



Treatment Options in Low-risk Prostate Cancer Patients: A Retrospective Database Report

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Abstract

Objective: This report examined the approaches to low-risk patients using the data from the Urologic Cancer Database - Prostate, Urooncology Association.

Materials and Methods: In this study, there were 920 patients with low-risk prostate cancer according to the current guidelines of the European Urology Association. Patient data were obtained from the Urological Cancer Database - Prostate, the Turkish Urooncology Association (UroCaD-P) from records of the years 1995-2021. Ethics committee approval was obtained for this study to publish in the form of a database report.

Results: Our study was conducted with 920 patients with low-risk prostate cancer. Therefore, at the time of diagnosis, all patients in the study were ISUP 1, had a prostate specific antigen (PSA) level lower than 10 ng/mL, and clinically T1-T2a. Surgical treatment was used in 750 (81.5%) of the patients. At the time patients were retrieved from the database for the study, 140 patients (15.2%) were in the active surveillance (AS) process. Thirty patients (3.2%) in the study received their local treatment as radiotherapy (RT). The mean age value at cancer detection in the study was 61.9. The mean ages of the patients who were under AS and who underwent radical prostatectomy (RP) were 61.3 and 61.7 years, respectively. In the RT group, the mean age was 66.7 years. The mean PSA value of the whole group was 5.81 ng/mL. While it was 5.94 in AS patients, it was calculated as 5.89 in patients who underwent radical surgery. The mean PSA value of the RT group was 5.40. The pathological upgrade was detected in 225 patients (30%) after surgery. Surgical margin positivity was in 160 of the patients (21.3%) who underwent surgery. In addition, 100 patients (13.3%) had extracapsular disease. The seminal vesicle invasion was detected in 25 patients (3.3%) after surgery.

Conclusion: We predict that the incidence of low-risk prostate cancer will increase over time due to the aging of the population, the use of PSA, advances in imaging modalities, and increasing biopsy success rates. Therefore, the importance of the existence of multicentric databases containing this patient group is undeniable. More studies are needed with these databases, including both patient demographics and treatment outcomes. Hopefully, this database report will be an important step in this direction.

Keywords: Database, prostate cancer, radical prostatectomy

Cite this article as: Erbatu O, Müezzinoğlu T, Akdoğan B, Aslan G, Sözen S, Baltacı S, Süer E, İzol V, Üçer O, Ataus S, Türkeri L, Tinay İ. Treatment Options in Low-risk Prostate Cancer Patients: A Retrospective Database Report. Bull Urooncol 2023;22(2):72-75.

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Received: 19.05.2022 **Accepted:** 04.07.2022

Introduction

According to the current literature, prostate cancer is the second most common type of cancer diagnosed in men, and its incidence in developed countries is higher, consistent with increased life expectancy (1). Its relationship with family history and ethnicity has been confirmed (2). The incidence of localized prostate cancer is increasing with the use of prostate specific antigen (PSA) and biopsy techniques with high success rates (3,4). Localized disease is divided into low, intermediate, and high risk (5).

When the life expectancy of the patient is between 10 and 15 years, an active surveillance (AS) approach can be applied to a group of patients from the low-risk group (6). This approach is based on preventing overtreatment and treatment toxicity, and it is designed to make a planned transition to curative treatment options eventually (7). There are two main treatment modalities for localized disease: radical prostatectomy (RP) and radiotherapy (RT) (8). This study was planned to determine the demographic characteristics of patients in the low-risk cancer group and the differences in treatment options.

