

The Oncologic Outcome of Laparoscopic Radical Cystectomy for Invasive Bladder Cancer in Siriraj Hospital Between 2005-2013

Nisaworn Siriboonpipattana, M.D., Chaiyong Nualyong, M.D., Tawatchai Taweemonkongsap, M.D., Sunai Leewansangtong, M.D., Patkawat Ramart, M.D., Teerapon Amornvesukit, M.D.

Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

ABSTRACT

Objective: To determine the oncologic outcome of laparoscopic radical cystectomy for invasive bladder cancer in Siriraj Hospital.

Methods: A retrospective review of 57 patients with muscle invasive bladder cancer who underwent laparoscopic radical cystectomy in Siriraj Hospital from July 2005 to August 2013. Patient's demographic data, intraoperative features, pathologic findings, early and late complications were all recorded. Five-year overall survival and 5-year cancer specific survival were evaluated by using Kaplan-Meier analysis.

Results: The mean age was 64 years with male/female ratio of 18:1. 47 patients had ileal conduit for urinary diversion (9 neobladder, 1 cutaneous ureterostomy). Extended lymph node dissection was performed in 19 patients (33%), the mean number of removed lymph nodes was 19 (range 6-37). The pathologic report of 50 patients (87.7%) showed high grade urothelial cell carcinoma, and 3 patients (5.3%) had concomitant adenocarcinoma of prostate. Altogether 29 patients had organ confined tumor (pT1-T2; 50.8%), 28 patients had non-organ confined tumor (pT3-T4; 49.2%), and 18 patients (31.6%) had lymph node involvement. Surgical margin was positive in 7 patients (12.3%). The most common early and late complications were urinary tract infection which responded to medical treatment. Seventy five percentile of follow-up time was 5.9 years, the 5-year overall survival was 69.6% in organ confined patient, 72.4% in extended lymph node dissection group, the 5-year cancer specific survival was 80.4% in organ confined patient, and 78.9% in extended lymph node dissection group. Twenty one patients died from bladder cancer, 10 patients died from other causes, and 26 patients were alive with no evidence of recurrence.

Conclusion: Radical cystectomy with lymph node dissection is the gold standard for invasive bladder cancer and laparoscopic approach is one of the effective alternative treatments with comparable oncologic outcome to open technique, T stage and extended lymph node dissection were the significant impact factors.

Keywords: Bladder cancer; laparoscopic; radical cystectomy; oncologic outcome (Siriraj Med J 2017;69: 377-383)

INTRODUCTION

Bladder cancer is the ninth most common cancer in worldwide, and the incidences varies among geographic regions or countries. In Thailand, bladder cancer is the eighth most common cancer in men in which the estimated incidence is 4.2 per 100,000 populations.^{1,2}

There are several choices of treatments such as intravesical therapy, surgery, radiation, chemotherapy,

depending on stage of the disease. Radical cystectomy with lymph node dissection is the gold standard treatment of muscle invasive bladder cancer (T2-T4aN0M0) or high risk, non-muscle invasive bladder cancer. The laparoscopic or robotic-assisted laparoscopic cystectomy has been developed as another approach to perform the operation. The perioperative data shown that minimally invasive techniques are associated with reduced blood

Correspondence to: Teerapon Amornvesukit

E-mail: teerapon.amo@mahidol.ac.th

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loss, decreased post-operative pain and shorter length of hospital stay but slightly increased operating time without difference in post-operative complications. The oncologic outcomes are comparable with open surgery.³⁻¹⁰

MATERIALS AND METHODS

From July 2005 to August 2013, data from 71 patients with invasive bladder cancer (T2-T4a N0M0 or high risk, non-muscle invasive bladder cancer, according to TNM stage of American Joint Committee on Cancer 2010), who underwent laparoscopic radical cystectomy, were collected, and 14 patients were excluded from analysis because 4 patients underwent robotic-assist laparoscopic approach, 4 patients were converted to open intraoperatively, 6 patients were lost to follow-up, leaving 57 patients were retrospectively reviewed.

Patient's demographic data, intra-operative features, pathologic findings, early and late complications were all recorded. Overall survival (OS), and cancer specific survival (CSS) were analyzed by the Kaplan-Meier survival analysis and the log-rank test was used to compare OS, CSS by tumor stage (organ-confined, non-organ confined), lymph node status (metastasis or non-metastasis), type

of lymph node dissection¹¹ (standard, extended), and surgical margin (positive, negative). P value less than 0.05 was considered statistically significant. Statistical analysis was performed with SPSS version 21.

