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The Functional and Oncological Outcomes of 242 cases of Extraperitoneal Laparoscopic Radical Prostatectomy

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Abstract

Objectives: We report the outcome of 242 cases of extraperitoneal laparoscopic radical prostatectomy performed by a single surgeon.

Methods: 242 patients with localized and locally advanced prostate cancer, who underwent extraperitoneal laparoscopic radical prostatectomy. Perioperative data, functional and oncological outcomes were evaluated.

Results: Average patients age was 66.67 years (range 42-83 years), and mean preoperative PSA level was 19.39 ng/ml (range 0.44-421 ng/ml). The mean operative time was 220 minutes. The mean intraoperative blood loss was 776.26 ml (range 50- 5,500 ml). 29.3% of cases were received blood transfusion. Margin positive rate was reported in pT2 and pT3 with 13.30% and 56.1%, respectively. The mean catheterization time and hospital stay duration were 9.73 days and 8.76 days, respectively. Continence outcome on 1st, 3rd, 6th, 12th month were 17.4%, 33%, 54% and 67.4%, respectively. 26 patients underwent nerve sparing procedure in patients younger than 60 years and the results in potency rate at 3, 6, 9 and 12 months were 7.7%, 27.8%, 41.2% and 69.2%, respectively.

Conclusions: Extraperitoneal laparoscopic radical prostatectomy is the minimally invasive surgery of prostate cancer benefits for pT2 staging with the good oncological outcomes and functional outcomes.

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Introduction

Extraperitoneal laparoscopic radical prostatectomy has been established and adopted by specialized urologic centers around the world as the primary therapeutic strategy for the management of localized prostate cancer[1-3].

We firstly reported 56 cases of laparoscopic radical prostatectomy in Thailand[4]. Since then, the numbers of laparoscopic radical prostatectomies has increased dramatically at Siriraj hospital. Extraperitoneal laparoscopic radical prostatectomy is feasible with equal oncological outcomes to open radical prostatectomy. The advantages are presented by extraperitoneal laparoscopic radical prostatectomy, the less invasive surgery and reduction in operative blood loss[5-6]. However, continence and potency outcomes after patients underwent extraperitoneal laparoscopic radical prostatectomy are not mentioned previously in Asia.

The goal of this study is conducted to investigate the effectiveness of extraperitoneal laparoscopic radical prostatectomy in managing functional and oncological outcomes.

Material and Method

242 patients with early prostate cancer, were undergone extraperitoneal laparoscopic radical prostatectomy by a single surgeon (Srinualnad S.) The surgical technique was as reported previously [7].

A retrospective review was conducted to identify patient demographics, surgical data, postoperative variables, clinicopathological characteristics, pathological variables, complications and functional outcomes, such as continence and erectile function, at the 3rd, 6th, 9th and 12th month.

Results

The mean patient's age was 66.67 (range, 42-83 years). Average preoperative PSA level was 19.39 (range, 0.44-421 ng/ml.) The mean operative time was 220 minutes. The mean intraoperative blood loss was 776.26 (range, 50- 5,500) ml. 29.3% of cases were received blood transfusion. The mean catheterization time and hospital stay duration were 9.73 days and 8.76 days, respectively. All data was shown in table 1.

Table 1 *Dermographic data*

	Minimum	Maximum	Mean	Std.Deviation
Age (year)	42	83	66.67	7.45
PSA (ng/ml)	0.44	421	19.39	38.79
IPSS	1	35	13.33	7.81
Prostatic weight (gm)	8.7	206.3	49.75	27.66
Operative time (minute)	106	540	220.3	73.53
Intra-operative blood loss (ml)	50	5500	776.26	576.96
total days of catheter insertion (day)	4	35	9.73	4.85
Hospital stay (day)	3	38	8.76	4.51

Table 2 *Pathological outcomes*

Staging		Number of case	% of positive margin
pT2		150	16.67%
	case no.1-75	75	20%
	case no.76-150	75	13.30%
pT3		82	65.90%
	case no.1-41	41	75.50%
	case no.42-82	41	56.10%

Table 3 *Continence outcomes*

Duration post operation (month)	Total continence rate
1	17.40%
3	33%
6	54%
12	67.40%

Table 4 *Potency outcomes*

Duration after surgery (month)	Full erection with sexual intercourse rate
3	7.70%
6	27.80%
9	41.20%
12	69.20%

Oncological outcomes after extraperitoneal laparoscopic radical prostatectomy were evaluated. In 150 patients, with pT2 staging, positive surgical margin was 16.67%. In 82 men with pT3 staging, positive margin was 65.9%, but sub-group analysis had showed that in the last 75 patients, the positive surgical margin of pT2 staging had been reduced from 20% to 13.3%, having compared to the first 75 patients as showed in table 2.

Continence outcome at the $1^{st.}$ 3^{rd}, 6^{th}, 12^{th} month were 17.4%, 33%, 54% and 67.4% respectively, as showed in table 3.

