

Case Report

Laparo-Endoscopic Single Site (LESS) Robotic Radical Prostatectomy in An Asian Man with Prostate Cancer: An Initial Case Report

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Objective: To report the feasibility of laparo-endoscopic single site (LESS) robotic radical prostatectomy performed in Asian man.

Material and Method: A 71 year-old man with adenocarcinoma of prostate presented at Faculty of Medicine Siriraj Hospital, Bangkok. Prostate-specific antigen level was 16.5 ng/ml and digital rectal examination approximately showed 30 gram prostate with nodule in both lobes. No clinical metastasis was found. Leuprorelin acetate and 50 mg of bicalutamide were used for 3 months. The patient's body mass index was 22 and healthy. With the consent form signed, laparo-endoscopic single site (LESS) robotic radical prostatectomy was performed with the robot daVinci S system.

Results: The total operative time was 335 minutes; docking time was 12 minutes; console time was 275 minutes. The estimate blood loss was 250 ml and no blood transfusion required. No intraoperative or post-operative complication was found. Jackson drain was removed within 60 hours after surgery. The patient was discharged from the hospital within 84 hours after surgery. The urethral catheter was removed within 14 days after surgery.

Conclusion: Laparo-endoscopic single site (LESS) robotic radical prostatectomy is feasible to be performed. In the initial experience, patient selection is required.

Keyword: Prostate neoplasm, Radical prostatectomy, Laparo-endoscopic single site surgery, Robotic surgery

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Radical prostatectomy for prostate cancer is now a more common operation in Thailand. There are 3 available types of radical prostatectomy; open retropubic radical prostatectomy, laparoscopic radical prostatectomy and robotic radical prostatectomy. Many centers in Thailand perform radical prostatectomy routinely both open and laparoscopic surgery. Usually, laparoscopic radical prostatectomy and robotic radical prostatectomy were standard technique with 5 to 6 instrument ports. At present, laparoendoscopic single site (LESS) surgery was introduced in urology^(1,2). Most

of LESS urological surgeries were performed in the upper urinary tract or benign prostatic condition^(1,2). For radical prostatectomy to treat prostate cancer, LESS surgery is very few in the literature⁽¹⁻³⁾. All LESS radical prostatectomy reported were performed in Western countries to the authors' best knowledge, there is no report from Asia. Since the authors' institute has a team with experience of both standard laparoscopic radical prostatectomy and standard robotic radical prostatectomy, the authors started performing LESS robotic radical prostatectomy in a Thai man.

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Material and Method

A 71 year-old man with symptoms of lower urinary tract symptoms (LUTS) and prostate-specific antigen (PSA) level of 16.5 ng/ml presented at Siriraj

Hospital, Bangkok. Digital rectal examination (DRE) approximately showed 30 gram prostate with nodule in both lobes. Transrectal ultrasound guided prostatic biopsy was done and the pathology showed adenocarcinoma gleason (4 + 4) both lobes. No clinical metastasis was found in imaging study of CT scan and bone scan. Clinical T3 was diagnosed. The patient was informed of the options of therapies of surgery, radiation, androgen deprivation therapy or combined therapy as well as the side effects of each therapy. During decision making, the patient received androgen deprivation of 3.75 mg of leuporelin acetate and 50 mg of bicalutamide once a day for 3 months. DRE after androgen deprivation showed a smaller prostate gland. Finally, the patient decided to have radical prostatectomy combined with hormonal therapy. The patient's body mass index was 22 and healthy. Discussion of the method and the risks for radical prostatectomy were introduced. The patient selected the new method of LESS robotic radical prostatectomy. With the consent form signed, LESS robotic radical prostatectomy was performed on October 26, 2009 in the Division of Urology, Department of Surgery, Faculty of Medicine Siriraj Hospital. The robotic machine used was daVinci S system.

Surgical technique

The patient was placed in lithotomy and Trendelenburg position. Cystoscopy was done to examine the anatomy of prostate, bladder neck and bladder wall and to exclude other conditions. Transverse lower half cycle incision of 4.5 cm was placed just below the umbilicus. Four ports were intraperitoneally inserted as shown in Fig. 1. Surgeon controlled 3 robotic arms which were a 12 mm port for camera and two of 8 mm ports for right hand and left hand control. The fourth port was 5 mm for suction by an assistant doctor. Then three robotic ports were docked as shown in Fig. 2. Then the surgeon performed the procedure the same as the standard robotic radical prostatectomy technique with 5 or 6 ports. The procedure was intraperitoneal approach with antegrade prostatic dissection technique as the following.

