

# Prospective Evaluation of Postoperative Complications of Radical Cystectomy according to Clavien Dindo Classification: Laparoscopy Versus Conventional Surgery



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## Summary

Radical cystectomy with lymphadenectomy is the standard treatment for invasive bladder tumors and non-muscle invasive high-grade and/or recurrent after conservative treatment. The objective of this work is to make a comparison between the results of the cystectomy surgery for patients operated by laparoscopy with those operated by conventional surgery in terms of postoperative morbidity using the classification of CLAVIEN DINDO because it meets requirements internationales relying on more concrete criteria and gone in five grades upward gravity goals. Over a period of 6 years, a sample of 80 patients who underwent surgery for bladder tumor were part of our study. 40 are operated by laparoscopy (group1) and 40 by conventional surgery (Group 2) in the Urology's serviceMed VI's hospital Marrakech .Intraoperative there was a significant reduction in blood loss in group 1, with fewer complications despite a significantly longer operative time, post operative pain was significantly decreased in group1 with consumption significantly lower analgesic, a resumption of transit significantly earlier and an average length of post operative stay significantly shorter in the same group . there was no significant difference in the postoperative complications between the two groups .This prospective study shows, with a review of the literature, the benefits of Laparoscopy allows a quicker recovery, decreased postoperative morbidity and mortality. However, larger cohorts with a long decline is necessary to judge the superiority of one surgical technique to another.

**Keywords:** Bladder neoplasm; Radical cystectomy; Laparoscopy; Conventional surgery; Post operatives complications

## Introduction

Laparoscopy has now become a common surgical approach that is increasingly used in public and private hospitals. Indeed, it tends to achieve a real alternative to conventional surgery called «open». The main advantage of this approach compared to conventional surgery is the reproduction of what is done in conventional minimally invasive surgery. This means a significant reduction in parietal and visceral trauma, and therefore a reduction of postoperative pain. This saves time in hospitalization and convalescence, not to mention the aesthetic benefit of the scar.

## Materials and Methods

Our work is a prospective, non-randomized study comparing the results of radical cystectomy for bladder tumors laparoscopically (group 1) and by conventional surgery (group 2). Its objective is to evaluate the experience of the urology department at the MED-VI Medical Center of Marrakech in

laparoscopy in terms of postoperative morbidity. The study concerns 80 patients with bladder tumor, of which 40 were operated by laparoscopy (group1), and 40 by conventional surgery (Group 2). the complications noted were classified according to the classification of «CLAVIEN DINDO», the latter, developed by CLAVIEN in 2004 [1] and revised by DINDO in 2009 [2], is considered a simple, reproducible and applicable classification whatever the field Surgical, it has 5 grades of complications of increasing severity which is based mainly on the type of therapy needed to curb the complication (Table 1 & 2). the statistical analysis was carried out at the epidemiology laboratory of the Faculty of Medicine and Pharmacy of Marrakech using a descriptive analysis for the qualitative variables (percentages, means and standard deviations) and a univariate analysis (test of Pearson's khi2, student test and fisher's exact test), the software used during the study is the SPSS version 16, the significance level set at 5%.

**Table 1:** classification of CLAVIEN DINDO.

Grade	Type of complication
G I	Any deviation from postoperative evolution normal without the need for pharmacological or surgical treatment, endoscopic, radiological. Administration of drugs such as antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy are included in this grade. This grade also includes infections of surgical wounds treated by local care.
G II	Requiring pharmacological treatment with drugs other than those authorized for first grade of complications. Blood transfusions and nutrition parenteral total should also be included
G III	Requiring Surgical, Endoscopic or Radiological Surgery
G IIIa	Intervention Under local anesthesia
G IIIb	Interventions under general anesthesia.
G IV	Complication that is life-threatening and/or requiring hospitalization intensive care unit
G Iva	Dysfunction of a single organ (including dialysis). Examples: Heart failure, respiratory failure requiring intubation, ischemic/hemorrhagic stroke, kidney failure requiring renal dialysis
G IVb	Multi visceral failure
G V	Death of the patient

