



RESEARCH ARTICLE

CYSTOLITHIASIS IN MAIDUGURI NORTH EASTERN NIGERIA

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ABSTRACT

Background: Vesical calculus is fairly common especially in the arid and semi arid regions of the World especially in the developing countries where is associated with lower socioeconomic status. Majority of vesical calculi occur on a background lower urinary tract obstruction. The study aimed at evaluating the pattern, presentation, and management outcome.

Patients and Methods: The study reviewed all patients with bladder calculi between January 2010 to December 2014 in University of Maiduguri Teaching Hospital (UMTH). The diagnosis of vesical calculus was made by clinical evaluation supported by laboratory investigations. Patients with concomitant obstructive uropathy (Benign prostatic enlargement, urethral stricture, and bladder neck stenosis) were thoroughly evaluated and planned for definitive treatment during which bladder stone were extracted. In children open cystolithotomy was combined with definitive treatment for posterior urethral valve, impacted urethral stone, and meatal stenosis.

Results: A total of 116 patients were studied age ranged from 18 months to 97 years with male to female ratio of 27: 1. Seventy four, 63.79% were farmers, and 25.86% were children. The peak age groups were children under ten years accounting for 25.86. The presenting clinical features were poor urinary stream, and strangury/pain occurring in 100% of the patients. Others were Hematuria in 32.76%, passage of stone in 15.52%, and improvement in urinary stream with change in posture in 27.59%. Complication at presentation was acute urinary retention (AUR) in 47.41%, and urinary tract infection (UTI) in 19.83%. Majority of the stones occurred as a result of obstructive uropathy with prostatic enlargement accounting for 34.48%. The largest stone recorded weighed 1.45kg. The postoperative complications were surgical site infection, and vesicocutaneous fistula in 3.45% each.

Conclusions: Vesical calculi are fairly common in the extreme of ages, majority of which are associated with obstructive uropathy making open cystolithotomy a formidable option enabling the surgeon to deal with the obstructing causes at the same sitting.

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INTRODUCTION

Urolithiasis is fairly common in arid and semi arid zones of the World, Sub Saharan Africa, Middle East and Far East, due to high ambient temperature and diet. Bladder stones are common in all ages and are associated with bladder outlet obstruction, chronic infection, or the presence of intravesical foreign body (Yoshida and Okada, 1990), they can occur in childhood and are related to malnutrition, especially in a protein – poor diet (Schwartz and Stoller, 2000). Regarding the clinical presentation, bladder stones may be asymptomatic. However, symptoms such as Suprapubic pain, dysuria, Hematuria weak and choppy urine stream, hesitancy, frequency, urgency, and

pain in the glands may occur in over 50% of patients (Menon et al., 2004 and Papatsoris et al., 2006). Bladder outlet obstruction is the main etiological factor in bladder lithiasis (Otnes, 1983), which provides stasis and infection, change in urinary PH, urine super saturation and heterogeneous nucleation, with calculus formation. In adults, BPH, urethral stricture and Adenocarcinoma of the prostate are the commonest. In children congenital anomalies such as posterior urethral valve and meatal stenosis are the commonest. Infections especially by urea splitting organism such as E. coli, proteus and pseudomonas that produce urease that hydrolyses urea resulting in ammonia and carbon dioxide raises the PH and promoting supersaturation and precipitation of crystals of magnesium ammonium phosphates – struvites stones (Sarica et al., 1994). Bladder stones are also seen in metabolic disorders such as Gout and hyperparathyroidism. Surgical management

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options vary depending on availability of facilities, expertise, size and composition, and whether patients present with complication or not. Such treatment options include percutaneous cystolithotomy, extracorporeal shock wave lithotripsy or transurethral cystolitholapaxy (Salah *et al.*, 2005; Bhatia *et al.*, 1993 and John 1931). In developing countries where facilities do not exist or stone burden is higher or patients presents with complication open surgery still play a vital role¹⁰. The aim of this study was to report some aspects of etiogenesis and mainly discuss open surgical treatment of bladder lithiasis.

MATERIALS AND METHODS

The study reviewed all patients with bladder calculi between January 2010 to December 2014 in University of Maiduguri Teaching Hospital (UMTH). Permission for the study was granted by the Hospital Research and Ethics Committee. Written informed consent was obtained from all patients. Information was extracted from clinical and laboratory records and analyzed using SPSS version 16. The diagnosis of vesical calculus was made by clinical evaluation supported by laboratory investigations. The investigations done included plain abdominal x – ray (KUB), abdominopelvic ultrasound scan, urine culture, urinalysis, full blood count, and blood chemistry. Patient that presented with acute urinary retention (AUR) were initially managed by catheterization or Suprapubic cystostomy (SPC) with antibiotic (ceftriaxone). Patients with concomitant obstructive uropathy (Benign prostatic enlargement, urethral stricture, and bladder neck stenosis) were thoroughly evaluated and planned for definitive treatment during which bladder stone were extracted. In children open cystolithotomy was combined with definitive treatment for posterior urethral valve, impacted urethral stone, and meatal stenosis. In all patients with suspicious bladder mucosa biopsy was taken.

