

Can cancer detection rate increase when transrectal biopsies were taken from the laterally?

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Abstract. According to general opinion when biopsy is taken from the prostate's lateral peripheral zone. More cancer is seen. In our study, the incidence of cancer in the lateral peripheral zone biopsies was investigated.

In our study, 93 patients were analyzed retrospectively transrectal prostate biopsy. 12 core biopsies were taken from each patient. Medial peripheral zone (MPZ) and lateral peripheral zone (LPZ) biopsies compared the detection of prostate cancer.

The average age of the patients was 67.2±10.3. Total PSA value in patients was found as 13.7 ng/mL. Prostate cancer was detected at the rate of 22.5% (21 patients) in 93 patients. 3 patients (14.3%) had prostate cancer in MPZ and 8 patients (38%) had prostate cancer in LPZ. Prostate cancer was detected at MPZ and LPZ at the rate of 47.7% (10 patients) in patients. Prostate cancer was more commonly detected in LPZ (p<0.05).

Prostate biopsies of the LPZ biopsies more commonly cancer is seen. We believe it will increase the capture rate for prostate cancer if a sufficient number of biopsies were taken from the LPZ.

Key words: Prostate, cancer, PSA, biopsy

1. Introduction

Prostate cancer is one of the most common cancers in men. Transrectal ultrasound guided prostate biopsy (TRUS-Bx) is the gold standard in the diagnosis of prostate cancer and TRUS-Bx is performed in the presence of high serum prostate specific antigen (PSA) levels and/or abnormal digital rectal examination findings (1,2). A standard sextant biopsy was described by Hodge et al. in 1989 (3). Currently the standard sextant prostate biopsies are not enough for detection of prostate cancer. Current approaches emphasize more sampling in the lateral peripheral zone at prostate biopsy (4,5). In this study, we aimed to investigate the incidence of cancer in the lateral peripheral zone biopsies.

2. Materials and methods

In our study, the data of 93 patients who underwent TRUS-Bx as a result of high PSA value (>4 ng/mL) and/or abnormal rectal examination findings were retrospectively evaluated. The data relating to TRUS-Bx applications were especially analyzed. Exclusion criteria were anorectal disease such as anal fissure and hemorrhoid, a previous history of anorectal surgery, anticoagulant medication, bleeding diathesis, lidocaine allergy, acute prostatitis and the re-biopsies.

Previous to TRUS-Bx, all patients were informed about the procedure, and consent form was obtained from all of the patients. In addition, the medication of 400 mg ofloxacin was initiated 1 day before the application and maintained during 5 days, and an enema was performed by using 2 pieces of 10 gr Libalaks (LIBA, Turkey) in the morning of TRUS-Bx application.

We performed TRUS-Bx with the combination of perianally and intrarectally lidocaine gel with intrarectally indomethacin suppository and a periprostatic nerve blockage by using 10 mL of 1% lidocaine solution. Patient was placed in

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lateral decubitus position, and perianal area was cleaned. After the placement of TRUS probe into the rectum, the prostate was visualized in sagittal plane. In the guidance of this view, 10 mL of 1% lidocaine solution was injected into the prostate at the level of the prostatic base and neurovascular bundle between the seminal vesicles through a 25 cm, 18-gauge spinal needle.

A total of 12 systematic biopsies of the medial peripheral zone (MPZ) and lateral peripheral zone (LPZ) were obtained in all patients in lateral decubitus position after the local anesthesia. Initially, the prostate volume was measured. Medial peripheral zone and lateral peripheral zone biopsies compared the detection of prostate cancer.

Statistical analyses were performed with SPSS version 18.0 and data were displayed as mean ± standard deviation (SD) (range). The Mann-Whitney U test and McNemar’s test were used for statistical comparisons. A 5% level of significance was used for all statistical testing. A p value <0.05 was considered significant.

3. Results

The average age of the patients was 67.2±10.3 years. The mean PSA value and prostate volume were 13.7±4.9 ng/mL and 53±11.7 mL in all patients respectively. The mean IPSS score and quality of life score were 17.3±2.7 and 4.8±0.8 in all patients respectively. The mean age was similar between positive and negative biopsy groups (p=0.82). There were no significant differences between the mean prostate volume (p=0.67), PSA value (p=0.53), Free/total PSA rates (p=0.43), IPSS score (p=0.41) and QoL score (p=0.71) in positive and negative biopsy groups. Suspicious digital rectal examination (DRE) findings were significantly higher in positive biopsy group. Although there were suspicious

DRE findings at 7 patients in positive LPZ biopsy group, the mean PSA value was lower than the others.

In our study we detected prostate cancer in 21 patients (22.5%). Prostate cancer was detected in 3 patients (14.3%) in MPZ and 8 patients (38%) had prostate cancer in LPZ. Prostate cancer was detected in 10 patients (47.7%) in MPZ and LPZ. Prostate cancer was more commonly detected in LPZ (p<0.05). Prostate cancer was not detected in 72 patients with high level PSA. Negative biopsy was detected at 45 (62.5%) patients in medial peripheral zone. Negative biopsy rate was % 16.6 (12 patients) at lateral peripheral zone in negative biopsy group. Some demographic characteristics of the patients are shown in table 1.

