Original Article

Outcome of extraperitoneal laparoscopic radical prostatectomy: The first 100 cases of a single surgeon

Danai Manorom

Division of Urology, Department of Surgery, National Cancer Institute, Bangkok, Thailand

Keywords:
laparoscopic radical prostatectomy, prostate cancer, learning curve

Abstract

Objective: To evaluate the outcome of technical feasibility, oncologic effectiveness, and perioperative and postoperative morbidity in the first 100 cases of a single surgeon.

Material and Method: This retrospective study collected data from the first case series of patients who underwent laparoscopic radical prostatectomy (LRP) by a single surgeon at the same institution from October 2011 to April 2013: 100 patients with clinically localized prostate cancer, including age, preoperative prostate-specific antigen (PSA), prostate volume, Gleason score, operation time, blood loss, surgical margin, incontinence rate, erectile function and complications.

Result: The mean age was 64.37 (43-77) years. Mean preoperative PSA was 4.2-370 ng/mL and prostate volume was 10-132 (39.01) mL. The mean operative time was 229 min. Mean blood loss was 487.52 mL. There were five surgical complications, four rectal injuries (first 30 cases) and one conversion to open surgery (5 of 100 cases).

Conclusion: We think that extraperitoneal laparoscopic radical prostatectomy requires a highly experienced surgeon in order to improve the outcomes of surgery.

Corresponding author: Danai Manorom
Address: Division of Urology, Department of Surgery, National Cancer Institute, Bangkok, Thailand
E-mail: danaimanorom@gmail.com

Introduction

Prostate cancer is the most common non-cutaneous cancer and the second leading cause of death from cancer in men in the United States[1]. Whereas prostate cancer in Thailand is number 4 of all male cancers (7.1:100,000 population)[2], the incidence of prostate cancer in Thailand is increasing every year.

Prostate cancer is prevalent in many countries and exhibits a wide spectrum of aggressiveness; thus, different methods of treatment have been developed. The preferred methods for detection and treatment are controversial.

However, no treatment has supplanted radical prostatectomy, and it still remains the gold standard because of the realization that hormone therapy and chemotherapy are never curative, and not all cancer cells can be eradicated consistently by radiation or other physical forms of energy, even if the tumor is contained within the prostate gland[3].

Laparoscopic prostatectomy may be associated with less bleeding, better visualization, less postoperative pain, and shorter convalescence than the standard open approach. Several large series of laparoscopic radical prostatectomy have been reported in France and Germany.[4,5]

Even robotic-assisted laparoscopic surgery is now spreading worldwide. However, laparoscopic procedures are still important in developing country. In this study, we analyzed the outcomes of laparoscopic radical prostatectomy in the initial 100 cases performed by a single surgeon[6].

Material and Method

We used data from the first retrospective study of cases of extraperitoneal laparoscopic radical prostatectomy performed by a single surgeon at the National Cancer Institute, Bangkok, Thailand from April 2011 to October 2013. A total of 100 patients underwent extraperitoneal laparoscopic radical prostatectomy and were followed up for at least 3 years.

Demographic data include age, preoperative prostate-specific antigen (PSA), prostate volume, Gleason score, and clinical stage. Surgical parameters including the mean operation time, estimated blood loss, surgical margin, pathologic stage, incontinence rates (pad free), erectile function, and postoperative complications during follow-up were retrospectively reviewed.

We performed standard pelvic lymphadenectomy in patients who had a risk of nodal metastases over 5% (Briganti nomogram, MSKCC, or Roach formula)[7], indications for nerve sparing surgery, a low risk of extracapsular disease,[8] or dependent on patient desire.

Using this technique, the patient is positioned at a 30-degree decline in the Trendelenburg position. First, the 12-mm trocar (blunt tip type) camera port is placed under the umbilicus, creating extraperitoneal space in the shape of a round balloon. Another four working trocars (12-mm at right pararectus, 5-mm at right Iliac fossa, 5 mm at left pararectus, 5-mm at suprapubic area), Figure 1. We perform vascular control of the dorsal-vein complex of the penis with an X-stitch using a 1-0 Vicryl suture. A vesicourethral anastomosis is performed by running a suture with 2-0 vicryl on a UR-6 needle. The final two anterior sutures are placed but not tied until an 18-Fr Foley catheter has been positioned in the bladder under direct vision. Foley catheter is retained for 1 week and then removed after retrograde cystogram is checked.

