Laparoscopic Radical Prostatectomy: Preliminary Result of Thailand Series

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Objectives: *Several published series from Western countries have demonstrated that laparoscopic radical prostatectomy is a safe and feasible approach to the management of localized prostate cancer. The authors report the initial experience with the first 56 cases of laparoscopic radical prostatectomy.*
Material and Method: *Between June 2001 and November 2005, 56 patients with clinically localized prostate cancer underwent transperitoneal laparoscopic radical prostatectomy. Their mean (range) age was 64.98 (50-77) years, prostate specific antigen (PSA) level was 9.92 (2.1-33.8) ng/ml, and Gleason sum was 6.28 (3-8).*
Results: *Complete laparoscopic removal of the prostate was achieved in 47 cases and conversions to open surgery were needed in 9 cases. The mean (range) operating time was 350 (200-750) min. and blood loss was 883 (200-2050) ml. The transfusion rate was 27.6%. Laparoscopic pelvic lymphadenectomy was done in 31 cases and all were negative. The positive surgical margin rate was 29.8%. There were 20 postoperative complications; catheter dislodged (2), urine leakage more than 2 weeks (5), peroneal nerve numbness (1), flank hematoma (1), pelvic collection (1), late recto-urethral fistula (1), anastomotic stricture (2), port site hernia (1), and inguinal hernia (6). Median catheter time was 7 (6-90) days. The complete continence rate at 3, 6 and 12 months were 27.7%, 55.9% and 72.2%.*
Conclusion: *Laparoscopic radical prostatectomy is a demanding procedure that is a feasible option for the surgical treatment of localized prostate cancer. Intraoperative results were improved once experience was gained. Some parameters of the present results, i.e. transfusion rate, positive surgical margin and continence rate were still inferior compared to those reported by other centers.*

Keywords: *Prostate cancer, Laparoscopy, Radical prostatectomy, Laparoscopic radical prostatectomy*

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Although the open retropubic radical prostatectomy is still considered to be the gold standard treatment for localized prostate cancers, laparoscopic radical prostatectomy has gained more popularity use in many centers as an alternative choice for patients[2-4]. The reasons for becoming more popular of this laparoscopic procedure are as follows: minimally invasive approach provides less pain and fast recovery, the magnifying effect of the optical equipment allows for an excellent identification of details and structures enabling a better sparing of important muscular and neurovascular structures. The open retropubic radical prostatectomy has been adopted to treat men with localized prostate cancer in our center since 1992. In order to offer minimal invasive surgical treatment to our standard care, the authors started laparoscopic radical prostatectomy procedures in 2001. However, the number of cases was only 2-3 in the first 3 years and just became more active in the late 2005. Herein, the authors report the preliminary experience of laparoscopic radical prostatectomy in the presented center, which is the first series in Thailand.

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Material and Method

Between June 2001 and November 2005, 56 patients with clinically localized and TRUS Bx proved

prostate cancer underwent laparoscopic radical prostatectomy in Siriraj Hospital. The mean age of the patients was 64.98 years (50-77). The mean preoperative PSA was 9.92 ng/ml (2.1-33.8). The mean Gleason score was 6.28 (3-8). Pelvic lymphadenectomy was performed in patients with PSA > 10 ng/ml or Gleason score > 7. A nerve sparing technique was considered in patients who were potent prior to surgery. A bilateral nerve sparing was performed if the PSA < 10 ng/ml, and no palpable nodule appeared on digital rectal examination. If the PSA < 10 ng/ml but there was a unilateral nodule, the neurovascular bundle was preserved only on the opposite side. However the nerve sparing procedure was abandoned if the dissection plane was difficult especially in cases which had a history of severe prostatitis after prostate biopsies, and this was informed to the patient prior to surgery.

