 368-370.
- [20] Okoko, A.R., Odzebe, A.S.W., Moyen, E., Ekouya Bowassa, G., Oko, A.P.G., Mbika, C.A., Bozock, P., Atanda, H.L. and Moyen, G.M. (2014) Priapisme chez l'enfant et l'adolescent drépanocytaire homozygote à Brazzaville. *Progrès en Urologie*, **24**, 57-61. <https://doi.org/10.1016/j.purol.2013.04.021>
- [21] Merrot, T., Chaumoitre, K., Robert, A., Alessandrini, P. and Panuel, M. (2009) La bourse aiguë de l'enfant: Corrélations radiocliniques. *Progrès en Urologie*, **19**, 176-185. <https://doi.org/10.1016/j.purol.2008.11.003>
- [22] Wattel, F., Mathieu, D., Biserte, J., Durocher, A., Saulnier, F., Van, T., *et al.* (1986)

Les cellulites périnéo-scrotales à propos de 46 observations. Notes Cliniques. *Medsubhyp*, **5**, 64-65.

- [23] Binder, J.P., Revol, M. and Servant, J.M. (2007) Dermohypodermes bactériennes nécrosantes et fasciites nécrosantes. *EMC-Techniques Chirurgicales-Chirurgie Plastique Reconstructrice et Esthétique*, **20**, 1-11.
[https://doi.org/10.1016/S1286-9325\(07\)44483-1](https://doi.org/10.1016/S1286-9325(07)44483-1)