

PERIPROSTATIC LOCAL ANESTHESIA IN TRANSRECTAL ULTRASOUND-GUIDED PROSTATE BIOPSY: IS IT POSSIBLE TO IMPROVE PAIN TOLERANCE?

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ABSTRACT

Objective: Evaluate objectively pain tolerance in transrectal ultrasound-guided prostate biopsy (TRUS) using local periprostatic anesthesia applied intrarectally, compared to the conventional method.

Material and Methods: Forty patients were submitted to TRUS-guided prostate biopsy due to clinical suspicion of neoplasia. Patients were randomized in 2 groups: group-I, with 20 patients submitted to local anesthesia by 4 periprostatic injection of 2.5 mL 1% lidocaine, without epinephrine, TRUS-guided; and group-II, with 20 controls, with no sedatives or analgesia. After biopsy, patients were questioned about pain intensity during the procedure, using a grading scale from 0 to 5, correlating numbers, colors, and pain intensity. Pain related to probe manipulation or biopsy punctures, acceptance of an eventual re-biopsy, side effects of the drug used, and later complications of the procedure were also evaluated.

Results: Both groups were consistent comparing PSA levels, and prostate volume. As for pain intensity, 18/20 patients had severe or intolerable pain on the group submitted to conventional biopsy, while for those submitted to periprostatic blockage this event occurred in 3/20 patients ($\chi^2=22.50$; $p<0.01$). The most important pain component was manipulation of the transrectal probe in 28% of patients, and puncture itself in 72%. Acceptance of re-biopsy as a pain evaluation criterion occurred in only 45% of patients submitted to conventional biopsy, compared to 100% of those submitted to periprostatic anesthesia ($\chi^2=15.17$; $p<0.01$).

Conclusion: TRUS-guided prostate biopsy is a traumatic and painful experience, but the periprostatic blockage use is clearly associated with more tolerance and patient comfort during the exam.

Key words: prostate; biopsy, needle; pain; ultrasonography; prostatic neoplasms

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INTRODUCTION

Transrectal ultrasound-guided prostate biopsy became essential in diagnostic investigation of patients with clinical suspicion of prostatic neoplasia due to gland alterations on physical examination, or rising of the prostatic specific antigen (PSA), based

on studies by Coorner et al. (1), and Hodge et al. (2). Prostatic biopsy indication is increasing in the last years owing to increases in life expectancy, better diagnostic methods, and Public Health Campaigns intensification (3,4).

This procedure is performed by most urologists, in the United States and in England, without

any kind of anesthesia or sedation (5,6). Besides the embarrassment and the anxiety, this exam is almost always accompanied by pain sensation, because of TRUS probe introduction, or by biopsy itself (7). Some series show that 11 to 90% of patients have pain during the exam, making the realization of this diagnostic procedure traumatic (8,9). However, the method of pain measurement by several studies has been subjective, underestimating sometimes the real upset suffered by the patients.

Our aim was to randomly compare the use of periprostatic blockage to the conventional prostate biopsy procedure. In order to achieve this, we used objective criteria for pain analysis, considering the importance of pain components related to puncture itself, to the transrectal probe, and evaluating the satisfaction and tolerance facing the possibility of re-biopsy need.

MATERIALS AND METHODS

Forty patients, with clinical suspicion of prostate neoplasia (abnormal clinic exams and/or laboratory measurement of serum PSA higher than 4.0 ng/mL) were submitted to a TRUS-guided prostatic biopsy.

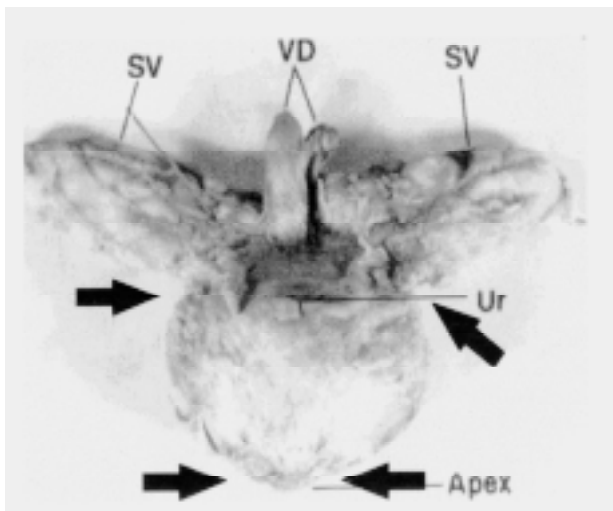


Figure 1 - Periprostatic local anesthesia in TRUS guided prostate biopsy. Observe the 4 injection points of 2,5 cc 1% lidocaine (arrows).

