

Symptomatic Urinary Lithiasis: Epidemiology and Management at Urology Department of University Hospital of Cotonou

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Abstract

Purpose: To study the epidemiology and treatment modalities of urolithiasis at Urology Department of University Hospital of Cotonou. **Materials and Methods:** It was a retrospective and descriptive study over a 10 years period ranging from January 1st, 2004 to December 31st, 2013. One hundred and two patients who were hospitalized for symptomatic urolithiasis at the Urology Department of University Hospital of Cotonou were enrolled. **Results:** Hospital incidence of urolithiasis was 3.7%. Patients mean age was 39.6 years (extremes: 10 years to 73 years). Male to female ratio was 2.2. The main reason for consultation was renal colic for 81 patients (79.4%). Average duration of symptoms at presentation was 5 months (range: 1 day to 10 years). A total of 173 stones were identified with an average size of 12 mm (range: 1 mm to 95 mm). Calyceal stones were seen in 32.9% of cases, renal pelvis stones in 21.4% of cases, ureteral stones in 34.1% and bladder stones in 11.5% of cases. Open surgery was the main treatment for stones that could not be managed medically. 50.8% of patients underwent surgery with extraction of 116 stones. This represented 67.1% of all stones. 9 patients (8.8%) had expelled their stone during urination. The postoperative course was uneventful in 77.5% of cases. **Conclusion:** Modern treatment options for urolithiasis remain rudimentary in our health facilities. Open surgery is still the main stay of treatment in our countries with limited resources.

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Keywords

Urolithiasis, Renal Calculi, Bladder Calculi, Epidemiology, Open Surgery

1. Introduction

Urolithiasis is a stony concretion created by a cluster of crystalline or amorphous particles precipitated in the urine [1]. The epidemiological characteristics of urolithiasis have continued to evolve in recent years in response to changes in dietary habits, health conditions, environmental factors and the prevalence of diseases that predispose to the risk of nephrolithiasis (obesity, diabetes, metabolic syndrome etc.) [2]. Imaging is a vital contribution to the diagnosis. Despite the advent of endoscopy, which has become the gold standard treatment for most of the calculus in developed countries, open surgery remains the main stay in developing countries [3] [4]. No studies in Bénin have addressed the management of symptomatic urolithiasis. The aim of our study was to describe the epidemiology and treatment modalities for patients who were hospitalized at the Urology Department of University Hospital of Cotonou for symptomatic urolithiasis.

2. Patients and Methods

This was a retrospective and descriptive study of patients hospitalized for symptomatic urolithiasis in the department Urology Andrology of University Hospital of Cotonou between January 1st, 2004 to December 31st, 2013 (10 years). The studied sample consists of patients admitted with radiologically confirmed symptomatic urolithiasis.

The items studied were: age, sex, presenting complaints, history of presenting complaint, mode of admission, main presentation of complaints, examination findings and imaging results. Also considered number, size and location of the stone(s), presence of urinary tract infection and treatment given, pre and postoperative management of the patient, and length of hospital stay. A pro forma was designed to collect the data. Data were retrieved from patients' medical records, operative register and hospital register. Data analysis was done by using EpiInfo 2012 version 3.5.4 French.

3. Results

During the study period of 10 years, 2748 patients were hospitalized, out of this, 102 patients (3.7%) have radiologically confirmed symptomatic urolithiasis. The average age of the patients was 39.6 years (range: 10 to 73 years). Male to female sex ratio was 2.2. The age group of 31 to 45 has the highest frequency (**Table 1**).

One out of five patients (19.6%) admitted in the year 2013 has radiologically confirmed urolithiasis. The overall incidence was 10.2 cases. The distribution of the patients who were confirmed with urolithiasis according to the year of hospitalization is shown in **Figure 1**.

The presence of renal colic episode was found in 14 patients (13.7%) and 5 patients (5%) had undergone pelvic and/or abdominal surgery for urolithiasis. It was also found that 12.7% of the patients consume alcohol and 10.8% of the patients were hypertensive. Tobacco abuse and high consumption of milk or dairy foods were found in 2 patients and 7 patients respectively.

The average duration of symptoms before presentation was 5 months (range: 1 day to 10 years). **Table 2** shows the distribution of patients according to the duration of symptoms at presentation.

The main presentation complaint was renal colic in 81 patients (79.4%). Distribution of the patients according to the reason for consultation was presented by **Table 3**. Forty patients (39.2%) were referred from peripheral health centers, while six patients (5.9%) were transferred from other units of University Hospital of Cotonou. Renal angle tenderness was present in 25 patients (24.5%).

