

OUTCOME OF OPEN SURGERY FOR URINARY TRACT CALCULI AT JOS UNIVERSITY TEACHING HOSPITAL.

Authors:

Shu'aibu S.I. (FWACS), Ofoha C.G (FWACS), Akpayak I.C. (FMCS), Dakum N.K. (FMCS, FWACS), Ramiyl V.M. (FMCS, FWACS)

Address:

Urology Unit, Department of Surgery, Jos University Teaching Hospital, Jos, Nigeria.

Correspondence:

Dr Samaila I Shu'aibu, Department of Surgery, Jos University Teaching Hospital, P.M.B 2076 Jos, Nigeria. Email: shuaibusam@yahoo.co.uk
Phone +23438036151113

ABSTRACT

Background: Urinary tract calculi are common affliction of humans. Surgeries to remove stones from the urinary tract are among the oldest forms of open surgery. These surgeries have evolved and minimally invasive procedures are now the choice procedures. Developing countries still depend on open surgeries to treat urinary stone disease due to lack of equipment or high cost. This study aims to review the treatment outcome of open stone surgery in a tertiary health institution in North-Central Nigeria.

Materials and methods: A retrospective review of open surgeries for urinary tract calculi done between December 2007 and December 2011 was done and demographics, type of open procedure, stone free rates and complications of surgeries were analysed with Epi-info 3.4.1. Being stone-free was defined as complete extraction of stone which had been preoperatively diagnosed on Intravenous Urogram (IVU) and/or Computed Tomogram Urography (CTU).

Results:

Forty-seven open procedures for urinary stone disease were done. Age range was 3-81 years with a mean of 40.95 ± 17.39 years. Five (10.6%) Nephrolithotomies, 11(23.4%) Pyelolithotomies, 9(19.1%) Ureterolithotomies, 20(42.6%) Cystolithotomies, 1(2.1%) Nephrectomy and 1(2.1%) Poucholithotomy was done.

There was 100% stone-free rate for all the procedures except Pyelolithotomies where stone free rate was 90.9%. There was a complication rate of 31.9% which included urinary tract infections (UTI), incisional hernia and surgical site infections.

Conclusion: For developing countries open stone surgery still remains the main option of treatment. Stone free rates are high following open surgeries, but these surgeries are inundated with morbidities.

Key words: Urolithiasis, Open Surgery, Outcome

Introduction

Urinary tract calculi have plagued mankind from prehistoric times. Vesical calculus was found within the pelvic skeleton of a 5000-year old Egyptian mummy.¹ Urolithiasis has traditionally been thought to be uncommon in Blacks.² Studies in the United States of America (USA) show that African Americans have a reduced risk of stone disease (1.7%) compared to Caucasians (5.9%) and Mexican Americans (2.6%).³ In Nigeria, hospital incidence of and in the South-East and South-South regions respectively have been found.

Whereas, open surgery was the main modality of treatment of urinary stone in the past, it has been supplanted by less invasive treatments.⁶ Over the last three decades, the development of endourological and non-surgical less invasive techniques such as extra-corporal shock wave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL) and ureterorenoscopy (URS) have revolutionized stone treatment and led to a marked decrease in the need for open treatment. In developing countries, open stone surgery still

remains the main stay of treatment.⁹ Factors responsible include (i) lack of expertise (ii) unavailability of equipment for non-invasive and minimally invasive technique, (iii) Increased emphasis on cost which is borne at least in part or wholly by the patient (iv) late presentation and therefore, more complex case.¹⁰

Results of Stone free rates and morbidity rates by open surgery vary across centers, ranging from 83-100% and 3-10% respectively with fatality rates of up to 4%.^{9,11,12} Data from Northern Nigeria is in relative short supply. This study was designed to evaluate the outcome of open stone surgery in a tertiary health care centre in North-Central Nigeria. Outcome measures being stone-free rates and complications of surgery.

Patients and methods

Available data of patients who had open urinary stone surgery between December 2007 and December 2011 were retrieved from the Records Department. Data was reviewed for demographics, type of open surgery, stone free rate and complication of surgery.

Being stone free was defined as complete extraction of stone which had been pre-operatively diagnosed on Intravenous Urography and/ or CT Urography.

Data was analysed using Epi- info version 3.4.1.

Results

In the period studied, records of 47 open procedures were available for review. All were performed as elective procedures. A nephrectomy was needed in a patient who had a non-functioning hydronephrotic kidney due to a renal pelvic stone.

Table 1: Stone- free rates for different open surgeries

Type of Surgery	Stone free	Not stone free	Stone free rate (%)
Nephrolithotomy	5	0	100
Poucholithotomy	1	0	100
Pyelolithotomy	10	1	90.9
Ureterolithotomy	9	0	100
Cystolithotomy	20	0	100
Nephrectomy	1	0	100
Total	46	1	

