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Urological Emergencies: An In-Depth Analysis of Incidence, Etiologies, and Therapeutic Approaches

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ABSTRACT

This study aimed to delineate the urological profile of patients managed at Casablanca University Hospital. A retrospective review of 456 cases overseen by the urology department's on-call team at CHU Casablanca throughout one year (January 2023-December 2023) was conducted. Patients, with an average age of 57.8 years, predominantly comprised males. Acute urinary retention (AUR) represented 38.32% of emergencies, with febrile low back pain (19.08%) and urogenital trauma (12.07%) following. Among urological emergencies, obstructive pyelonephritis (51.9%) was prevalent. Benign prostatic hyperplasia (67.56%) was the primary AUR cause, while renal trauma (40%) was prominent in urogenital trauma cases. Bladder tumors (48.58%) constituted most urological hematuria instances. Key therapeutic interventions included evacuative urethral catheterization (41.66%), nephrostomy (13.88%), and JJ stent insertion (11.58%). Our study highlights acute urinary retention as the predominant urological emergency, emphasizing the necessity for proactive management strategies, followed by febrile low back pain and urogenital trauma

Keywords: Emergency, Urology, Profile, University Hospital.

ABBREVIATIONS

FCC: Fracture of the Corpora Cavernosa; AUR: Acute Urinary Retention; CHU: University Hospital Center; ADK: Adenocarcinoma.

INTRODUCTION

Urological emergencies are urological conditions that require immediate intervention and treatment. They account for 6% of total admissions to surgical emergencies and 27% of admissions in urology [1]. Urological emergencies can be classified into traumatic, infectious, obstructive emergencies, among others. They hold significant importance with diverse clinical manifestations specific to each distinct pathology.

Infectious pathologies seen in urological emergencies hold a prominent

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position. According to a study conducted by Mondet F, et al. [2] in France in 2002, they were the most frequent. In a Togolese study published in 2017 by Tengue K, et al. [3], they ranked second among all urological emergencies managed during their study period.

These emergencies can complicate into urosepsis and thereby jeopardize the patient's prognosis. The common therapeutic approach for such emergencies involves initiating antibiotic therapy and/or a urological procedure (endoscopic or surgical), which may range from urinary tract drainage to emergency nephrectomy.

The objective of this work is to delineate the profile of urological emergencies seen at the Casablanca University Hospital (CHU), evaluating their management within our working context.

PATIENTS AND METHODS

This was a descriptive retrospective study conducted from January 1, 2023, to December 31, 2023, at the urology department of Ibn Rochd University Hospital in Casablanca. It included a cross-sectional analysis of 456 patient record admitted for urological emergencies during this period. It was an exhaustive sampling of urological emergency cases recorded by the on-call team of the urology department at CHU Casablanca. This on-call team consisted of an on-duty urologist, a resident physician, and a nurse. However, in the Casablanca region, there is another private university hospital, other peripheral hospitals, and several health centers. Consequently, many urological emergencies are managed in other healthcare facilities. Therefore, our study included all emergency consultations and surgical interventions performed by the on-call team and documented with all clinical, paraclinical, and therapeutic data in the logbook during the study period. Excluded from our study were emergencies (consultations and surgical interventions) received during the study period but not recorded in the logbook, emergency consultations and surgical interventions performed by another urologist not part of the on-call team, and emergency consultations for a patient already hospitalized in a department of CHU Casablanca.

The following data were collected and analyzed: age, sex, diagnosis, therapeutic modalities, and outcome. A predefined form was used for data collection. Calculations were arithmetic, and the results were expressed as mean and percentage.

RESULTS

Over a 12-month period, 456 patients were managed in urological emergencies. The monthly incidence was 38 cases.

Male patients were predominantly represented (n=327) with a male-to-female ratio of 2.53. The average age of patients was 57.8 years with a range from 24 to 87 years. The most represented age group was between 61 and 80 years.