First step was creation of a retropubic space and dissection anterior surface of prostate gland and anterior surface of the bladder.

Second step was cutting endopelvic fascia and dissection of lateral surface of prostate gland.

Third step was division of the bladder neck and prostate gland from the anterior to posterior urethra and dissection of vas deferens and seminal vesicles.

Fourth step was cutting denonvilliers' fascia and dissection of the posterior surface of the prostate from the rectum.

Fifth step was division of the dorsal vein and urethra and removal of the prostate gland.

Sixth step was anastomosis of the bladder and urethra with monocryl 3-0 using running technique with urethral catheter inside.

Seventh step was removal of the prostate gland and bilateral seminal vesicles and then Jackson drain insertion via single site skin incision.

Eighth step was suturing the abdominal sheath and skin as shown in Fig. 3.

Results

The laparoendoscopic single site robotic radical prostatectomy was successfully performed without an additional port or conversion to standard robotic radical prostatectomy. The total operative time was 335 minutes; docking time was 12 minutes; console

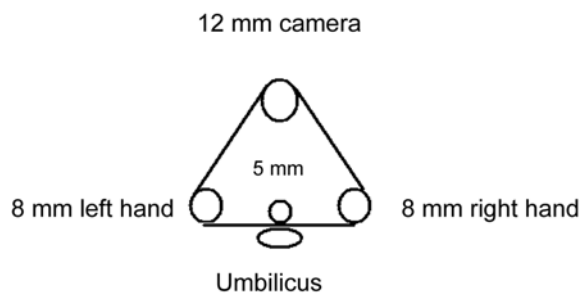


Fig. 1 Diagram shows port position of LESS robotic radical prostatectomy



Fig. 2 Robotic arms and instrument positions for LESS robotic radical prostatectomy

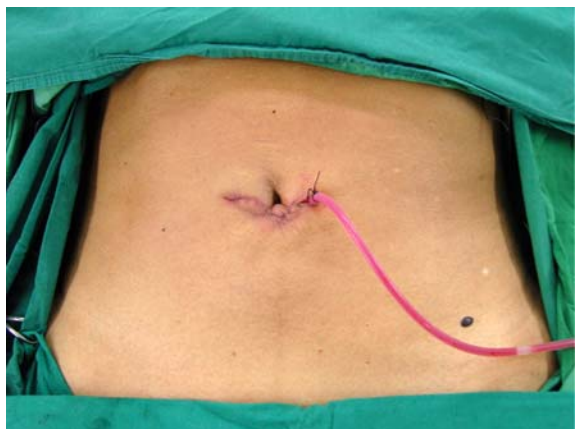


Fig. 3 Skin incision and Jackson drain of LESS robotic radical prostatectomy

time was 275 minutes. The estimate blood loss was 250 ml and no blood transfusion was required. No intraoperative complication was found. The prostate gland weight was 25 gm since he received androgen deprivation for 3 months before surgery. The patient had a fast recovery. He could ambulate and had diet within 24 hours. He received 2 doses of 5 mg morphine at 6 and 12 hours after surgery. After the postoperative time of 12 hours, the patients had not received any pain controlled medicine. Jackson drain content was less than 100 ml per a day and was removed within 60 hours after surgery. The patient was discharged from the hospital within 84 hours after surgery. There was no postoperative fever or other complications. Total hospital stay was 4 days. The urethral catheter was removed in 14 days after surgery.

The pelvic lymphadenectomy was not performed in this patient since there was no pelvic lymph node enlargement at the locations between the internal iliac vein and obturator nerve. The pathology showed pathological T3c gleason 9 with presence of tumor regression after hormonal therapy. Androgen deprivation was continued for combined therapy as discussed before surgery.