Materials and Methods

In this study, there were 920 patients with low-risk prostate cancer according to the current guidelines of the European Urology Association (5). Patient data were obtained from the Urological Cancer Database - Prostate, Turkish Urooncology Association (UroCaD-P) from the records of the years 1995-2021. Data were collected by REDCap data collection software developed by Vanderbilt University and licensed by the Urooncology Association in Turkey (9,10). Online and simultaneous data are entered into this database from clinics all over Turkey. These data are stored and used in relevant clinical studies. In addition, the treatment follow-up data of the patients are updated regularly. All data are kept securely in an encrypted and anonymous way in the study, demographic characteristics of our patient group, laboratory results, and differences between the treatment methods, biopsy, pathologies were compared. Ethics committee approval was obtained from Manisa Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee (decision no: 1758, date: 29.03.2023).

Statistical Analysis

SPSS 26.0 (IBM Corporation, Armonk, New York, United States) programs were used in the analysis of variables for statistical calculations. In the comparison of two independent groups according to quantitative data, the Independent-Samples t-test was used together with the Bootstrap results, while the Mann-Whitney U test was used together with the Monte Carlo results. Less than 0.05 for p value was accepted as significant.

Results

Our study was conducted with 920 low-risk prostate cancer patients. Therefore, at the time of diagnosis, all patients were ISUP 1, had a PSA level lower than 10 ng/mL, and clinically T1-T2a. Two hundred of these patients (21.7%) were diagnosed with magnetic resonance imaging (MRI) fusion biopsy, and

ultrasound-guided transrectal biopsy was performed in 720 (78.2%) of them.

Surgical treatment was used in 750 (81.5%) patients. Open method was used in 445 patients (59.3%) and laparoscopic method was used in 200 patients (26.6%). Robot-assisted surgery was performed in 105 patients (14%). At the time patients were retrieved from the database for the study, 140 patients (15.2%) were in the AS process. We found that the MR fusion biopsy method was used in 75 patients (%53.5) from the group in AS. Thirty patients (3.2%) in the study received their local treatment as RT, and the MR fusion biopsy method was used in 18 of them (60%).

The mean age value at cancer detection in the study was 61.9. The mean ages of the patients who were under AS and who underwent RP were 61.3 and 61.7 years, respectively. In the RT group, the mean age was 66.7 years. The mean PSA value of the whole group was 5.81 ng/mL. While it was 5.94 in AS patients, it was calculated as 5.89 in patients who underwent radical surgery. The mean PSA value of the RT group was 5.40 (Figure 1).

The pathological upgrade was detected in 225 patients (30%) after surgery. In subgroups, 123 of them (16.4%) was ISUP 2, while 65 of them (8.6%) was ISUP 3. The remaining 37 (4.9%) was ISUP 4 and above. Surgical margin positivity was in 160 patients (21.3%) who underwent surgery. In addition, 100 patients (13.3%) had extracapsular disease. The seminal vesicle invasion (SVI) was detected in 25 patients (3.3%) after surgery. We found that 194 (25.8%) patients underwent lymph node dissection during surgery. While the mean number of lymph nodes removed was 7.7, no lymph node metastasis was detected in the surgery group. According to the pre-operative biopsies, 225 of the patients (30%) had perineural invasion, while this number was 260 (34.6%) according to the postoperative pathologic evaluation (Figure 2).

Discussion

There were 920 low-risk prostate cancer patients in our study. Surgical treatment was used in 750 (81.5%) patients. AS was preferred in 140 (15.2%) patients, and 30 patients (3.2%) received RT. The mean ages of the patients who

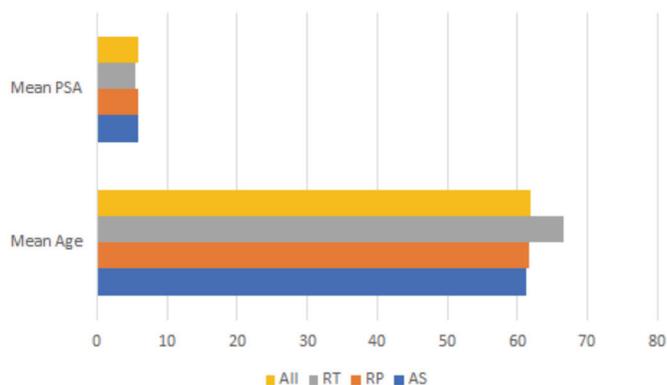


Figure 1. Mean age and PSA values

PSA: Prostate specific antigen, RP: Radical prostatectomy, RT: Radiotherapy, AS: Active surveillance