All patients were admitted through the emergency department. Sixty-seven percent of patients presented within 3 to 7 days of the onset of symptoms. The main urological emergencies were acute urinary retention (AUR), febrile low back pain, and urogenital trauma, accounting for 38.82%, 19.08%, and 12.07%, respectively, as indicated in Table 1. Fournier's gangrene was observed in 17 cases, accounting for 3.73%.

Table 1. Distribution of patients according to types of urological emergencies

Pathology	Number of Cases	Percentage (%)
Febrile low back pain	87	19.08%
Simple renal colic	30	6.58%
AUR	177	38.82%
Urogenital trauma	55	12.07%
Spermatic cord torsion	22	4.39%
Urological-origin hematuria	35	7.68%
Priapism	8	1.76%
Fournier's gangrene	17	3.73%
Scrotal abscess	6	1.32%
Epididymo-orchitis	7	1.54%
Prostatitis	4	0.88%
Ourachal abscess	3	0.66%
Psoas abscess	5	1.10%
Total	456	100%

Torsion of the spermatic cord was also observed in 22 patients, accounting for 4.39%. Urological-origin hematuria was the reason for consultation in 35 patients, accounting for 7.68%. Eight patients were admitted with priapism, accounting for 1.76%.

The main admissions in emergency for infectious pathologies were represented by obstructive pyelonephritis and its complications, and Fournier's gangrene, accounting for 67.23% and 13.18%, respectively, as indicated in Table 2.

Table 2. Distribution of infectious pathologies according to type

Type	Number	Percentage (%)
Obstructive pyelonephritis	67	51.90%
Renal and perinephric abscess	8	6.20%
Pyonephrosis	12	9.31%
Fournier's gangrene	17	13.18%
Scrotal abscess	6	4.66%
Epididymo-orchitis	7	5.43%
Prostatitis	4	3.11%
Ourachal abscess	3	2.33%
Psoas abscess	5	3.88%
Total	129	100%

The conditions responsible for AUR were mainly prostate adenoma followed by prostatic adenocarcinoma, accounting for 67.56% and 15.59%, respectively, as indicated in Table 3.

Table 3. Distribution of patients admitted for AUR according to etiologies

Etiologies	Number	Percentage (%)
Prostate adenoma	132	67.56%
Prostatic adenocarcinoma	29	15.59%
Urethral stricture	6	6.49%
Neurological bladder	3	3.89%
Bladder tumor	6	7.79%
Urethral lithiasis	1	1.29%
Total	177	100%

Renal traumas were the most frequent in urogenital traumas, followed by fractures of the corpora cavernosa and scrotal traumas, accounting for 40%, 21.8%, and 16.37%, respectively, as indicated in Table 4.

Table 4. Distribution of urogenital traumas according to site

Trauma Site	Number	Percentage (%)
Kidney	22	40%
Ureter	1	1.82%
Bladder	7	12.73%
Urethra	4	7.28%
Scrotum	9	16.37%
Corpora cavernosa fracture	12	21.80%
Total	55	100%

In our study, we excluded hematurias of nephrological or drug origin and focused solely on urological-origin hematurias. Bladder tumors with active clotting bleeding were the most common cause of hematuria, followed by prostatic tumors. We also noted a few cases of renal tumors, vesical stones, prostate adenoma, or urinary lithiasis causing hematuria as indicated in Table 5.

Table 5. Etiologies responsible for urological-origin hematuria

Etiologies	Number	Percentage
Bladder tumor	17	48.58%
Renal tumor	2	5.72%
Prostate adenoma	3	8.56%
Prostatic adenocarcinoma	11	31.43%
Vesical stone	1	2.86%
Urinary lithiasis	1	2.86%
Total	35	100%

