

## Low Dose Spinal Saddle Block Anesthesia (With 1.5 Mg Bupivacaine) For Transrectal Prostate Biopsy-Experience with 120 Cases

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### Abstract

**Objective:** To share our experience on the use of low dose spinal saddle block anesthesia (SSBA) for prostate biopsy.

**Methods:** The efficacy of low dose SSBA using 1.5 mg of 0.5% bupivacaine in dextrose injection USP was evaluated in 120 patients undergoing transrectal prostate biopsy. Pain score, patient's cooperativeness, and willingness to have a repeat biopsy was assessed. Also assessed were patients age, prostate volume, Prostate specific antigen (PSA), biopsy cores, complications, blood pressure (BP) changes, duration and cost of the procedure.

**Results:** The mean patient age (yrs) was 63.3 ( $\pm$  8.98), Mean pain Score was 0.0  $\pm$  0.2 (range 0-1). There were no anesthetic complications. Mild complications related to prostate biopsy occurred in 65% of patients while the remaining 35% of patients had no complications. There was no mortality. All patients were very cooperative during the procedure and 100% of them were willing to have a repeat biopsy should the need arise. Mean PSA (ng/ml) was 39.6  $\pm$  45.6, mean prostate volume (cm<sup>3</sup>) was 109.5  $\pm$  46.1, mean biopsy cores taken was 12.6  $\pm$  0.8, mean systolic BP change (mmHg) was 8.6  $\pm$  5.4. Duration of biopsy (minutes) was 35.6  $\pm$  5.8. There were no motor deficits. All Patients were able to position themselves for biopsy and walk immediately after biopsy and go home within one hour of biopsy.

**Conclusions:** Properly administered low dose spinal saddle block anesthesia offers definite anesthesia for prostate biopsy without motor deficits or appreciable drop in systolic BP from baseline. It has high levels of patient cooperativeness and willingness to have a repeat biopsy. It could be an alternative anesthetic technique for prostate biopsy.

**Keywords:** Low dose spinal saddle block anesthesia; Prostate biopsy

### Introduction

Prostate biopsy has evolved into the standard method for obtaining tissue for histologic diagnosis in patients with suspected prostate cancer. While some urologists still carry out the procedure without anesthesia or analgesia, several studies have shown that up to 19% to 30% of patients experience moderate to severe pain during prostate biopsy [1,2]. Irani et al. [2] reported that 6% of their patients believed that the procedure should have been performed using general anesthesia, while 19% would not agree to undergo it again without some form of anesthesia.

Nash et al. [3] first introduced transrectal ultrasound (TRUS) guided prostatic nerve blockade in 1996 to ease the discomfort associated with prostate biopsy. Since their landmark publication, several modifications of Nash's original description of periprostatic lignocaine (PPL) have been tried and published, in addition to several other anesthetic and analgesic techniques. It is obvious that the ideal anesthetic technique for prostate biopsy that will guarantee patient comfort, safety and allow prostate biopsy to be carried out as a day case/office procedure is yet to be agreed on by the urologic community. Of the numerous methods that have been tried and published in the literature the most popular appears to be periprostatic lignocaine (PPL) [3-10]. However studies have shown that PPL does not adequately relieve the pain associated with prostate biopsy [7,11-13]. A randomized trial [14] has even suggested that needle punctures for lidocaine infiltration are more painful than probe insertion and the actual biopsy in addition to other drawbacks of PPL.

In order to guarantee patient comfort and allow the operator obtain as many biopsies as are needed to make a diagnosis an ideal

anesthetic technique must be found. This ideal anesthetic technique must give full anesthesia and yet be adaptable to the outpatient or office. In our previous randomized study [15] we established the superiority of low dose spinal saddle block anesthesia (SSBA) with 0.5 ml (2.5 mg) bupivacaine over conventional PPL. In this report we share our experience with low dose SSBA using a lower dose of bupivacaine, 0.3 ml (1.5 mg) in a larger number of patients and show that SSBA at this dose meets the criteria of an ideal anesthetic for prostate biopsy.

### Patients and Methods

Following institutional ethics board approval and haven obtained informed consent from all patients, the efficacy of low dose SSBA using 0.3 ml of 0.5% hyperbaric bupivacaine in dextrose injection USP (equivalent to 1.5 mg bupivacaine) was evaluated in 120 patients undergoing transrectal prostate biopsy. Anesthesia was administered by either a physician or nurse anesthetist under standard monitoring with a multiparameter patient monitor. The indications for biopsy were a PSA > 4.0 ng/ml or a suspicious digital rectal examination.

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All patients had an abridged 2 day bowel preparation consisting of low residue diet, bisacodyl tablets 10 mg b.i.d, tab neomycin 1 g t.i.d and tab metronidazole 400 mg t.i.d. The patients were administered intravenous (i.v) ciprofloxacin 400 mg and i.v metronidazole 500 mg, 15 minutes before biopsy. 500 ml normal saline infusion was set up on the patient to maintain i.v access and allowed to run at 20 drops/minute. 0.3 ml of 0.5% hyperbaric bupivacaine in dextrose injection USP (equivalent to 1.5 mg bupivacaine) was drawn in a 2 ml syringe and diluted with water for injection up to 1.0 ml. The purpose of the dilution was to reduce dead space loss of active ingredient. This was injected into the spinal subarachnoid space between L3/L4 vertebrae using a size 23G or 21G pencil-point spinal needle with the patient in the sitting position and the spine arched backwards (same as for spinal anesthesia). The patient was required to remain seated for 5 to 7 minutes after the injection to enable the bupivacaine gravitate down and block the saddle region. Thereafter the patient was positioned in the left lateral decubitus position for biopsy. The spring loaded biopsy gun and an 18G trucut needle were used for biopsy. Six to fourteen cores of prostatic tissue were taken from the apex, midland and bases of both halves of the prostate including any suspicious nodules. All biopsies were done by the author. Patient's blood pressure was measured before injection of bupivacaine, after the injection and immediately after biopsy. Pain from prostate biopsy was assessed at the end of biopsy using the visual analog scale (VAS); where 0 represents no pain at all and 10 represents the worst pain ever. Also assessed were; patients cooperativeness, willingness to have a repeat biopsy, duration of the entire procedure, presence of dizziness, differences in attempts at lumbar puncture between the physician and nurse anesthetist, presence of neurological deficits, spinal headache, cost of the procedure, PSA, prostate volume, biopsy cores taken and patients age. Prostate biopsy complications were assessed immediately after biopsy and 8 days later in the outpatient department.