RESULTS

A total of 116 patients were studied age ranged from 18 months to 97 years with male to female ratio of 27: 1. Seventy four (63.79%) were farmers, and 30(25.86%) were children. The peak age group were children under ten years accounting for 30(25.86) Table 1.

Table 1. Age Distribution

Age (Years)	NO	%
<10	30	25.86
10-19	8	6.90
20-29	10	8.62
30-39	7	6.03
40-49	9	7.76
50-59	10	8.62
60-69	7	6.03
70-79	16	13.79
80+	18	15.52
TOTAL	116	100.00

The presenting clinical features were poor urinary stream, and strangury/pain occurring in 116(100%) of the patients. Others were Hematuria in 38(32.76%), passage of stone in

18(15.52%), and improvement in urinary stream with change in posture in 32(27. 59%).

Table 2. Background obstructive uropathy

Obstructive Uropathy	No	%
BPH/Carcinoma prostate	40	34.48
Urethral stricture	18	15.52
BPH and Urethral stricture	3	2.59
Meatal stenosis	10	8.62
Phimosis	2	1.72
Bladder neck stenosis	4	3.45
Posterior Urethral Valve	3	2.59
Bladder carcinoma	1	0.86
No Obstruction	35	30.17
Total	116	100.00



Figure 1. Giant vesical calculus weighed 1.51kg

Metabolic disorders found were hyperuricemia in 11(9.48%), diabetes in 5(4.31%), and hyperparathyroidism in 3(2.59%). Complication at presentation were acute urinary retention (AUR) in 55(47.41%), urinary tract infection (UTI) in 23(19.83%), anemia in 8(6.90%), and impaired renal function in 7(6.03%). Solitary stone were found in 92(79.31%) and multiple stones in 24(20.69%). Urine culture yielded `positive growth in 67(57.76%) of the patients out of this E. coli accounted in 33(49.25%), mixed coli form in 13(19.40%), pseudomonas in 5(7.46%), and klebsiella and proteus in 8(11.94%) each. ` Majority of the stones occurred as a result of obstructive uropathy with prostatic enlargement accounting for 40(34.48%) table 2. Associated stone were also found in the kidneys where 2 were bilateral, 3 on the left and 1 on the right,

there were 2 distal ureteric stones 1 on either side, and 6 impacted urethral stones in children. The largest stone recorded was in the patient that developed squamous cell carcinoma one year after surgery, it weighed 1.51kg Fig.1. Bladder biopsy was reported as inflammatory except in one that confirmed squamous cell carcinoma. The postoperative complications were surgical site infection, and vesicocutaneous fistula in 4(3.45%) each, UTI, and epididymorchitis in 3 (2.59%) each. Others were irritable bladder syndrome, and cardiac failure in 2(1.72%) each, atelectasis, and clot retention in 1(0.86%) each. Two (1.72%) patients developed squamous cell carcinoma of the bladder, one at presentation, and another within one year of follow up. There was no mortality.

DISCUSSION

Cystolithiasis occur in both sexes with male preponderance, and no age is exempt. This study found Cystolithiasis to be predominantly a male disease with 96.55%, in keeping with previous studies (Thalut *et al.*, 1976 and Sharma *et al.*, 2004). In the current study children below the age of 10 years accounted for 25.86% of all patients, and 63.79% of the patients are rural farmers thus from low socioeconomic group. When compared to the findings by El Bushra from Sudan (El Bushra, 2008), whose study population showed farmers constituting 81.70% and children 81.67%. The low socioeconomic groups are associated with malnutrition which is a common finding in regions with endemic bladder stone (Hussain, 1990 and Johnson, 1995). Vesical calculi particularly primary type is often associated with metabolic disorders such as hyperuricaemia (Ibrahim, 1977) and hyperparathyroidism. This study found similar trend. Majority of patients in this series presented late with higher stone burden, and complications such as UTI, chronic anemia impaired renal function, more so some have background obstructive uropathy which are indications for open cystolithotomy (Syed *et al.*, 2010). The findings of culture – proven UTI in this study buttressed the role of infection especially with urea – splitting strains of *E. coli*, *pseudomonas*, and *proteus* are the hall mark of struvites stones (Bichler, 2003). Patients with bladder outlet obstruction such as BPH, and urethral stricture are prone to stone formation due to stasis, infection, and urinary PH alteration that favor nucleations, crystallization, and stone formation (Doueenias *et al.*, 1991). The complication of squamous cell carcinoma developing in association with bladder stone is not an unusual finding (Jae, 2013). Conclusion Cystolithiasis is common in the tropics and no age is immune, with endemic stones predominating in children while in adults lower urinary tract obstructions and metabolic disorders were the main causes. Thorough evaluation of patients for metabolic disorders is therefore essential. Stone burden, complications, background obstructive uropathy necessitate open cystolithotomy especially in centers where facilities for minimally invasive techniques are not available.

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