Patients that agreed and signed the Informed Consent of Brazilian Society of Urology, and the Adhesion Term, were included in the study. Were excluded those who were known to be allergic to the drug used, those indicated to re-biopsy, those presenting contraindications (coagulation disorders, users of drugs affecting coagulation, acute prostatitis, inflammatory diseases, or other rectal conditions), and those that were not submitted to an appropriate bowel preparation for the exam (prophylactic antibiotics with chloramphenicol 500mg PO q6h, beginning 12 hours before the procedure, laxative on the previous afternoon and 6 hours fasting).

Patients were randomized by drawing envelope lots in two groups: Group-I (periprostatic local anesthesia): single intrarectal application of 20 mL of hydrophilic gel lubricant. After 10 minutes, local anesthesia was performed with 4 periprostatic injections of 2.5 mL of 1% lidocaine hydrochloride without epinephrine, TRUS-guided, using a 25 cm x 22-G needle, introduced through the biopsy guide, after the chance of vascular puncture by aspiration has been excluded. The applications were executed in the neurovascular bundle region (cross-section) and in prostatic apex (longitudinal section), bilaterally TRUS-guided (Figure-1); Group-II (conventional biopsy): single intrarectal application of 20 mL of hydrophilic gel lubricant 10 minutes before the procedure. All biopsies were performed in the Urologic Department, by one of the authors, guided by TRUS using the 6.5MHz "end-fire" probe. Twelve prostatic fragments were removed (apex, midgland, base, midlateral region and transition zone) with an 18-G needle. No sedatives or analgesics were given for this group of patients.

Based on pain evaluation studies of Melzack & Tongerson (10,11), a grading scale from 0 to 5 correlating numbers, colors, and pain intensity, was developed (Figure-2). This option took into account the known difficulty of this kind of evaluation, owing to the subjectivity of the symptoms, and the intellectual level of some patients attending our service.

Immediately after biopsy, this pain scale was presented by other physician that did not know which group the patient belonged to, and the patient was questioned about pain intensity during the exam, if

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0	1	2	3	4	5
NO PAIN	VERY LIGHT PAIN	LIGHT PAIN	MODERATE PAIN	STRONG PAIN	UNBEARABLE PAIN

Figure 2 - Grading scale from 0 to 5 correlating numbers, colors and the pain intensity.

the symptom was more acute with probe manipulation or because of biopsy punctures, if he would submit himself to a new biopsy, if necessary, and about side effects of the drug used.

All patients returned 7 days after the procedure when the symptoms related with exam complications were evaluated.

To facilitate statistical pain analysis, patients were rearranged in two groups: those without pain and with mild pain constituted the first group, and those with moderate, severe, and intolerable pain, constituted the second group. The statistical analysis was performed in EpiInfo 2000 software, using the Chi-square test (χ^2) and Fischer's Exact Test, with 95% of confidence interval ($p < 0.05$) for all criteria evaluated. No statistical tool was used for correcting values.

RESULTS

Of 40 patients, 20 were included in Group I (periprostatic local anesthesia), and 20 in Group II (conventional treatment). Patients' mean age was 70

years, mean PSA was 15ng/mL, and prostatic volume evaluated by TRUS was 36.0g. There was no statistical difference ($p > 0.05$) in these variables (Table-1).

Among the patients submitted to conventional biopsy (Group II), 19 (95%) presented some kind of pain, one of them (5%) had mild pain, 4 patients (20%) moderate pain, 9 patients (45%) severe but tolerable pain, and 5 patients (25%) had intolerable pain. But in the group where periprostatic local anesthesia was performed (Group I), 13 patients (65%) complained of pain, of which 5 patients (25%) had very light pain, 5 patients (25%) mild pain, 1 patient (5%) moderate pain and 2 patients (10%) defined pain as severe but tolerable (Figure-3). No patient complained of intolerable pain ($p < 0.001$, $\chi^2 = 22.5$).

Among the patients presenting pain, when questioned about the most significant factor in this symptom origin, 4 patients (21%) of Group II, and 5 patients (38.5%) of Group I complained of TRUS probe manipulation. On the other hand, 15 patients (79%) of group II, and 8 patients (61.5%) of group I,

Table 1 – Mean and standard deviation of the groups according to age, PSA blood value and prostatic volume (TRUS), showing the uniformity of the studied groups.

