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# Management of Urinary Trauma in the Urology Department of the Ignace Deen National Hospital in Conakry

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**Abstract:** Objective: to highlight the epidemiological, lesional and therapeutic aspects of urinary trauma in the urology department of the Ignace Deen National Hospital in Conakry. Material and methods: this was a retrospective study that took place over a period of 5 years, during which we collected all cases of urinary trauma in the urology department of the Ignace Deen National Hospital in Conakry. The variables studied were socio-demographic, anatomical-clinical and therapeutic. Results: we collected 75 cases of urinary trauma, representing 15.5% of abdomino-pelvic trauma admitted to hospital during the study period. The average age of patients was 29 years old with extremes of 8 and 66 years. Men were the most affected with a gender ratio of 25. Road traffic accidents were the most frequent etiologies. The consultation time was less than 24 hours in 92% of cases. Trauma involved the urethra in 80% of cases, the bladder (10.7%) and the kidney (9.3%). The mechanism of trauma to the urethra was dominated by astride falls on the perineum in 52% of cases. Posterior urethra ruptures were associated with pelvic trauma in 20/25 cases and bladder trauma in 5/8 cases. The treatment was carried out according to the type of lesion. Conclusion: urinary trauma is not uncommon in our practice. They are the prerogative of young men in full activity. They are dominated by urethral ruptures, followed by trauma to the kidney and bladder. Treatment should be as conservative as possible in closed kidney trauma and peritoneal ruptures of the bladder.

**Keywords:** Trauma, Urinary, Epidemiology, Diagnosis, Treatment

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## 1. Introduction

Trauma is a major cause of morbidity and mortality and loss of productivity. Worldwide, they are the sixth cause of death and the fifth cause of moderate and severe disability [1]. Trauma to the urinary tract often occurs in a polytraumatic context due to their anatomical situation [2]. They can cause urinary and sexual complications, but also be life-threatening

when associated with other lesions. They represent 10% of the traumatic pathology. Kidney trauma is the most reported [3]. However, some studies [4-7] place urethral trauma at the forefront in sub-Saharan Africa.

In Guinea, there is not yet a reliable system for collecting trauma data, apart from hospital data. This could under evaluate the extent of the trauma in the country. In 2010, a study in a hospital center in Conakry showed that urogenital

trauma represented 7% of all urological emergencies [8]. It is to help improve data on the epidemiological and lesion aspects of urinary trauma in our department, that we undertook this study.

## 2. Material and Methods

This was a descriptive retrospective study lasting 5 years from January 1, 2016 to December 31, 2020. It took place at the Ignace Deen National Hospital in Conakry, which houses the main Urology department in the country. This service mainly receives patients from the capital Conakry and its surroundings. In the regions, there are Urology units, in the absence of visceral surgery that can manage some of these traumas. We included in the study all cases of urinary trauma treated in the Urology Department of Conakry University Hospital during the study period. Patients with iatrogenic urinary trauma were excluded from the study. The variables studied were socio-demographic (age, gender, profession), anatomical-clinical (etiology of trauma, type of trauma, mechanism, seat of trauma, associated lesions, clinical signs) and therapeutic.

