Research Paper

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Open Prostatectomy in a Nascent Teaching Hospital in Nigeria: A 5-Year Survey.

Medical Science

KEYWORDS : Efficacy; Hospital stay; Open prostatectomy.

Patrick Temi Adegun	Urology Division, Department of Surgery, College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria.
Julius Olusanmi Esho	Urology Division, Department of Surgery, College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria.
Philip Babatunde Adebayo	Philip B Adebayo.Department of Medicine,Ladote Akintola University,Ogbomoso, Nigeria. E-mail

ABSTRACT

Objective: *To evaluate the efficacy and outcome of openProstatectomy in a nascent hospital in Nigeria.*

Methods: *This is a 5-year cross-sectional descriptive study involving patient with Benign Prostatic Hypertrophy who had open prostatectomy in a five- year period. Socio-demographic, clinical variables and surgical outcomes were prospectively studied.*

Results: *A total of 96 consecutive patients were studied with mean age of 65 years. Acute urinary retention was the commonest symptom. Surgical site infection was the most frequent complication while clot retention was more prevalent among the elderly (P<0.05). Multivariate logistic regression analysis revealed that, the presence of co-morbidities (P<0.05) and post-operative anaemia (P<0.05) were independent predictors of long post-operative hospital stay.*

Conclusion: *Open prostatectomy is still relevant as a treatment option for BPH in our environment. Reducing pre-and post-operative infections, adequate treatment and control of co-morbidities as well as correction of anaemia should reduce post-operative hospital stay.*

Introduction:

The treatment options for bladder outlet obstruction due to benign prostatic hyperplasia (BPH) have been expanded dramatically over the past two decades with the development of medical and minimally invasive therapies. Minimally invasive procedures such as transurethral resection of the prostate (TURP)[1], visual laser ablation of the prostate (VLAP), transurethral electro-vaporization of the prostate (TVP), transurethral needle ablation (TUNA), transurethral microwave thermotherapy (TUMT), interstitial laser coagulation (ILC) and transurethral incision of the prostate (TUIP) are fast becoming mainstream treatment options. These approaches are readily available in the developed countries and are usually reserved for men with moderate symptoms and a small to medium-sized prostatic enlargement.[2-5] However, in the developing world, where there is ignorance and lack of access to health facilities, patients present late with complications of bladder outlet obstruction (diverticulae, stones, impaired renal function etc) and large prostates. Hence, open prostatectomy is still quite relevant.[6] Besides, most of these patients are elderly with inter-current medical conditions that are best treated by open surgery.[7,8] Furthermore, an overwhelmed and poorly funded healthcare delivery system is typical of sub- Saharan African settings; these factors make it difficult to procure endoscopic equipment and those available are poorly maintained. With the heavy burden of urological diseases (Schistosomiasis, prostatic disease, urethral strictures, complex congenital abnormalities, vesico-vaginal fistulae, etc) overwhelming the health care delivery, it is imperative to apply any available proven scientific method to treat the patients.

Prior to 2008, before the establishment of a division of urology for EKSUTH, open prostatectomies were essentially performed by non-urologists who employed a transvesical approach. The outcome and efficacy of these surgeries were however undocumented. We there fore set out to review open prostatectomies in a sample of patients seen at this tertiary institution with the aim of determining the types of open prostatectomy as well as the efficacy and outcome of the practice.

Methods

Study Design

This was a descriptive prospective cross-sectional study of consecutive patients who presented with symptomatic BPH between Jan 1, 2008 and December 31, 2012 at Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, South-western Nigeria. All surgeries were done by the Urologists patients were followed for a minimum of 3 months postoperatively. Patients were initially evaluated by history and physical examination (including digital rectal examination). All patients had Full blood count (FBC), serum urea, creatinine, urine analysis, and ultrasonography of the kidney, ureters and urinary bladder done before surgery.