Discussion

Radical prostatectomy is more common in Asia including Thailand. It is the procedure that has been changed for two decades. From open retropubic radical prostatectomy⁽⁴⁾ to laparoscopic radical prostatectomy⁽⁵⁾ and then robotic assisted laparoscopic radical prostatectomy⁽⁶⁾, today novel technique with the use of laparo-endoscopic single site (LESS)

surgery was introduced. Several centers in urology reported LESS in the literature^(1,2). However, most of them were surgery of the upper urinary tract. For radical prostatectomy, there are very few cases reported and all of them were in Western countries. At present, there has been no report of LESS radical prostatectomy from Asia. Thus, the authors reported LESS robotic radical prostatectomy that was firstly undertaken in a Thai man at the Faculty of Medicine Siriraj Hospital.

In the literature, surgeons who were experienced with LESS radical prostatectomy indicated that LESS radical prostatectomy for prostate cancer was very difficult with a lot of limitations of using instruments when compared to LESS surgery of kidney or benign prostatic hyperplasia^(1,2). However, LESS radical prostatectomy was feasible. The authors decided to start LESS robotic radical prostatectomy since the authors had experience of radical prostatectomy in both laparoscopic radical prostatectomy and robotic radical prostatectomy. The authors thought that the wrist angle of the daVinci system could solve the limitation of instrument movement since the locations of instrument ports in the single site were very close to each other. After the authors designed the port locations and used in laboratory box, the authors found that it was feasible and then the authors start on the patients. The authors successfully performed on the first attempt. The operative time was significantly longer than the standard technique. However, the console time of 275 minutes was not too long for the first case. Blood loss was 250 ml and no blood transfusion was required. The presented data in the Asian man agreed that LESS robotic radical prostatectomy was feasible to do in the hands of an experienced team in laparoscopic radical prostatectomy and robotic radical prostatectomy. In addition, there was no complication in both during operation and postoperative period. The patient was discharged from the hospital within 4 days after surgery.

There are several issues to be considered within the initial experience. First, LESS robotic radical prostatectomy requires patient selection. The authors' first patient had a body mass index 22 which was suitable to do. Secondly, the prostate volume should not be large. In this patient, prostatic weight was 25 gm. The authors thought that it would be more difficult to perform in a patient with a large prostate. Thirdly, the surgeon needs practice in the laboratory box model or in a cadaver model since hand movement control by the surgeon was different from the standard robotic

radical prostatectomy technique although the method of dissection and anastomosis were the same.

There was a question of crushing of the instruments in LESS robotic radical prostatectomy. Several surgeons indicated this was a problem when performing this procedure^(3,7). The authors' experience had the same problem. Crushing of instruments occurred many times both inside and outside the abdominal cavity. The authors found that the crushing would be less when the surgeon had more experience of instrument movement direction control.

The objective of the present report was to assess the feasibility of laparoendoscopic single site (LESS) robotic radical prostatectomy performed in an Asian man. The presented data showed the results of operative and early postoperative period as a case report. The results of long term effect and cancer control are needed to be further evaluated in a larger number of patients. In the presented patient, clinical T3 was diagnosed and the option therapy was combined therapy of radical prostatectomy and androgen deprivation therapy. After surgery, the pathological stage is the same. Thus, combined therapy was continued. Long term follow-up is needed.

At present, although laparoscopic radical prostatectomy and robotic radical prostatectomy are the standard operation and widely used around the world, LESS radical prostatectomy is still a difficult procedure. Only a few centers have reported the feasibility of this operation. This new method needs a high experienced surgical team to perform within the limitation of instruments that are available today. The authors believe that if there are more suitable instrument designs, LESS robotic radical prostatectomy may become a standard technique and be widely used.

Conclusion

Laparo-endoscopic single site (LESS) robotic radical prostatectomy is feasible to be performed. In the initial experience, patient selection is required.