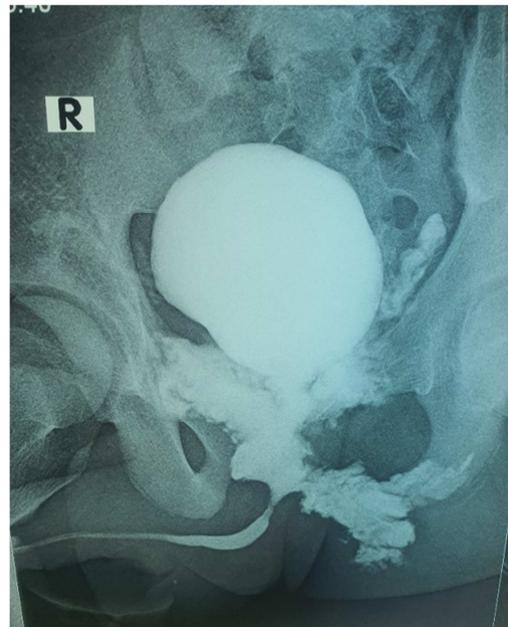
## 3. Results

Out of 484 patients admitted to hospital for abdominal-pelvic trauma during the study period, we recorded 75 cases of urinary trauma, a proportion of 15.5%. This represented 2.2% of the reasons for hospitalization in the Urology department. The average age of patients was  $29 \pm 17.4$  years with extremes of 8 and 66 years; 60% of patients ( $n=45$ ) were between 20 and 40 years old. Men were the most affected by these traumas with 72 cases, a sex ratio of 25. Regarding the profession, drivers were the most affected with 26.6% of cases ( $n=20$ ), followed by workers and students with 21.3% ( $n=16$ ) and 18.6% ( $n=14$ ) of cases respectively. The consultation time was less than 24 hours in 69 cases or 92% and between 24 and 48 hours in 6 cases or 8%. According to the topography of the lesions, the trauma was on the urethra in 60 cases, the bladder in 8 cases and the kidney in 7 cases (Table 1). Of the 60 cases of urethra trauma recorded, 35 (58.3%) sat on the anterior urethra and 25 on the posterior urethra. The mechanism of these traumas was dominated by a astride fall on the perineum from a height in 31 cases (51.7%) (Figure 5). Associated lesions were present in 38.3% of cases ( $n=23$ ). This was a fracture of the pelvis (Figure 1) in 20 cases mainly in ruptures of the posterior urethra, a case of perineal decay with rectal wound, a case of bladder trauma and a traumatic amputation of a lower limb. Three cases of trauma to the anterior urethra were associated with a fracture of the corpora cavernosa. The clinical presentation was dominated by the bleeding of the urethra with 51 cases (85%) and bladder urine retention with 42 cases (70%). At the urethrography we observed a complete rupture of the urethra in 80% of cases ( $n=48$ ), evoked before the extravasation of the contrast medium, without passage into the bladder. In the other cases, a partial rupture of the

urethra was mentioned before the extravasation of the contrast or a decrease in the caliber of the urethra with opacification of the bladder upstream (Figure 2).



**Figure 1.** X-ray photograph of the pelvis showing a fracture of the shutter frames and a pubic disjunction.



**Figure 2.** Photograph of urinal cystography showing a significant extravasation of the contrast medium, evoking a traumatic rupture of the urethra.

Bladder trauma ranked second among urinary trauma with 10.7% ( $n=8$ ) of cases. It was an intraperitoneal rupture in 3 cases and an extraperitoneal rupture in 5 cases. We observed a lesion in the bladder neck (Figure 3). In any case, the trauma was closed. The etiologies were represented by a road traffic accident in 5 cases, a work accident in 2 cases and a case of a domestic accident. Pelvic trauma was associated in 5 cases (62.5%) and urethral rupture in one case. Clinically, we noted hematuria in 4 cases, absence of unwanted urination in 5 cases, and painful hypogastrium in 6 cases. Retrograde cystography was performed in all our patients, it was supplemented by an abdomino-pelvic ultrasound in case of doubt about an abdominal lesion.



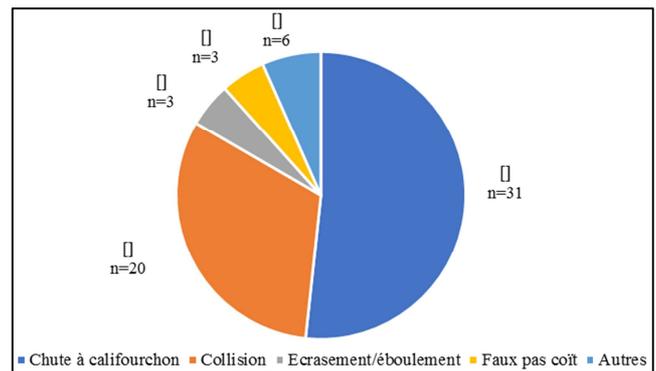
**Figure 3.** Retrograde urethrography photo showing a progression of the contrast medium to the bladder where there is an extravasation of contrast at the bladder neck (lesion of the bladder neck).



**Figure 4.** Large notch of the kidney of nearly 8 cm at its outer edge by knife.

Kidney trauma accounted for 9.3% (n=7) of urinary trauma. The etiologies were a road traffic accident in 4 cases with closed trauma. In the other 3 cases, it was a fight with a stabbing wound (Figure 4). Macroscopic hematuria and low back pain were present in all cases. Hemodynamic instability was noted in 3 cases and fever in 2 cases. Computed tomography was performed in 5 cases and ultrasound in the other 2 cases. According to the AAST classification, closed kidney trauma was grade III lesions in 2 cases, grade IV in one case and grade V (multi-fractioned kidney) in one case.