The patients had either retropubic or suprapubic (transvesical) prostatectomy under either spinal or general anesthesia, depending on the patient's pre-surgical status and safety as evaluated by the anaesthetists. Patients who were considered to have truncal obesity, who had been on prolonged suprapubic cystostomy or who had a preoperative diagnosis of intravesical calculi either through cystoscopy or ultrasonography had transvesical prostatectomy. All other patients who did not meet the above criteria for transvesical prostatectomy had the retropubic approach. For each patient who had transvesical prostatectomy, the bladder was approached through an extra peritoneal supra-pubic midline or a pfannenstiel incision. Longitudinal cystostomy was subsequently performed between two stay sutures and the bladder inspected. If there were foreign bodies, fragments from long standing catheterization or stones, they were removed. Digital enucleation of the prostate adenoma was done by developing a plane between the adenoma and the prostatic false capsule, pressing the index finger against the pubic bone.

The fossa was packed temporarily with hot gauze to reduce bleeding and visible bleeders coagulated thereafter. Furthermore, a haemostatic suture of 2/0 vicryl was used routinely at 5 and 7 O'clock positions. A three way Foley catheter size 22 F with balloon inflated to 30ml was positioned inside the prostatic fossa. The bladder was then closed with 1 vicryl continuous su-

ture in two layers. Post-operatively the catheter was connected to a sterile urine bag and irrigation done as required using normal saline.

For those that had retropubic simple prostatectomy, Pfannenstiel incision was made and the cave of Retzius was developed. A self retaining retractor was inserted to expose the prostatic capsule. A transverse incision was made on the capsule 1cm inferior to the bladder neck and the prostate shelled out by blunt dissection. The prostatic bed was packed with a hot gauze roll to enhance haemostasis. Direct coagulation of any bleeder was done. A size 22F catheter was passed into the bladder and inflated to 30mls. The prostatic capsule was closed by placing vicryl 1 figure of eight suture on each end.

One of the sutures was run continuously to close the capsule of the prostate and tied to the suture at the other end. A tube drain was then placed in the space of Retzius and brought out through a separate stab incision laterally. The abdominal wall was closed in layers. Post-operatively the catheter was connected to a sterile urine bag and intermittent irrigation done as required using normal saline. Once the urine was clear, the catheter was removed at the 3rd or 4th post operatively day. Blood transfusion was instituted as indicated. Post-operative PCV was done on post-operative day two. The adenoma was weighed and subsequently sent for histopathology. Patients were followed up monthly for three months and during these visits, they were interviewed for long term complications and satisfaction with the outcome of surgery.

Data analysis

In analysing the data, socio-demographic and clinical variables were summarized using proportion and percentages for discrete variables and mean ± SD for continuous variables. A 5% significance level was chosen. The Statistical Package for the Social Sciences (SPSS), version 20 (SPSS Inc.) was used for all analyses. For numerical variables, t - tests for independent samples was used while Chi-Square test was utilized for categorical variables.

Ethical consideration

Ethical clearance was obtained from the EKSUTH Ethical Committee. Informed consent was obtained from each patient prior to commencement of the study.

Results

Demography and clinical presentation.

Ninety-six patients were recruited with mean age±SD of 65.36 ± 8.54; the age ranged from 44 to 83 years. Acute urinary retention was the most frequent presenting symptom (66.68%) in this cohort while frequency and urgency, accounted for 54.16% and 46.87% respectively. Poor urinary flow and nocturia each accounted for 41.66%. See Table 1.

With regards to concurrent co-morbidities, systemic hypertension was present in 33(34.4%) while diabetes mellitus was found in 12(12.5%) of individuals. Three (3.1%) patients were obese (diagnosed as a BMI≥30 kg/m2). Inguinal hernia was present in 16(16.7%) patients while associated urethra stricture was found in 4(4.2%) patients. Four (4.2%) patients had external hemorrhoids while 6(6.2%) had dyspepsia. Other co-morbidities such as arthritis were present in 4(4.2%) patients. See Table 2.

Only 39 (40.6%) patients had prostate biopsy done and they were significantly elderly patients (p=0.018). See Table 3 Operative Procedure/intraoperative findings.

Of the 96 patients evaluated, 70(72.9%) patients had retropubic open prostatectomy while the 26 had transvesical approach. There was no significant difference in the age of patients who had the two approaches (p<0.05). Only 18(18.7%) patients needed blood transfusion and they only had one or two pints of blood. Bilobar enlargement of the prostate was the most frequent intraoperative finding (62.5%) while intraoperative finding of thickened bladder wall was significantly prevalent among the elderly group (p<0.05). Most of the excised prostate weighed between 100-200g, although more elderly individuals had a slightly lighter (<100g) prostate (p<0.05). Benign prostatic enlargement was the predominant finding (90.6%) in most of our patients. However, incidental adenocarcinoma was significantly prevalent among the elderly (p<0.05). Fifty-six (58.3%) patients had general anaesthesia. See Table 4.

