

# Epidemiology of Renal Trauma at the Yaounde University Teaching Hospital

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## Abstract

**Introduction:** Renal trauma is the most common type of genitourinary trauma, often occurring in the context of polytrauma, and can be severe, putting the patient's life at risk due to hemorrhagic or infectious complications. Management has become more conservative over the past twenty years, thanks to advances in minimally invasive surgery and interventional radiology. **Methodology:** We conducted a cross-sectional observational study with retrospective recruitment at the Urology Department of the Yaoundé University Teaching Hospital over a period of 5 years. All patients diagnosed with renal trauma and managed at the Yaoundé University Teaching Hospital were included, regardless of age, sex, or treatment methods used. **Results:** Most patients were between 20 and 39 years old (60.0%) and male (68.0%), with a sex ratio of 2.13. Lumbar pain was present in all cases (100.0%), hematuria in 52.0% of cases. Factors of decompensation were found in 44.0% of patients, dominated by hemodynamic instability in 44.0% and fever in 12.0% of cases. Computed tomography, the most commonly performed radiological examination, was found in 84% of cases, with 32.0% in association with ultrasound. Management was dominated by non-operative treatment (NOT) at 56.0%. Surgical management (nephrectomy) was frequent in 44.0% of cases (n = 11). **Conclusion:** Given the favorable evolution in our patients who underwent simple surveillance and taking into account the good results in the literature regarding

therapeutic abstention in major closed renal trauma, we believe that in the absence of associated intra-abdominal lesions or hemodynamic instability, simple surveillance remains the therapeutic method of choice.

## Keywords

Epidemiology, Nephrectomy, Renal Trauma, Non-Operative Treatment

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## 1. Introduction

Renal trauma is the most common type of genitourinary trauma, often occurring in the context of polytrauma. It can be caused by blunt trauma due to direct impact on the flank or penetrating trauma, most often resulting from stab or gunshot wounds. Given the kidney's high vascularization and vital function, renal trauma can be severe and life-threatening due to hemorrhagic or infectious complications. The advent of CT scans has allowed for better visualization of the lesions. Management, which previously involved nephrectomy, has become more conservative over the past twenty years. Thanks to advances in minimally invasive surgery, interventional radiology, and resuscitation. The purpose of this study was to investigate the epidemiological data of patients with renal trauma and associated lesions at the Yaoundé University Teaching Hospital.

## 2. Methodology

We conducted a 5 years (January 2020-February 2025) cross-sectional observational study with retrospective data collection at the Urology Department of the Yaoundé University Teaching Hospital (YUTH). The study population consisted of patients admitted to the emergency department and hospitalized in the urology department of the YUTH. We used a consecutive and non-exhaustive sampling method. All patients diagnosed with renal trauma and managed at the YUTH were included in our study, regardless of age, sex, or treatment methods used after obtaining informed consent. Prior to this study, we obtained research authorizations from the hospital management and ethical clearance from the institutional ethics and research committee of the Faculty of Medicine and Biomedical Sciences, University of Yaounde 1. data were collected and recorded in a pre-established survey form, which was kept confidential. The collected data were then entered and analyzed using Epi-info version 7.0, Cs Pro version 7.3, and SPSS software.

## 3. Results

### 3.1. Total Number of Patients Recorded in the Study

#### 3.1.1. Sociodemographic Characteristics of the Study Population

Most patients were between 20 and 39 years old (60.0%) and male (68.0%), with a sex ratio of 2.13. Patients with occupations other than driver or motorcycle taxi driver were the most frequent at 76.0% (**Table 1**).

**Table 1.** Sociodemographic characteristics of the study population.

Variable	Frequency (N = 25)	Percentage (%)
<b>Age range (years)</b>		
<20	8	32.0
20 - 39	15	60.0
60 - 79	2	8.0
<b>Sex</b>		
Male	17	68.0
Female	8	32.0
<b>Occupation</b>		
Bike rider	5	20.0
Driver	1	4.0
others	19	76.0

### 3.1.2. Clinical Characteristics of the Study Population

#### 1) Functional signs and local-regional physical signs

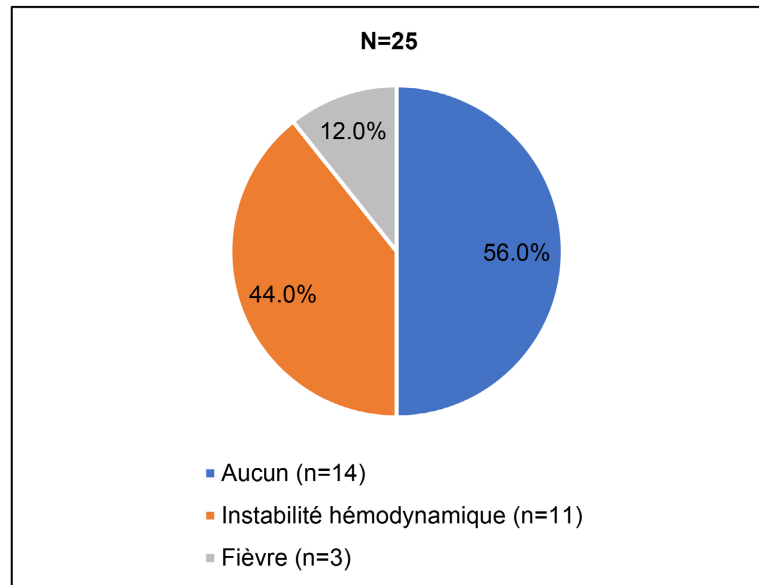
Lumbar pain was present in all cases (100.0%), hematuria in 52.0% of cases. Regarding local-regional physical signs, they were frequent in 12.0% of cases, mainly consisting of lumbar ecchymosis (8.0%) and lumbar swelling (4.0%) (**Table 2**).