Criteria	Biopsy with periprostatic local anesthesia	Conventional biopsy
Age (years)*	70.9 (± 8.5)	69.0 (± 7.3)
PSA (NG/ML)*	14.9 (± 13.3)	16.5 (± 13.9)
Prostatic volume (g)*	35.9 (± 14.1)	37.2 (± 24.7)

* $p > 0.05$

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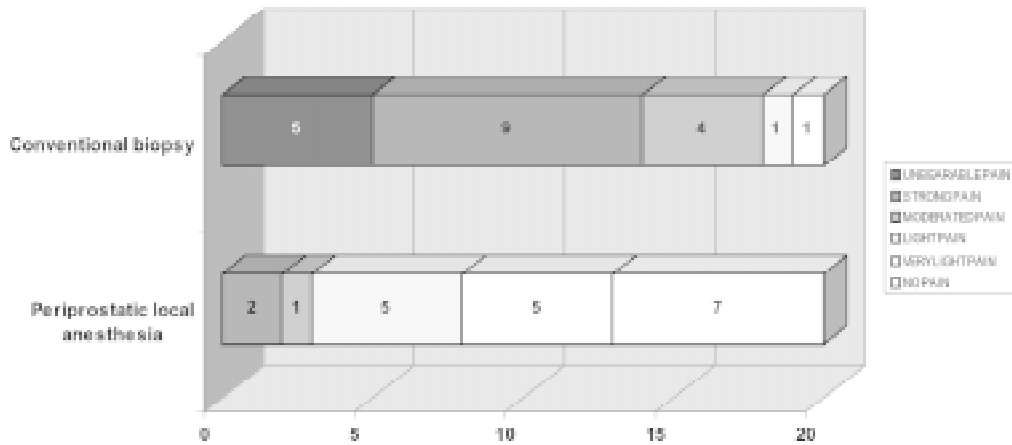


Figure 3 – Pain intensity according to the color grading scale, comparing conventional biopsy and biopsy with periprostatic local anesthesia.

complained of pain by biopsy puncture ($p=0.42$, $\chi^2=0.46$).

Considering pain impact in an eventual re-biopsy acceptance, all patients of Group I accepted a new biopsy. However, 11 patients (55%) of Group II refused to repeat the procedure if necessary ($p<0.001$, $\chi^2=15.17$).

Complications observed were hematuria, anal bleeding, fever, and prostatitis. There were no complications related to the drug used (Table-2). No morbidity predominated among the groups.

DISCUSSION

Advancement in prostatic innervation knowledge made the use of local anesthesia in urologic procedures possible. Most of ventral afferent innervation is commanded by sensorial nerves of L5-L6 segments, and a small part by T12-L2 (12). Autonomic fibers of pelvic plexus reach the prostate through their anterior branches, contributing to 2 neurovascular bundles formation, observed on the posterior-lateral aspect of the prostate (13). Cavernous nerves arise

Table 2 – Number of patients that presented complications when compared periprostatic local anesthesia and conventional biopsy.

Complications	Biopsy with periprostatic local anesthesia	Conventional biopsy	Total
Hematuria	16	16	32
Anal bleeding	11	15	26
Fever	1	2	3
Prostatitis	1	2	3
Anesthetic complication	0	0	0

$p<0.05$ (for all criteria)

between the prostatic capsule and the endopelvic fascia, with posterior-lateral localization between the base and the apex, 9 to 12 mm cranial to the urogenital diaphragm. Tenuous fibers of these nerves supply the prostate, rectum, and urethra (12).

Capsular nerves emerge mainly of 2 segments: the first is localized on the anterior aspect of seminal vesicles, and transversally cross the gland in caudal direction; the second arises in posterior-lateral edge directing to posterior aspect and apex. Fibers longer than 95 mm are particularly dense in capsule and in caudal end of prostate, and several nerves longer than 30 mm are found in the prostatic urethra (13).

The obvious necessity of reducing discomfort of TRUS-guided prostate biopsy is represented by the increasing number of recent papers in this field.

