

# A 5-Year Review of the Presentation and Management of Urolithiasis in a Nigerian Teaching Hospital

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**Abstract:** Introduction: Urolithiasis has afflicted humans since centuries dating back to 4000BC, with the disease prevalence differing in various parts of the world. Contrary to earlier studies that depicted urinary stone disease as rare in Nigeria, recent reports have shown an increasing incidence. We aim to document the pattern and management of urinary tract calculi seen at the Lagos State University Teaching Hospital, Ikeja, Nigeria. Patients and Methods: We retrospectively reviewed the cases of urolithiasis managed at Lagos State University Teaching Hospital, Ikeja, Nigeria between January 2012 and December 2016. Variables analyzed were patients' age, gender, presenting symptoms, investigations and modalities of treatment. Results: The clinical records of a total of seventy-six patients treated for urinary stone disease within the 5-year study period were available for review. The ages of the patients ranged from 2 years to 84 years with a mean age of  $49.13 \pm 16.27$  years. The male to female ratio was 1.8:1. While the urinary bladder was the commonest site of the stone amongst our patients ( $n=37, 48.7\%$ ), 4 (5.3%) were found at multiple sites. All the patients had abdominal ultrasound and 57.9% had, in addition, a computerized tomography (CT) urography. Majority, (53.9%) were treated by open surgery. There was no statistically significant impact of gender on disease presentation ( $P=0.167$ ) or treatment ( $P=0.8381$ ). However the patients who had surgical treatment were significantly older than those who were treated conservatively ( $P=0.033$ ). Conclusion: Urolithiasis in our region has become more common, mimicking the increasing prevalence reported in the West. Most of the cases of urinary tract stones are still successfully managed by open surgery and thus open stone surgery should be considered as a valid alternative to endourologic management techniques in resource poor regions lacking endoscopic facilities.

**Keywords:** Urolithiasis, Nigeria, Open Surgery

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## 1. Introduction

Urolithiasis or stone in the urinary tract has afflicted humans since centuries dating back to 4000BC [1], with the disease prevalence varying widely from one part of the world to another. The prevalence is estimated to be 1-5% globally, 2-13% in developed countries and 0.5-1% in developing nations [2, 3].

Contrary to earlier studies that depicted urinary stone disease as being rare in Nigeria [4-6], a number of recent reports have shown an increasing incidence [7-12]. Although the reasons for

this change in incidence rates remain speculative, rising socio-economic development and climatic change in the Sub-Saharan nations have been advanced as possible causes [13]. As one of the biggest economies in Africa, more Nigerians have shifted from traditional African diets which were agro-based to the rather additives-laden and processed western diet. Also, there have been suggestions of temperature increases during hot seasons. In addition, improved availability of modern diagnostic tools and trained personnel have made the disease more easily detectable [13, 14].

The options of treatment of urolithiasis that have been described include watchful waiting, stone dissolution,

medical expulsive therapy, extracorporeal treatment, endoscopic interventions with lithotripsy and open surgery. The specific mode of treatment will depend on the site, size and number of stones, patient’s clinical condition and in resource poor settings also on the hospital’s capability for uroendoscopic procedures. Though a number of private hospitals are beginning to acquire equipment for minimally invasive surgery, most public health facilities in Nigeria still offer only open surgeries for urinary tract stones.

In this study, we aim to document the pattern and management of urinary calculi disease seen at the Lagos State University Teaching Hospital, Ikeja.

## 2. Patients and Methods

We retrospectively reviewed the cases of urolithiasis managed at the Lagos State University Teaching Hospital, Ikeja between January 2012 and December 2016. The patients’ clinical records were retrieved from the surgical emergency unit, urology clinics and wards. Information obtained included patients’ age, gender, occupation, dietary and social habits as well as presenting symptoms, radiological findings (location and number of stones), laboratory/urinalysis findings and treatment modality.

The data were expressed as means and medians, and analysis was by Statistical Package for Social Sciences (SPSS) version 20.0 for windows. Tests for statistical significance were carried out using the Fischer’s exact and Chi square test, with a *P* value <0.05 considered significant.

## 3. Results

The full records of a total of seventy-six patients who were treated for urinary stone disease within the 5-year study period were available for review. Their ages ranged from 2 years to 84 years with a mean age of  $49.13 \pm 16.27$  years. The median age was 50.5 years while modal class was the 6<sup>th</sup> decade [Figure 1].

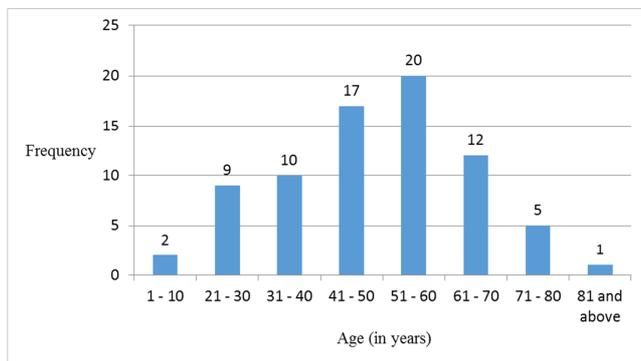


Figure 1. Age Distribution of the patients.

