Ten-Year Review of Outcomes after Surgery, Radiation, or Active Surveillance for Localized Prostate Cancer

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Abstract

Objective: Prostate cancer is the second most common male cancer worldwide and the fifth leading cause of death in Thailand. This research aimed to evaluate the overall survival and disease-free survival of patients with localized prostate cancer who received different treatment options for the adjustment of future treatment policies.

Method: This retrospective cohort study was conducted using secondary data analysis and phone checkup. The population included patients diagnosed with localized prostate cancer (T1 and T2) and treated by laparoscopic radical prostatectomy, radiation therapy, or active surveillance at Vajira Hospital from December 2009 to December 2019. Survival and disease-free survival were analyzed.

Results: The median overall survival was 8.60 years (95% CI, 7.95–9.24) in the laparoscopic radical prostatectomy group and 7.98 years (95% CI, 6.13–9.82) in the radiation group. No statistically significant difference was found between these two treatments (p = 0.53). The median disease-free survival was 8.45 years (95% CI, 7.73–9.18) in the laparoscopic radical prostatectomy group and 5.89 years (95% CI, 5.60–6.18) in the radiation group. Statistically significant difference was found between these two treatments ($p < 0.001$).

Conclusion: The disease-free survival in the laparoscopic radical prostatectomy group was significantly higher than that in the radiation group ($p < 0.001$). The overall survival was the same for both groups.

Keywords: prostate cancer, locally prostate cancer, overall survival prostate cancer, disease free survival prostate cancer

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การศึกษาผลของการรักษาผู้ป่วยโรคมะเร็งต่อมลูกหมากเฉพาะที่หลังการรักษาด้วยวิธีการผ่าตัด การฉายแสง หรือการเฝ้าระวังโดยติดตามการรักษาย้อนหลังเป็นระยะเวลา 10 ปี

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บทคัดย่อ

วัตถุประสงค์: โรคมะเร็งต่อมลูกหมากเป็นโรคมะเร็งที่พบได้มากที่สุดเป็นอันดับสองของมะเร็งในเพศชายทั่วโลก และยังเป็นสาเหตุการตายเป็นอันดับ 5 ของประเทศไทย คณะผู้วิจัยจึงสนใจศึกษาผลของการรักษาผู้ป่วยโรคมะเร็งต่อมลูกหมากเฉพาะที่ หลังการรักษาด้วยวิธีการผ่าตัด การฉายแสงหรือการเฝ้าระวังโดยติดตามการรักษาย้อนหลัง เป็นระยะเวลา 10 ปี เพื่อศึกษาประสิทธิผลของการรักษาแต่ละวิธี

วิธีดำเนินการวิจัย: ศึกษาเปรียบเทียบผลของการรักษาผู้ป่วยโรคมะเร็งต่อมลูกหมากระยะไม่ลุกลาม (T1, T2) ที่ได้รับการรักษาด้วยวิธีการผ่าตัดแบบส่องกล้อง, การฉายแสงหรือการเฝ้าระวังอย่างใกล้ชิด โดยการศึกษาระยะเวลาที่มีชีวิตรอด และระยะเวลาที่ปลอดจากโรคหลังการรักษาแต่ละวิธีของผู้ป่วยในโรงพยาบาลวชิรพยาบาล ตั้งแต่เดือนธันวาคม 2552 จนถึงเดือนธันวาคม 2562

ผลการวิจัย: ผู้ป่วยกลุ่มที่ได้รับการรักษาโดยการผ่าตัดแบบส่องกล้องมีค่าเฉลี่ยอัตราการรอดชีวิตที่ 8.6 ปี และมีระยะเวลาปลอดโรคเฉลี่ยที่ 8.45 ปี ผู้ป่วยกลุ่มที่ได้รับการรักษาโดยการฉายแสงมีอัตราการรอดชีวิตเฉลี่ยอยู่ที่ 7.98 ปี และมีระยะเวลาปลอดโรคเฉลี่ยที่ 5.89 ปี

สรุป: จากการศึกษานี้พบว่าการรักษาโดยการผ่าตัดมีระยะเวลาปลอดโรคที่นานกว่าการรักษาโดยการฉายแสง

คำสำคัญ: โรคมะเร็งต่อมลูกหมาก โรคมะเร็งต่อมลูกหมากเฉพาะที่ รอดชีวิตมะเร็งต่อมลูกหมาก ระยะเวลาปลอดโรคมะเร็งต่อมลูกหมาก

วันที่รับบทความ 20 เมษายน 2565 **วันแก้ไขบทความ** 20 ตุลาคม 2565 **วันตอบรับบทความ** 21 ตุลาคม 2565

