Original Article
The effect of the type of surgery performed due to prostate cancer on preoperative patient anxiety, a prospective study

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Abstract: Objective: Anxiety level in prostate cancer patients is common due to the increase in the incidence of prostate cancer diagnosis. We aimed to search for answers to the following questions such as whether there is preoperative anxiety in patients who will be operated for prostate cancer, what are the risk factors that may cause disease-induced anxiety and the type of surgery especially does robotic surgery reduce patient anxiety. Method: The patients who were taken into operation were divided into 2 groups as Open Radical Retropubic Prostatectomy-Group 1 and Robot-Assisted Laparoscopic Radical Prostatectomy-Group 2. Age, active surveillance history, preoperative prostate spesific antigen (PSA) level, prostate biopsy pathology result, time between prostate biopsy and operation, state and trait anxiety scores of these patients were recorded. Result: The study was conducted with a total of 149 patients; 61 patients in Group 1 and 88 patients in Group 2. The presence of active surveillance history, time between prostate biopsy and operation and state and trait anxiety levels were not found to be significant between both groups. However, it was concluded that the patients in Group 2 were significantly younger and operated with lower PSA and Gleason scores. The type of surgery had no effect on anxiety levels. Conclusion: Preoperative information about the surgical procedure was found to be an effective factor in reducing anxiety. Regardless of the type of surgery we recommend that patients' anxiety should be reduced by explaining the surgical procedure to patients enough and in a way that they can understand.

Keywords: Anxiety, prostate cancer, radical retropubic prostatectomy, robot-assisted laparoscopic radical prostatectomy, STAI

Introduction

Prostate cancer is the most common non-skin cancer in men and is the second most common cause of cancer-related deaths [1]. Since the introduction of prostate specific antigen (PSA) as a screening marker in the diagnosis of prostate cancer, there has been an increase in the number of patients screened with PSA, the number of ultrasound-guided transrectal prostate biopsies (TRUS-PB), which is the gold standard method for histological diagnosis, and the cases of prostate cancer diagnosed. Due to the increase in the incidence of prostate cancer diagnosis, an increase in anxiety and depression is also observed [2, 3]. All these show that this very common cancer causes serious stress and anxiety in men from diagnosis to treatment.

Many studies have evaluated the effect of treatment results on the quality of life of patients treated for prostate cancer [4-7]. Many of the frequently used quality of life scales focus on the effects of the patient's physical and psychosocial status on mental health, rather than evaluating the psychological difficulties caused by prostate cancer [8]. However, our knowledge about the relationship between psychological stress caused by prostate cancer and the quality of life of patients is very limited.

Anxiety and depression levels in patients diagnosed with cancer were higher than in the nor-

mal population, but less than half of these patients were treated for anxiety or depression diagnosis [9, 10]. In a study; it has been found that increased anxiety in patients undergoing prostate cancer screening causes an increase in plasma cortisol levels [11]. Therefore, increased anxiety levels increase heart rate and blood pressure because of that the amount of drugs needed for sedation to be used in the operation increases, and all these increase the morbidity and mortality risks associated with the surgical procedure [12]. In addition, collateral effects are seen in these patients due to increased anxiety, and an increase in the number of hospital admissions, pain, and significant psychosocial and psychophysical changes can be observed from diagnosis to treatment [3].

Some of the main treatments for localized and locally advanced prostate cancer are active surveillance, radiotherapy, and open or robot-assisted laparoscopic radical prostatectomy [13]. Strong evidence is needed to balance symptoms and quality of life against potential mortality and morbidity when choosing one of these therapies in clinician and patient cooperation. Currently, there is no study examining preoperatively psychological stress in patients diagnosed with localized prostate cancer and undergoing surgery. With this perspective, this is the first study and in this study, we aimed to find answers to the following questions such as whether there is preoperative anxiety in patients who will be operated for prostate cancer, what are the risk factors that may cause disease-induced anxiety and the type of surgery or, most importantly, does robotic surgery reduce patient anxiety.

