



## RESEARCH ARTICLE

## Using Modified Clavien-Dindo's Classification System for Reporting Postoperative Complications of Transvesical Prostatectomy at Souro Sanou University Teaching Hospital of Bobo-Dioulasso (Burkina-Faso)

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### Abstract

**Aims:** The aim of this study was to evaluate the postoperative complications using a standardized classification; modified Clavien's classification.

**Patients and methods:** We have included all patients aged at least 50-years-old on the day of surgery between the 1<sup>st</sup> June 2015 and 31<sup>st</sup> May 2017 at the urology division of Souro Sanou University Teaching Hospital of Bobo-Dioulasso. Complications reports were performed according to the modified Clavien-Dindo system.

**Results:** Hundred patients (100) presenting a complication after BPH surgery were included in this study in a total of 312 open prostatectomies performed. The postoperative complication rate was 32%. Seventy percent of the patients had at least one complication. Grade I and Grade II complications according to the modified Clavien's classification system were the most represented (87%). Two patients (2) died in the immediate postoperative period (Grade V). The presence of urethral catheter before surgery was identified as a risk factor for complication. A statistically significant difference was found in the group ICC > 2 (Charlson Index of Comorbidity) for age parameter in the occurrence of complication.

**Conclusions:** Open prostatectomy is associated with high morbidity in subjects with urinary catheters prior to surgery. Grade I and Grade II according to the modified Clavien's classification system were the most reported.

### Keywords

Open prostatectomy, Postoperative, Complications

### Introduction

Benign prostate hyperplasia (BPH) is the most common urinary problem of the elderly man due to the discomfort for which it is responsible [1]. Surgical management of BPH occupies an important place in the urological activity. Despite the advent of mini invasive treatment as transurethral resection of prostate (TURP), open prostatectomy, the oldest method of BPH treatment, has remained the treatment of choice of BPH in many developing countries [2,3]. Like any surgical technique, it is not free from complications. Clavien's classification system is an excellent tool of reporting complications associated with surgical procedures. It was used for the first time in 1992 on a case of cholecystectomy [4]. Modified in 2004, it was recommended in 2012 and is validated in 2017 by many scientific societies of urology for post-operative complications reports [5-7]. The aim of this study was to evaluate the post-operative complications of open prostatectomy in order to describe the associated factors.

### Patients and Methods

Our study was retrospective and included all the medical records of the patients in whom open transvesical prostatectomy were performed with complications. Data have been collected from June 1<sup>st</sup>, 2015 to May 31<sup>st</sup>, 2017 at the urology division of Souro Sanou

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University Teaching Hospital of Bobo-Dioulasso. The In-patients and out-patients register of the service, the operative procedure registers, medical records files were used for the collection of the data. Inclusion criteria were clinical observation, programmed open transvesical prostatectomy, and a minimum six months post-operative follow-up. All surgical procedures were performed by urologist surgeons or by senior resident assisted by the urologist surgeon. Fever has been defined by a temperature of at least 38 °C. A level of hemoglobin < 9 g/dl was selected for bleeding requiring blood transfusion. Transitory hematuria was defined as

**Table 1:** Charlson Index of comorbidity [8].

Clinical condition	Weight
50-60 years old	1
Myocardial infarction	1
Congestive heart failure	1
Peripheral vascular disease	1
Cerebrovascular disease	1
Dementia	1
Chronic obstructive pulmonary disease	1
Connective tissue disease	1
Ulcer disease	1
Mild liver disease	1
Slight Diabetes without complication	1
61-70 years old	2
Hemiplegia	2
Moderate to severe renal disease	2
Diabetes with en-organ damage	2
Tumors	2
Leukemia	2
Lymphoma	2
71-80 years old	3
Moderate to severe liver disease	3
Up to 90-years-old	6
Metastatic solid tumor	6
Acquired immunodeficiency syndrome	6

**Table 2:** Classification of complications on the basis of modified Clavien-Dindo system [5].

<b>Grade I:</b> Any deviation from normal postoperative course without the need for pharmacological treatment or surgical, endoscopic or interventional radiology. The accepted therapies are drugs such as antiemetic, antipyretics, analgesics, diuretics, electrolytes and physiotherapy.
<b>Grade II:</b> Complication requiring pharmacological treatment with drugs other than those used in Grade I complication (including hematuria requiring blood transfusion)
<b>Grade III:</b> Complications requiring surgery, endoscopy or interventional radiology
<b>Grade IIIa:</b> Intervention carried out under any form of anesthesia other than general anesthesia (including performing a cystostomy)
<b>Grade IIIb:</b> Intervention performed under general anesthesia
<b>Grade IV:</b> Life-threatening complications (including central neurological complications)
<b>Grade IVa:</b> Dysfunction of a single organ. Including renal failure supported by dialysis
<b>Grade IVb:</b> Multiple organ dysfunction with Intensive Care Unit admission
<b>Grade V:</b> Death of the patient

that which persisted for 48 h and then spontaneously resolved. Creatinine and a blood count were performed postoperatively. All patients received antibiotics.

