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Clinical, Diagnostic, and Therapeutic Aspects of Kidney Trauma at the Sylvanus Olympio Teaching Hospital in Lome

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Abstract

Introduction: Kidney injuries represent 5 to 10 % of all abdominal injuries. The aim of our study was to estimate the incidence, describe diagnostic methods, and their management. **Methods:** This was a retrospective and descriptive study from January 1, 2012 to December 31, 2021. It focused on the files of patients admitted and treated in the urology and surgical emergency departments of the teaching hospital Sylvanus Olympio in Lomé, for kidney trauma. **Results:** We collected 15 cases in 10 years. The average age of patients was 31.87 ± 9.77 years. The trauma patients were divided into 9 men and 6 women. The most common etiology was road traffic accident. Blunt trauma was the most frequent and the right side was the most affected. The clinical symptoms were dominated by hematuria and low back pain. Urinary CT-scan was the reference examination, performed in all patients and minor grade injuries were more frequent, in 11 patients. It was associated with splenic contusion in 4 patients. All minor injuries received medical treatment. Two grade IV cases underwent nephrorrhaphy. Total nephrectomy was performed in 2 grade V cases. Mortality was zero. **Conclusion:** Kidney injuries are rare in our setting. They most often occur in young people. Although their management is most often non-operative, open surgery is still performed in some cases in our setting, in the absence of minimally invasive techniques.

Keywords

Renal Contusion, Hematuria, Nephrectomy

1. Introduction

Kidney trauma refers to injuries resulting from physical impact on the components of the kidney, namely the capsule, parenchyma, excretory ducts, or pedicle. They are relatively uncommon and represent 5% to 10% of all abdominal injuries [1]. They most often occur in a context of polytrauma where the prognosis can become poor in the immediate future and the evolution can be marked by the occurrence of medium and/or long-term sequelae [2]. In Africa, the incidence of kidney injuries is variable. The diagnosis of injury is based on imaging and its management nowadays is increasingly conservative with the advent of minimally invasive surgery and interventional radiology [3]. But in our context, the unavailability of these methods pushes towards conventional treatments. The aim of this work was to identify the incidence of these injuries and to describe their management.

2. Material and Methods

The urology department of the teaching hospital Sylvanus Olympio in Lome served as our study framework. This was a retrospective, descriptive study of patients admitted for kidney trauma from January 1, 2012 to December 31, 2021 (10 years). Were included in this study all the records of trauma patients, aged 15 years or older, admitted to the Surgical Emergency and Urology departments of the Sylvanus Olympio teaching Hospital for abdominal trauma with renal injury on the lesion assessment. Records of patients with abdominal trauma but without renal injury and incomplete records were not included. The parameters studied were epidemiological data (age, sex, affected side, circumstances of occurrence and mechanism); diagnostic data (clinical and paraclinical signs, associated lesions, classification), therapeutic data, progression, and prognosis. We considered injuries classified as grade III or lower on the AAST scale to be minor trauma, and injuries classified as grade IV and V to be major trauma.

Data processing and statistical analysis were performed using Microsoft Office Excel and Word 2013 software. Data collection was carried out anonymously.

3. Results

We collected 15 cases, corresponding to a hospital frequency of 3 cases every two years. There were 9 men and 6 women, for a sex ratio of 1.5. The mean age of the patients was 31.87 years ± 9.77, with a range of 20 to 50 years. The 20 - 30 age group was the most represented, as shown in **Figure 1**.

Twelve (12) trauma patients, or 4/5, had blunt kidney trauma. Road traffic accidents were the most common cause of injury, as shown in **Figure 2**.

Clinically, lower back pain was present in all patients and 2 had an unstable hemodynamic state (**Table 1**).

The left kidney was affected in 7 cases and the right kidney in 8 patients.