Materials and methods

Inclusion and exclusion criteria

This study was carried out prospectively after the ethics committee approval of our hospital was obtained with the decision number 2019/4-24. Patients who were diagnosed with localized prostate cancer as a result of TRUS-PB pathology in our clinic between January 2018 and March 2020 and were planned to undergo radical surgery were included. Patients who had previously undergone radiotherapy for prostate cancer, converted from robotic surgery to open surgery during the operation, had

a history of anxiety or depression before being diagnosed with prostate cancer, used antidepressant medication, filled in the questionnaire incorrectly or incompletely, did not accept to fill in the questionnaire and were illiterate have been excluded.

Grouping and evaluated parameters

The patients who were taken into operation were divided into 2 groups as Open Radical Retropubic Prostatectomy (RRP)-Group 1 and Robot-Assisted Laparoscopic Radical Prostatectomy (RALP)-Group 2. The study was carried out with a total of 149 patients, 61 patients in Group 1 and 88 patients in Group 2. Age, whether active surveillance was applied before the operation, PSA, prostate biopsy pathology result, time between biopsy and operation, state and trait anxiety scores of these patients were recorded. The type of operation of the patients was determined according to the order of the surgeon or patient preference. Each procedure was performed by the same surgeons with the most experience in both types of operations, consistent with best practice, to reduce surgical heterogeneity. The da Vinci S® robot system (Sunnyvale, CA, USA) was used in Group 2. After the patients were informed about the procedure before the operation, informed consent forms were received for both the operation and the questionnaire.

Questionnaire

The patients filled out the questionnaire reflecting the general (trait) anxiety level during their hospitalization. Then, one day before the operation, the patient was informed about the type of surgical method to be applied. Thereupon, the questionnaire reflecting the state anxiety level was filled out to all patients. For all these, the State Trait Anxiety Inventory (STAI) questionnaire, designed to evaluate the variable anxiety state and characteristics, was used. This scale was designed in 1964 to make objective measures for self-assessment of patient anxiety [14].

State Trait Anxiety Inventory is a self reported anxiety questionnaire with two divided twenty questions multiple choice subitems (look to **Appendix**). STAI questionnaire evaluates state anxiety (STAI-S: State (situational) anxiety; how does it feel right now) and trait anxiety (STAI-T:

Table 1. Preoperative data and anxiety levels

	Group 1 (RRP) (n=61)	Group 2 (RALP) (n=88)	p value
Age (mean ± sd)	64.9±6.18	61.11±5.81	0.0001*
Active surveillance history (n)	2	9	0.11^x
Preoperative PSA (ng/ml)	12.82±9.17	8.89±5.14	0.001*
Preoperative pathology (Gleason score)	7.05±1.02	6.36±0.59	0.0001*
Time between TRUS-PB and operation (days)	129.46±177.85	139.77±100.6	0.133*
STAI-T (mean ± sd)	48.46±6.28	49.04±6.04	0.633*
STAI-S (mean ± sd)	45.88±6.13	44.78±5.15	0.219*

(RRP: Open Radical Retropubic Prostatectomy, RALP: Robot-Assisted Laparoscopic Radical Prostatectomy, sd: standard deviation, PSA: prostate specific antigen, TRUS-PB: ultrasound-guided transrectal prostate biopsy, STAI-T: State Trait Anxiety Inventory-Trait, STAI-S: State Trait Anxiety Inventory-State) (*: Mann-Whitney Test, X: Chi-Square Test).

Trait (basical) anxiety; how does it feel normally). Turkish validation of the questionnaire was done by Le Compte and Öner [15]. The questionnaire score of ≤35 shows no anxiety, score of 36 to 41 shows middle anxiety and score of ≥42 shows serious anxiety [16]. Anxiety level increases as the score increases. The total score is between 20 and 80.

Statistical analysis

First, descriptive statistics (arithmetic mean, standard deviation) of the data obtained from the study were calculated. The compatibility of the data to the normal distribution was investigated by using the Shapiro-Wilk test and it was found that it was not compatible with the normal distribution (P<0.05). Comparisons of two independent groups were made with the Mann-Whitney U test; such as age, preoperative PSA, preoperative pathology, time between TRUS-PB and operation and STAI variables. The evaluation of categorical data like active surveillance history variable was done with the Chi-square test. *P* value less than 0.05 was considered statistically significant. SPSS 25.0 (IBM Corporation, Armonk, NY, USA) package program was used for statistical analysis of the data.