Operative technique

The patient is placed in the extreme trendelenburg position with the television monitor at the end of the legs. A foley catheter is inserted. Trans-peritoneal approach is used and laparoscopic access is provided with five trocars (Fig. 1). The first 10 mm. trocar is placed with open technique infraumbilically and is used for optical port. 0 laparoscope is used mainly except in some cases for bladder neck dissection in which case more angles of vision are needed, then the 30 lens is replaced. The secondary trocars were placed under laparoscopic control. The first five cases were started with incising the pouch of Douglas to mobilize the vases and seminal vesicles before opening up the prevesical and retropubic space as described by the Montsuris technique[5]. After these 5 cases, the technique was changed to directly opening the prevesical and retropubic space, and followed by the next steps. After the endopelvic fascias were incised on both sides, the lateral sides of the prostate were dissected to expose the prostatic apex. The puboprostatic ligaments were sectioned and the dorsal venous complex was sutured ligated with vicryl suture no.0 but still not transected. The bladder neck was identified and incised anteriorly. With the aid of magnification, the bladder neck preservation was permitted. The balloon of the foley catheter was then deflated, the tip of the catheter was lifted and the circumferential division of the bladder neck was accomplished. After transecting the posterior bladder neck, the anterior Denonvillier fascia was incised and the previously freed seminal vesicles were met (as in the first five cases). If the vases and seminal vesicles were still not dissected at the beginning, they were dissected free from surrounding tissue, grasped and upwardly tracted to identify the lateral pedicles which were either clipped or cauterized by bipolar forceps and transected. If nerve sparing was planned, the dissection was accomplished with scissors, bipolar forceps and metalic clips. When the prostate was dissected free from surrounding tissue except for the attachment to the urethra, recto-urethralis muscle and dorsal venous complex, the dorsal venous complex which was ligated at the beginning, was then divided, and the urethra and recto-urethralis muscle were transected consecutively. Prostate was put in the endobag and placed in the left iliac region for later removal. Then the urethro-vesical anastomosis was performed with either interrupted or running technique[6]. Foley catheter no.18F was inserted and the anastomosis was checked with 150 ml of saline for water tightness. Suction drain was placed and the endobag with the prostate inside was removed via the extended umbilical port wound. Cystography was done routinely on day 7, and the catheter was removed if there was no leakage. The results were presented in the frequency distribution tables with number, percentage, mean, range and median where appropriated.

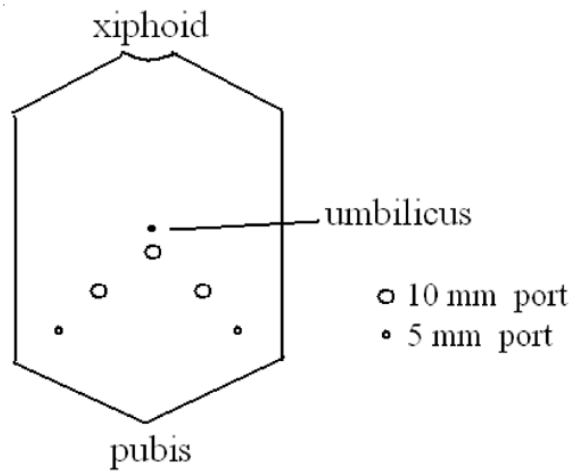

Fig. 1 Port position

Results

The number of laparoscopic radical prostatectomies in each year is shown in Table 1. Of the total 56 patients, 47 had prostate removed successfully by laparoscopy and 9 required conversions to open surgery. Causes of conversion are listed in Table 2. Most conversions occurred in early cases except for the last patient in the late part of the series who developed

unexplained cardiac sinus pause for 4 seconds intraoperatively and the conversion was made mainly due to anesthetist's uneasiness. The intra and post operative results including pattern of learning curve are listed in Table 3. The mean operating time was 350 min (200-750 min). The mean blood loss was 883.57 ml (200-205 ml) with the transfusion rate of 27.6%. Neurovascular bundles were preserved in 13 cases which were bilateral preservation in 2 cases and the rest of these were unilateral preservation. The median time for catheter-indwelling was 7 days (6-90 day). The operative time, blood loss and the duration of catheter time were improved as experience was gained. The authors encountered 20 surgical complications as listed in Table 4. Urine leakage that persisted for more than 2 weeks occurred in 5 patients. Of these, 2 stopped after prolonged urethral catheter indwelling, 2 needed suprapubic cystostomy to stop leakage and the last one required bilateral percutaneous nephrostomy for 24 days due to very close ureteric orifices to the anastomosis and the leakage was finally uneventful by conservative measure. There were two patients who developed anastomotic stricture in the present series. One required only a single time of optical urethrotomy and the other one required two dilations to alleviate the anastomotic stricture. One patient presented with urinary tract infection and pneumaturia 3 weeks postoperatively and small recto-urethral fistula was diagnosed and spontaneously healed subsequently. One incisional hernia at the umbilical port wound and 6 inguinal hernias were found after 2 months postoperatively which were all finally repaired surgically.

