Passing a Learning Curve after 200 Cases of Robotic Assisted Laparoscopic Radical Prostatectomy: Experience from a single surgeon.

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Abstract

Introduction: There are many options of treatment in early prostate cancer patients. Nowadays, the patients seek treatment aiming for cure without much troublesome. Robotic Assisted Laparoscopic Radical Prostatectomy is one of them.

Objective: To evaluate oncological outcome of 200 cases of Robotic Assisted Laparoscopic Radical Prostatectomy done by a single surgeon's experience.

Materials and Methods: 200 patients with localized prostate cancer, who underwent Robotic Assisted Laparoscopic Radical Prostatectomy were enrolled. Oncological outcomes and peri-operative results were evaluated.

Results: Within the last 61 cases of pT2 disease, positive surgical margin rate was reported as 4.9%. Operative time and intra-operative blood loss were significantly reduced in the last 100 cases.

Conclusion: Robotic Assisted Laparoscopic Radical Prostatectomy is one of the good options for early prostate cancer patients. The author's learning curve was 100 cases to get significantly improved outcomes.

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Introduction

Prostate cancer is found more often than before in Thai male. This is due to increasing numbers of elderly people and a screening tool with PSA test. Patients with prostate cancer are seeking the treatment option, which provides them of good cancer control without much compromising of their routine life-style. There are many modalities of treatment for early prostate cancer patients; each has pros and cons. To date Robotic Assisted Laparoscopic Radical Prostatectomy (RALRP) is one of the gold standard treatments for early prostate cancer patients. Robotic Prostatectomy was firstly reported in Thailand in 2007 [1]. Since then the numbers of such surgery has been rapidly increased [2-6]. This article is meant to analyse the oncological outcomes and peri-operative outcomes of 200 consecutive cases of RALRP done by the author.

Material and Method

From February 2007 to March 2010, data of 200 consecutive cases from patients with prostate cancer, who had successfully undergone RALRP by the author as the console surgeon at the department of Surgery, Faculty of Medicine, Siriraj Hospital was retrieved. The studied protocol was approved by the Faculty's ethical committee. Perioperative data, operative results and oncological outcomes were analysed.

Results

Robotic Assisted Laparoscopic Radical Prostatectomies were performed using transperitoneal and extraperitoneal approach in 118 cases and 82 cases, respectively.

Average age of the patients was 66.0 years. Mean serum PSA was 18.7 ng/ml. The average operative time, blood loss, catheterization time and hospital stay were 153.8 minutes, 427.0 mls, 8.6 days, and 7.5 days, respectively. Transfusion rate was 7.6%, most of them were in the first 50 cases. All data was shown in table 1.

Of 200 cases of prostate cancer, 122 cases were organ confined disease, and 74 patients were found to be extra-prostatic disease including 9 cases of metastatic lymph nodes. There were 4 cases of no residual cancer found on final report. Pathological outcome reported positive surgical margin rate of 16.4% and 60.8% in pT2 and pT3, respectively. However, sub-group analysis has shown that in the last 61 consecutive cases the positive surgical margin in pT2 case has been reduced from 27.9% to 4.9%, having compared to the first 61 cases, as shown in table 2.

Table 1 *Perioperative data*

N=200	Minimum	Maximum	Mean	Std.Deviation
Age (year)	47	82	66.0	8.0
PSA (ng/ml)	0.7	300	18.7	33.4
Prostatic weight (gm)	7.0	160	42.2	17.6
Operative time (min)	70	720	153.8	68.4
Intra operative blood loss	50	2,500	427	338
Tot.days of cath insertion	5	24	8.6	3.7
Hospital stay	3	28	7.5	2.8

Operative time and operative blood loss was significantly reduced when comparing the last 100 consecutive cases to the first 100 cases, as shown in table 3.

Complication was found in 20 cases (10%). Two patients had experience major complication including 1 pulmonary emboli and 1 pelvic collection with sepsis. All complications were reported in table 4.

Table 2 *Pathological outcomes*

Staging	Number of Case	% of Positive Margin
pT2	122	16.4%
Case no.1-61	61	27.9%
Case no.62-122	61	4.9%
pT3	74	60.8%
Case no.1-37	37	59.5%
Case no.38-74	37	62.2%

Table 3 *Perioperative data*

N=200	Case No. 1-100	Case No. 101-200	P-value
Age (year)	66.7±7.5	65.3±8.3	0.2
PSA (ng/ml)	19.7±35.7	17.7±30.9	0.7
OR time (minute)	169.3±86.5	137.9±37.0	0.001
Blood Loss (ml)	506.0±396.1	346.4±245.2	0.001
Hospital Stay (day)	7.5±3.2	7.3±2.3	0.6
Catheter Time (day)	8.6±3.8	8.6+3.5	0.4

Table 4 *Complication*

N=200	Complication	Number
Major		
	Pulmonary Emboli	1
	Pelvic collection with sepsis	1
Minor		
	Stricture of anastomosis	4
	Bleeding required blood transfusion	3
	Orchitis	3
	Prolong drainage	2
	Foley catheter dislodge	2
	Pelvic collection	1
	Retention of Urine	1
	UTI	2

Discussion

The most concerns of Thai patients with prostate cancer is, namely, cancer control. Previously, the author had reported oncological outcome of RALRP in early prostate cancer patients[6]. The goal of surgery is to completely remove cancer tissue, whilst preserving continence and erectile function. The present study has shown that a significant decline in the positive surgical margin rate as the author gains more experience of Robotic technology. It is the author's believe that with experience one can achieve a lower positive margin rate in pathological T2 cancer with RALRP than with open Radical Prostatectomy or Laparoscopic Radical Prostatectomy.

The author has previously shown that continence rate is reasonably good, although a small proportion of the patients continue to have incontinence after 1 year[7]. Better understanding of the anatomy and physiology could help delineate surgical techniques that may be, one day, eliminate the problem.

The promise of well preserved erectile function is one of the driving forces behind the acceptance of RALRP. In the author's previous study, patients undergone nerve-sparing procedure can gain erection in 78% which is comparable to many studies[7-11]. With superb visualization and meticulous dissection, the neurovascular bundle can be well preserved. It is essential to remember that preserving erectile function at the expense of leaving cancer cells behind do more harm than good to the patients. The author strongly believes that erectile function can be well preserved by using endo-wrist technology, excellent visualization and good cases selection.

Learning curve is a matter of outcomes. To gain a better oncological outcome and functional outcome, one needs 150 cases experience in RALRP [12-13]. In the present study, better operative results can be improved after 100 cases' experience as intra-operative blood loss and operative time is reduced significantly. It is the author's believe that these learning experiences can be made much easier, if one can learn from a supervisor, who has a high volume of cases.

Conclusion

Robotic Assisted Laparoscopic Radical Prostatectomy is now well established in Thailand. The patients undergone the procedure can gain benefit of good cancer control with good quality of life. However, quality of surgery is a major contribution to those two outcomes. Surgeons who perform such a surgery should pay more attention to their surgical techniques to rapidly improve the outcomes.

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