Imaging investigations which were performed include urinary tract ultrasound in 34 patients (33.3%), combined IVU and ultrasound in 19.6%, IVU was performed in 18.7% and CT urography was performed in 9 patients (8.8%). A total of 173 stones were identified. The average stone size was 12 mm with a range of 1mm and 95 mm. Three cases of bladder stones were recorded. In 66.7% of the cases (68 patients) single stone was found, while 20.6% of cases (21 patients) had two stones, and more than three stones were found in 12.7% of cases (13 patients). Stone

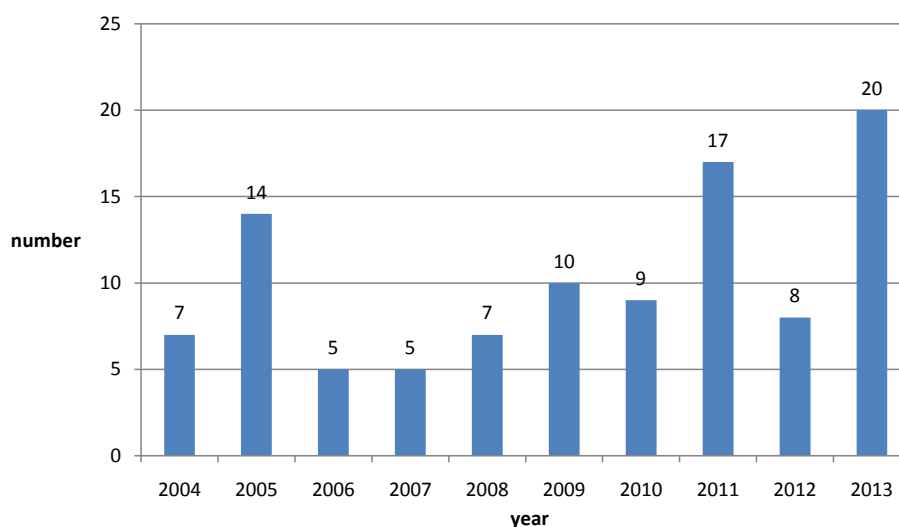


Figure 1. The distribution of the patients who were confirmed with urolithiasis according the year of hospitalization.

Table 1. Distribution of the patients according to age group.

Age group (years)	Number	Percent (%)
<15	2	1.9
16 - 30	25	24.5
31 - 45	45	44.2
46 - 60	21	20.6
61 - 75	9	8.8
Total	102	100

Table 2. Distribution of the patients according to consultation delay.

Deadline of consultation	Number	Percent (%)
<1 month	35	34.3
1 months - 5 months	24	23.5
6 mouths - 1 year	11	10.8
1 year - 4 years	24	23.5
≥5 years	8	7.8
Total	102	100

Table 3. Distribution of the patients according to mean presentation of complaint.

Mean presentation of complaint	Number (N = 102)	Percent (%)
Renal colic	81	79.4
Back pain	42	41.2
Dysuria	18	17.6
Burns urination	18	17.6
Hematuria	16	15.7
Nausea/vomiting	15	14.7
Fever renal colic	15	14.7
Obstructive anuria	8	7.8
Urinary tract infection	7	6.9

of the upper urinary tract accounted for 81.5% of cases. Distribution of the patients according to location of stone at radiography is shown in **Table 4**.

5.7% of the patients have both lower and upper urinary tract lithiasis and 10% have bilateral stones. Urine microscopy, culture, and sensitivity was performed in 74.6% of cases; UTI was diagnosed in 37.3% of the cases and two-thirds of these cases cultured *Escherichia coli*. Renal failure was noted in 9 patients (8.8%).

Open surgery was offered to patient with stone who could not be treated medically. Two patients underwent emergency nephrostomy. All patients were advice on dietary modification and were placed on symptomatic treatment including excessive water intake and use of non-steroidal drugs. Sixty-one patients (50.8%) underwent open surgery. The different treatment modalities offered are listed in **Table 5**.

One hundred and sixteen (67.1%) stones were extracted through open surgery. Among the patients who received medical therapy, 9 patients (8.8%) expelled their stone.

The postoperative course was uneventful in 77.5% of the cases. Postoperative complications observed include surgical site infection in 15.7% of cases, macroscopic hematuria in 1.9% and epididymo-orchitis in 2.9% of cases. Seven patients (6.9%) left hospital against medical advice. The postoperative clinical parameters and urinary tract imaging picked missed/residual stone 4.9% of cases. All patients were seen in the clinic between first to second week after discharged. The average hospital stay was 12 days and ranged from 1 day to 60 days.

4. Discussion

Urolithiasis is a common urological indication for admission in our center. The clinic leads mainly to hospitalization. Urolithiasis a disease of the young patients as found in several studies. In our study, most patients (68.7%) are within the age range of 15 to 45 years. Our data are consistent with the results of Kabore *et al.* [5] in Burkina Faso and Daudon *et al.* [2] in France. Male gender is more affected in this study with male to female

Table 4. Distribution of the patients according to location of stone at radiography.

Location of stone	Number (Sex)		Total (%)
	Male	Female	
Upper calix	7	10	17 (9.8)
Middle calix	16	6	22 (12.7)
Distal calix	13	5	18 (10.4)
Renal pelvis	27	10	37 (21.4)
Upper ureter	10	14	24 (13.9)
Middle ureter	6	2	8 (4.6)
Distal ureter	17	10	27 (15.6)
Bladder	16	4	20 (11.5)
Total	112	61	173 (100)

Table 5. Distribution of the patients according management.