Outcome

Surgical site infection was the most prevalent (31.25%) postoperative complication although clot retention was more prevalent among the elderly group (p<0.05). In terms of length of hospital stay, patients younger than 65 years had significantly shorter hospital stay (p<0.05). Seventy four (77.1%) patients were discharged from the clinic.

In a multivariate logistic regression model, variables that showed an association with hospital stay in a univariate analysis were analyzed to determine the important predictors of long hospital stay in the simultaneous context of other variables. Co-morbidity (p<0.05, 95%CI=0.08-0.81) and post-operative anaemia (p<0.05,95%CI=0.01-0.45) were the significant predictors of long hospital stay in this cohort. See Table 5.

Discussion

Open prostatectomy can be performed through retropubic or suprapubic approach. Freyer was reported to have performed his first suprapubic prostatectomy in 1900 and claimed the operation as novel.[10] The claim was not strictly valid as seven years previously, Mansell Moullin at The London Hospital was said to have reported all the cases of prostatectomy then known. The operation was said to have first been used as early as 1884 by McGill in Leeds, Goodfellow and Fuller in the USA.[10] By 1912, Sir Peter Freyer, was said to have reported his results with 1000 patients, and thus popularized the procedure. In retropubic prostatectomy, the enucleation of the hyperplastic prostatic adenoma is achieved through a direct incision of the anterior prostatic capsule. The retropubic approach to open prostatectomy was popularized by Terrence Millin, who reported the results of the procedure on twenty patients in 1945.[1,10] With the emergence of Transurethral resection of prostate (TURP) and the development of excellent optical instruments, TURP became established as the standard treatment for BPH[11] When compared with (TURP), open prostatectomy offers the advantages of lower re-treatment rate; more complete removal of the prostatic adenoma under direct vision and avoidance of the risk of dilutional hyponatraemia (TURP syndrome) or prolonged TUR that occurs in patients undergoing TURP [12] for large prostate. The disadvantages of open prostatectomy as compared with TURP, include the need for a lower midline incision and a resultant longer hospitalization and convalescence period. In addition, there may be an increased potential for perioperative hemorrhage.[1,12]

This study profiles a 5- year outlook of open prostatectomy in Ekiti State, south-western Nigeria. The principal clinical presentation in this cohort is acute urinary retention (AUR); which was present in about two-third of the study population. Although this symptom may be an indication of the poor health

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seeking behavior of the population of people with BPH in this environment, (as a result of ignoring earlier urinary symptoms), the natural history of BPH is however known to be characterized by AUR in at least 30% of individuals.[12] Furthermore, AUR creates significant anxiety, discomfort and inconvenience for the patient. The impact on patient's health-related quality of life has been likened to an attack of renal colic.[13] Although not fully understood, the mechanism of AUR in BPH has been attributed to many factors including prostatic inflammation, prostatic infarction, differential epithelial/stroma growth, genitourinary instrumentation, constipation, medications, alcohol and UTI.[14]

In this cohort, only about 20% of the subjects presented less than 6 months of onset of urinary symptoms. It was shown in this study that about a quarter of the subjects presented to the hospital after 2 years. This suggests that early presentation is not the norm in this environment. There was however, no significant difference in the duration of symptoms between the two age groups under review. Frequent screening as well as community education will encourage early detection and prompt intervention in patients with obstructive symptoms in this environment thereby reducing the relatively high incidence of AUR.

