Laparoscopic Radical Prostatectomy: Oncological and Functional Outcomes of 559 Cases in Siriraj Hospital, Thailand

Phisaiphun Wattayang MD*, Chaiyong Nualyong MD*,
Sunai Leewansangtong MD*, Sittiporn Srinualnad MD*,
Tawatchai Taweemonkongsap MD*, Bansithi Chaiyaprasithi MD*,
Teerapon Amornvesukit MD*, Kittipong Phinthusophon MD*,
Siros Jitpraphai MD*, Buncha Thiptirapong MD*,
Pichaya Sujijantararat MD*, Suchai Soontrapa MD*

** Division of Urology, Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Objective: *To evaluate the results of oncological and functional outcomes of laparoscopic radical prostatectomy (LRP) during the first five years experience in Siriraj hospital.*

Materials and Method: *Between September 2004 and September 2009, the functional and oncological outcomes of 559 patients that underwent LRP were retrospectively evaluated.*

Results**:** *The distribution of pathological T stage was T2 (52.1%), T3 (39.9%), and T4 (2.9%). Lymph node metastasis (N1) were found in 19 patients (3.4%). The positive margin rates in pT2a-b, pT2c, pT3a, pT3b and pT4 were 13.2%, 34.7%, 65.9%, 72.7% and 76.9%, respectively. The 3-year biological progression free survival (bPFS) rate for all patients was 87.2%. Three-year bPFS rates in pT2a-b, pT2c, pT3a, pT3b and pT4 were 96.3%, 93%, 75%, 55.6% and 62.5% respectively. The continent rate at 12 months was 84% and potency rate at 12 months in group that received bilateral nerve sparing was 29.1%.*

Conclusion: *The oncological and functional results of our first LRPs in Thai men are acceptable and compared well with the early experience of previous studies. However, longer follow up is needed for further evaluation.*

Keywords: *Laparoscopic, Radical prostatectomy, Prostate neoplasm*

J Med Assoc Thai 2011; 94 (8): 941-6
Full text. e-Journal: *http://www.mat.or.th/journal*

Radical prostatectomy has now remained as the treatment of localized prostate cancer for more than two decades[1]. The aim of radical prostatectomy is to achieving optimal cancer control with minimal morbidity and the best functional results. Since the new surgical trends are minimally invasive surgery, laparoscopic radical prostatectomy (LRP) was first performed in 1992. It has been popular since 1998 and has gained a lot of attention in the urological community over the last years[2,3]. Two approaches have been described for the laparoscopic procedure: transperitoneal and extra-peritoneal[4-6]. Various centers worldwide now regularly perform LRP and the early results show stimulating oncological and functional outcomes with low perioperative morbidity and complications[6-8]. In light of these data, several authors already support laparoscopic radical prostatectomy as a first-line surgical treatment for localized prostate cancer[5].

The common advantages of laparoscopic surgery are short convalescence, lower blood loss and blood transfusion, lower perioperative morbidity and analgesic requirements and include early return to work[6-10]. Continence rates (no pad) vary from 85 to 90% and potency rates after one year ranged from 40 to 55% according to bilateral bundle preservation. Positive surgical margins in pT2 cases occurred in 10.6-14.6%, pT3 cases 26-32%[10-12].

Since 2004, we have adopted LRP at our institute. The present study focused on oncological

Correspondence to:
Leewansangtong S, Division of Urology, Department of Surgery, Faculty of Medicine, Siriraj Hospital, Bangkok 10700, Thailand.
Phone: 0-2419-8010
E-mail: sislt@mahidol.ac.th

and function outcomes for patients who had undergone LRP.

Material and Method

Patients

Between September 2004 and September 2009, 566 patients underwent LRP at Siriraj Hospital, Bangkok, Thailand. For this study, clinically localized and locally-advanced prostate cancer was retrospectively reviewed. Of 566 patients, seven patients [1.2%] were excluded due to convert to open surgery. Five hundred fifty nine patients with complete operative data from outpatient and inpatient record forms were included in the study after approval of the institutional review board at faculty of Siriraj medicine.