There were 49 (64.5%) males and 27 (35.5%) females, with a male: female ratio of 1.8:1. The presenting symptoms were as detailed in [Figure 2]. The most common symptom was flank pain in 36.8% (n=28) of the patients.

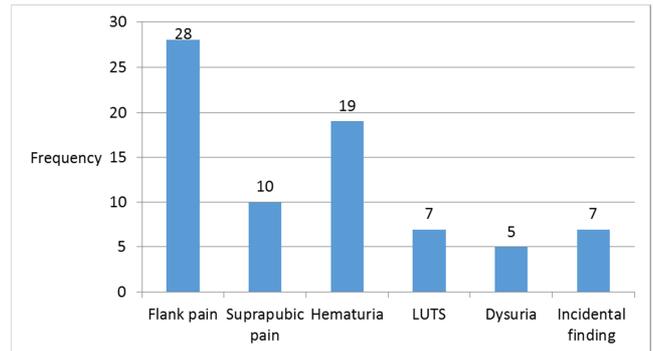


Figure 2. Presenting complaints.

Figure 3 depicts the various locations of the calculi in the urinary tract. While urinary bladder was the commonest site of the stone amongst our patients (n=37, 48.7%), 4 (5.3%) were found at multiple sites.

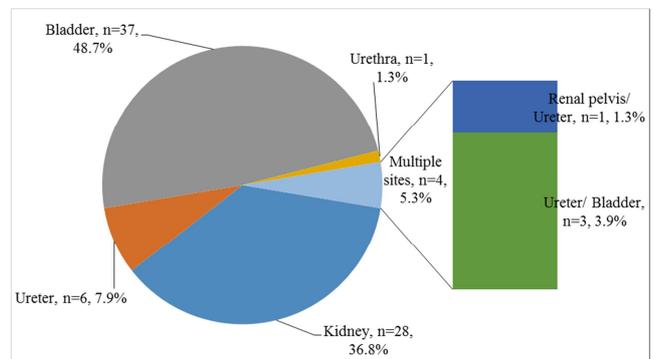


Figure 3. Site of stone.

Of the 38 patients with upper urinary tract (kidneys and ureters) calculi, 57.9% (n=22) were on the right side and 34.2% (n=13) were on the left, while 7.9% (n=3) had bilateral calculi.

Twenty-six (34.2%) out of the 76 patients had hematuria while only 22.4% (n=17) had crystals on urinalysis. All our patients had Abdominal Ultrasonography done and 57.9% (n=44) had in addition, Computerized Tomography (CT) urography done.

Open surgery was the most common modality of treatment used in the management our patients (Figure 4).

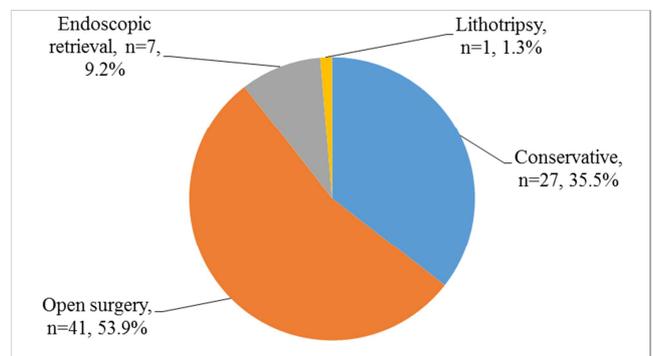


Figure 4. Treatment Approach.

Only one patient (1.3%) had a significant urine leak which

persisted for 6 weeks before it closed up.

There was no mortality.

There was no statistically significant impact of gender on

the number of stones ( $P=0.167$ ) or the need for treatment ( $P=0.8381$ ), Table 1 and Table 2.

**Table 1.** Gender distribution of the patients.

		Male	Female	Inference
Age	Mean $\pm$ SD	50.8 $\pm$ 18.0	46.1 $\pm$ 12.2	p=0.183
Number of stones	Mean $\pm$ SD	1.31 $\pm$ 0.55	1.48 $\pm$ 0.51	p=0.167
Urinalysis with hematuria	Positive	18	8	$\chi^2=0.390$
	Negative	31	19	p=0.532
Need for treatment	Conservative	17	10	$\chi^2=0.0417$
	Intervention	32	17	p=0.8381
Form of intervention	Open	26	15	$\chi^2=0.3965$
	Minimally invasive	6	2	p=0.5289
Laterality	Right	16	9	$\chi^2=1.6244$
	Left	7	9	p=0.2025