Bladder catheterization was the most frequent procedure used in emergencies, primarily indicated for patients with acute urinary retention (147 cases) and also for patients admitted for a bladder tumor with active bleeding requiring catheterization and clot removal in emergency. It was also performed for some patients admitted to urological emergencies for Fournier's gangrene, scrotal abscess, or prostatic tumor (Table 6). Suprapubic cystocatheterization was performed in case of failure or contraindication to bladder catheterization (30 cases). All cases of Fournier's gangrene required triple antibiotic therapy, debridement, and necrosectomy (17 cases). Scrotal exploration was indicated

in cases of suspected spermatic cord torsion (17 cases) or some cases of scrotal trauma where surgical exploration was indicated (5 cases). Puncture of the corpora cavernosa with lavage and spongiosum-cavernous shunts was the procedure performed for all patients admitted for priapism (12 cases). Unclamping and suturing of the fracture line involving the corpora cavernosa was indicated in cases of corpora cavernosa fracture (12 cases). Percutaneous drainage was performed in cases of psoas or ourachal abscess (08 cases). Exploration through an infraumbilical laparotomy was performed in cases of bladder trauma with an intraperitoneal collection (5 cases). Percutaneous nephrostomy was the most frequently used method of urine diversion in cases of obstructive anuria secondary to a tumor obstruction, and JJ stent insertions were primarily performed in cases of obstructive pyelonephritis or hyperalgic renal colic or when contrast material passed to the bladder after a descending pyelography through percutaneous nephrostomy Table 6.

Table 6. Procedures performed in emergencies

Procedures	Number	Percentage (%)
Suprapubic cystocatheterization	45	10.41%
Bladder catheterization	180	41.66%
Debridement + Necrosectomy	17	3.94%
Percutaneous nephrostomy	60	13.88%
JJ stent insertion	50	11.58%
Scrotal exploration	27	6.25%
Corpora cavernosa puncture + shunts	8	1.86%
Lavage + Clot removal	20	4.63%
Percutaneous drainage	8	1.86%
Fracture of corpora cavernosa repair	12	2.77%
Infraumbilical laparotomy (bladder suturing)	5	1.16%
Total	432	100%

The analysis of urological emergencies further revealed notable disparities between genders, with a total of 327 cases reported in males and 129 cases in females, as summarized in Table 7.

Table 7. Distribution of urological emergencies by gender

Pathology	Number of Cases (Male)	Number of Cases (Female)
Febrile Low Back Pain	12	75
Simple Renal Colic	11	19
Urinary Tract Infection	166	11
Urogenital Trauma	45	10
Testicular Torsion	22	0
Urological Hematuria	28	7
Priapism	8	0
Fournier's Gangrene	15	2
Scrotal Abscess	6	0
Orchiepididymitis	7	0
Prostatitis	4	0
Urachal Abscess	1	2
Psoas Abscess	2	3
Total	327	129

DISCUSSION

In our study, the total number of patients was 456 cases per year. Compared to other studies like Tengue K, et al. [3] in Togo, Tfeil YO, et al. [4] in Mauritania, and Bobo Diallo 5 in Guinea, we found 147 patients/year, 240 patients/year, and 252 patients/year, respectively. The average age of our patients was 54 years with extremes ranging from 24 to 87 years, and the elderly were most affected in our study and in the literature. Therefore, geriatric activity has a significant role in emergency care, requiring particular vigilance due to the already fragile condition of these patients [5]. A male predominance was noted in our study and in the aforementioned studies [3,4,6].

In our study, acute urinary retention represented the primary urological emergency with 38.32% of cases. Acute urinary retention was also the main diagnosis in the study by Bobo Diallo [6] in Guinea, Tfeil et al in Mauritania [4], and Tengue et al in Togo [3]. However, in France, lower back pain represents the main reason for consultation, which can be explained by the fact that patients in France seek medical attention at the dysuria stage, while in Africa, patients wait until the onset of urinary retention [7].

The main etiologies of acute urinary retention in our study were prostate adenomas followed by prostate adenocarcinoma. These results do not match the studies by Fall et al. [8] in Senegal and Ikuerowo et al. [9] in Nigeria, where prostate tumors and urethral strictures were the main etiologies. In a study by Ndemanga et al. [10] on acute urinary retention, they found that benign prostatic hyperplasia was the etiology in 47.8% of cases, followed by urethral stricture and prostate cancer in 27% and 16.9% of cases, respectively, which is consistent with our study where benign prostatic hyperplasia was the main cause of acute urinary retention in 67.56% of cases. The high frequency of acute urinary retention in urological emergencies in our study is due to patients tolerating dysuria on one hand and self-medication and delayed consultation with a specialist on the other hand. This high incidence of acute urinary retention leads to infectious problems, especially with the placement of indwelling catheters while waiting for surgical treatment of the underlying pathology [11].