Surgery

All 559 LRP were performed by seven surgeons, 206 (36.8%) patients by transperitoneal approach and 353 (63.2%) patients by extraperitoneal approach. The nerve sparing was performed in case where low risk of extracapsular invasion and good sexual function preoperatively by identifying pre-existing anatomic planes and the avoidance of thermal injury near the nerves.

Pathological analysis

Prostate and pelvic lymph node pathologic specimens were examined by pathologists. A positive surgical margin was defined by the pathologist as extension of the tumor to the inked surface of the specimen.

Oncological outcome

Pathologic stage according to the 2002 TNM classification, Gleason score, prostate weight and margin status were routinely recorded. Biochemical recurrence was indicated by a PSA level of > 0.2 ng/ml. The patients who received neoadjuvant hormonal treatment were excluded from analysis of margin status and those that received immediate postoperative adjuvant treatment were excluded from biochemical recurrent evaluation. Vanishing tumor, the specimen that was undiscovered tumor cell by pathologists, were excluded from margin status evaluation.

Functional outcome

Sexual and urinary functions were assessed according to the interviews conducted by the operating surgeon. Continence was defined as the use of one pad or less daily. Those who used more than one protective pad daily were categorized as incontinent. Erectile function was assessed at 12 months only in those patients who were potent preoperatively and who underwent a bilateral nerve-sparing procedure. A patient was considered potent if he reported that he was able to have intercourse with or without the use of Phosphodiesterase 5 inhibitors.

Data

All data were retrospectively collected on data sheets, transferred to a database and analyzed with SPSS. Data are presented as mean $\pm$ SD with ranges in parentheses. The positive surgical margin rate was evaluated with Chi-square with Yate's correction. A p-value of less than 0.05 was considered significant. The 3 years biological progression free survival was calculated by Kaplan Meier graph.

Results

Table 1 shows the patient characteristics. The mean age was 66 years (range 42 to 83). Mean preoperative PSA level was 17.6 ng/mL. The most PSA range of the patient was 4-10 ng/ml. The most clinical stage was T1. The most Gleason score was less than 7.

Mean prostatic weight was 43.8 grams (range 9.8-279 g). Lymphadenectomy was performed in 420 patients (75.1%). In 120 patients (21.5%), preservation of the neurovascular bundle was accomplished bilaterally. Median follow-up was 35.0 months (range 1-74 months).

Table 2 shows the distribution of pathological results of 559 patients. The presented data shows that

Table 1. Preoperative characteristics (n = 559)

Age (years)	66.91 $\pm$ 7.2 (42-83)
PSA (ng/ml) mean $\pm$ SD	17.60 $\pm$ 22.84
Clinical stages (n = 558)	n (%)
T1	242 (43.4%)
T2	196 (35.1%)
T3	120 (21.5%)
PSA level (n = 546)	
0-4 (ng/ml)	35 (6.4%)
4-10 (ng/ml)	239 (43.8%)
10-20 (ng/ml)	147 (26.9%)
> 20 (ng/ml)	125 (22.9%)
Gleason score (n = 530)	
< 7	216 (40.8%)
7	200 (37.7%)
> 7	114 (21.5%)

Table 2. Distribution of pathological results in 559 patients

Pathological stage	Number (%)
T2	291 (52.1)
T3	223 (39.9)
T4	16 (2.9)
No tumor (vanishing tumor)	29 (5.2)
No	401 (71.7)
N1	19 (3.4)

the most pathological stage was T2. Of 559 patients, 19 patients (3.4%) had lymphnode metastasis. The proportion of clinical localized and clinical locally advanced disease was 291:239 (54.9%:45.1%).

Oncological outcome

Table 3 shows the positive margin rates. The positive margin rate for all patients was 45.2%. The positive margin rates in pT2a-b, pT2c, pT3a, pT3b and pT4 were 13.2%, 34.7%, 65.9%, 72.7% and 76.9%, respectively. The presented data shows that pathological localized disease had significant lower positive margin rate than those of pathological locally advanced disease ($p < 0.001$).

