Ultrasound-guided biopsy is more sensitive to biopsy performed under the digital control, because 29% of prostatic cancers are not palpable. On the other hand, at least 30% of cancers are isoechoic, so they cannot be viewed by transrectal ultrasound examination. It means that target biopsy is not sufficient for diagnosis of localized prostatic cancer, i.e., randomized samples are needed as well. More than ten years ago, the technique of sampling the six specimens became a standard procedure to which previously harvested target specimens from suspected growths were added. Today, the expansion of biopsy protocol is recommended, by obtaining the additional specimens from peripheral lateral area, four plus two samples if the prostate has volume over 50 ml. Larger number of biopsies requires anesthesia. In order to reduce complication, the cleaning of rectal ampulla and prophylactic use of quinolone are suggested.

Key words: prostatic cancer, TRUS biopsy, complications, standardization of biopsy protocol

INTRODUCTION

On the basis of accumulated records, sextant biopsy verifies only a half of the existing prostatic cancers in patients with normal digital rectal examination and prostatic specific antigen value over 4 ng/ml\(^2,3,4,5,6\).

The increase of the number of sections over 10 had the effect in prostates with volume over 45 ml. When the consensus to increase the number of biopsies was reached, it immediately raised the questions where and how many additional samples were needed and whether the increased number of sections would cause higher comorbidity. In searching for an answer, new strategies of transrectal ultrasound-guided biopsy have been developed. The objective of our study was the standardization of biopsy protocol by the number of sections and way of preparation for biopsy.

MATERIAL AND METHODS

Prospective study was conducted in the period 2002-2004. The patients were divided into two groups according to the mode of biopsy. In group B, the number of sections was increased in the way that the additional sections were placed in the same way as they were in the initial six biopsies procedure, i.e. by classic Hodge techniques. This technique includes performing the biopsy in parasagittal direction, about 10 mm from the base, middle and apex of the prostate, while the needle is guided at an angle of 45 degrees against the rectal wall. Apical-lateral technique was applied in group A and involved the additional 4-6 section (in relation to prostatic volume) that are placed at different angles in apical region with lateralization to sagittal axis of prostate. In introducing the needle to rectum, maneuver of anal sphincter evasion is applied.

The study included the patients with indication for biopsy on account of early detection of prostatic cancer. Indications for biopsy were suspicious finding upon digital rectal examination or higher prostatic specific antigen than 3 ng/ml. The patients whose initial value of serum prostatic specific antigen (PSA) was over 10 ng/ml were not included in the study. PSA was determined before rectal examination. Biopsy was performed on outpatient basis by standard procedure. The preparation involved the cleaning of rectal ampulla and prophylactic use of oral quinolone. During biopsy, the patients assumed the left decubitus. Local anesthesia was applied by means of transrectal tube and implied the infiltration of 10 ml 1% Lidocaine in the base and apex bilaterally. Specimens were obtained by biopsy pistol and True Cut 18 G needles. Maximal length of sections was 17 mm, and average about 10 mm. (Figure 1, 2)
RESULTS

Group A and B were not different by mean age (t=1.764, df=183, p=0.79), serum PSA level (t=-1.051, df=186, p=0.295), prostatic volume (t=-0.977, df=121, p=0.331) and percentage of biotic tissue involved by cancer (t=1.635, df=57, p=0.107).

There was no significant difference of distribution of patients by Gleason score between two compared groups (Chi-square=7.566, df=6, p=0.272). In both groups, the percentage of aggressive cancers (Gleason score 7 or more) was about 10%. In apical lateral group, 40% of cancers were detected, and 34.8% of prostatic cancers were identified in the group of sextant biopsies with additional parasagittal specimens, but no significant difference was found (Chi square=4.230, df=6, p=0.646).

Apical lateral method (10-12 sections) detected 5% more cancers, and the proportion of biotic specimens involved by tumor was 7% higher when compared with sextant biopsy with additional parasagittal sections (10 to 12).

80% of Group A patients and 76% of group B patients had at least one complication resulting from trauma or infection. Severe complications such as sepsis, acute urinary retention (AUR) or massive hematuria requiring bladder washing, were recorded in both groups in less than 1% of cases, individually. Out of minor complications, hematuria was the most common, which abated within 3-7 days, in 72% (A) and 69% (B) of the time. Hemospermia was manifest in 21% of group A patients, and 23% of group B patients, and subsided in 7-15 days. Rectal hemorrhage was recorded in 20% of subjects (A) and 18% (B), and the difficulties abated in three days after the procedure.

DISCUSSION

TRUS guided transrectal biopsy with Tru-Cut needle and pistol is a method of choice for obtaining top-quality tissue specimen for histopathological examination. The procedure is safe, well tolerated by patients and intravenous sedation or narcotic analgesia is not required.

Limitation of transrectal ultrasound examination for detection of prostatic cancer is its lack of uniform visualization (hypoechogenic lesions – about 70%, isoechogenic – about 28%) and that it is not localized always in peripheral area.