were under AS and who underwent RP were 61.3 and 61.7 years, respectively. In the RT group, the mean age was 66.7 years. The pathological upgrade was detected in 225 patients (30%). Surgical margin positivity was in 160 of the patients (21.3%) who underwent surgery and 100 patients (13.3%) had extracapsular disease.

Leapman et al. (11) included 895 low-risk patients who received surgical treatment. The mean age was 61 years and the mean PSA level was 5.20 ng/mL. These values are similar to the values of 61.9 and 5.81, respectively, for our study. Of these patients, 642 (71.7%) underwent open retropubic surgery and 197 (22%) underwent open perineal surgery. While 25 (2.7%) patients had laparoscopic approach, 21 (2.3%) patients had robot-assisted surgery. The surgical method of 10 patients is unknown.

In our study, the open method was used in 445 patients (59.3%) and the laparoscopic method was used in 200 patients (26.6%) who underwent radical surgery. Robot-assisted surgery was performed in 105 patients (14%). The study by Leapman et al. (11) was multicentric like ours and was conducted with patients are undergoing surgery between 1989 and 2011. The reason why laparoscopic and robot-assisted methods seem to be used less than ours may be that they use patient data from earlier years than ours. However, we see that the most used method is open surgery, which is consistent with the two studies.

In this study (11), the number of pathologic upgrades was found to be 372 (41.5%). In this group, 282 people (31.5%) were ISUP 2, 53 people (5.9%) were ISUP 3, and 37 people (4.1%) had higher ISUP values. In our study, pathological upgrade was detected in 225 patients (30%) after surgery. In subgroups, 123 (16.4%) of them were in ISUP 2, while 65 (8.6%) of them were in ISUP 3 group. The remaining 37 (4.9%) was ISUP 4 and above. It can be seen that the rates of pathological upgrades are lower in the centers in our study. In the pathologic upgrade subgroups, on the other hand, there is a similarity in the scores and the majority is ISUP 2.

In Leapman et al. (11) study, postoperative lymph node metastasis was detected in 1 patient in the entire group. Consistently, there was no lymph node metastasis in our study either. In this study (11), the number of patients with positive surgical margin was given as 323 (36%). In our study, surgical margin positivity was in 160 patients (21.3%). Again, we found

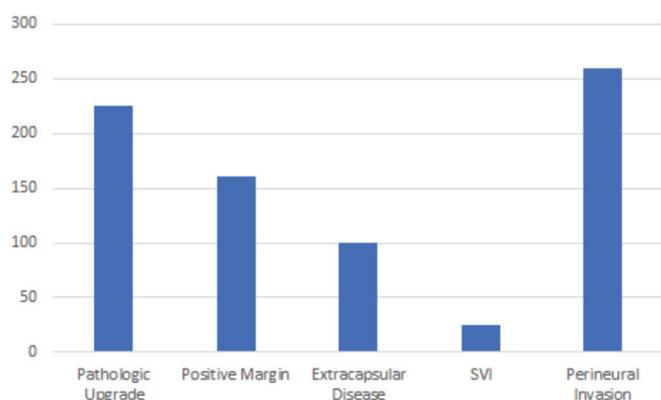


Figure 2. Pathological evaluation
SVI: Seminal vesicle invasion

a lower but consistent rate in our database. The extracapsular extension rate was found to be very similar to our rate of 100 patients (13.3%) with 83 patients (9.27%). Finally, SVI invasion was detected in 24 patients (2.6%), which is almost equal to the 25 patients (3.3%) in our study.