The 3-year biological progression free survival rate for all patients was 87.2%. Of 559 patients, 135 patients who received immediate postoperative adjuvant hormonal therapy were excluded. Three-year biochemical progression free survival (bPFS) rates in pT2a-b, pT2c, pT3a, pT3b, and pT4 were 96.3%, 93% and 75%, 55.6% and 62.5% respectively as shown in Table 4. The authors found that 3-years bPFS in patients with pathological localized disease was significantly lower than those of pathological locally advanced disease (p-value = 0.001 log rank test); as shown in Fig. 1. Five patients died from prostate cancer.

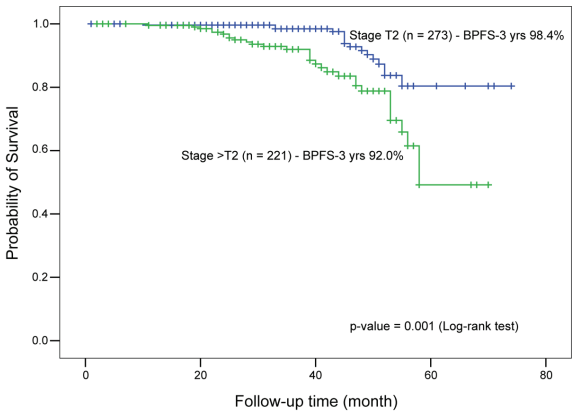

Fig. 1 Biological progression-free survival (bPFS) according to pathological stage

Functional outcome

Of 559 patients, 457 patients (81.8%) had available incontinence data. Three hundred eighty eight out of 457 patients (84%) were continent at 12 months (use of 1 pad or less daily). In the present study, 79 patients had good preoperative sexual function and had available postoperative potency data. Twenty-three out of 79 pre-operatively potent men (29.1%) who had a bilateral nerve-sparing

Table 3. Positive margin rate according to pT, Gleason score and PSA interval

Value	Positive margin/total (%)
p T	
2a-b	12/91 (13.2)
2c	61/176 (34.7)
3a	81/123 (65.9)
3b	48/66 (72.7)
4	10/13 (76.9)
Total	212/469 (45.2)
Gleason score	
< 7	65/213 (30.5)
7	85/175 (48.6)
> 7	49/81 (60.5)
Total	199/469 (42.4)
Range PSA	
0-4 (ng/ml)	9/35 (25.7)
4-10 (ng/ml)	77/239 (32.2)
10-20 (ng/ml)	64/147 (43.5)
20-30 (ng/ml)	27/48 (56.3)
30-40 (ng/ml)	17/26 (65.4)
40-50 (ng/ml)	12/15 (80)
> 50 (ng/ml)	25/36 (69.4)
Total	231/546 (42.3)

Table 4. Biological progression free survival and overall survival stratified by pathological stage

pT stage	Biological progression free survival (3 years)/total (%)	Number of death from Pca (person)
2a-b	78/81 (96.3)	
2c	159/171 (93)	1
3a	60/80 (75.0)	1
3b	10/18 (55.6)	2
4	5/8 (62.5)	1
Total	312/358 (87.2)	5

prostatectomy were potent within 12 months after surgery.

Discussion

Since 1997, laparoscopic radical prostatectomy (LRP) has been widely performed because of its minimal invasiveness and facilitated visualization during prostatic dissection. Various centers worldwide now regularly perform LRP and the early results show encouraging oncological and functional outcomes with low perioperative morbidity and complications. Siriraj Hospital has performed LRP since 2004 either transperitoneum or extraperitoneum approach, by seven surgeons. More than half of the presented cases were localized disease (pT2 = 52.1%, pT3 = 39.9% and pT4 = 2.9%). The oncological and functional outcome were evaluated in the present study.

The rate of positive surgical margins is related to many factors including a surgeon's experience. Disease extent is closely related to the incidence of positive margins. The presented data regarding positive margin rates showed inferior results to previous reports (the positive margin rates in pT2a-b, pT2c, pT3a, pT3b, and pT4 were 13.2%, 34.7%, 65.9%, 72.7%, and 76.9%)[10-12], but the positive margin rates were quite similar in the localized disease (pT2). The higher positive margin rate of Siriraj Hospital may be caused from the initial experience of various surgeons in Siriraj Hospital.