Introduction

Prostate cancer is the second most male cancer worldwide and the fifth most common cause of death in Thailand. Its incidence increases with the aging society, making it a serious health issue. Prostate cancer is a highly diverse disease with a variety of biological variations that affect disease progression and clinical behavior. The common symptoms are lower urinary tract symptoms, pathological fractures, and bone pain. Major risk factors for the development of prostate cancer include age, race, inherited genes/genetic susceptibility, obesity, smoking, diet, and other factors. Prostate-specific antigen (PSA) levels are used to diagnose patients with asymptomatic prostate cancer. The European Randomized Study of screening for Prostate Cancer (ERSPC) trial demonstrated that PSA screening considerably lowers the risk of progression and improves survival; however, it incurs high expense and leads to overdiagnosis and overtreatment[1-2]. Meanwhile, The Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial showed that PSA screening has no advantage to prostate cancer screening. However, the application of PLCO results is still debatable because of its several problems, including poor allocation and significant levels of contamination[3-5]. Thus, both trials revealed the controversial effectiveness of PSA screening.

The treatments for prostate cancer are being developed and improved. When patients are diagnosed with prostate cancer, the physician evaluates the disease's stage and patient's life expectancy to obtain data for informed decision-making regarding the appropriate treatment choice. Nowadays, standard treatment options for prostate cancer include active surveillance, radical prostatectomy, radiation therapy, brachytherapy, ADT, and chemotherapy. Laparoscopic radical prostatectomy, a minimally invasive procedure, was developed in 1998 and showed superior short-term oncologic results to open surgery and watchful waiting in early prostate cancer[6-11]. Age, underlying diseases, and reimbursement schemes are important factors to consider in the appropriate treatment choice in Thailand. Reimbursement schemes are a potential limitation for some patients because of their inability to access certain types of treatment, e.g., surgery or advanced drugs.

The current treatment options in Thailand are surgery, radiation, and active surveillance; however, domestic efficacy and effectiveness are not well defined. Nevertheless, a prior international trial, The Prostate Testing for Cancer and Treatment (ProtecT) trial, revealed that mortality was not different among localized prostate cancer cases but the disease progression and metastasis were lower in the group of surgery and radiation than in the active surveillance group[12]. Thus, this research aimed to evaluate the effectiveness of the above treatment options for patients with localized prostate cancer to adjust future treatment policies. This study aimed to compare the overall survival and disease-free survival of patients with localized prostate cancer (clinical T1 and T2) who underwent laparoscopic radical prostatectomy, radiation, and active surveillance.

Methods

This retrospective cohort study was conducted using secondary data analysis and phone checkup. Medical records were reviewed and abstracted using a data abstract form. The study population included patients diagnosed with localized prostate cancer (T1 and T2) and treated by laparoscopic radical prostatectomy

treatment, radiation therapy, or active surveillance which were conducted following the NCCN Guidelines for Prostate Cancer at Vajira Hospital from December 2009 to December 2019. Exclusion criteria were as follows: 1) death from other diseases, and 2) incomplete medical record data.

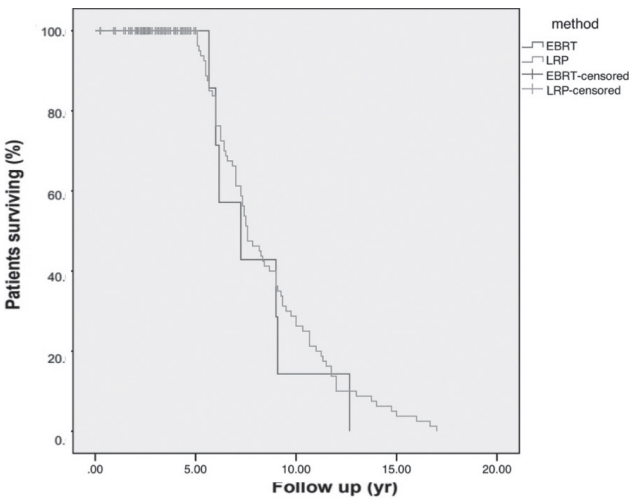
All statistical analyzes were conducted using SPSS software version 22. For the descriptive study, survival analysis and disease-free survival analysis were performed. Demographic data were presented as mean and standard deviation. For the analytical study, cox regression and chi-square analysis were conducted to investigate the association between groups. The alpha ratio was set at 0.05. The study was approved by the Ethical Review Committee for Human Research, Vajira Hospital (COA No: 156/63).

Results

A total of 678 men diagnosed with prostate cancer were treated in Vajira Hospital between December 2009 and December 2019. However, only 193 were included in our study. Among these patients, 164 (84.98%) were treated with laparoscopic radical prostatectomy, 27 (13.99%) were treated with radiation therapy, and two (1.04%) were treated with active surveillance.