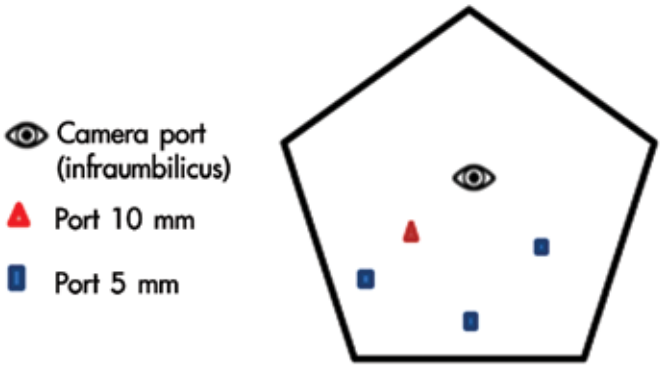

Figure 1. Port sites for laparoscopic radical proatstectomy procedure

Result

There was no postoperative mortality, and only one conversion to open surgery was necessary in order to find some pieces of fragments needle during suture dorsal vein.

Preoperative data are shown in Table 1. The mean age was 64.37 (43-77) years. The mean preoperative PSA was 20.08 (4.2-340) ng/mL, and prostate volume was 39.01 (10-132) mL. Clinical staging and pathological staging are shown in Table 2.

Operative data is shown in Table 3. The mean average operative times were 4 hr 59 min, 3 hr 38 min and 2 hr 50 min. Average operative blood loss was 587.4 ml, 443.33 ml and 432.14 ml. Incontinence data recorded 3 months after the operation: more than 90% of patients were pad free. Erectile function (Erection Hardness Score ≥3)[9] recorded 2 years after the operation was 66.67%, 94.12% and 75%. Perioperative complications were encountered in 4 patients with rectal injury, three of which were in the initial 28

Table 1. Preoperative data of the patients

Clinical characteristics	MAX	MIN	Average
AGE	77	43	64.37
PSA	340	4.2	20.08
PROSTATE VOLUM	132	10	39.01

Table 2. Clinical staging and pathological staging of the patients

	Stage I	Stage II	Stage III	Stage IV
Clinical stage	28%	55%	17%	0%
Pathologic stage	15%	58%	21%	6%

cases. All of the cases of rectal injury we repaired by double layer suturing with 2-0 vicryl suture. One patient suffered from fecaluria after removing the Foley catheter. We treated this patient by sigmoidscope and clips at the fistula lesion (Figure 2). Postoperative complications found: anastomosis leakage in 4 cases and a single case of postoperative myocardial infarction.

The oncologic results are described in Table 4. Total positive surgical margin rates found at stage 1, 2, 3 and 4 were 6.67%, 24.14%, 33.33%, and 83.33%, respectively. All patients were alive at the time of this writing, except two. One patient died from percutaneous coronary intervension after postoperative myocardial infarction at 2 months; the other had pelvic lymph node involvement (stage 4) and died at 48 months postoperation.