Results

Preoperative data

In our study, 162 patients were examined. After the exclusion criteria, the study was conducted with a total of 149 patients. According to the type of surgery applied, the number of patients was 61 patients in Group 1 and 88 patients in

Group 2. The mean age of the patients included in the study was 62.66±5.14 years. The mean PSA value of the patients was 15±5.6 ng/ml. According to the TRUS-PB pathology result, the Gleason score (GS) varied between 6-10. Group 1 had 22 patients with GS 6; 21 patients with GS 7; 12 patients with GS 8; 5 patients with GS 9; and 1 patient with GS 10. Group 2 had 60 patients with GS 6; 24 patients with GS 7; 2 patients with GS 8; and 2 patients with GS 9. There were no patients with GS 10 in group 2. The mean time between TRUS-PB and operation applied was 135.5±5.5 days in all patients. This period was 40-451 (min-max) days in Group 1 and 28-570 (min-max) days in Group 2. The mean STAI-T value was 48.42±7.5 and the STAI-S value was 44.61±7.4, and all patients included in the study had state and trait severe anxiety levels.

RALP patients are younger and had lower PSA and Gleason scores

Table 1 shows demographic, preoperative data and anxiety levels between both groups. According to these results, the presence of active surveillance history, the time between TRUS-PB and the operation, and the state and trait anxiety levels were not found to be significant between both groups. However, there was a statistically significant difference between the two groups in terms of age, preoperative PSA and preoperative GS from TRUS-PB. It is observed that the patients who underwent RALP were statistically significantly younger and operated with lower PSA and GS.

It is observed that the patients in both groups have generally and momentarily severe anxi-

Table 2. Comparison of anxiety levels between groups in subgroups

	Group 1 (RRP) (n=61)	Group 2 (RALP) (n=88)	p value
STAI-T (mean ± sd)			
General	48.46±6.28	49.04±6.04	0.633*
Mild (≤35)			
Moderate (36-41)	38.71±1.49	39.22±1.79	0.513*
Severe (≥42)	49.72±5.50	50.19±5.25	0.378*
STAI-S (mean ± sd)			
General	45.88±6.13	44.78±5.15	0,219*
Mild (≤35)			
Moderate (36-41)	38.40±1.76	38.37±1.66	0.929*
Severe (≥42)	45.43±4.84	47.39±3.54	0.262*

(RRP: Radical Retropubic Prostatectomy, RALP: Robot-Assisted Laparoscopic Radical Prostatectomy, sd: standard deviation, STAI-T: State Trait Anxiety Inventory-Trait, STAI-S: State Trait Anxiety Inventory-State) (*: Mann-Whitney Test).

Table 3. Reflection of trait anxiety on state anxiety according to surgery type

	STAI-T (mean ± sd)	STAI-S (mean ± sd)	p value
Group 1 (RRP)	48.46±6.28	45.88±6.13	0.01*
Group 2 (RALP)	49.04±6.04	44.78±5.15	0.00*

(STAI-T: State Trait Anxiety Inventory-Trait, STAI-S: State Trait Anxiety Inventory-State, RRP: Open Radical Retropubic Prostatectomy, RALP: Robot-Assisted Laparoscopic Radical Prostatectomy, sd: standard deviation) (*: Mann-Whitney Test).

ous personality. The fact that these results were statistically insignificant between the groups indicates that there is a homogeneous distribution of patients in both groups in terms of anxiety.

No significant difference between the groups in terms of state and trait anxiety

The patients were divided into subgroups according to their anxiety levels as mild, moderate and severe (**Table 2**). Accordingly, there were no mild anxious patients in either group in cases of state or trait anxiety. Considering the analysis of the subgroups, there was no statistically significant difference between the groups of all patients with both state and trait moderate and severe anxiety.

Providing preoperative information reduced patient anxiety

Table 3 shows the effect of the type of surgery on the change of trait anxiety in state anxiety.

Accordingly, the fact that the patients knew about the treatment method preoperatively, that the patients would be operated with open or robotic surgery, created a statistically significant change in their anxiety level. According to the trait anxiety scores of the patients, a 3-5 point decrease in state anxiety scores indicates that the patients are psychologically relieved.