The studied parameters concerned the age, the average weight of the adenoma, the duration of the intervention, the weight of the enucleated tissue, the pre-existing co-morbidities, the operative indication and the postoperative complications. Complications were classified as immediate, early, or late, depending on whether they occurred during the procedure, in the month following surgery, or later. The Charlson Comorbidity Index (Table 1) was used for the assessment of comorbidity factors. Report of complications was made on the basis of the modified Clavien's classification system (Table 2). Complication grade distributions based on the different Charlson comorbidity indexes were compared using chi-square test and p value < 0.05 was considered significant statistically.

## Results

Out of 312 prostatectomies carried out during the study period, 100 cases of complications were noted, giving a rate of 32.05%.

The average age of patients was 69, 95 years  $\pm$  9.10 [50; 86].

The average weight of the adenoma was 113, 25 g  $\pm$  39.52 [40; 186].

The average operating time was 107 mn  $\pm$  33.91 [60; 180].

Most patients (78%) had a comorbidity Index of Charlson of at least 2.

The characteristics of patients are resumed in Table 3.

Complicated BPH was the main operative indication (71%). Recurrent urinary retention accounted for 83% of these complications. In Table 4, the different indications for prostatectomy are presented.

Patients who had a urinary catheter before they

**Table 3:** Characteristics of patients presenting at least one postoperative complication (n = 100).

Parameters	Mean $\pm$ SD	Min-Max
Age	69.95 $\pm$ 9.1	50-86
IPSS	22.4 $\pm$ 4.5	17-30
QoL	4.8 $\pm$ 0.6	3-6
Prostate size (g)	113.25 $\pm$ 39.5	40-186
PSA (ng/ml)	3.66 $\pm$ 4	0.68-12
Charlson Comorbidity Index	2 $\pm$ 2	0-4
Preoperative hemoglobin (g/dl)	10 $\pm$ 3	7-11
Preoperative creatinine ( $\mu$ mol/l)	110 $\pm$ 3.5	60-300
Duration of operation (mn)	107 $\pm$ 33.9	60-180
Urinary catheter duration (days)	10 $\pm$ 4	7-14
Hospital stay duration (days)	10 $\pm$ 3	7-28
Follow-up duration (months)	12 $\pm$ 4	6-18
Postoperative hemoglobin (g/dl)	11 $\pm$ 2	9-13
Postoperative creatinine ( $\mu$ mol/l)	90 $\pm$ 3.5	60-160

IPSS: International Prostatic Symptoms Scale; UTI: Urinary Tract Infection; SD: Standard Deviation.

**Table 4:** Different indications of prostatectomy.

Indications of open simple prostatectomy	n	%
BPH with complication	71	71%
Recurrent urinary retention	59	59%
Recurrent urinary tract infections	7	7%
Gross hematuria	3	3%
Renal insufficiency	1	1%
Concurrent bladder calculi	1	1%
Failure of medical treatment	29	29%
<b>Total</b>	<b>100</b>	<b>100%</b>

were admitted into the operative theatre for surgery were 20 times more likely to develop a post-operative complication (OR = 20.06).

Seventy percent of patients exhibited at least one complication and the majority of these complications (87%) were classified as Grade 1 or 2 according to the modified Clavien's classification System (Table 2).

## Discussion

Out of 312 prostatectomies carried out during the study period, 100 cases of complications were noted during twenty-four months, giving a complication rate of 32.05% or approximately four complications after BPH surgery per month. BPH surgery is the most surgical procedure performed in our urology division comparatively with endoscopic procedures. This prostatic surgery mainly concerned elderly subjects, with an average age of 70, comparable to data from recent series, confirming that this pathology is that of the elderly. Thus Salako, et al. in their study found an average age of 67 years with a complication rate of 36.4%, slightly higher than ours which was 32% [9]. The classic open

prostatectomy performed in our department was performed by transvesical route. Hryntschack described the transvesical open prostatectomy, with the principles and steps that are now followed in most urological centres [10]. It is the same technique performed in all our patients. Of all the modalities for treating symptoms of lower urinary tract (LUTS) due to benign prostatic hyperplasia (BPH), prostatectomy provides the highest symptomatic improvement and the lowest failure rate [11]. If in western countries with advanced technology, it is reserved for BPH of 80 g and more [10], in our context it is the main option of treatment. Surgery of BPH is indicated in presence of symptomatic BPH with obstructive or infectious complications or in case of failure of a well-conducted medical treatment using alpha-blockers, the 5-alpha-reductase inhibitors or phytotherapy. In the present study, complications indicated surgery for 60% of patients and 29% of patients were operated because of the failure of well conducted medical treatment.