Treatment of urinary trauma was done according to the type of lesions. It is presented in Table 2.



**Figure 5.** Mechanisms of urethra trauma.

**Table 1.** Distribution of patients by topography of lesions.

Seat of the lesions	Number of case	%
Urethral:		
Anterior = 35	60	80
Posterior = 25		
Bladder		
Intraperitoneal rupture = 3	8	10,7
Rupture under peritoneal = 5		
Kidney	7	9,3
Total	75	100

**Table 2.** Distribution of patients according to the treatment of lesions.

Type of injury	Treatment	Number of case
Trauma of the urethra (n=60)	Urethral repair opened in emergency	4
	Delayed endoscopic uretrotomy	15
	Delayed termino-terminal urethrorrhaphy	41
Intraperitoneal rupture of the bladder (n=3)	Surgical exploration: abdominal toilet + bladder suture + bladder drainage	3
	Bladder drainage	3
Extraperitoneal rupture of the bladder (n=5)	Bladder suture + bladder drainage	2
	Bladder drainage	3
Penetrating trauma of kidney (n=3)	Emergency total nephrectomy	3
Multi-fractured kidney (n=1)	Emergency total nephrectomy	1
Kidney trauma grade IV (n=1)	JJ posing	1
Kidney trauma grade III (n=2)	Surveillance	1

### 4. Discussion

The main limit of this study remains its retrospective nature with the related data loss. We have recorded 75 cases of urinary trauma over a 5-year period, or an annual average of 15 cases. This rate remains higher than that of most series

reported in Africa [4-6] with an average that varies between 7 and 10 cases.

Young subjects who are the most active group of the population are generally the most exposed to trauma. The average age of patients in our study is in the average age range between 25 and 35 years in the literature.

We noted a clear male predominance with a sex ratio of 25.

For Dekou [4], the preponderance of men could be explained by the high-risk activities they carry out. Indeed, drivers exposed to road traffic accidents and workers due to lack of safety in the workplace are the most affected by these traumas in our study.

The consultation time was less than or equal to 24 hours in 92% of cases. This short time could be explained by the urgency of trauma symptoms. In the literature, road traffic accidents rank first among the etiologies of urinary damage [4, 7, 9]. This is clear from our study where they were the etiology of nearly half of urinary trauma.

As in our series, closed traumas are the most reported in many works [5, 7].

Regarding the site of the lesion, the urethra was the most affected organ with 80% of cases. This predominance of urethra trauma is also reported by most African authors [4-7].

Trauma to the urethra mainly affects the man. We did not record any trauma to the urethra in women. Indeed, urethral lesions are uncommon in women because the urethra is short and mobile, without significant attachment to the pubis [10].

Urethral lesions occur mainly in the posterior urethra [1]. Unlike our work, where we recorded 58% of trauma to the anterior urethra. This could be explained by the preponderance in our study of astride falls on the perineum (52% of cases) that cause trauma to the anterior urethra.

We discussed the diagnosis of trauma of the urethra in front of bleeding urethra associated or not with bladder retention in a traumatic context. It was confirmed in all cases by the urethrography, which remains the reference examination for the urethral lesion assessment [10].

From a therapeutic point of view, the time of the surgical procedure and the surgical technique depend on the associated lesions and the technical platform.

We do not have a flexible cystoscope in our department, which limits the realization of primary endoscopic realignment that would simplify subsequent management [10]. Our attitude is generally to drain urine by a supra pubic catheter in an emergency and then the repair of the urethra by end-terminal urethrorraphy or endoscopic urethrotomy is performed between 2 and 3 months after the trauma. This attitude offers the advantage of having waited for the disappearance of hematomas, stabilizing possible associated bone lesions and inquiring about the patient's erectile function before surgery [11].

We performed an emergency urethral repair at the time of cavernorrhaphy, when the urethral rupture occurred during a rupture of the penis. In the case of the urethral rupture with dilapidation of the perineum we have achieved an immediate open urethral realignment.

Bladder trauma is rare because of good protection of the bladder by the osteotendinous frame of the pelvis, especially when it is empty [12]. She becomes vulnerable when she fills up and its dome exceeds this boney framework. We counted 8 cases (10%) of bladder trauma, including 3 intraperitoneal ruptures. This low rate could also be explained by the non-inclusion in the study of iatrogenic lesions that are the most common in the literature, representing 50% of bladder

trauma [12].