The culture of Thai people preferred surgery when they found prostate cancer even in clinical locally advanced or high-risk prostate cancer. The mean preoperative PSA in the present series was higher than those in the West. This caused a high proportion of pathological T3 prostate cancer and high positive margin in locally advanced disease. However, the authors usually discussed with the patients about combined therapy as radical prostatectomy with adjuvant radiation or adjuvant hormonal therapy. Most of the patients accepted this protocol before surgery.

Biological progression free survival describes the oncological success of radical prostatectomy. Our 3-year bPFS results were almost identical to previous reports of LRP[12,14,16]. The biological progression free survival rate depends on the pathological stage of disease. However, the present series needed long term follow-up.

The lack of standardization also exists in the evaluation of postoperative continence and potency. In the present study, 84% used no pad or one protective pad daily. In potency status, the authors only evaluated those men with normal erections preoperatively and who underwent a bilateral nerve-sparing operation. The presented potency rate (29.1%) at 12 months was acceptable.

Conclusion

The oncological and functional results of the authors' first LRPs in Thai men is acceptable and compared fairly well with the early experience of previous studies. However, longer follow-up is needed for further evaluation.

Potential conflicts of interest

None.

References

1. Reiner WG, Walsh PC. An anatomical approach to the surgical management of the dorsal vein and Santorini's plexus during radical retropubic surgery. J Urol 1979; 121: 198-200.
2. Guillonneau B, Vallancien G. Laparoscopic radical prostatectomy: the Montsouris technique. J Urol 2000; 163: 1643-9.
3. Schuessler WW, Schulam PG, Clayman RV, Kavoussi LR. Laparoscopic radical prostatectomy: initial short-term experience. Urology 1997; 50: 854-7.
4. Bollens R, Vanden Bossche M, Roumeguere T, Damoun A, Ekane S, Hoffmann P, et al. Extraperitoneal laparoscopic radical prostatectomy. Results after 50 cases. Eur Urol 2001; 40: 65-9.
5. Guillonneau B, Rozet F, Barret E, Cathelineau X, Vallancien G. Laparoscopic radical prostatectomy: assessment after 240 procedures. Urol Clin North Am 2001; 28: 189-202.
6. Hoznek A, Salomon L, Olsson LE, Antiphon P, Saint F, Cicco A, et al. Laparoscopic radical prostatectomy. The Creteil experience. Eur Urol 2001; 40: 38-45.
7. Guillonneau B, Rozet F, Cathelineau X, Lay F, Barret E, Doublet JD, et al. Perioperative complications of laparoscopic radical prostatectomy: the Montsouris 3-year experience. J Urol 2002; 167: 51-6.
8. Sulser T, Guillonneau B, Vallancien G, Gaston R, Piechaud T, Turk I, et al. Complications and initial experience with 1,228 laparoscopic radical prostatectomies at 6 European centers. J Urol 2001; 165: A615.
9. Turk I, Deger S, Winkelmann B, Schonberger B,

Loening SA. Laparoscopic radical prostatectomy. Technical aspects and experience with 125 cases. Eur Urol 2001; 40: 46-52.
10. Rassweiler J, Stolzenburg J, Sulser T, Deger S, Zumbe J, Hofmockel G, et al. Laparoscopic radical prostatectomy-the experience of the German Laparoscopic Working Group. Eur Urol 2006; 49: 113-9.
11. Rozet F, Galiano M, Cathelineau X, Barret E, Cathala N, Vallancien G. Extraperitoneal laparoscopic radical prostatectomy: a prospective evaluation of 600 cases. J Urol 2005; 174: 908-11.
12. Guillonneau B, el Fettouh H, Baumert H, Cathelineau X, Doublet JD, Fromont G, et al. Laparoscopic radical prostatectomy: oncological evaluation after 1,000 cases a Montsouris Institute. J Urol 2003; 169: 1261-6.
13. Klein EK, Platz EA, Thompson IM. Diagnosis and staging of prostate cancer. In: Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA, editors. Campbell-Walsh urology. 9th ed. Philadelphia: WB Saunders; 2007: 2912-46.
14. Salomon L, Levrel O, de la TA, Anastasiadis AG, Saint F, Zaki S, et al. Radical prostatectomy by the retropubic, perineal and laparoscopic approach: 12 years of experience in one center. Eur Urol 2002; 42: 104-10.
15. Rassweiler J, Schulze M, Teber D, Marrero R, Seemann O, Rumpelt J, et al. Laparoscopic radical prostatectomy with the Heilbronn technique: oncological results in the first 500 patients. J Urol 2005; 173: 761-4.