**Table 2.** Distribution of the population according to the physical signs.

Variable	Frequency (N = 25)	Percentage (%)
<b>Symptoms</b>		
Low back pain	25	100.0
Hematuria	13	52.0
Abdominal distension	1	4.0
<b>Loco-regional physical signs</b>		
None	22	88.0
Lumbar ecchymosis	2	8.0
Lumbar swelling	1	4.0

### 3.1.3. Factors of Decompensation

**Figure 1** shows that factors of decompensation were found in 44.0% of patients, dominated by hemodynamic instability in 44.0% and fever in 12.0% of cases.



**Figure 1.** Distribution of the population according to the factors of decompensation.

### 3.1.4. Radiological Characteristics of the Study Population

Computed tomography, the most commonly performed radiological examination, was found in 84% of cases, with 32.0% in association with ultrasound. Unilateral lesions were present in all cases, mainly grade 1 (32.0%) (**Table 3**).

**Table 3.** Distribution of the study population according to the radiological findings.

Variable	Frequency (N = 25)	Percentage (%)
<b>Imagery</b>		
Abdominal CT scan	13	52.0
Abdominal CT scan + Ultrasound	8	32.0
Ultrasound	4	16.0
<b>Localisation of the lesion</b>		
Right	12	48.0
Left	13	52.0
<b>Severity of the injury</b>		
Grade 1	8	32.0
Grade 3	5	20.0
Grade 4	1	4.0
Grade 5	7	28.0
Imaging not done	4	16.0

### 3.2. Management of the Study Population

Non-operative treatment (NOT) was done in 56.0% cases. Surgical management (nephrectomy) was frequent in 44.0% of cases ( $n = 11$ ), with findings of splenic lesions (100.0%) and colonic lesions (63.6%), as shown in **Table 4** below.

**Table 4.** Distribution of the population according to the various treatment modalities and per-operative findings.

Variables	Frequency (N = 25)	Percentage (%)
<b>Therapeutic modalities</b>		
Non-operative treatment	14	56.0
Nephrectomy	11	44.0
<b>Intra-operative findings</b>		
Splenic injury	11	100.0
Colonic injury	7	63.6
Hemoperitoneum	1	9.1

### 4. Discussion

Trauma to the entire genitourinary system accounts for 1% to 5% of trauma cases. Renal trauma is the most common type of traumatic injury to this system, accounting for 64% (reference). About 8% of these trauma are due to road traffic accidents, falls, and sports accidents [1]. Men are more frequently affected. Renal trauma can occur at any age, with a predominance in young adults, mainly between 20 and 40 years old [2] [3]. These figures are similar to those in our series, where we found a male predominance in young adults aged 20 - 40 years. This can be explained by the fact that this age group is more active and mobile, and therefore more at risk of accidents that can cause renal trauma. Motorcycle riders were the most affected, as it is a profession exclusively male and the main means of transportation in developing countries. Hematuria is the main symptom, and it is macroscopic in 66.6% to 99% of cases in the literature [4]. In our series, the symptomatology was dominated by lumbar pain (100.0% of cases) and hematuria (52.0%). Hemodynamic instability was found in 44% of cases. L. Freton *et al.* reported that hematuria, lumbar pain, and hematoma of the flank, lumbar fossa, or hypochondrium are the most common symptoms [5]. The imaging examination of choice is CT urography, which is a CT scan of the abdomen and pelvis with contrast injection and delayed phase with opacification of the urinary tract [6] [7]. It was performed in 52% of patients in this series. Some patients who appeared hemodynamically stable underwent emergency abdominal ultrasound. The classification used for staging lesions was the American Association for the Surgery of Trauma classification (AAST). It is used to classify trauma into five grades of increasing severity and guides therapeutic strategy. It is based on CT scan find-

ings. Trauma is classically divided into low-grade trauma (grades I to III), which accounts for three-quarters of renal trauma cases, and high-grade trauma (grades IV and V), which accounts for the remaining quarter [8] [9]. In our study, high-grade trauma accounted for 32% of cases, which can be explained by the severity of the impact in road traffic accidents involving two-wheeled vehicles. Conservative treatment (NOT) has become the standard treatment in the vast majority of published series in the literature, regardless of the grade, when hemodynamics are stable. Conservative treatment is associated with shorter hospital stay and better preservation of renal function [10]. Our results are in line with this trend. In our series, 56% of patients underwent non-operative treatment. The current trend is towards simplification of conservative treatment. For a long time, prolonged hospitalization, strict bed rest, regular biological monitoring, and systematic early imaging and follow-up were recommended. Several recent series, including a large multicenter study by the TRAUMAFUF study, have shown that maintaining strict bed rest in the initial phase is not necessary. In fact, early mobilization did not increase the risk of bleeding recurrence and was even beneficial, associated with faster recovery of bowel function and shorter hospital stays [11]-[13]. The TRAUMAFUF study has also shown in a recently published series that early discharge could be considered without risk in certain patients with minor isolated renal trauma (AAST grade 1 to 3) [5].