Twenty six patients with sexually active prior to the operation, and younger than 60 years who were not received neoadjuvant, underwent nerve sparing procedure. Full erection with sexual intercourse on follow up at 3, 6, 9 and 12 months were 7.7%, 27.8%, 41.2% and 69.2% respectively, as showed in table 4.

Complications were found in 33 cases (13.63%) with pulmonary embolism 2 cases. 3 cases of rectal injury were detected intra-operatively. All of rectal injuries were corrected by laparoscopic suturing intra-operatively. All complications were reported in table 5.

Table 5 *Complications (N=242)*

Complication	Number
Pulmonary embolism	2
Rectal injury	3
AUR	4
Foley catheter dislodge	1
Prolong drain	4
Lymph leak	4
Urine leak	4
Stricture anastomosis	2
UTI	3
Inguinal hernia	5
Bilateral ureteral obstruction*	1

*Required opened ureteric reimplantation

Discussion

Incidence of prostate cancer is increased due to PSA screening. Open radical prostatectomy is a standard treatment of localized and locally advanced prostate cancer, but patients have experienced problems of incontinence and erectile dysfunction.

Vincenzo F, et al[8] presented a systematic review and cumulative analysis of comparative studies of retropubic, laparoscopic and robotic-assisted radical prostatectomy in 37 studies. The oncological outcomes of positive surgical margin rate was similar in robotic-assisted laparoscopic radical prostatectomy, laparoscopic radical prostatectomy and retropubic radical prostatectomy procedure. Within pT2 staging, positive surgical margin rate was ranging from 11% to 37% in retropubic radical prostatectomy, 11% to 30% in laparoscopic radical prostatectomy, and 9.6% to 26% in robotic-assisted laparoscopic radical prostatectomy, respectively. Touijer et al[9] compared outcomes between 818 retropubic radical prostatectomy and 612 laparoscopic radical prostatectomy. The overall positive surgical margin rate was 11% in both retropubic radical prostatectomy and laparoscopic radical prostatectomy (pT1 and pT2). In this study the positive surgical margin of pT2 staging was 13.3%, so that any procedure of the radical prostatectomy has the similar result for positive surgical margin in pT2 staging.

Continence outcome at 12th month rate was ranging from 66% to 93% after retropubic radical prostatectomy, 77% to 87.8% after laparoscopic radical prostatectomy, and 84% to 97% after robotic-assisted laparoscopic radical prostatectomy, respectively[8]. Srinualnad reported continence outcome after robotic-assisted laparoscopic radical prostatectomy (10) at 1st, 3rd, 6th and 12th month of 12.7%, 36.1%, 66.7% and 81.1%, respectively. While from the present study extraperitoneal laparoscopic radical prostatectomy had continence outcome at 1st, 3rd, 6th and 12th month of 17.4%, 33%, 54% and 67.4%, respectively. From our experience, robotic-assisted laparoscopic radical prostatectomy procedure provides better continence outcome.

Potency at 12th month rate was ranging from 10% to 73% after retropubic radical prostatectomy, 42% to 76% after laparoscopic radical prostatectomy, and 70% to 80% after robotic-assisted laparoscopic radical prostatectomy, respectively[8]. In the present study, patients younger than 60 years with nerve sparing procedure, who have not been prescribed GnRH analog, have a good potency outcome, with 69.2% achieving sexual intercourse at 12th month post-operation. In the largest extraperitoneal laparoscopic radical prostatectomy series, Stolzenburg

et al[6] showed that bilateral nerve-sparing in patients younger than 55 years resulted in potency rate of 32.4%, 75.3% and 84.9% at 3rd, 6th, and 12th month, respectively. Causes of the different results of these studies are methods of collecting data and experience of surgeons. Srinualnad reported potency outcome after robotic-assisted laparoscopic radical prostatectomy[10] at 3rd, 6th, 9th and 12th month of 15.3%, 54.8%, 68% and 78%, respectively.

From our experience[10], having compared extraperitoneal laparoscopic radical prostatectomy and robotic-assisted laparoscopic radical prostatectomy, we found oncological outcomes and positive surgical margin rates were similar (ranging from 13.3% and 20%, respectively), but in functional outcomes, robotic-assisted laparoscopic radical prostatectomy procedure provides better continence and potency outcomes than extraperitoneal laparoscopic radical prostatectomy.

Surgical technique mimicking technical used in robotic-assisted laparoscopic radical prostatectomy should be adopted in extraperitoneal laparoscopic radical prostatectomy to achieve better continence and potency outcomes.

Conclusion

Extraperitoneal laparoscopic radical prostatectomy is the minimally invasive surgery of prostate cancer benefiting for pT2 staging. However surgical technique and skill are important factors.

Patient with prostate cancer concerns about their continence and potency after undergoing radical prostatectomy. In this study it is showed that extraperitoneal laparoscopic radical prostatectomy provides good oncological outcomes and functional outcomes. Continuous refinements contribute to the improving outcome of the procedure. Long term results of especially survival and biochemical recurrent rate are expected.

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