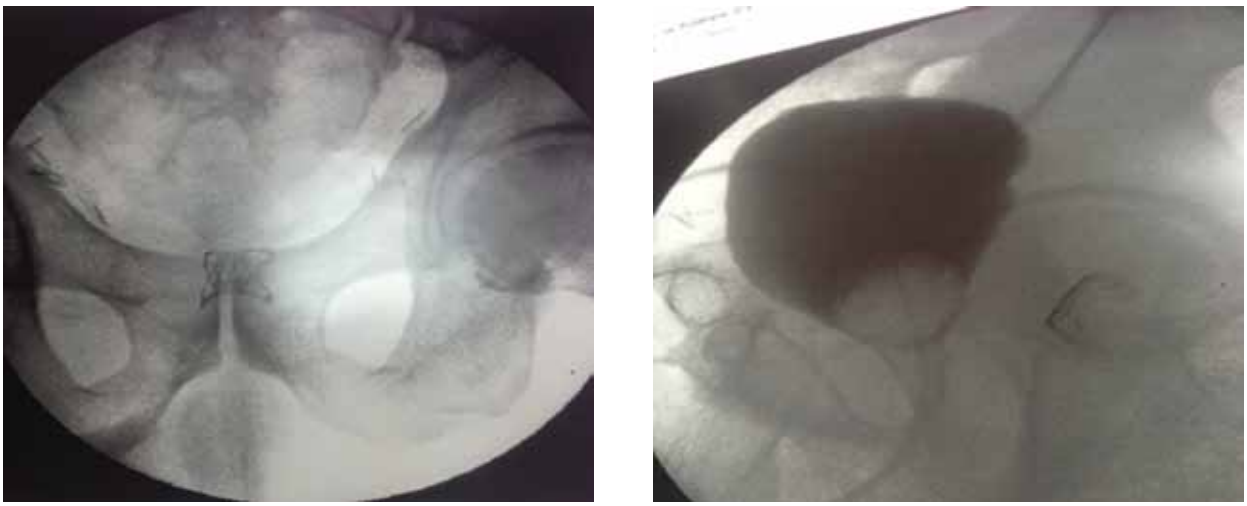

Figure 2. Retrograde cystogram after sigmoidoscope and applied clip at the fistula tract site.

Table 3. Operative data

	2011 Total case 28	2012 Total case 51	2013 Total case 21
Opearation time (AVERAGE)	4' 59"	3' 38"	2' 50"
Blood loss + urine (AVERAGE)	587.14 cc.	443.33 cc.	432.14 cc.
Incontinence rates (pad free)	92.86%	90.20%	100%
Erectile function	66.67%	94.12%	75%
Complications	- Rectum injury (3 cases) - Conversion to open (1 case)	Rectum injury (1 case)	

Table 4. Results of positive margins in 100 cases of operation

	Stage I (n=15)	Stage II (n=58)	Stage III (n=21)	Stage IV (n=6)
Positive Margin	6.67% (1 case)	24.14% (14 cases)	33.33% (7 case)	83.33%

Discussion

This study reveals a decrease in surgical time and blood loss correlated with more surgical cases performed. The most common side effect was rectal injury in the year 2011 without colostomy procedure and good incontinence in every case after repairing the rectum. In the cases of anastomosis leakage, we checked the leakage of the urinary bladder by filling the bladder with 100 ml of water before the end of the procedure. After 1 week, in 4 cases leakage of anastomosis was found; the Foley catheter was retained for another week and retrograde cystograms were repeated. No leakage was found.

Most patients with CA prostate gland were elderly males. Although laboratory screening was normal before surgery, 1 case was found to have ischemic heart disease and finally died.

Conclusion

Treatment of prostate cancer by laparoscopic radical prostatectomy by a single surgeon requires enough equipment and good team work. A more experienced surgeon reduces the side effects.

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2016. CA Cancer J Clin 2016;66:7-30.
2. Imsamran W, Chaiwerawattana A, Wiangnon S, et al. Cancer in Thailand. Volume VIII, 2010-2012, Bangkok; 2015 (in Thai): p.10
3. Catalona WJ, Han IM. Definitive Therapy for Localized Prostate Cancer. In: McDougal W, Wein A, Kavoussi L, et al. Campbell-Walsh Urology, 10 ed, Saunders: 2012: pp. 2775.
4. Guillonneau B, Vallancien G. Laparoscopic radical prostatectomy: The Montsouris experience. J Urol 2000;163:1643-1649.
5. Rassweiler J, Sentker L, Seemann O, et al. Laparoscopic radical prostatectomy with the Heilbronn technique: an analysis of the first 180 cases. J Urol 2001;166:2101-2108.
6. Akita H, Okamura T, Naiki T, et al. Evaluation of the outcome of laparoscopic radical pro-statec-tomy by a single surgeon: Experience with an Initial 30 Cases. J Rural Med 2010;5: 134-139.
7. Mottet N, Bellmunt J, Briers E, et al. European Association of Urology Guidelines on Prostate cancer. 2017, P.36.
8. Sokoloff MH, Brendler CB. Indications and contraindications for nerve-sparing radical prostatectomy. Urol Clin North Am 2001;28: 535-543.
9. Stoykov BA, Nikolay KH, Vladislav DR, et al. Application of erection hardness score as a diagnostic tool to assess erectile function recovery after robot-assisted radical pro-statectomy. Biomed J Sci & Tech Res 3-2018. BJSTR.MS.ID.000830.DOI:10.26717/BJSTR. 2018.03.000830.
10. Roberts WB, Tseng K, Walsh PC, et al. Critical appraisal of management of rectal injury during radical prostatectomy. Urol 2010;76: 1088-1091.