Laboratory-wise, all trauma patients underwent a complete blood count. The mean hemoglobin level was 10.35 g/dL, with a range of 7.4 g/dL to 12.6 g/dL. On

imaging, all patients underwent a uro-CT scan, which allowed for the diagnosis of the lesion. The lesions identified are listed in Table 2.

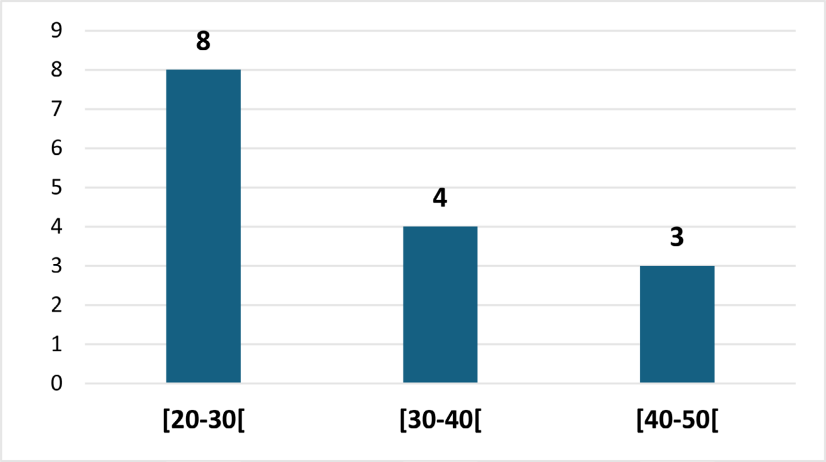

Figure 1. Distribution of trauma patients by age group.

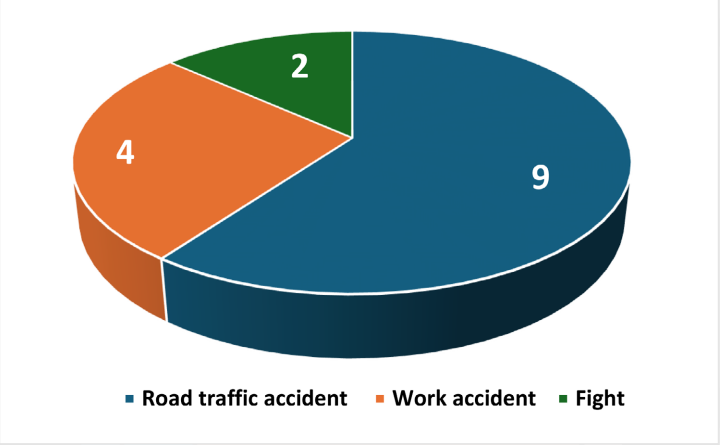

Figure 2. Distribution of trauma patients according to the causes of trauma.

Table 1. Distribution of trauma patients according to clinical signs.

	n/N
Functional signs	
Low back pain	15/15
Hematuria	6/15
Physical signs	
Unstable hemodynamic state	2/15
Abdominal tenderness	8/15
Lumbar bruise	3/15
Lumbar defense	2/15
Lumbar wheelbase	1/15
Flank dullness	1/15

Table 2. Summary of renal lesions found on uro-CT scan.

	n/N
Parenchymal hematoma	8/15
Renal fracture	12/15
Perirenal hematoma	4/15
Subscapular hematoma	1/15

Minor renal lesions according to the AAST classification were the most common, as shown in **Table 3**.

Table 3. Distribution of patients according to AAST grade.

	n/N
Grade I	5/15
Grade II	3/15
Grade III	3/15
Grade IV	2/15
Grade V	2/15

The renal injury was isolated in 5 patients. Splenic injuries were most often associated as noted in **Table 4**.

Table 4. Distribution of polytrauma patients according to associated injuries.

	n/N
Splenic contusion	4/10
Hemopetitoneum	4/10
Hemothorax	3/10
Leg fracture	2/10
Liver contusion	1/10

In terms of treatment, surgical abstention was adopted in 11 patients who had minor trauma. Surgical treatment was indicated in patients who did not respond to resuscitation measures. Two hemostatic nephrectomies were performed (**Table 5**).