Overall 6 of 21 patients (28.5%) had a biopsy Gleason score 6. Gleason score were found higher than 7 in 8 patients (38.09%) and lateral peripheral zone had higher Gleason score. Gleason score distribution in patients with positive biopsy are shown in table 2.

4. Discussion

TRUS-Bx is a standard diagnostic tool in the diagnosis of prostate cancer. A standard sextant biopsy was described by Hodge et al. in 1989 (3) and currently the standard sextant prostate biopsies are not enough for detection of prostate cancer and standard sextant biopsies may miss over 20% of cancers. Recently most studies advised that 12 cores extended biopsy protocols are more important to detect prostate cancer (6). Current approaches emphasize more sampling in the lateral peripheral zone at prostate biopsy (4,5). Haas et al. (7) suggest that the accuracy of prostate cancer detection depends more on the anatomic location from where the biopsies are taken rather than the number of biopsies taken.

Table 1. Some demographic characteristics of the patients

	Age (years)	Prostate volume (mL)	PSA ng/mL	Free/total PSA	DRE: suspected	IPSS score	QoL score
Overall patients (n 93)	67.2±10.3	53±11.7	13.7±4.9	0.13	23	17.3±2.7	4.8±0.8
Positive biopsy (n 21)							
MPZ (14.3%)	65.3±9.7	55±9.8	11.3±6.7	0.17	3	18.1±2.7	3.8±0.7
LPZ (38%)	66.5±8.3	59±11.3	9.8±5.9	0.11	7	17.5±3.1	4.1±0.3
MPZ+LPZ(47.7%)	68.7±9.6	51±8.5	14.2±7.8	0.14	5	18.9±1.9	4.7±0.6
Negative biopsy (n 72)							
MPZ (62.5%)	62.7±5.6	61.3±13.5	12.3±5.8	0.19	1	17.3±2.9	4.9±0.9
LPZ(16.6%)	69.5±7.4	57.6±9.3	14.7±6.9	0.17	4	15.8±2.1	4.8±0.3
MPZ+LPZ (20.8%)	65.6±9.8	51.8±7.9	13.4±7.3	0.12	3	18.6±3.1	4.5±0.5

MPZ; Medial Peripheral Zone, LPZ; lateral Peripheral Zone, PSA; Prostate Specific Antigen, IPSS; International Prostate Symptom Score, QoL; Quality of Life Score, DRE; Digital Rectal Examination.

Table 2. Gleason score distribution in patients with positive biopsy.

	MPZ	LPZ	MPZ+LPZ
Gleason 6	1	2	3
Gleason 7	1	2	4
Gleason>7	1	4	3

They detected more cancers in prostate biopsies from the medial peripheral zone and lateral peripheral zone. Presti et al. (4) emphasized that extended peripheral zone biopsy schemes increase cancer detection rates. They observed increased detection rates by increasing the number of biopsies, although laterally directed biopsies as well as the 2 apical biopsies were responsible for this observation. They explained the situation by the zonal anatomy of the prostate. It is thought that most prostate cancer is originated in the peripheral zone. Siu et al. (8) concluded that using an extended prostate biopsy pattern involving more than 10 cores increases detecting prostate cancer. They said that 10 core biopsy is effective to diagnose prostate cancer according to standard sextant biopsy. The standard sextant biopsy is failure to detect 25% of cancer.

Eichler et al. (6) have examined 87 studies (20698 patients) and they showed that prostate cancer detection rate is rising if core numbers increases and taken from the laterally. They showed that biopsy taken from the laterally in 12 core prostate biopsy protocol detected more than 31% cancer according to sextant biopsy protocol and they said 18-24 core biopsy schemes didn't increase cancer detection rates.

Radical prostatectomy series have showed that cancer in men with previous negative biopsies are more commonly located in the posterolateral aspect of the gland. This result is actually probably due to the standard sextant biopsies which miss this region of the prostate (9). In the previous study Stewart et al. (10) performed saturation needle biopsy technique in 224 men for repeat prostate needle biopsy. They performed an average of 23 biopsies according to prostate gland size. They have reported 77 prostate cancers and their detection rate was 34%.

In our study, we investigated the incidence of cancer in the lateral peripheral zone biopsies. We detected prostate cancer in 21 patients (22.5%). Prostate cancer was detected in 3 patients (14.3%) in MPZ and 8 patients (38%) had prostate cancer in LPZ. Prostate cancer was detected in 10 patients (47.7%) in MPZ and LPZ. Prostate cancer was more commonly detected in

LPZ ($p<0.05$). Negative biopsy was detected at 45 (62.5%) patients in medial peripheral zone. Negative biopsy rate was 16.6% (12 patients) at lateral peripheral zone in negative biopsy group. Overall 6 of 21 patients (28.5%) had a biopsy Gleason score 6. Gleason score were found higher than 7 in 8 patients (38.09%) and lateral peripheral zone had higher Gleason score.

5. Conclusion

In conclusion, based on our finding, the standard sextant prostate biopsies are not enough for detection of prostate cancer. Using an extended prostate biopsy pattern involving more than 10 cores increases detecting prostate cancer. Prostate cancer detection rate is rising if core numbers increases and taken from the laterally.

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