The mean prostatic weight was 44 gm (9.8-100). The pathologic results are listed in Table 5. The authors demonstrated pT1b tumors in 1 patient (2.1%), pT2b tumor in 12 patients (25.5%), pT2b tumors in 22 patients (46.8%), pT2c tumor in 1 patient (2.1%), pT3a tumor in 3 patients (6.4%), pT3b tumors in 5 patients (10.6%) and pT3c tumor in 3 patients (6.4%). Pelvic lymph node dissections were done in 31 cases and all of them were negative for metastasis. Overall, positive surgical margin rate was 31.9% and were stratified as 25.7% in pT2 and 54.5% in pT3. With a median time follow-up of 9.06 months (range 3-54), the percentage of serum PSA below 0.1 ng/ml at 3, 6 and 12 months were 89.4% (42/47), 87.9% (29/33) and 92.9% (13/14)

Table 1. Number of laparoscopic radical prostatectomy in each year (n = 56)

2001	2002	2003	2004	Nov. 2005
2	2	2	12	38

Table 2. Causes of convesion (n = 9)

Cause (s)	N
Misunderstood that subcutaneous emphysema was pulmonary congestion	1
Inadequate resection	1
No progression	3
Uncontrolled bleeding from dorsal venous complex	1
Wide bladder neck from large median lobe	1
Unstable cardiac status	2

Table 3. Intra and post operative results including pattern of learning curve after laparoscopic radical prostatectomy (n = 47)

Data	Mean (Range)	1-15	16-30	31-47
Operative time (min)	350 (200-750)	453	320	285
Blood loss (ml)	883 (200-2050)	818	1060	785
Catheter time (days)	7* (6-90)	18	9.3	8.6
Postoperative hospital stay (days)	8* (7-30)	10.2	9.6	10.6

* median value

Table 4. Postoperative 20 complications after laparoscopic radical prostatectomy

Complication	N	Therapy
Catheter dislodged	2	Uneventful reinsertion
Peroneal nerve numbness	1	Conservative therapy with spontaneous
Flank hematoma	1	Conservative therapy with spontaneous
Pelvic collection	1	Antibiotics therapy
Urine leakage (>2 weeks)	5	- Prolonged urethral catheter in 4 cases - Suprapubic cystostomy in 2 cases - Bilateral nephrostomy insertion in 1 case
Late recto-urethral fistula	1	Conservative therapy with spontaneous healed
Anastomotic stricture	2	- Optical urethrotomy in 1 case - Urethral dilation in 1 case
Port-site hernia	1	Surgical repair
Inguinal hernia	6	Surgical repair

Table 5. Pathological stages and positive surgical margins

Pathological stages	N	Positive surgical margins		
		N	%	
pT1b	1	-	-	
pT2a	12	3	25.0	25.7
pT2b	22	6	27.2	
pT2c	1	-	-	
pT3a	3	1	33.3	
pT3b	5	2	40.0	54.5
pT3c	3	3	100	
Total	47	15	29.8	

respectively and this included patients with positive margin.

The data on at least 3 months follow-up for urinary continence were available in all patients. The complete continence rate at 3, 6 and 12 months were 27.7% (13/47), 55.9% (19/34) and 72.2% (13/18) consecutively. The complete continence was defined as no pad required in 24 hrs. The potency outcomes in neurovascular bundle preserving cases were still too early due to short follow-up.

Discussion

Though Schuessler reported the first laparoscopic radical prostatectomy series in 1997[7] and concluded that the procedure had no benefit over open retropubic radical prostatectomy due to long operative time, some centers in Europe still pursued this challenge. Two years later Guilloneau et al reported the feasibility and good benefit in terms of decreasing operative morbidity of laparoscopic radical prostatectomy and since then many reports have come out to confirm these advantages[9-11]. In 2002 Guillonneau et al reported a series of 567 patients which stated that laparoscopic access has lower morbidity than open retropubic surgery[12]. Furthermore, the same authors in 2003 reported the oncological results in a series of 1,000 cases and concluded that the laparoscopic radical prostatectomy offers satisfactory results in oncological aspect which is comparable to its open technique counterpart[4].