Hypertension was the most frequent co-morbid condition, followed by diabetes mellitus in this study. This is similar to other studies[15,16] and it probably reflects the fact that BPH increases with age just like these co-morbidities. Our data did not explore a causal relationship between the co-morbidities; especially hypertension, although obstructive uropathy is a well known cause of secondary hypertension.[17] Furthermore, abnormal renal function tests and ultrasonographic evidence of urinary tract abnormalities were significantly prevalent among the elderly population. This is no surprise however, as genitourinary abnormalities such as bladder wall changes, bladder muscle weakness, urethra obstruction (prostatic and non-prostatic) as well as chronic kidney disease all increase with age.[18] Our intraoperative findings equally support this inference in that, detrusor wall thickness (DWT) was significantly prevalent among the elderly subjects (P<.05). Although DWT may actually reflect the severity of the obstructive symptoms as suggested by ElSaied et al.[19] It appears however, that the higher prevalence of urinary abnormalities is not significantly associated with urinary tract infection (UTI) among the elderly subjects, in view of the fact that culture positive UTI was not significantly higher even though the data reflected a higher trend Table 2.

Surgical site infection, impotence, incontinence, sepsis and clot retention were the most frequent post-operative complications. The infection rate in this survey is higher than that reported by Ugwunba et al [15] as well as kiptoon et al[20] although clot retention was less prevalent in our study when compared with the above studies. The high surgical site infection rate here may probably be due to the high rate of preoperative UTI. Low rate of clot retention may be due to a higher number of patients that had retropubic rather than the suprapubic approach, because of the ability to directly control any bleeder involved in this approach. The prevalence (8.3%) of clot retention is less than the experience of Ibrahim et al (10.3%) in the North-east, Nigeria [21].

Impotence and clot retention were significantly prevalent in the elderly subjects in this study.

This is probably due to the fact that cardiovascular risk factors are associated with increasing age, and since penile erection is primarily a vascular event, it may be impaired in conditions in which degenerative changes result in endothelial dysfunction [22,23,24]. Also, associated pelvic atherosclerosis may decrease blood flow in the pelvic organs and induce structural and functional derangements that may affect haemostasis and erectile function [24].

With regards to mortality, 1% mortality in this study is less than 3% reported by Shaheen et al [10] in their review of 37 patients that had open prostatectomy within a 10-year period. This may indicate that open simple prostatectomy is still relatively safe in this environment although the relatively shorter duration of our study may have accounted for the lower mortality rate in our survey.

Conclusion

Open prostatectomy is still relevant as a treatment option for BPH in our environment because facilities for other treatment options are not readily available. Reducing pre-and post-operative infections, adequate treatment and control of co-morbidities as well as correction of anaemia should reduce post-operative hospital stay.

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Conflict of Interest: The authors declare no conflict of interest.

Table 1: Showing the clinical features of patients

Clinical features*	Frequencies N(%)
Frequency	52(54.16)
Incomplete emptying	28(29.16)
Intermittency	34(35.41)
Urgency	45(46.87)
Poor/weak stream	40(41.66)
Overflow Incontinence	1(1.04)
Haematuria	31(32.29)
Post- Micturition Dribbling	10(10.41)
Nocturia	40(41.66)
Dysuria	25(26.04)
Acute Urinary Retention	64(66.68)
Others	1(1.04)
* Patients may have more than 1 symptoms	

Table 2: clinical characteristics of the study sample

Variables	≤65 years 46(%)	≥ 65 years 50(%)	Test statistics	p-value
Duration of symptoms:			X^2=2.577	0.63

< 6 months	7(15.2)	13(26.0)		
6 months- 1 year	15(32.6)	16(32.0)		
>1 year < 2 years	13(28.3)	10(20.0)		
≥ 2 year	11(23.9)	11(22.0)		
Pre-operative PCV	39.26±2.36	39.34±5.56	t= -0.089	0.92
Pre-operative Creatinine	72.51±16.55	123.01±47.38	t= -6.851	<0.001
Pre-operative Urea	4.17±0.69	6.67±5.35	t= -3.148	0.007
Pre-operative renal impairment:			X^2=23.24	<0.001
None	46(100)	30(60)		
Elevated urea	0	9(9.4)		
Elevated creatinine	0	2(2.1)		
Elevated Urea &Creatinine	0	9(9.4)		
Abnormal Renal/Prostate USS	1(2.2)	10(20.0)	X^2=7.504	0.006
Abnormal Urinalysis	43(93.5)	46(92.0)	X^2=0.077	0.78
UTI(culture positive)	22(47.8)	34(68.0)	X^2=3.225	0.073
Pre-Operative Prostate Biopsy	13(33.3)	26(66.7)	X^2=5.597	0.018
Pre-operative PSA Level	12.28±11.38	17.57±14.4	t= -1.927	0.085
Number of co-morbidities:			X^2=1.557	0.67
None	19(52.8)	18(36.0)		
1 co-morbidity	18(43.9)	23(46.0)		
2 or more co-morbidities	9(19.6)	9(18.0)		