In the study conducted by Stattin et al., (12) there were 6,849 patients who were younger than 70 years with prostate cancer. 2,686 patients were in the low-risk group. Of the 2,686 patients, 1,085 (40.4%) were in the AS group, 1,227 (45.7%) in the RP group, and 374 (13.9%) in the RT group. The mean age of the patients was calculated as 64.7 years for AS, 61.2 years for RP, and 63.4 years for RT. For PSA values, the mean of the AS group was 7.6 ng/mL, while the values for surgery and RT were found to be 8.2 and 9.3, respectively. In our study, surgical treatment was used in 750 (81.5%) patients. In addition, 140 patients (15.2%) were in the AS process. The least group of patients was 30 patients (3.2%) in the study who received their local treatment as RT.

In both studies, the group with the highest number of patients was found to be the radical surgery group. In our database, there is a very high percentage of surgical subgroups. The reason for this may be that patient selection to be entered into the UroCaD-P database is done by prioritizing the surgical group. In our study, the mean age of the surgical group was 61.7, the AS group was 61.3, and RT group was 66.7. The values are very close to each other, especially for the surgical group. However, when the two studies are compared, it is seen that RT is preferred, especially for the older age group in our study. In our study, the mean PSA values were found to be 5.89, 5.94 and 5.40 for the surgery, AS, and RT groups, respectively. When compared with Stattin et al., (12) it is seen that all mean PSA values were calculated lower in ours.

According to the results of two other studies in which pathological upgrade rates were also investigated, there is a 36% upgrade rate for all local prostate cancer risk groups (13,14). For low-risk local disease, this rate was found to be as high as 46% after RP (14). In a study conducted with 10,273 low-risk patients, the pathological upgrade rate was found to be 44% (15). Most of them were upgraded from ISUP 1 to ISUP 2. In our study, all patients were in the low-risk group, and the upgrade rate was 30%, which was consistent with these studies.

In Dinh et al., (15) the extracapsular extension rate was found to be 8.5%. It is seen that this result is compatible with our 13.3% rate. In addition, according to this study, the rate of the SVI was 1.4%. In our article, as stated earlier, this rate was 3.3%. In the mentioned study, the rate of pathological lymph node metastasis was found to be 3.0%. It was not detected in any patient in our group. Although these two situations do not contradict each other, we think that the reason for the difference is that the study by Dinh et al. (15) was conducted with a larger patient group than ours.

Study Limitations

The main limitations of our study are that it is retrospective and multicentric. However, this resulted in many patients compared with the literature. There seems to be a need for prospective studies with this database and patient groups. In addition, a way

such databases can be more inclusive is by coordinating them with radiation oncology.

Conclusion

We predict that the incidence of low-risk prostate cancer will increase over time due to the aging of the population, the use of PSA, advances in imaging modalities, and increasing biopsy success rates. Therefore, the importance of the existence of multicentric databases containing this patient group is undeniable. This study shows that the low-risk prostate cancer patient group is still a heterogeneous group. Multiple treatment and follow-up methods suitable for this patient group are also widely used. It has been seen with the results of postoperative pathological evaluation that the importance of staging before surgery continues. More studies are needed with these databases, including both patient demographics and treatment outcomes. Hopefully, this database report will be an important step in this direction.

Acknowledgements

Publication: The results of the study were not published in full or in part in form of abstracts.

Contribution: There is not any contributors who may not be listed as authors.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

Ethics

Ethics Committee Approval: Ethics committee approval was obtained from Manisa Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee (decision no: 1758, date: 29.03.2023).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: T.M., B.A., G.A., S.S., S.B., E.S., V.I., O.Ü., S.A., L.T., I.T., Concept: T.M., B.A., G.A., S.S., S.B., E.S., V.I., O.Ü., S.A., L.T., I.T., Design: O.E., Data Collection or Processing: O.E., Analysis or Interpretation: O.E., Literature Search: O.E., Writing: O.E.

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