References

1. Desai MM, Berger AK, Brandina R, Aron M, Irwin BH, Canes D, et al. Laparoendoscopic single-site surgery: initial hundred patients. *Urology* 2009; 74: 805-12.
2. White WM, Haber GP, Goel RK, Crouzet S, Stein RJ, Kaouk JH. Single-port urological surgery: single-center experience with the first 100 cases. *Urology* 2009; 74: 801-4.
3. Kaouk JH, Goel RK, Haber GP, Crouzet S, Desai MM, Gill IS. Single-port laparoscopic radical prostatectomy. *Urology* 2008; 72: 1190-3.
4. Walsh PC. Radical prostatectomy for the treatment of localized prostatic carcinoma. *Urol Clin North Am* 1980; 7: 583-91.
5. Guillonnet B, Cathelineau X, Barret E, Rozet F, Vallancien G. Laparoscopic radical prostatectomy: technical and early oncological assessment of 40 operations. *Eur Urol* 1999; 36: 14-20.
6. Menon M, Shrivastava A, Tewari A, Sarle R, Hemal A, Peabody JO, et al. Laparoscopic and robot assisted radical prostatectomy: establishment of a structured program and preliminary analysis of outcomes. *J Urol* 2002; 168: 945-9.
7. Barret E, Sanchez-Salas R, Kasraeian A, Benoist N, Ganatra A, Cathelineau X, et al. A transition to laparoendoscopic single-site surgery (LESS) radical prostatectomy: human cadaver experimental and initial clinical experience. *J Endourol* 2009; 23: 135-40.

การผ่าตัดมะเร็งต่อมลูกหมากออกทั้งหมดด้วยการผ่าตัดแบบเจาะรู และใช้หุ่นยนต์ช่วยผ่าตัดแบบแผลเดียวในชายเอเชีย; รายงานผู้ป่วยรายแรก

สุนัย ลีวันแสงทอง, พุทธิพรณี วรกิจโกศาทร, อีระพล อมรเวชสุกิจ, ธวัชชัย ทวีมันคงทรัพย์, ไซยงค์ นวลยง, พิชัย ศุภจินทรรัตน์

วัตถุประสงค์: เพื่อรายงานการผ่าตัดมะเร็งต่อมลูกหมากออกทั้งหมดด้วยการผ่าตัดแบบเจาะรู และใช้หุ่นยนต์ช่วยผ่าตัดแบบแผลเดียวในชายเอเชีย

วัสดุและวิธีการ: ชายไทยอายุ 71 ปี ได้รับการวินิจฉัยเป็นมะเร็งต่อมลูกหมากที่โรงพยาบาลศิริราช กรุงเทพฯ ค่า Prostate-Specific Antigen คือ 16.5 นาโนกรัมต่อมิลลิลิตร การตรวจทางทวารหนักได้ต่อมลูกหมากหนัก 30 กรัม และคลำได้ nodule ทั้ง 2 ข้าง โรคยังไม่กระจายไปที่อื่น ๆ ผู้ป่วยได้รับยา Leuprorelin acetate และ bicalutamide 50 มิลลิกรัม เป็นเวลา 3 เดือน ก่อนผ่าตัด ผู้ป่วยที่มี body mass index 22 และแข็งแรงดี ผู้ป่วยได้รับการผ่าตัดแบบเจาะรู และใช้หุ่นยนต์ช่วยผ่าตัดแบบแผลเดียวโดยใช้เครื่องหุ่นยนต์แบบ daVinci S

ผลการศึกษา: ระยะเวลาการผ่าตัดทั้งหมด 335 นาที ระยะเวลาประกอบหุ่นยนต์กับผู้ป่วย 12 นาที ระยะเวลาผ่าตัดในคอนโซล 275 นาที เสียเลือด 250 มิลลิลิตร และไม่ได้รับการให้เลือด การผ่าตัดไม่มีผลแทรกซ้อนทั้งในช่วงเวลาผ่าตัดและช่วงเวลาหลังผ่าตัด สามารถนำท่อระบาย Jackson ออกได้ภายใน 60 ชั่วโมงหลังผ่าตัด ผู้ป่วยออกจากโรงพยาบาลภายใน 84 ชั่วโมงหลังผ่าตัด สายท่อปัสสาวะสามารถออกได้ในเวลา 2 สัปดาห์

สรุป: การผ่าตัดมะเร็งต่อมลูกหมากออกทั้งหมดแบบเจาะรูและใช้หุ่นยนต์ช่วยผ่าตัดแบบแผลเดียวสามารถทำได้ในประสบการณ์ระยะแรกการเลือกผู้ป่วยเป็นสิ่งจำเป็น