Although laparoscopic radical prostatectomy was commenced in 2001 in our center, the number of cases was still sporadic for the first three years (Table 1). The reasons were that PSA test had been introduced to our practice for only a decade, the localized prostate cancer detection had just become sharply increased over the last 2-3 years, and the authors were just about comfortable with open retropubic radical prostatectomy. Therefore, once the authors were confident with

Table 6. Comparison of the present series to the world's series

	Rassweiler et al[10] (n = 180)	Turket et al[11] (n = 125)	Dahl et al[12] (n = 70)	Present series (n = 47)
Operative time (min)	270	265	274	350
Operative blood loss (ml)	1230	185	449	883
Transfusion rate (%)	31	2	10	27.6
Catheter time (day)	7	12	NS	7

the open technique and gained experience in laparoscopy together with increasing an incidence of localized prostate cancer, our numbers of laparoscopic radical prostatectomy had risen.

Among 9 conversion cases, 8 were at the beginning of the series. The last conversion case was due to unexplained sinus pause heart-beat and though no technical problem was encountered, open surgery was needed to alleviate the anesthetist's tension for the remainder of the procedure.

The presented operative time, blood loss and catheter time were improved when experience was gained (Table 3). However all of these parameters were still inferior compared to many series in the literature except from Rassweiler's one (Table 6). It should be noted that the ascending dissection technique was used in Rassweiler's series whereas, the present series and other's used the descending technique. The catheter time in the present series was comparable to most of the other series.

Most complications in the present series were minor. Urine leakage persisting more than 2 weeks was resolved by prolonged catheter drainage except in one case that required a month of bilateral percutaneous nephrostomy to correct the leakage that was caused by close distance between the ureteric orifices and the anastomosis. After that, it was the authors' policy to repair the bladder neck in inverted tennis racquet as in open surgery in such a case before making the urethrovesical anastomosis to prevent inclusion of the orifice into the suture line and the authors never encountered this problem again. Though there was no intraoperative rectal injury in the present series, the authors found late urethro-rectal fistula occurring 3 weeks postoperatively in one case which was resolved by conservative measures. This late fistula was suspected to be caused by rectal necrosis secondary to excessive intraoperative coagulation as reported by Rozet et al[14]. Therefore, cauterization should be carefully applied if needed during posterior dissection especially at the prostatic apex.

From the oncological point of view, it is still too early to state the long term results from the present series. The authors' overall positive surgical margin rate of 29.8% is slightly high compared to many series which are reported to be 11.4%- 26.4%[2,4,11,13,15]. Furthermore, when positive surgical margin rate were selected in pT2 only, the figure of 25% is still high compared to 15.5%-16.8% from other reports and this result certainly needs to be improved. However, after a median time follow-up of 9.06 months (range 3-54), the percentage of serum PSA below 0.1ng/ml at 3, 6 and 12 months were 89.4% (42/47), 87.9% (29/33) and 92.9% (13/14) respectively and this also included patients with positive margins. This indicates quite a favorable result. Again, from the oncological point of view, the presented follow-up is too short.

Although laparoscopy gives a magnified view and good access which theoretically will enhance apical and urethral dissection to get benefit of continence. However, the present result in continence rate seems to be low compared to other series. The complete continence rate at 12 months was only 72.2% while other reports are 86.2%- 90.3%[2,15,16]. This data challenges the authors to improve the surgical technique during apical dissection and urethral transection aiming to preserve the length and sphincteric elements of the urethra in the next following cases. It should be noted that the good result of urethra-vesical anastomosis indicated by the median time for catheter indwelling of only 7 days and low number of patients who have urine leakage for more than 2 weeks might not be the main factor that plays a role in the urine continence rate in the present series.

Conclusions

Laparoscopic radical prostatectomy is a demanding procedure, but a feasible treatment option for localized prostate cancer. The operative time, blood loss and catheter indwelling time were improved with experience. Positive surgical margin and continence rate were slightly higher compared to other series and

these certainly need further improvement. The authors were able to establish this procedure as an alternative treatment to the open surgery counterpart for localized prostate cancer in our center.