การผ่าตัดแบบส่องกล้องในมะเร็งต่อมลูกหมาก: ผลการรักษาภายหลังการผ่าตัดของผู้ป่วย 559 คน ที่ผ่าตัดที่โรงพยาบาลศิริราช

พิสัยพันธุ์ วัตตะยัง, ไชยยงค์ นวลยง, สุนัย ลีวันแสงทอง, สิทธิพร ศรีนวลนัด, ธวัชชัย ทวีมั่นคงทรัพย์, บรรณสิทธิ์ ไชยประสิทธิ์, ธีระพล อมรเวชสุกิจ, กิตติพงษ์ พินธุโสภณ, ศิรส จิตประไพ, บัญชา ทิพย์ถิระพงศ์, พิชัย ศุจิจันทรรัตน์, สุชาย สุนทราภา

วัตถุประสงค์: *ศึกษาถึงผลการรักษาภายหลังการผ่าตัดแบบส่องกล้องในมะเร็งต่อมลูกหมากของโรงพยาบาลศิริราช ในระยะเวลา 5 ปีที่ผ่านมาในแง่ของการดำเนินโรคของมะเร็ง (oncological outcome) และคุณภาพชีวิตของผู้ป่วยภายหลังการผ่าตัด (functional outcome)*

วัสดุและวิธีการ: *ผู้ป่วยทั้งหมด 559 คน ผู้ซึ่งได้รับการผ่าตัดแบบส่องกล้องในมะเร็งต่อมลูกหมาก ที่โรงพยาบาลศิริราช โดยศัลยแพทย์ทั้งหมด 7 คน ระหว่างกันยายน พ.ศ. 2547 ถึง กันยายน พ.ศ. 2552 โดยเป็นการศึกษาแบบย้อนหลังถึงผลการผ่าตัดในแง่ของการดำเนินโรคของมะเร็ง และคุณภาพชีวิตของผู้ป่วยภายหลังการผ่าตัดโดยข้อมูลได้รับการรวบรวมและวิเคราะห์*

ผลการศึกษา: *การกระจายระยะของโรคในการศึกษานี้ มีระยะที่ 2, 3 และ 4 เท่ากับ 52.1%, 39.9% และ 2.9% ตามลำดับ พบการกระจายไปที่ต่อมน้ำเหลือง 3.4% อัตราการพบเซลล์มะเร็งที่ขอบของต่อมลูกหมากในระยะ 2a-b, 2c, 3a, 3b และระยะ 4 เป็น 13.2%, 34.7%, 65.9%, 72.7% และ 76.9% ตามลำดับ อัตราการปลอดโรค โดยดูจากค่า PSA ที่เวลา 3 ปี (biological progression free survival) ในระยะ 2a-b, 2c, 3a, 3b และระยะ 4 เป็น 96.3%, 93%, 75%, 55.6% และ 62.5% ตามลำดับ โดยในแง่ของคุณภาพชีวิตของผู้ป่วยภายหลังการผ่าตัด (functional outcome) พบว่าอัตราการกลั้นปัสสาวะได้ที่ระยะเวลาหนึ่งปีเท่ากับ 84% และอัตราการแข็งตัวได้ของอวัยวะเพศในกลุ่มที่ได้รับการผ่าตัดแบบเก็บรักษาเส้นประสาททั้งสองข้างเท่ากับ 29.1%*

สรุป: *ผลการศึกษาภายหลังการผ่าตัดแบบส่องกล้องในมะเร็งต่อมลูกหมากในแง่ของการดำเนินโรคของมะเร็ง (oncological outcome) และคุณภาพชีวิตของผู้ป่วยภายหลังการผ่าตัด (functional outcome) อยู่ในเกณฑ์ที่ยอมรับได้ และมีผลลัพธ์ที่ใกล้เคียงกับการศึกษาที่อื่น ๆ อย่างไรก็ตามการเก็บข้อมูลในระยะยาวยังต้องมีการศึกษาเพิ่มเติมต่อไป*