RESULTS

Pre-operative demographic data of 57 patients are shown in Table 1. The mean age was 64 years (range 36 to 83) with male/female ratio of 18: 1. The average body mass index was 22.72 kg/m³ (range 13.76 to 35.7). The patients were stratified by the American Society of Anesthesiologists classification (ASA) by the ASA House of Delegates on October 15, 2014 ; class 1, 8 patients (14%); class 2, 39 patients (68.4%); and class 3, 10 patients (17.5%). Twenty six patients (45.6%) had hypertension; and 7 patients (12.3%) had previous intra-abdominal surgery.

For intra-operative features, ileal conduit (extracorporeal) was performed in 47 patients (82.5%), 9 patients had neobladder, and 1 patient had cutaneous ureterostomy for urinary diversion. One third of patients underwent extended lymph node dissection, the mean numbers of lymph node dissection were 19 (range 6-37),

TABLE 1. Demographic data

Characteristics	Mean (range), number (%)
Age (year)	64 (36-83)
Sex	
Male	54 (94.7)
Female	3 (5.3)
BMI (kg/m ²)	22.72 (13.76-35.70)
ASA score	
1	8 (14)
2	39 (68.4)
3	10 (17.5)
Underlying disease	
DM	7 (12.3)
Hypertension	26 (45.6)
CVA	2 (3.5)
Heart disease	5 (8.8)
Renal disease	3 (5.3)
Pulmonary disease	4 (7.1)
Other malignancy: CA nasopharynx	1 (1.8)
Previous intra-abdominal surgery	7 (12.3)

the mean operative time was 360 minutes for ileal conduit, 470 minutes for neobladder, and the mean estimated blood loss was 670 ml.

The mean length of hospital stay was 19 days (range 10-50, median 16) for ileal conduit, and 40 days (16-150, median 28) for neobladder. (Fig 1)

Pathologic outcome was summarized in Table 2. The pathologic report of 50 patients showed (87.7%) with high grade urothelial cell carcinoma, 3 patients (5.3%) had concomitant adenocarcinoma of prostate, and no patient had carcinoma in situ. Twenty nine patients had organ

confined tumor (pT1-T2; 50.8%), and 28 patients had non-organ confined tumor (pT3-pT4; 49.2%). Eighteen patients (31.6%) had lymph node involvement, and surgical margin was positive in 7 patients (12.3%).

Complications were scored by Clavian-Dindo grading system¹² (Table 3), and the most common early complication was urinary tract infection which responded to medical treatment; 4 patients had post-operative bowel ileus; 1 patient had anastomosis leakage that was managed conservatively; only 1 patient had bowel injury who underwent exploratory laparotomy

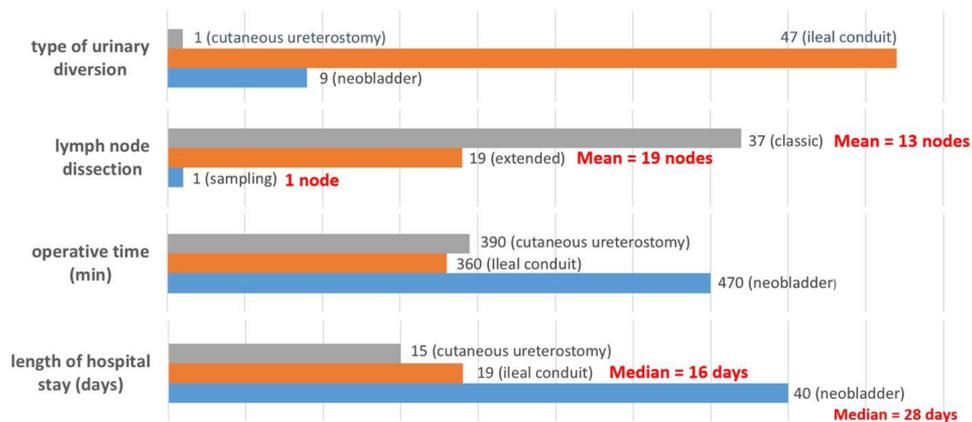


Fig 1. Result of intraoperative features.