Table 3: Perioperative Characteristics

Variables	**≤65 years 46(%)**	**≥ 65 years 50(%)**	**X**	**p-value**
Surgical Approach:				
Retropubic	36(78.3)	34(68.0)	1.277	0.258
Transvesical	8(17.4)	16(32.0)	2.727	0.099
Number of Blood Pint Transfused:			1.89	0.389
None	40(86.9)	38(76.0)		
1-2	6(13.0)	12(24.0)		
Weight of Prostate			7.885	0.048
<100g	4(8.7)	12(24.0)		
100-200g	28(60.9)	32(64.0)		
>200g	14(30.4)	6(12.0)		
Intraoperative findings *				
Thickened Bladder Wall	5(10.9)	19(38.0)	9.405	9.405
Trabeculations	4(8.7)	10(20.0)	2.458	0.117
Globally Enlarged Prostate	12(26.0)	9(18.0)	0.917	0.338
Isolated Median Lobe Enlargement	5(10.9	9(18.0)	0.978	0.323
Bilobar enlargement	29(63.0)	31(62.0)	0.011	0.916
Stones/ Others	3(6.5)	3(6.0)	0.011	0.916
Type of Anaesthesia:			1.193	0.551
General Anaesthesia	25(52.1)	31(62.0)		
Spinal Anaesthesia	21(45.9)	19 (38.0)		
Histology:			5.391	0.02
Benign Prostate Enlargement	45(97.8)	42(84.0)		
Incidental Adenocarcinoma	1(2.2)	4(8.0)		

*=more than one intra-operative finding did occur.

Table 4 Post-Operative Complications, Length of Hospital Stay and Outcome

Variables	**≤65 years46(%)**	**≥ 65 years50(%)**	**X^2**	**p-value**

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Post-Op Complications:				
Clot Retention	0(0.0)	8(16.0)	8(16.0)	0.005
Haemorrhage	0(0.0)	2(4.0)	1.879	0.170
UTI	2(4.3)	6(12.0)	1.837	0.175
Epididymo–Orchitis	2(4.3)	6(12.0)	1.837	1.837
Surgical site Infection	13(28.3)	17(34.0)	0.367	0.544
Bladder Neck Contracture	4(8.7)	4(8.0)	0.015	0.902
Sepsis	3(6.5)	7(14.0)	1.436	0.231
Irritable bladder syndrome	0(0)	2(4.0)	1.879	0.17
Incontinence	1(2.2)	10(20.0)	7.504	0.006
Retrograde Ejaculation	1(2.2)	3(6.0)	1.936	0.380
Impotence	4(8.7)	8(16.0)	1.169	0.280
Others	0(0.0)	1(2.0)	0.930	0.335
Length of Hospital Stay:			**7.141**	**0.028**
3-6	18(39.1)	8(16.0)		
7-14	28(60.9)	41(59.4)		
15-21	0(0.0)	1(2.0)		
Outcome:			.993	0.609
Discharged From the Clinic	33(71.7)	34(68.0)		
Died	0	1(2.0)		
Lost to Follow up	13(28.3)	15(30.0)		

Table 5: Predictors of Long Hospital stay in the Study Population

Model	B	S.E	df	Sig	95%CI	
					Upper	Lower
Age	-1.09	0.65	1	0.095	1.21	0.09
Renal impairment	-0.24	1.03	1	0.818	5.92	1.11
Co-morbidity	-1.37	0.59	1	0.020*	0.81	0.08
Post-op. sepsis	-19.12	124001.68	1	0.999	---	0.00
Clot retention	0.82	1.34	1	0.537	31.6	0.17
PSA above 4ng	-0.32	0.58	1	0.580	2.27	0.23
Post-op. anemia	-2.93	1.09	1	0.007*	0.45	0.01

B Beta, S.E, standard error; df-degree of freedom; significance; CI-confidence interval

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