Figure 1: Pie Chart showing over-all Stone-free rate

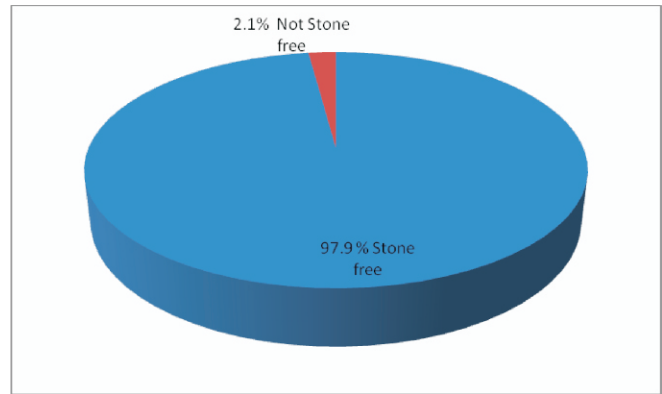
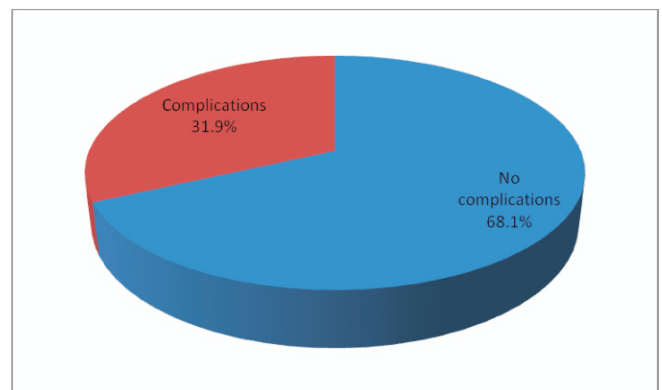


Table 2: Complications of open surgery for urolithiasis By procedure

	Cysto-lithotomy	Uretero-lithotomy	Pyelo-lithotomy	Poucho-lithotomy	Nephro-lithotomy	Nephrectomy	Total
Wound infection	2	1	-	-	-	-	3
UTI	2	2	-	-	-	-	4
*V-C fistula	2	-	-	-	-	-	2
Azotaemia	-	-	-	-	1	-	1
Flank pain	-	-	-	-	1	-	1
Urine retention	-	-	-	1	-	-	1
Haematuria	-	-	1	-	-	-	1
Incisional hernia	-	-	1	-	-	-	1
**N-C fistula	-	-	-	-	1	-	1
No complication	14	7	8	-	2	1	32
Total	20	10	10	1	5	1	47

Key: * V-C= vesicocutaneous; **N-C= Nephrocutaneous

Figure 2: Pie Chart showing over all complication rates



The age range of patients was 3-81yrs with a mean of 40.95 17.39yrs. Male to female ratio was 1.9:1.

Cystolithotomy made up 42.6% of the procedures, Ureterolithotomy 19.1%, Pyelolithotomy 23.4%, Nephrectomy 2.1%, Poucholithotomy 2.1% and Nephrolithotomy 10.6%.

All the procedures had 100% stone -free rate except pyelolithotomy where stone free rate was 90.9 %.(Table 1) There was an overall stone free rate of 97.9%(Fig 1)

Commonest complication was UTI (8.5%); others were wound infections (6.4%), vesicocutaneous fistula (4.3%), haematuria (2.1%) and incisional hernia (2.1%). (Table 1) There were no complications in 68.1% of cases while 31.9% had complications. (Figure 2)

Discussion

The fundamental principle guiding treatment selection for patients with urinary tract calculi is to maximise stone clearance while minimising patient morbidity.

Our study reveals that (i) 97.9% of patient who underwent open stone surgery were stone free at review post operatively; while 2.1% were not (ii) Patients who had cystolithotomy and ureterolithotomy had the highest stone-free rate (100%) whereas patients who had pyelolithotomy had 91.9% stone-free rate (iii) Sixty eight percent of patients who had surgery had no complications while 31.9% had complications, the commonest being UTI (8.5%).

This study was undertaken in a population that had open stone surgery which is the only modality of treating stones in our institution. Foremost is the obvious verity of a wide gulf in treatment options between developed and developing nations. A centre in the USA reports open surgery as accounting for only 3.5% of treatment modalities.⁸ A tertiary referral centre in Pakistan reports open surgery rate of 26% .¹³ The global trend in managing urinary stone disease is towards endourological and other minimally invasive techniques, the advantages being lesser morbidity and quick return to normal activity.^{7,8} Open surgery on the other hand has been reported to give better stone free rate than minimally invasive procedure but with a higher morbidity rate.¹⁴

An overall stone free rate of 97.9% was achieved in our study which was higher than 90% Sy and co-workers reported from Singapore in a review of 2651 procedures for urinary stone disease patients.¹¹ Variation in the stone-free rates may be due to differences in patient selection and study population size. Patients who were obese, had complex stone disease or failed minimally invasive procedures were those who had open surgery in that report. Stone free rate by open surgery in a hospital in Karachi, Pakistan were pyelolithotomy 91%, ureterolithotomy 100% and cystolithotomy 100%¹², these figures are quite similar to our findings, though the study population of 1175 was higher than ours.

Morbidity in our study was 31.9% mostly urinary tract infections and an incisional hernia. This is higher than 8% reported from Singapore General Hospital¹¹ and the 3% complication rate found by Syed et al¹². The differences may be explained by difference in study population and perhaps different criteria used to define particular complications. Another reason may be that 42.6% of the stones in our study were lower tract stones which are often infective in origin whereas the report from Singapore was wholly on upper tract stones which are less likely to be infective. This may explain a higher likelihood of urinary tract infections in the index study.

Odzebe and co-workers in a tertiary centre in Brazzaville Congo reported 10% morbidity and 4.4% mortality in a retrospective survey of outcome of open surgery of urinary tract calculi.⁹ There was no mortality in our study but the study from Congo shows that fatalities are potential occurrences in open stone surgery.

This study suggests that open stone surgery though offering stone -free rates comparable to or sometimes higher than minimally invasive procedures is fraught with more complications. It is thus imperative for developing countries to acquire minimal access technology and the requisite manpower skills to reduce these complications.

This was a retrospective study and there were limitations of data extraction. The number of procedures analysed is also relatively small.

In conclusion, our study shows overall stone-free rates following open procedures are above 95% depending on the specific type of open procedure, with an overall complication rate of 31.9%.

Further prospective studies to analyse correlation between stone size, location and stone clearance will be needed.

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