Repeated biopsies are not comfortable either for attending doctor or patient. Therefore, currently, the improvement of biopsy sensitivity has been attempted in different ways, in order to detect the maximal number of cancers in the first set of samples. According to works by Hodge, McNeal and Stamey, randomized systemic sextant biopsy has been accepted as golden standard for detection of prostatic cancers. (Figure 3)

In 1998, Levin was among the first to demonstrate that the sampling of two sets each containing 6 specimens, during the same session, resulted in the increase of rate of detected cancers for 30%. Other articles ensued, reporting the increased detection with the increase of number of biopsies ranging from 12 to 14, 18, 24, 30 and even 40 specimens.

Accumulated records of different authors showed that sextant biopsy failed to detect a half of the existing prostatic cancers in patients with normal digital rectal examination and PSA4 ng/ml.

The results of multicentric study, including 1051 patients with PSA values of 4-10 ng/ml, revealed that sextant biopsy findings were negative in 853 patients, out of whom 83 (10%) cases had cancers during the repeated biopsy.

According to work by Norberg and assoc. (1997), the sensitivity of sextant biopsy was 85%, 10-specimen technique – 98% (where 12-specimen technique was used as referential model for 100%) (19). All researchers agree that the increased number of specimens increases the rate of detected cancers. "More is better" will not be surprising for anyone, if one realizes that 1x17 mm, approximately
0.05%-0.025% of specimen may be excised by 18G needle if mean volume of prostate is 25-50 ml.

Prospective studies revealed that the addition of lateral biopsies from peripheral area to standard sextant protocol resulted in detection of 14%-30% of cancers which otherwise would not be detected by standard sextant biopsy only. Combination of standard sextant and biopsy of lateral peripheral area significantly increased the detection of cancers and almost eliminated the need for target biopsy of observed lesions\textsuperscript{20,21,22,23,24}.

Sextant biopsy was introduced to the Institute of Urology and Nephrology in 1996, and such step resulted in higher detection of clinically localized prostatic cancers and increased number of radical prostatectomies\textsuperscript{25}. (Table 4.)

Method of 10-12 specimens (PZ laterally and 2 sections from TZ) was introduced in 1998. In comparison with sextant biopsy, it detected 13.8% more prostatic cancers, and 6% more in the subgroup of patients whose PSA was 4-10 ng/ml\textsuperscript{26}.

Apical-lateral technique (10-12 sections) was based on the fact that 75% of cancers were localized in the apex, and that repeated biopsies verified that the cancer was localized in apicodorsal region of peripheral zone. The pathway of needle through the peripheral zone was longer if it was inserted laterally, what was the reason for obtaining higher percentage of cancer-involved biopptic material. Since these results were not confirmed by statistically significant difference between the studied groups, it is necessary to expand the study with larger number of subjects.

An estimate of possible complications caused by prostate biopsy ranges from 2% to 79%. The complications result from trauma or infection. Hematuria and hemospermia are the most common, while sepsis is extremely rare, particularly if antibiotic prophylaxis is used\textsuperscript{27,28}. In our study, low percentage of complications resulting from infection was achieved by cleaning the rectal ampulla and prophylactic use of quinolone\textsuperscript{29}. Localization of additional sections did not increase the rate of severe complications while the proportion of minor complications was approximately the same. Owing to applied maneuver of anal sphincter evasion, the percentage of patients with rectal hemorrhage was not significantly higher in spite of the fact that additional sections were excised from the apical prostate.

CONCLUSION

TRUS-guided transrectal biopsy with Tru-Cut needle and pistol is the method of choice for obtaining top-quality tissue specimen for histopathological examination. The procedure is safe, well tolerated by patients and no intravenous sedation or narcotic analgesia is required. The increase of sections from 6 to 10-12 gives rise to significantly higher rate of cancer detection. Apical-lateral method (10-12 sections) detected 5% more cancers, and the amount of tissue involved by cancer was 7% higher when compared to sextant biopsy method with additional parasagittal specimens (10-12), but this difference was not statistically significant. The increase of the number of sections and lateralization had no effect on the increase of severe complications.

An optimal biopsy protocol involves 10 to 12 specimens, what depends upon the volume of prostate. Since lateralization of additional biopsies was not confirmed by statistical significance, it is necessary to establish its significance by multicentric studies including a larger number of subjects.

REZIME

\textbf{STANDARDIZACIJA TRANSREKTALNE ULTRAZVUČNO VODJENE BIOPSIJE}

Biopsija vodjena ultrazvukom je senzitivnija od biopsije koja se vrši samo pod kontrolom prsta, zato što 29% karcinoma prostate nije palpabilno. Sa druge strane minimum 30% karcinoma je izoehogeno, tako da se ne uočavaju transrektalnim ultrazvučnim pregledom. To znači da u dijagnostici lokalizovanog karcinoma prostate ciljana biopsija nije dovoljna, odnosno potrebni su i randomizirani uzorci. Pre više od deset godina postala je standardna procedura uzimanje šest isečaka kojima se dodaju prethodno ciljano uzeti isečci iz suspektnih promena. Danas se preporučuje proširenje bioptičkog protokola uzimanjem dodatnih uzoraka iz periferene zone lateralno, četiri plus dva ukoliko je prostata veća zapremine od 50 ml. Veći broj biopsija uslovljava potrebu za anestezijom. Da bi se smanjile komplikacije preporučuje se čišćenje ampule rektuma i profilaktička upotreba hinolona.

Ključne reči: karcinom prostate, TRUS biopsija, komplikacije, standardizacija biopsijskog protokola.

\textbf{REFERENCES}