Therapeutic modalities	Number	Percent (%)
Pyelolithotomy	17	16.7
Ureterolithotoy	17	16.7
Cystolithotomy	16	15.7
Nephrolithotomy	9	8.9
Nephrectomy	2	1.9
Medical treatment	41	40.2
Total	102	100

ratio of 2.2. Coulibaly *et al.* [6] found male to female ratio of 1.4. Diallo *et al.* [4] and Odzébé *et al.* [7] found male to female ratio of 3.3 and 3.2 respectively. Daudon [2] in his study also found male preponderance. Urolithiasis is one of the commonest cause of colicky loin pain. Past history of retroperitoneal surgery may be particularly important as they can induce inflammatory respond with healing with fibrosis that may occur cause extrinsic compression of the urinary tract and subsequent risk of urinary stasis and formation of upper tract urolithiasis. Synchronous occurrence of gall bladder stone and urolithiasis was noted in several series; in our study, we found 5%. Metachronous gall bladder stone is estimated at about 50% with a statistically higher risk in the first 5 years following the discovery of the first urolithiasis as reported in several series [8] [9]. Renal colic was the main presenting complaint in our study. This is similar to report by Diallo *et al.* in Guinea [4]. The average consultation time was 35 months in the series of Diallo *et al.* [4]; it was 5 months in our series. This period long enough is explained by the made the first in augural crisis sometimes gives spontaneously after a few minutes and the time between the onset of the crisis and the second opening is long enough which causes patients to consult in case complications of gallstone disease (anuria, renal colic, hyperalgor feverish).

Urinary stone may be caused by urinary tract infection (UTI). It is the third leading cause of urolithiasis [10]. The most commonly implicated organism are the urea splitting bacteria such as *Proteus* species, *Klebsiella pneumoniae*, *Pseudomonas* sp., and *Staphylococcus aureus* [11].

In this study, urine microscopy, culture and sensitivity test was positive for bacteria in 37.3% of cases with a predominance of *E. coli*. This is similar to observation made by Diallo *et al.* [4] in their study. They found urinary tract infection in 88.5% of cases and the presence of *E. coli* in 33.3% of cases.

Although CT scan is the gold standard radiologic investigation in patient with suspected urolithiasis, most of our patient had ultrasonography and IVU of the urinary tract due to non availability or affordability of CT scan.

Open surgery was the main route of surgical removal. It was performed in 50.8% of our patients, and about 67.1% of all the stones were extracted via this modality of treatment. In a study by Kabore *et al.* [3] in Ouagadougou, 32.3% of patients underwent open surgery. Similarly, all patients in a study by Odzébé [7] in Brazzaville underwent open surgery. Open surgery still remains the primary route of stone extraction in many developing countries despite the advent of modern methods of stone extraction. The advent of endoscopy has revolutionized treatment of urolithiasis [12] [13]. However, there is still place for open surgery in large or complex stones. The committee on stones of the French Association of Urology (AFU) in 2013 [14] has given guidelines regarding therapeutic approach to upper urinary tract stones. Pyelolithotomy and ureterolithotomy were the commonest (33.4%) surgical procedures performed. Nephrolithotomy came in 4th position and constitute 8.9% of the open surgeries, while cystolithotomy is the 3rd accounting to 15.7% of open surgeries. This may reflect the recent trend in distribution of stone, patient form upper tract stone more the lower tract stone. Very often, calyceal stones (especially upper and middle calyceal stone) are not obstructive are small in diameter, they can be easily passed with excessive water intake. Kabore *et al.* [3] had found in their study that nephrolithotomy was the commonest surgical procedure (55% of cases); ureterolithotomy was done in 13.7% of the cases; and pyelolithotomy in 8.4% of cases. After ureterolithotomy, patients may benefit from ureteric stent and drainage of the retroperitoneal space 3 - 5 days. The postoperative courses in our series were uneventful in 77.5% of cases. Complications noted were predominantly surgical site infection. This is similar to report made by other African studies [3] [15]. Nephrectomy was done to two patients due to pyonephrosis with significant renal parenchymal destruction. This is a complication of obstructive uropathy that should be prevented by early diagnosis and appropriate treatment because it can lead to life-threatening sepsis.

The average hospital stay was 12 days. The average duration was 6.5 days in the study of Kaboré *et al.* [3]. The prolonged hospital stay in our study is due to patient preference to stay until when their wounds healed following surgical site infection. In addition, some patients stay long because they could not settle their hospital bill.

5. Conclusion

Management of urolithiasis remains a challenge for our health services. The diagnosis is easily made with the aid of radiological imaging, but presentation is usual. The introduction of endoscopy in the management of urinary stones is now the standard. There is still place for open surgery in some staghorn and complex stones.

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