Discussion

Patients are exposed to serious stressors until they are diagnosed with prostate cancer. The fact that physical examination is performed rectal route, PSA screening, and this process that starts and develops with TRUS-PB within the indication can put patients into anxiety and/or severe stress. According to a study, it shows that approximately 20% of patients are under anxiety and/or serious stress even in this process until the diagnosis of prostate cancer [17]. Anxiety was not detected in only 2% of our patients. Although there are various methods to evaluate anxiety, STAI is the standard method that has the ability to evaluate both situational (STAI-S) and basical (STAI-T) anxiety [16].

There are many studies in the literature on the effect of giving general health and procedural information either verbally or visually on anxiety levels. As far as we know, this is the first study to evaluate the effect of information given to patients who will be operated for prostate cancer on the patient's anxiety [18-20].

When the literature is reviewed, it is observed that patients admitted to hospital or outpatient have mild state and trait anxiety levels [21-23]. According to an anxiety study conducted by Pastore et al. [3] on patients undergoing surgery for urological malignancy, it was observed that the state and trait anxiety of the patients was also mild. In this study, it was concluded that the state and trait anxiety scores of patients who underwent radical prostatectomy for prostate cancer were mild as 18.1 and 18.4 in the subgroup analysis. In the ProtecT study, it was concluded that patients undergoing active

surveillance, radiotherapy and surgery for prostate cancer had low level of anxiety at the PSA screening and TRUS-PB stages in the anxiety assessment and this result was at the same level with the normal population [24]. In our study, the mean state and trait anxiety scores of all patients were found as severe as 44.6 and 48.4. These results were quite high compared to the literature. The reason for this can be interpreted as an indicator that the Turkish population has a very emotional character.

Providing a detailed explanation to all patients, from the diagnosis method to the surgical procedure, can be a way to reduce anxiety on the patient. Based on this hypothesis, we investigated whether the type of surgery or simply explaining the surgical procedure has an effect on anxiety in prostate cancer patients. As a matter of fact, the patients in both groups were generally severe anxious patients, and it was seen that explaining the surgical procedure to the patients in the two groups was the reason for the significant decrease in state anxiety scores regardless of the type of surgery, but because of the thought of 'getting rid of the disease' created by them that they will be operated.

It was expected that the robotic surgery application, which developed as a result of the reflection of technological developments on surgical equipment, would create an extra decrease in the anxiety scores of the patients compared to other conventional procedures. Considering our results, although there was no significant difference between the state anxiety scores in both groups, the decrease in the anxiety scores of the patients who underwent RRP was 2 points less than the patients who underwent RALP. In other words, although the robotic surgical procedure applied to the patients did not significantly reduce anxiety, it was observed that it provided a 2-point support.

From a different point of view, some studies have found that providing more comprehensive information increases levels of anxiety. It was observed that 25% of our patients had an increase in their anxiety levels after they were informed. Inglis et al. [25] questioned whether providing detailed information about the possible complications of general anesthesia the night before the surgery increased anxiety and reached the conclusion that it did not. Therefore, we think that the information given should be given enough without causing confusion in patients.

Our study has some limitations. The main limitation of our study, the fact that only the STAI questionnaire was used to evaluate patient anxiety constitutes. The results could be correlated by comparing subjective data such as anxiety with different questionnaires. In addition, the lack of standardization in the details of the operation information given to the patients in the preoperative period and the lack of postoperative anxiety scores of the patients constitute the other limitations of our study.

Preoperative information about the surgical procedure was found to be an effective factor in reducing anxiety. However, it was observed that the robotic surgical procedure had insignificant benefit in reducing anxiety in patients. Based on our results, we recommend that to explain surgical procedure to patients enough before the operation and should be explained in a way that they can understand. We believe that robotic surgery can be a significant factor in reducing anxiety by supporting our results with other new studies with a larger number of patients.

Disclosure of conflict of interest

None.

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SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following infomration:

Name _____ Date _____ S _____

Age _____ Gender (Circle) M F   T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I fee calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-2

Please Provide the following infomration:

Name _____ Date _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circlt the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4

	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix Figure 1. STAI questionnaire.