## 5. Conclusion

Renal trauma trends because of the increasing prevalence of road traffic accidents and urban violence. It still poses a therapeutic problem. Given the favorable evolution in our patients who underwent simple surveillance and taking into account the good results in the literature regarding therapeutic abstention in major closed renal trauma, we believe that in the absence of associated intra-abdominal lesions or hemodynamic instability, simple surveillance remains the therapeutic method of choice.

## Conflicts of Interest

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

## References

- [1] Herney, A.G., María, F.U., Alejandra, S. and Luis, J.A. (2009) Clinical Management of Renal Injuries at University Hospital of El Valle (Cali, Colombia). *Actas Urológicas Españolas*, **33**, 881-887.
- [2] Alex, T., John, L. and Sebastian, V. (2011) Non-Operative Management of Renal Trauma in Very Young Children: Experiences from a Dedicated South African Paediatric Trauma Unit. *Injury*, **43**, 1476-1481.
- [3] Morita, S., Inokuchi, S., Tsuji, T., Fukushima, T., Higami, S., Yamagiwa, T., *et al.* (2010) Arterial Embolization in Patients with Grade-4 Blunt Renal Trauma: Evaluation of the Glomerular Filtration Rates by Dynamic Scintigraphy with 99mTechnetium-Diethylene Triamine Pentacetic Acid. *Scandinavian Journal of Trauma, Resuscitation*

- and Emergency Medicine*, **18**, Article No. 11.  
<https://doi.org/10.1186/1757-7241-18-11>
- [4] Uriot, C., Hoa, D., Leguen, V., Lesnik, A., *et al.* (2005) Traumatismes du rein et de l'uretère. *EMC—Radiologie*, **2**, 637-652.  
<https://doi.org/10.1016/j.emcrad.2005.09.002>
- [5] Freton, L., Scailteux, L.M., Hutin, M., *et al.* (2019) Early Discharge in Selected Patients with Low-Grade Renal Trauma. *World Journal of Urology*, **38**, 1009-1015.
- [6] Bryk, D.J. and Zhao, L.C. (2016) Guideline of Guidelines: A Review of Urological Trauma Guidelines. *BJU International*, **117**, 226-234.  
<https://doi.org/10.1111/bju.13040>
- [7] Morey, A.F., Brandes, S., Dugi, D.D., Armstrong, J.H., Breyer, B.N., Broghammer, J.A., *et al.* (2014) Urotrauma: AUA Guideline. *Journal of Urology*, **192**, 327-335.  
<https://doi.org/10.1016/j.juro.2014.05.004>
- [8] Moore, E.E., Shackford, S.R., Pachter, H.L., *et al.* (1989) Organ Injury Scaling: Spleen, Liver, and Kidney. *The Journal of Trauma: Injury, Infection, and Critical Care*, **29**, 1664-1666. <https://doi.org/10.1097/00005373-198912000-00013>
- [9] Shariat, S.F., Roehrborn, C.G., Karakiewicz, P.I., Dhimi, G. and Stage, K.H. (2007) Evidence-Based Validation of the Predictive Value of the American Association for the Surgery of Trauma Kidney Injury Scale. *Journal of Trauma: Injury, Infection & Critical Care*, **62**, 933-939. <https://doi.org/10.1097/ta.0b013e318031ccf9>
- [10] Arunan, S., Elshout, P.J., Veskimäe, E., MacLennan, S., Yuan, Y., Serafe-Tinidis, E., *et al.* (2017) Is Nonoperative Management the Best First-Line Option for High-Grade Renal Trauma? A Systematic Review. *European Urology Focus*, **5**, 290-300.
- [11] Broghammer, J.A., Fisher, M.B. and Santucci, R.A. (2007) Conservative Management of Renal Trauma: A Review. *Urology*, **70**, 623-629.  
<https://doi.org/10.1016/j.urology.2007.06.1085>
- [12] London, J.A., Parry, L., Galante, J. and Battistella, F. (2008) Safety of Early Mobilization of Patients with Blunt Solid Organ Injuries. *Archives of Surgery*, **143**, 972-976.  
<https://doi.org/10.1001/archsurg.143.10.972>
- [13] Peyronnet, B., Olivier, J., Hutin, M., Ruggiero, M., Dominique, I., Freton, L., *et al.* (2018) Early Mobilization Is Safe after Renal Trauma: A Multicenter Study. *European Urology Supplements*, **17**, e199-e202.  
[https://doi.org/10.1016/s1569-9056\(18\)30983-7](https://doi.org/10.1016/s1569-9056(18)30983-7)