TABLE 2. Pathologic feature

Pathologic feature	Number (%)
Grade	
Low	7 (12.3)
High	50 (87.7)
Concomitant localized adenocarcinoma of prostate	3 (5.3)
pT stage	
Organ confined tumor	
T1	12 (21.1)
T2	17 (29.8)
Non-organ confined tumor	
T3	19 (33.3)
T4	9 (15.8)
pN stage	
0	39 (68.4)
1	7 (12.3)
2	11 (19.3)
Margin status	
Negative	50 (87.7)
Positive	7 (12.3)

TABLE 3. Post-operative complications

Complications	No	Management
Early complications		
I. obturator nerve neurapraxia	2	Conservative
II. bowel ileus	4	Conservative
II. anastomosis leakage	1	Conservative
II. collection	2	Conservative
II. urosepsis	1	Antibiotics
II. urinary tract infection	5	Antibiotics
IIIb. duodenal injury	1	Explore laparotomy for primary duodenal repair (simple suture with omental patch)
IIIb. rectal injury	1	Rectal repair
Late complications		
I. parastomal hernia	3	Conservative
I. renal calculi	1	Conservative
II. urinary tract infection	6	Antibiotics
IIIa. ureteric stricture	1	Ureteric stent
IIIb. bowel obstruction	2	Explore laparotomy with jejunum resection with side to side enteroenterostomy anastomosis Explore laparotomy with side to side ileoileostomy anastomosis
IIIb. renal calculi	1	PCNL
IIIb. neocystocolonic fistula	1	Explore laparotomy with sigmoid loop colostomy
IIIb. ureteroenteric anas. Stricture	1	Explore laparotomy with re-anastomosis

in post-operative day 1 for primary duodenal repair and 1 patient had intra-operative rectal injury that was managed laparoscopically without conversion.

For late complication (longer than one month), 1 patient had neocystocolonic fistula, managed by exploratory laparotomy with sigmoid loop colostomy, and 1 patient had ureteroenteric anastomosis stricture, managed by re-anastomosis.

The median follow up was 2.44 years (range 0.12 to 9.27); and 75 percentile was 5.94 years. Twenty six patients (45.62%) were alive without evidence of recurrence disease. Twenty one patients (36.84%) died from bladder cancer and 10 patients (17.54%) died from other causes. (Fig 2)

The Kaplan-Meier analysis showed 5-year overall survival (OS) was 47.1% and 5-year cancer specific survival (CSS) was 60.3%. (Fig 3)

Five-year overall survival (OS) was 69.6% in organ confined tumor, 17.2% in non-organ confined tumor and 5-year cancer specific survival (CSS) was 80.4% in

organ confined tumor, and 27% in non-organ confined tumor. (Fig 4)

Five-year overall survival (OS) was 33.8% in standard lymph node dissection, 72.4% in extended lymph node dissection, and 5-year cancer specific survival (CSS) was 45.4% in standard lymph node dissection, and 78.9% in extended lymph node dissection. (Fig 5)

Stratification of survival outcome by pathologic T stage, types of lymph node dissection found that organ confined tumor and extended lymph node dissection have significantly better overall survival, and cancer specific survival compared to non-organ confined and standard lymph node dissection. (Table 4)

DISCUSSION

Radical cystectomy is the standard treatment for muscle invasive bladder cancer, providing excellent local cancer control and accurate evaluation of the primary bladder tumor and regional lymph node. This study collected data in 57 patients who underwent laparoscopic