Table 5. Therapeutic attitude according to AAST grade.

	Traitement	n/N
Grade I et II	Painkillers et antibiotics, monitoring	8/15
Grade III	Painkillers, macromolecule, antibiotics, monitoring	3/15
Grade IV	Nephrorraphy	2/15
Grade V	Blood transfusion, total nephrectomy	2/15

The medium-term outcome was good in 14 cases. A complication of surgical site infection was found in 1 patient. Mortality was zero. The average hospital stay was 20 days, with a range of 8 days to 48 days. All patients were followed up at three months, six months, and one year. We noted one case of secondary hypertension in a patient who had undergone nephrorrhaphy.

4. Discussion

Our study is the first of its kind in our context, due to the low frequency of these lesions. Being retrospective, it involved certain biases, particularly regarding the completeness of the files for analysis. This could underestimate the actual frequency of these lesions. Nevertheless, it lays the foundations for future studies. The frequency of kidney trauma is assessed in various ways. Over ten years, fifteen cases were collected in our study. This result is comparable to the results of Modou *et al.* [4] in Senegal, who also found 20 cases over a 16-year period. These injuries are the prerogative of young males, as found by several authors [4]-[6]. The average age in our study, which is 31.87 years, reflects this demographic, given their very socially active, sometimes reckless, and less respectful of the highway code, leading to an increase in road accidents, which was the most common mechanism of occurrence.

Clinically, hematuria was observed in 5 trauma patients. Total hematuria is a sign suggestive of renal injury in a traumatic context [7]. Kane *et al.* [8] in Senegal found 93 % in their work. It is not correlated with the degree of renal damage, but its abundance can lead to a state of hemodynamic shock. When it is associated with lumbar pain in a context of trauma, it strongly reflects kidney trauma.

The right kidney was relatively more affected than the left one. This result is consistent with data from the literature, such as the work of Yé *et al.* [9] in Burkina Faso, which found a predominance on the right. Right-sided involvement may be justified, on the one hand, by the vulnerability of the right kidney, which is located low and less protected by the rib cage, but it should be noted that the affected side depends on the point of impact.

Radiological assessment is essential in the case of kidney trauma. Thus, CT-scan appear to be the gold standard for accurate lesion assessment: they were performed in all cases in our study. They not only specify the renal injury but also allow for assessment of associated abdominal injuries [4].

Regarding injuries associated with renal trauma, 10 patients presented with them: isolated renal injury is rare. The violence of the trauma could explain this, and in our series, splenic injury was the most common, as in that of Syarif *et al.* [10]. This could be due to the etiological circumstances of the trauma, occurring in a context of polytrauma, with sudden deceleration being one of the most common mechanisms.

Conservative treatment was performed in all cases of minor trauma. Nowadays, non-surgical treatment represents a new therapeutic approach and requires simple monitoring with prescription of analgesics and associated antibiotic coverage

in the case of open trauma; only hemodynamic instability or associated visceral injuries constitute an absolute indication for emergency laparotomy [11].

In our study, surgical treatment was necessary in major trauma (grades IV and V). These grades can now be treated conservatively with minimally invasive surgery and interventional radiology [1] [12]. In our series, open surgery was performed due to the limited technical platform. Thus, nephorrhaphy and nephrectomy were the most commonly performed procedures. Odzébé *et al.* [13] also reported a case of nephrectomy in their series. These cases involved multiple renal fractures, sometimes with pedicle involvement.

5. Conclusion

Kidney injuries are uncommon in our hospital practice. Uro-CT is very important for lesion diagnosis, allowing for guidance in management. Although advances in interventional radiology and urological endoscopic procedures are recommended today, their unavailability in our setting sometimes still leads to open surgery.

Conflicts of Interest

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

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