**Table 2.** Factors associated with different forms of intervention.

S/N	Factors	Conservative (n=27)	Intervention (n=49)	Test of significance	
1	Age (in years)	43.4 $\pm$ 18.08	52.9 $\pm$ 14.42	t=2.196 p=0.033	
2	Gender	Male	17	32	$\chi^2=0.0417$ p=0.8381
		Female	10	17	
3	Number of stones	1.41 $\pm$ 0.57	1.35 $\pm$ 0.52	t=-0.454 p=0.651	
4	Number of stones	1	17	33	$\chi^2=0.149$ p=0.700
		2 or more	10	16	
5	Exact number of stones	1	17	33	F=0.625 p=0.907
		2	9	15	
		3	1	1	

The patients who had surgical intervention for treatment were however significantly older than the patients who had conservative treatment ( $P=0.033$ ). Table 2

## 4. Discussion

Recent reports have shown an increasing incidence of urolithiasis in Nigeria, [7, 8, 12], similar to the data from the Western world and the Middle East. [1, 15–17] Different factors have been suggested to explain this changing pattern in our region viz; improving socioeconomic indices and climatic change [13, 18]. Added to these are improvements in modern investigation tools as well as improved capacity of trained personnel in making diagnosis of urinary stone disease.

In our study, we found urolithiasis in all age groups, corroborating the findings in other researches which suggested that urinary stone disease is no respecter of age [3, 19, 20].

It has been documented that male predominance has been on the decline over the recent years [21]. We recorded a male: female of 1.8:1.

Globally, upper urinary tract stones are more common in contrast to the picture in developing countries where preponderance of lower tract calculi is documented [5, 22]. We found the urinary bladder as the commonest site of urinary calculi in our patients. This finding is similar to the recent report by Abubakar et al. [23] These calculi may be attributed to complications of poorly managed bladder outlet obstruction leading to stasis and infection. Some workers

have argued for the possible role of urinary tract infections in the formation of uroliths in Nigerians. [24]

All our patients had abdominal ultrasonography. Ultrasound is usually the primary investigation of choice in urinary stone disease. It is easily accessible and affordable with no risk of radiation. It has a sensitivity of 45% and specificity >85% for nephrolithiasis and ureterolithiasis [25]. Indeed some of the bladder stones were incidental findings on ultrasound. In addition to the abdominal ultrasound, 57.9% of the cases we treated had a CT Urography done. Apart from giving detailed information about abdominal pain in the absence of calculi [26], non-contrast CT has a sensitivity of 100% and specificity of >94% for urinary calculi >3mm except with indinavir stone [27]. A CT Urography was always the investigation of choice in our patients with suspected ureteric stones in particular.

A considerable number of our patients were managed conservatively (35%, n=27). They expelled their stones spontaneously after 3-4 weeks on oral Tamsulosin and proper hydration. These were mainly the patients with stones  $\leq$ 4mm in size. Tamsulosin is a selective alpha – blocker and is a known agent for medical expulsive therapy [28]. Studies have shown that spontaneous passage of stone depends on the size of the calculus and its actual site in the ureter [29-31]. Most of the patients in our study were however treated by open surgery. These were mostly large vesical, large renal pelvic and staghorn renal calculi which were removed during open cystolithotomies (as well as prostatectomies sometimes), pyelolithotomies and nephrolithotomies respectively. Few patients had endoscopic stone retrieval (n=7, 9.2%) at cystoscopy for small bladder calculi and

stones impacted at the vesicoureteric junction. The single patient who had lithotripsy (n=1, 1.3%) for a distal ureteric stone had the surgery done as a demonstration surgery which was carried out in our institution. Flexible ureteroscopy, percutaneous nephrolithotomy (PCNL) set and laser equipment are unavailable in most public health institutions in Nigeria, including ours.

There was no impact of gender on the pattern of presentation or treatment modality. The significantly higher incidence of surgical intervention with increased age that we found was probably due to the high incidence of elderly patients with huge bladder stones and bladder outlet obstruction. Further studies will be needed to clarify the significance of this finding. Though most of the surgeries were open, the outcome was very good and to patients' satisfaction with no mortality or significant morbidity.

The global trend in the management of urolithiasis is now towards one form of minimally invasive procedure or the other and this should be the aspiration of medical centres in developing countries. However the appropriate selection of stone removal therapies will continue to require further investigations [32]. Some authors have indeed documented that some of these minimally invasive treatment options for urolithiasis may actually not be cost effective for patients and hospital management in some resource poor regions like Nigeria. [33] When safely done, open stone surgery still holds a strong position in the management of urolithiasis especially for complicated cases and complex stone burden. [34]

## 5. Conclusion

Urolithiasis in our region has become more common, mimicking the increasing prevalence reported in the West although we still have preponderance of the calculi in the lower urinary tract. Most of the cases of urinary tract stones are still successfully managed by open surgery. Though investment in minimal access equipment and skill should be encouraged, open surgery for urinary tract stone remains a safe and valid alternative to endourologic management techniques in most situations in resource poor regions.

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