Traumatic lesions of the bladder are rarely isolated [13]. They are often the result of high-energy shock and are associated in 85% of cases with damage to other organs [14]. We found associated pelvic trauma in 62.5% of cases and urethral rupture in a patient.

Paraclinically, the cystoscanner remains the reference examination [12, 15]. At the same time, it makes it possible to take stock of bladder lesions and associated lesions. The cost of the scanner in our context where the majority of patients do not have health insurance, limits the use of this examination.

Retrograde cystography supplemented by an abdominal ultrasound that we perform in our service is a good alternative to cystoscanner. Indeed, classical cystography has good sensitivity in the diagnosis of bladder ruptures [15] and ultrasound allows the diagnosis of possible associated abdominal lesions. However, retrograde cystography must be performed under conditions of surgical aseptic, with caution due to the risk of associated urethral injury in the case of pelvic trauma [15].

The treatment of bladder trauma depends on the type of lesion and the existence of associated lesions [12].

We have systematically surgically explored intraperitoneal ruptures. This avoids peritoneal resorption of urine and closes the bladder rupture [12].

In extraperitoneal ruptures, bladder drainage allowed the healing of the bladder injury in 3 of our patients. In the other 2 cases, a surgical exploration was done. This was a case where the lesion interested the bladder neck and an associated urethral rupture. In these two cases, the surgical consequences were marked by a urinary fistula that was slow to dry up.

The conservative attitude in extraperitoneal ruptures remains the rule when the bladder lesion is isolated and does not affect the bladder neck and trine. This conservative attitude is associated with low morbidity [16].

The kidney is the most affected organ of the urinary tract in the literature [17], while our study finds only 7 cases of kidney trauma, or 9.3% of cases. It should be noted that kidney trauma, when associated with intra-abdominal lesions (hepatic or splenic), is managed in the visceral surgery department in our hospital. In addition, some minor kidney traumas that progress favorably under surveillance may go unnoticed when admitted to certain peripheral centers that do not have paraclinical exploration means (ultrasound and computed tomography). Very often it is persistent macroscopic hematuria found in all our patients or hemodynamic instability that lead to refer patients to our department. This would explain why no grade I and II lesions were found.

We recorded three penetrating traumas of the kidney by knife, which indicates the increase in urban violence.

The CT scan, which is more sensitive and more specific to characterize renal damage, but also to detect associated abdominal lesions, is the examination to be performed in first intention [18]. It is difficult to carry out in our hospital

because of its cost, which is not within the reach of all our patients. Two penetrating traumas admitted with an ultrasound suggestive of kidney damage, were managed directly in the operating room without uroscanner in the face of hemodynamic instability.

Treatment of kidney trauma depends on the stage of AAST classification and the hemodynamic state. Conservative attitude has become the reference in care. The few indications for emergency surgical exploration of retroperitoneum are [19-22]:

An avulsion or laceration of the pedicle.

Hemodynamic instability not explained by another extrarenal lesion, and persistent despite resuscitation.

The presence of associated lesions requiring surgical exploration. An approach of the retroperitoneum is then carried out only if there is a pulsatile retroperitoneal hematoma, if the preoperative imaging shows a grade 5 or grade 4 vascular lesion.

In our study, we performed an emergency hemostasis necroectomy in the face of hemodynamic instability in the 3 penetrating wounds of the kidney and closed grade V trauma.

In other cases, a conservative attitude has been adopted. The evolution was favorable in 2 cases and in one case a persistent fever on uro-hematoma led us to install a JJ probe.

We did not find any ureteral trauma in this study. These traumas are rare, due to the movable nature of the ureter, its small diameter and anatomical position [23]. They mostly result from iatrogenic lesions. In a study conducted in the same department between 2008 and 2015, 19 iatrogenic lesions of the ureter were reported in the course of gynecological or obstetric surgery [24].

## 5. Conclusion

Urinary trauma is not uncommon in our practice. They are potentially serious by the urinary or sexual complications they can cause. They affect young subjects in full activity with a loss of productivity. Road traffic accidents are the most frequent etiologies. They are dominated by the traumas of the urethra often following a astride fall on the perineum. Therapeutic management depends on the type of injury. Treatment should be as conservative as possible in closed kidney trauma and peritoneal ruptures of the bladder.

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