**Table 2:** preoperative parameters.

P value		Group 1	Group 2	Parameter
Age		58.5±9.99	59.5±10.32	0.88
Sex	Male	34 (85%)	40 (100%)	0.026
	Female	6 (15%)	0	0.13
ASA (average)		1.27±0.45	1.50±0.58	0.09
BMI (average)		25.90±2.030	25,76±3,22	0.27
Preoperative Creatinine (mg / dl)		12.09±7.12	18.72±25.84	0.025
Preoperative Transfusion (number)		11 (27.5%)	12(30%)	0.5
Urinary Infection (number)		10 (25%)	5 (12.5%)	0.47

### Results and Analyzes

Per operating, in group 1: The average operating time was 298.75±72min and the blood loss was between 60 and 700cc. In group 2: the operating time varies between 150min and 480min and blood loss is between 200 and 1500cc. In group 2: 1 patient (2.5%) had a perioperative rectal wound related to dissection of the posterior surface of the bladder, 2 patients (5%) presented with perioperative hemorrhage, in 1 patient in connection with the bleeding of Santorini and in the other in relation to poor control of the laterovesical pedicle. 13 patients (32.5%) required intraoperative transfusion because of significant bleeding (including 2 patients related to the bleeding incident). In group 1: 2 patients (5%) presented a vascular lesion of the epigastric

artery at the introduction of the trocar easily controlled by bipolar forceps. 1 patient (2.5%) required an intraoperative transfusion, related with bleeding peroperatively. EVA in group 1 indicated «4» [3,4]. In group 2: The EVA indicated «6» [5,6]. In group 1: The mean transit time was 1.9±0.6 days and 2.4±0.9 in group 1 and 2 respectively. The mean time to resumption of feeding was 4.45±1.5 days and 4.7±1.7 days in the group 1 and 2 respectively. The duration of hospitalization was in average 8.5±5.3 days for group 1 and 11±5.4 days in group 2.

For the results of postoperative complications of the two groups of our study are shown in Table 3 according to CLAVIEN DINDO classification, for the etiologies of these complications, they are shown in Table 4.

**Table 3:** complications according to CLAVIEN DINDO.

	From D1 to D30		From D30 to D90		P value
	Grp1 (coelio)	Grp 2 (open)	Grp 1 (coelio)	Grp 2 (open)	
Total number of patients	40	40	40	40	-
Complications absent	27	25	27	22	0.334
Complication present	13	15	0	3	-

Grade 1	3	2	0	0	0.431
Grade 2	4	9	0	0	0.067
Grade 3	3	2	0	0	0.6
Grade 4	1	0	0	1	0.428
Grade 5	2	2	0	2	0.42

**Table 4:** Etiologies of complications.

Grade	GROUP 1 (coelio)	GROUP 2 (Open)
G 0	27 (67.5%)	22 (55%)
G I early	3 (7.5%) Infection of the wall (x3)	2 (5%) Acute dehydration (x2)
G I Tardif	0	0
G II early	4 (10%) Infection of the wall (x1) Acute pyelonephritis (x2) Blood transfusion (x1)	9 (22.5%) Infection of the wall (x4) Blood transfusion (x5)
G II Tardif	0	0
G IIIa early	0	0
G IIIa Tardif	0	0
G IIIb early	3(7.5%) Deep Suppuration (x1) Lymphorrhoea (x1) Evisceration (x1)	2(5%) Suture release (x1) Peritonitis (x1)
G IIIb Tardif	0	0
G Iva early	1 (2.5%) Paralytic ileus (x1)	0
G IVa Tardif	0	0
G Ivb early	0	0
G Ivb Tardif	0	1(2.5%) Septicemie (x1)
G V early	2 (5%) Respiratory distress (x1) Pulmonary embolism (x1)	2 (5%) Sepsis (x1) Intestinal fistula (x1)
G V Tardif	0	2(5%) A domicile

The perioperative factors that may influence the overall complication rate in the series, namely age, ASA score, BMI, and preoperative creatinine, were subject to univariate analysis; the

results showed that in our current series there is no correlation between these perioperative factors and the increase in the rate of global complications (Table 5).