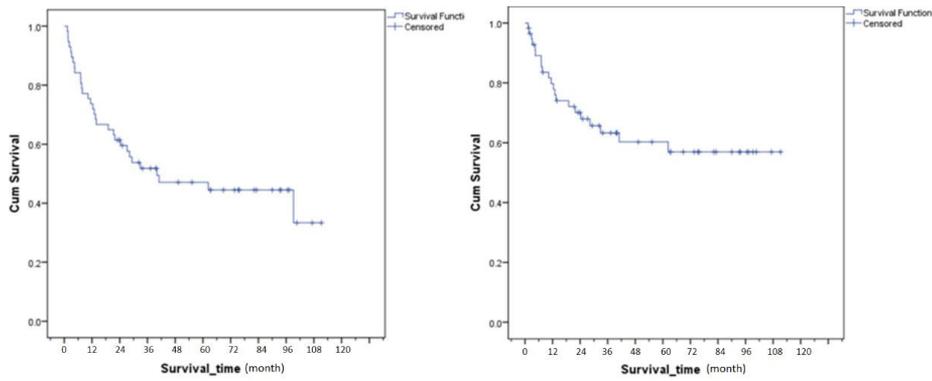


Fig 2. The patient status at 5.9 years (percentile 75) of follow-up time

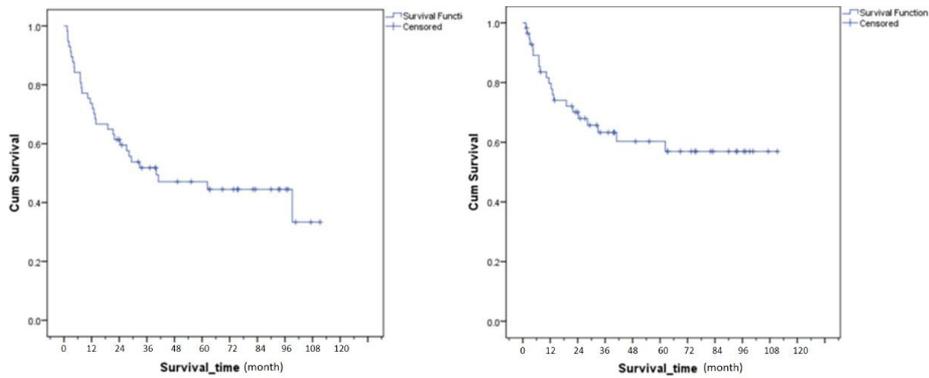


Fig 3. 5-year overall survival (OS) and 5-year cancer specific survival (CSS)

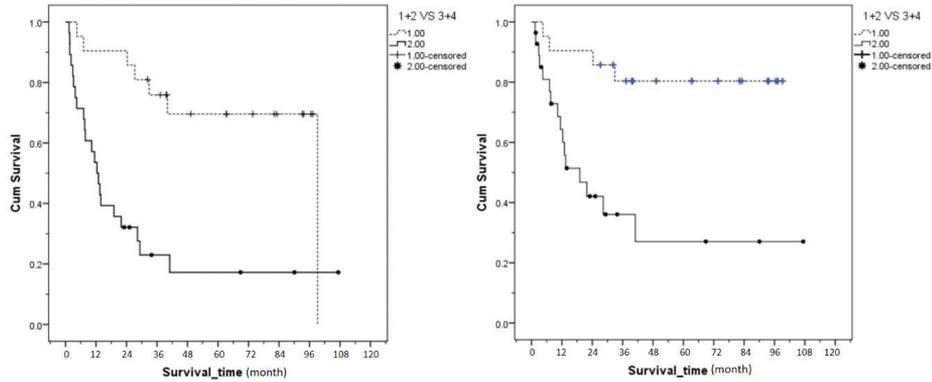


Fig 4. 5-year overall survival (OS) and 5-year cancer specific survival (CSS) in organ confined and non-organ confined tumor

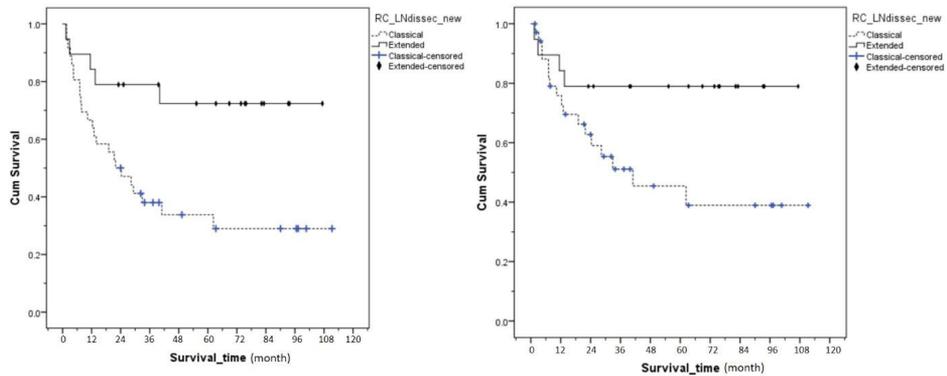


Fig 5. 5-year overall survival (OS) and 5-year cancer specific survival (CSS) in standard lymph node dissection and extended lymph node dissection.

TABLE 4. Summary of 5-year overall survival (OS) and 5-year cancer specific survival (CSS) in all groups.

	5-yr overall survival (%)		5-yr cancer specific survival (%)	
		P-value (Log Rank)		P-value (Log Rank)
Organ confined				
Yes	69.60%	< 0.001	80.40%	0.001
No	17.20%		27%	
LN metastasis				
Yes	30.90%	0.063	35.30%	0.029
No	53.70%		69.40%	
LN dissection				
Standard	33.80%	0.008	45.40%	0.037
Extended	72.40%		78.90%	
Surgical margin				
Negative	50.10%	0.386	63.40%	0.245
Positive	21.40%		42.90%	

radical cystectomy at Siriraj Hospital between July 2005 to August 2013. The Kaplan-Meier analysis for 5-year overall survival and 5-year cancer specific survival were 47.1% and 60.3%; and pathologic staging was one of the significant impact factors on survival outcome. We found that 5-year overall survival and 5-year cancer specific survival in organ confined group were 69.6% and 80.4%.