The laparoscopic radical prostatectomy, radiation, and active surveillance groups had a mean age of 74.90 (7.10), 76.85 (8.02), and 81 (5.66) years, respectively; a body mass index of 24.14 (3.53), 22.83 (3.31), and 25.33 (1.75) kg/m^2, respectively; and an initial PSA of 12.55 (14.34), 26.38 (40.17), 4.44 (0.40) ng/mL, respectively. (Table 1)

The median overall survival was 8.60 years (95% CI, 7.95–9.24) in the laparoscopic radical prostatectomy group and 7.98 years (95% CI, 6.13–9.82) in the radiation group. Statistical test found a p-value of 0.53. (Table 2 and Figure 1)



LRP was defined as laparoscopic radical prostatectomy
EBRT was defined as radiation

Figure 1: Kaplan-Meier of The Overall survival

Table 1:
General Characteristics among laparoscopic radical prostatectomy, radiation, and active surveillance groups

Variables	Laparoscopic radical prostatectomy* (n = 164)	Radiation* (n = 27)	Active surveillance* (n = 2)
Age (year-old)	74.90 ± 7.10	76.85 ± 8.02	81 ± 5.66
BMI (Kg/m2)	24.14 ± 3.53	22.83 ± 3.31	23.33 ± 1.75
PSA Initials (ng/mL)	12.55 ± 14.34	26.38 ± 40.17	4.44 ± 0.40

* Showed in Mean ± SD

Table 2:

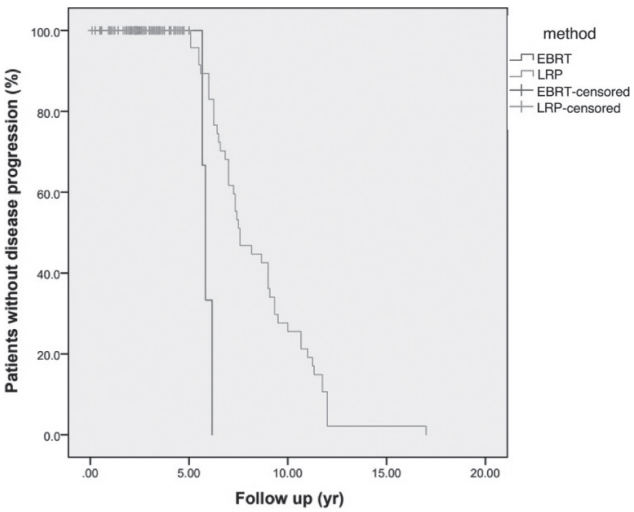
Overall survival and disease-free survival among laparoscopic radical prostatectomy, radiation, and active surveillance groups*

	Laparoscopic radical prostatectomy* (n = 164)	Radiation* (n = 27)	p-value
Median Overall survival (year)	8.60 (95% CI, 7.95 to 9.24)	7.98 (95% CI, 6.13 to 9.82)	0.53**
Median Disease-free survival (year)	8.45 (95% CI, 7.73 to 9.18)	5.89 (95% Cl, 5.60 to 6.18)	<0.001**

*Exclude active surveillance due to limited sample
**Log Rank

The median disease-free survival was 8.45 years, (95% CI, 7.73–9.18) in the laparoscopic radical prostatectomy group and 5.89 years (95% CI, 5.60–6.18) in the radiation group. Statistical test found a p-value of <0.001. (Table 2 and Figure 2)

The data of the active surveillance group were not calculated due to the limited sample size. Data of overall survival were missing for one patient in the laparoscopic radical prostatectomy group, and data of disease-free survival were missing for 46 patients in the laparoscopic radical prostatectomy group.



LRP was defined as laparoscopic radical prostatectomy
EBRT was defined as radiation

Figure 2: Kaplan-Meier of The Disease free survival

Discussion

The differences in the overall survival rates between the radiation and laparoscopic radical prostatectomy groups were not statistically significant. This result was same as that in the ProtecT trial[12]. Locally, prostate cancer is a slow progressive cancer. Despite the lack of action from the physician, the mortality rate of this cancer is extremely low. Therefore, the different outcomes of both techniques are difficult to identify.

The disease-free survival in the laparoscopic radical prostatectomy group was higher than that in the radiation group. This finding was different form current recommendation. The NCCN guidelines[13] reported that the disease-free survival in both groups is the same as that for early prostate cancer. This difference might have occurred because the aged radiation therapy does not have high intensity to destroy local cancer lesions, especially when conducted in Vajira Hospital. Therefore, the patients who receive radiation therapy have lower disease-free survival than those receiving laparoscopic radical prostatectomy. To date, both techniques can completely evacuate the local cancer lesion using improved equipment and techniques.

The active surveillance group had a limited sample size. The patient's treatment choice depends on many factors e.g. patient's concerns and expectations

for a cure, patient's decision-making with family members, and surgeon's recommendation. Most patients might select a specific intervention to fulfill their expectation. The term cancer is forbidding in Thailand's culture.

Conclusion

The disease-free survival in the radical prostatectomy group was significantly higher than that in the radiation group. The survival was the same for both groups. The active surveillance group cannot be evaluated due to the limited sample size.

Conflict of interest

None

Acknowledgement

none

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