In our study the complication rate was 32.05%. It is close to the 28% reported by a recent American prospective study [12]. Rates of 40.1% and 17.3% were reported in African and European series respectively [13,14]. Indeed, prostatectomy as an open surgery is known to have higher morbidity compared to other surgical means of symptomatic BPH. Immediate complications (15%) were mainly represented by per operative bleeding with the need for blood transfusion (complication Grade II). Transfusion rates of 7 to 14% were reported in the literature [15,16]. We have reported a blood transfusion rate of 13% among our patients. During surgery, haemostasis consists in the ligation of bleeding arteries per operatively at 5 o'clock and 7 o'clock as described by some authors [17]. A link between the risk of complication and the volume of the prostate could not be determined in this study (Table 5). Traction of the balloon of urethral catheter into the prostatic fossa and haemostasis secured by ligation of bleeding arteries at the bladder neck help in securing the haemostasis [18]. Fever requiring antipyretic administration came as a head of complications grade I (9%). This value was influenced by antibiotherapy post operatively. Other causes of fever like urosepsis, urinary infections, orchi-epididymitis, wound suppurations were eliminated and taken into consideration in other grading of complications as shown in Table 6. Urinary infections were noted in 21% of cases and E.coli was isolated in 76.19% of cases. Patients older than 75-years-old were most at risk and ascending infection through urinary catheter can explain the post-operative bacteriuria [19]. It requires antibiotherapy in our case (Grade II) other factors like long duration in the hospital, long pre-operative hospital admission for more than two days and the time of exposure to the urinary catheter have been identified as risk factors [20]. Parietal suppuration requires dressing at the bed side of the patient, swab

**Table 5:** Comparison of complications of prostatectomy, classified according to the modified Calvien system, between patients with various Charlson comorbidity scores.

	Charlson Comorbidity Index			Test for comparison	
	Total	CCI < 1	CCI ≥ 2	Chi square	P_ value
Total patients	312	64 (21)	248 (79)		
Grade I	29	8 (8)	21 (21)	2.747	0.253
Grade II	55	12 (12)	33 (33)	2.853	0.240
Grade III	10	4 (4)	6 (6)	NA	NA
Grade IV	4	1 (1)	3 (3)	NA	NA
Grade V	2	0 (0)	2 (2)	NA	NA
Total number of complications (%)	100 (100)	22 (22)	78 (78)	0.212	0.899

**Table 6:** Complications of open prostatectomy classified according to modified Clavien system.

Complications	Grade	n (%)	Management
<b>Immediate complications</b>	II. Peroperative bleeding	13 (13)	Blood transfusion
	IVb. Tensional instability	02 (2)	Adrenaline, Intensive unit care
<b>Early complications</b>	I. Fever	09 (9)	Antipyretics
	I. Transient elevation of serum creatinine	06 (6)	Hydration
	I. Failed voiding trial without catheter	04 (4)	Indwelling bladder catheter
	I. Stress incontinence	04 (4)	Muscarinic receptor antagonist
	I. Transient hematuria	06 (6)	Bladder washout, irrigation
	II. Urinary tract infection	21 (21)	Antibiotic therapy
	II. Wound infection	10 (10)	Antibiotic therapy, antiseptic wound dressing
	II. Epididymo-orchitis	08 (8)	Antibiotic therapy
	II. Vesico-parietal fistula	05 (5)	Prolonged bladder catheter
	IIIa. Vesico-parietal fistula	05 (5)	Secondary suturing under local anesthesia
	IVa. Urosepsis	02 (2)	Indwelling bladder catheter removal, Urine and blood culture, Antibiotic therapy, Intensive unit care admission
V. Death	02 (2)	-	
<b>Late complications</b>	IIIa. Urethral stenosis	02 (2)	Suprapubic cystostomy, differed anastomotic urethroplasty
	IIIb. Textiloma	01 (1)	Foreign body removal

and antibiotherapy (grade II), is one of the specific complications for of open surgery. It was seen in about 10% of cases. Other studies reported the rates of 2.5% to 4.3% [21]. This high rate of infection in our study can be explained by non-sterile urine before intervention for all the patients because many of them have previously urinary catheters in place. Mortality represent grade V complication, it happens during immediate post-operation in 2% of our patients. It was estimated at less than 0.25% in one contemporary series [22]. The situation in our context could be explained by the fact that there was already an associated comorbidity factors pre-operatively. Lates complications were rare in our series (3%) with one case of urethral stenosis and one case of textiloma. They are all rare complications but well known [23]. These late complications were managed respectively by performing anastomotic urethroplasty and foreign body removal in the bladder

and postoperative course were uneventful for the two patients.

## Conclusions

Open transvesical prostatectomy complications are common in our setting. They are mostly Grade I and II of Clavien classification. Two cases of high-Grade V complication (death) were noted. The appearance or the disappearance of post-operative complications depend on the operator experience and on the comorbidity, factors carried by the patient. The frequency of post-operative death is still high and depends on multiple factors. The immediate cause of death still difficult to established without autopsy.

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