**Table 5:** Predictors of Complications.

Perioperative Factors	Univariate Analysis of Postoperative Global Complications	
	RR (95% with IC)	P-value
Age	3.150 (1.374-7.674)	0.88
ASA	0.200 (0.664-4.660)	0.09
IMC	0.142 (3.685-3.401)	0.27
Preoperative creatinine	6.627 (1.81-15.065)	0.025

Radical cystectomy with pelvic lymph node dissection is the standard treatment for infiltrating or non-muscle invasive bladder tumors and/or recurrent after conservative treatment [7], our review of the literature found only three prospective comparative studies, comparing the morbidity

of two conventional and laparoscopic approaches and which, unfortunately, treat the chapter «postoperative complications» by an old and non-standardized method [major or minor complication]. In our literature search we found no study that deals with the «complications of cystectomy» using CLAVIEN

DINDO's classification, hence the importance of our work which brings together a series, certainly at its beginning but which reflects a courageous approach to our service to a technique that is worldwide in testing and expertise. Throughout our series, we have found a significant length of laparoscopic surgical procedure compared to conventional surgery, the same results were found by Guillotreau J et al. [3] in a prospective series comparing 38 laparoscopic cystectomies to 30 open cystectomies as well as Hemal AK et al. [5] in their prospective series of 35 laparoscopic radical cystectomies compared to 30 patients operated by laparotomy. Laparoscopic cystectomy is a procedure that combines both the difficulties of laparoscopy and those of pelvic cancer surgery while respecting the principles of minimally invasive surgery, including careful haemostasis to ensure a clean surgical field. This may explain this lengthening of the operating time. G-Pascal Haber [8], Guillotreau and Hemal and others have shown that blood loss is significantly lower in laparoscopy, which was the same for our work. A more precise dissection, a better vision of the small vessels and a fine coagulation with the bipolar forceps can explain it. It is recognized today that the laparoscopic approach in cystectomy reduces the use of analgesics postoperatively and avoids the use of opioids [4,5,8-10]. The EVA used for the assessment of pain in our patients indicated «4» in group 1 against «5.3» in group 2. Ileus is the most common complication after cystectomy [6,11] and a usual cause of prolongation of hospitalization [12], laparoscopy allows to decrease it, which has been proven through comparisons of Porpiglia et al. [13]. Basillote as well as Guillotreau, our study concluded with the same results. This reduction of pain with the reduction of analgesic consumption, and the early resumption of transit allows early ambulation, hence a decrease in the risk of pulmonary infection, and a reduction in the duration of hospitalization which is clearly lower in our series. Laparotomy cystectomy is an intervention associated with morbidity rates of 25 to 35% and mortality rates of up to 4% [1,12] regarding laparoscopic cystectomy. Haber [15] had shown a greater morbidity and surgical revision with laparoscopic derivation. Our classification of postoperative complications did not show any difference between the two groups despite a higher parietal complication rate in the second group, the same results being found by the different comparative studies except that of Guillotreau.

## Conclusion

In our current experience, there is no difference in morbidity between laparoscopy and conventional surgery, but the difference that would make the difference statistically significant, between the two approaches, in favor of laparoscopy, would come with the increase of the number of patients compared and the improvement of the operative technique. The terms «MINOR» and «MAJOR» used to report the complications of a surgical

technique must be removed from the surgical literature as they give a subjective, ambiguous, inaccurate and confusing picture of the real value of these complications. Thus modification of the general principle of classification of surgical complications is warranted for ongoing clinical trials and randomized studies have more hindsight to judge the efficacy of a laparoscopic procedure.

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