From our single center, Pakawat reported the outcome of open radical cystectomy in Siriraj hospital between 1998-2003 in 70 patients, in which 5-year overall survival and 5-year cancer specific survival were 50% and 59.8%, respectively. Pathologic T stage, lymph node metastasis and positive surgical margin were significant in the survival outcome.¹³ (Fig 6)

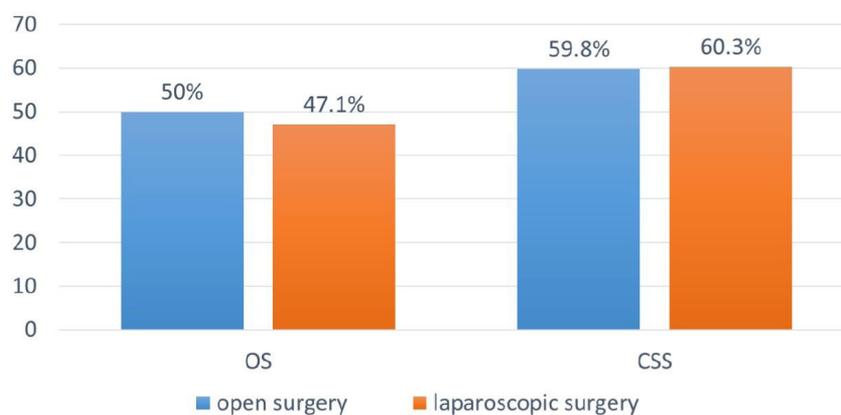


Fig 6. 5-year outcome of radical cystectomy from our single center (Siriraj Hospital)

In our study, we found that extended lymph node dissection had significant impacts on survival outcome with 5-year overall survival and 5-year cancer specific survival (72.4% and 78.9%, respectively). The mean number of lymph node dissections was 19 (range 6-37), but we performed in only 19 patients which is limited data. Harman M. Bruins reported systematic review in

the impact of extent of lymphadenectomy on oncologic outcome which still required data from ongoing RCT to clarify remaining uncertainties.¹¹

We found that lymph node status had significant impact on 5-year cancer specific survival (35.3%) which was significantly different in non-lymph node metastasis group (69.4%). Simone reported 5-year cancer specific

survival in lymph node metastasis and non-metastasis was 48% and 83% on multicenter study in Europe which was reported in 2014,¹⁴ in which the ratio of organ-confined and non-organ confined tumor was 1.37 (in our study, the ratio was 1.04). Comparing to multicenter study from Europe, our study had lesser survival outcome, although our study had percentage of patients with non-organ confined tumor more than the European study by about 17%. (Fig 7)

CONCLUSION

Radical cystectomy with lymph node dissection is the gold standard for invasive bladder cancer and laparoscopic approach is one of the effective alternative treatments with comparable oncologic outcome to open surgery. T stage and extended lymph node dissection were the significant impact factors. However, longer follow-up in a larger series in randomized control trials is recommended.

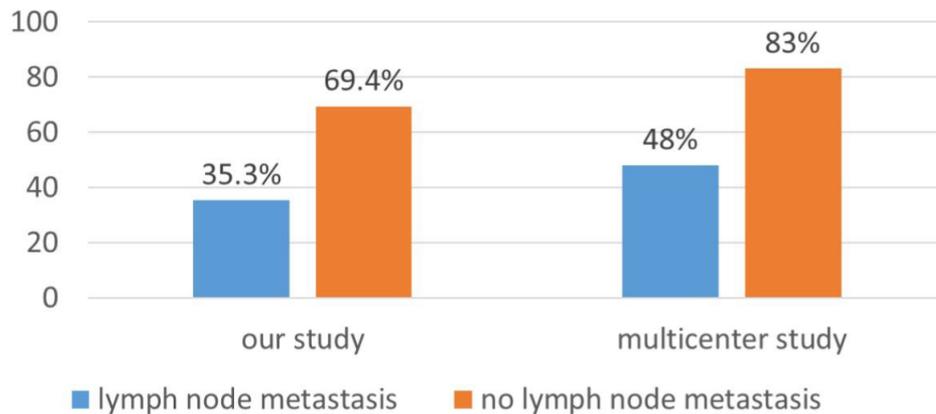


Fig 7. Lymph node status and 5-year cancer specific survival

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