Urological-origin hematuria was rare in our study (7.6%) and was mostly secondary to a bladder tumor requiring lavage and decalcification in urological emergencies. A similar observation was made by Diallo et al. [6] in Guinea [13] and Tfeil et al in Mauritania [4]. This low percentage in our study is explained by excluding other etiologies of hematuria such as nephrological or drug-induced causes.

Orchiepididymitis was infrequent in our study, accounting for 1.54% of cases. This observation was also made in the study by Bobo Diallo [6] with 1.8% of cases. Most orchiepididymitis cases are treated on an outpatient basis in peripheral emergencies, explaining this low percentage.

Infections of the urogenital tract in our study were mainly represented by obstructive pyelonephritis followed by Fournier's gangrene secondary to a urological cause, with a scarcity of patients presenting to emergencies for orchiepididymitis or prostatitis. These results are not comparable with the study by Tengue et al in Togo [3], where orchiepididymitis ranked first in admissions for urogenital infections in emergencies. Additionally, our results are not in line with a European study where Fournier's gangrene was not reported [13].

In our study, more than half of Fournier's gangrene cases were secondary to a urological cause, followed by digestive causes, and then cutaneous or idiopathic causes. These results are consistent with several studies reported in the literature [14].

Urogenital traumas accounted for 12.07% in our study, with renal traumas being the most frequent, followed by cavernous body fractures and scrotal traumas, with 40%, 21.8%, and 16.37%, respectively. Our results do not match the study by Bobo Diallo [6] in Guinea, where urethral trauma was the most frequent. We did not note circumcision accidents in our study, which is not consistent with the study by Fall B [15], where circumcision-related accidents were reported as minimal bleeding, wound infection, partial or total amputation of the glans, or urinary retention. The absence of circumcision-related accidents in our study is explained by the practice of circumcision in specialized centers. In the study by Paparel et al. [8], kidneys (43%) and testicles (24%) were the most affected urogenital organs, which aligns with the results of our study.

Therapeutically, the most frequent procedure in urological emergencies was urinary catheterization mainly indicated in cases of acute urinary retention secondary to prostate adenoma. On the other hand, the most frequent procedure

performed in the study by Fall [15] and Bobo Diallo [4] was debridement of external genitalia gangrene.

Obstructive pyelonephritis and Fournier's gangrene were the two most frequent infectious pathologies in urological emergencies in our study, consistent with most studies in the literature. The management of obstructive pyelonephritis in our study was based on antibiotic administration and urine drainage mainly through percutaneous nephrostomy. Similarly, in the study by Fall [15] in 2008 and Mondet et al. [2] in 2002 in France, where pyelonephritis accounted for 31% of cases, management was similar to our study. Scrotal exploration was mainly indicated in cases of suspected torsion of the spermatic cord or in the presence of scrotal trauma when there was an indication for surgical exploration (large hematoma, hematocele, albuginea fracture, etc.). Priapism, in our study, was an infrequent pathology encountered in emergencies (1.76%), consistent with the study by Tfeil YO, et al. [4] and Bobo Diallo [6], and management involved puncture and lavage of the cavernous bodies and creation of spongiosal-cavernous shunts, but unfortunately, frequent recurrences of priapism cases were noted.

CONCLUSION

Urological emergencies play an important role in our daily practice. Acute urinary retention is the most frequent reason for consultation in urological emergencies and is predominant in elderly subjects in our study. The severity of certain pathologies such as obstructive pyelonephritis, Fournier's gangrene, to a lesser extent renal traumas, priapism, or cavernous body fractures requires a better understanding of their profiles for improved management in our country

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