Crundwell et al. (5) reported that 26 (24%) of 108 patients complained of moderate or severe pain during the procedure, and 20 patients (19%) had maintained the symptoms for a week. Collins et al. (9) reported that 20 (22%) of 89 patients had pain during the procedure. Zisman et al. (14) reported pain during 7 to 30 days in 10% of 218 patients submitted to prostate biopsy. Desgrandchamps et al. (8) observed moderate to severe pain in 13 (12%) of 109 patients. Peyromaure et al. (15) reported that only 51 (18.6%) of 275 patients submitted to prostate biopsy with 10 fragments, related no pain or discomfort. However, Aus et al. (16) observed this symptom in only 24 (7%) of 343 patients studied, and one should note that an average of 2.6 biopsies per patient was performed. However, in our study, 90% of patients submitted to prostate biopsy with 12 fragments had moderate to intolerable pain when blindly evaluated by an objective questionnaire.

Nash et al. (17), in 1996, described the periprostatic anesthesia technique in 64 patients in TRUS-guided biopsy performance. Four transrectal punctures were performed with 5 mL of 1% lidocaine administration. There was an important reduction of pain compared to placebo group ($p < 0.0001$), with no additional complication. Soloway et al. (6), in 2000, performed this procedure in 50 patients, nevertheless using 6 punctures, and observed moderate pain in only 1 patient, with no complications. Though this study

was published in a high impact journal, he did not use a control group for results analysis. Taverna et al. (18) reported that 93 (93%) of 100 patients had from absence of pain to moderate pain with periprostatic blockage performed with 10 mL of 1% lidocaine, compared to the presence of moderate to severe pain in 55 (55%) of 100 patients where no anesthetic procedure was performed. Of 20 patients in our study submitted to local periprostatic anesthesia with 10 mL of 1% lidocaine, 13 (65%) had mild pain sensation, just 1 (5%) patient complained of moderate pain, and 2 (10%) had severe, but tolerable pain. No patient complained of intolerable pain. The statistic difference observed confirms the periprostatic blockage superiority when compared to conventional biopsy with no analgesic, as previously suggested by those authors. Due to anesthetic blockage of capsular sensitive fibers, there is an important reduction on pain sensation related by patients. As the procedure progresses, the patient feels less anxious and more relaxed, not contracting the pelvic muscles, making the exam more tolerable. Probably there is some degree of systemic drug absorption due to the great absorptive capacity of rectal mucosa.

Considering which pain component is more important, 9 patients (28%) reported more discomfort due to probe manipulation, and 23 patients (72%) due to biopsy puncture, not having an important impact of periprostatic anesthesia in this issue ($p = 0.42$; $\chi^2 = 0.46$). This is extreme relevant data, since a significant sample still feel uncomfortable, even if to a lesser degree when comparing to those submitted to conventional biopsy using local anesthesia blockage. Perhaps this occurs due to contraction of external anal sphincter, where periprostatic anesthesia has poorer action, added to an eventual possibility of incomplete blockage of several prostatic sensitive fibers.

Another criterion for establishing local anesthesia efficacy is the patient subjective impression, considering the eventual re-biopsy necessity. In an 81 patient sample, Irani et al (19) reported moderate or severe pain in 13 patients (16%), with 15 (19%) claiming that they would not accept a new biopsy without anesthesia. It was interesting to note that those who refused to suffer a new exam had the higher scores on pain scale. We observed that over half of

the patients submitted to the exam without anesthesia (55%) refused to repeat the procedure because of the pain. All patients for whom the procedure was performed with anesthesia accepted a new biopsy (20).

The results of this study showed that a large number of patients submitted to a transrectal biopsy presented some kind of significant pain if no analgesic procedure was used during the exam. This data obtained with an objective evaluation may be more reliable than those reported on literature, showing that pain sensation has been, generally, underestimated in most series. There are no doubts that our data show the statistic superiority of periprostatic blockage in this group compared to the placebo group. Biopsy become much more soothe and tolerable; this data is confirmed by pain scales and the acceptance of a hypothetical re-biopsy.

We also observed that the transrectal probe is an important instrument of discomfort in up to 38.5% of patients under anesthesia, and most of the studies do not consider this data. In these cases, using periprostatic blockage had an analgesic action less efficient.

CONCLUSION

Periprostatic local anesthesia promotes significant pain reduction, making the TRUS-guided prostate biopsy well tolerated by the patients. We believe that some analgesia method must be routinely performed during this exam. In this context, the periprostatic anesthesia is a feasible and low cost option, and can be performed as an outpatient procedure with no additional morbidity.

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