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การผ่าตัดต่อมลูกหมากโดยใช้กล้องผ่านหน้าท้อง:รายงานผลการรักษาระยะเริ่มแรกในประเทศไทย

ไชยยงค์ นวลยง, สิทธิพร ศรีนวลนัด, ธวัชชัย ทวีมั่นคงทรัพย์, ธีระพล อมรเวชสุกิจ

วัตถุประสงค์: *มีรายงานทางวิชาการหลายฉบับจากประเทศทางตะวันตกที่บ่งบอกว่า การผ่าตัดต่อมลูกหมากโดยใช้กล้องผ่านหน้าท้อง สามารถทำได้ และมีความปลอดภัยในการรักษามะเร็งต่อมลูกหมากที่ยังไม่กระจาย ในที่นี้ผู้เขียนขอนำเสนอประสบการณ์ในระยะแรกของการผ่าตัดต่อมลูกหมากโดยใช้กล้องผ่านหน้าท้อง ในผู้ป่วย 56 ราย*

วัสดุและวิธีการ: *ตั้งแต่เดือนมิถุนายน พ.ศ. 2544 จนถึงเดือนพฤศจิกายน พ.ศ. 2548 มีผู้ป่วย 56 รายที่เป็นมะเร็งต่อมลูกหมากระยะต้น ซึ่งวินิจฉัยโดยการเจาะเนื้อต่อมลูกหมากโดยใช้อัลตร้าซาวนด์ ได้รับการผ่าตัดต่อมลูกหมากโดยใช้กล้องผ่านหน้าท้อง ค่าเฉลี่ยของอายุคนไข้เท่ากับ 64.98 (50-77) ปี ค่าเฉลี่ยของ prostate specific antigen (PSA) เท่ากับ 9.92 ng/ml (2.1-33.8) และค่าเฉลี่ยของ gleason sum เท่ากับ 6.28 (3-8)*

ผลการศึกษา: *ในผู้ป่วยทั้งสิ้น 52 ราย มีผู้ป่วยที่ได้รับการผ่าตัดสำเร็จ 47 ราย และมี 9 รายที่จำเป็นต้องเปลี่ยนเป็นการผ่าตัดเปิด ค่าเฉลี่ยของเวลาในการผ่าตัด เท่ากับ 350 นาที (200-750), ค่าเฉลี่ยของการเสียเลือด เท่ากับ 883 ซีซี (200-2050), อัตราการให้เลือด เท่ากับ 27.6%, มีผู้ป่วย 37 ราย ที่ได้รับการเจาะต่อมน้ำเหลืองในอุ้งเชิงกรานและผลการตรวจทางพยาธิวิทยา ไม่มีการกระจายของมะเร็งไปที่ต่อมน้ำเหลืองเลย อัตราของการพบมะเร็งที่ขอบนอกของต่อมลูกหมากที่ได้รับการตัด เท่ากับ 29.8% มีข้อแทรกซ้อนทั้งหมด 20 ราย ได้แก่ สายสวนปัสสาวะหลุดก่อนกำหนด 2 ราย, การรั่วซึมของน้ำปัสสาวะหลังการผ่าตัดมากกว่า 2 อาทิตย์ 5 ราย, มีอาการชาที่เส้นประสาท peroneal 1 ราย, มีการคั่งค้างของเลือดที่บริเวณเอว 1 ราย, มีการคั่งของน้ำเหลืองในอุ้งเชิงกราน 1 ราย, พบรูรั่วระหว่างท่อปัสสาวะและทวารหนักหลังการผ่าตัด 1 ราย, มีการตีบแคบของรอยต่อระหว่างท่อปัสสาวะกับกระเพาะปัสสาวะ 2 ราย, มีไส้เลื่อนที่แผลเจาะรูหน้าท้อง 1 ราย, มีไส้เลื่อนที่ขาหนีบ 6 ราย, ค่าเฉลี่ยของการคาสายสวนปัสสาวะหลังผ่าตัด เท่ากับ 7 วัน (6-90), อัตราการกลั้นปัสสาวะได้ที่ระยะ 3, 6 และ 12 เดือน หลังผ่าตัด เท่ากับ 27.7%, 55.9% และ 72.2%*

สรุป: *การผ่าตัดมะเร็งต่อมลูกหมากโดยใช้กล้องผ่านหน้าท้อง เป็นการผ่าตัดที่ยาก แต่ถือเป็นทางเลือกหนึ่งที่สามารถทำได้ เพื่อใช้ในการรักษามะเร็งต่อมลูกหมากระยะต้น ผลของการผ่าตัดจะดีขึ้นเรื่อย ๆ เมื่อผู้ทำผ่าตัดมีประสบการณ์มากขึ้น ในรายงานฉบับนี้ อัตราในการให้เลือด, อัตราในการพบมะเร็งที่ขอบนอกของต่อมลูกหมากที่ถูกตัดออก และอัตราในการกลั้นปัสสาวะได้หลังผ่าตัดยังด้อยกว่าเมื่อเปรียบกับหลายรายงาน*