### Exclusion Criteria

We excluded all patients with chronic pain of any etiology, patients with clinical or radiological evidence suggestive of spinal metastasis from prostate cancer, patients with bleeding disorders or neurological deficits resulting in decreased perineal or rectal sensation and patients with known allergy to bupivacaine.

### Statistical Analysis

Data were analysed using the statistical package for social sciences version 17.0 (SPSS Chicago, IL). Descriptive statistics was used to determine means and standard deviations, while chi square test was used for test of significance between groups. P<0.05 was taken as significant.

### Results

Low dose SSBA at the dose given was able to anesthetize the saddle region. Specifically there was anesthesia of the prostate and the anal sphincter was completely paralyzed. Patients retained full power in the lower limbs; Bromage score 0 and were able to position them for biopsy. 20% of patients experienced transient paresthesia of the lower limbs lasting 15 to 20 minutes. All patients were able to go home unaided within hour of biopsy.

Mean pain score was 0.0 (± 0.2). 100% of patients were very cooperative during the biopsy. Patients cooperativeness was measured as previously described [15]. Willingness to have a repeat biopsy assessed as yes or no response was 100%. Currently we have

not observed any anesthetic complications. Complications related to prostate biopsy occurred in 65% of patients, most of which were mild. Fever and exacerbation of lower urinary tract symptoms were the commonest complications. Details of these will be reported in a separate publication. There was no mortality. Mean systolic BP change (mmHg) was 8.6 ± 5.4. The rest of the results are as shown in Table 1.

### Discussion

Prostate biopsy wether by the transrectal or transperineal route is currently the standard method of confirming a diagnosis of prostate cancer in patients with elevated prostate specific antigen values or abnormal digital rectal examination. Historically Takahashi and Ouchi [16] are credited with performing the first transrectal ultrasound (TRUS) scan of the prostate in 1963 while Top-pederson et al. [17] are credited with performing the first TRUS guided trucut biopsy of the prostate in 1989. Nash et al. [3] introduced TRUS guided prostatic nerve blockade in 1996 to ease the discomfort associated with prostate biopsy.

Several studies have shown that a significant number of patients experience varying degrees of pain and discomfort during prostate biopsy [1,2,18,19]. Clements et al. [18] and Collins et al. [19] in seperate studies showed that between 65% and 90% of patients experience discomfort during prostate biopsy while Irani et al. [2] reported that 6% of their patients believed that the procedure should have been carried out under general anesthesia and 19% would not agree to undergo it again without some form of anesthesia. The need for adequate pain relief or anesthesia during prostate biopsy cannot be overemphasized; Topmost is the need to ensure patient comfort during biopsy. Secondly confirmation of a diagnosis of prostate cancer has evolved from TRUS directed biopsy of suspicious lesions to the sextant, the 10 to 12 core and recently the saturation biopsy approach with 20 or more cores. This is because current treatment paradigms such as active surveillance and focal therapy require that all lesions in the prostate be detected and characterized to determine the appropriate course of action rather than simply making a diagnosis of prostate cancer. Studies have shown that the pain and discomfort associated with prostate biopsy is proportional to the number of biopsies taken [3,18,19]. These extended biopsies will naturally be associated with more pain and discomfort. In addition repeat biopsies will often be required because of initial negative biopsy in patients with raised PSA. The willingness to accept these repeat biopsies will be determined by the amount of pain and discomfort felt at the initial biopsy.

Responses	Mean (SD)
Patients age (years)	63.3 (± 8.98)
Prostate volume (cm <sup>3</sup> )	109.5 (± 46.1)
PSA (ng/ml)	39.6 (± 45.6)
Biopsy cores	12.6 (± 0.8)
Duration of biopsy (mins)	35.6 (± 5.8)
Pain score (VAS)	0.0 (± 0.2)
Level of cooperativeness	100% very cooperative.
Willingness to have a repeat biopsy	100%
Complication rate (prostate biopsy related)	a) No complications-35% b) Complications-65%
Mean Systolic Blood pressure change (mmHg)	8.6 (± 5.4)
Attempts at Lumbar Puncture	a) Physician anesthetist 1.6 (± 0.81). Range 1-3 b) Nurse anesthetist 1.9 (± 0.85). Range 1-3. P=0.106

**Table 1:** Patient demographics and outcome parameters in 120 patients administered low dose SSBA.

Currently the most widely used and most studied method of anesthesia for prostate biopsy is periprostatic lignocaine. Despite its widespread use several studies have shown that PPL is far from being the gold standard anesthetic technique for prostate biopsy. At least one prospective double blind placebo controlled study has shown no difference in pain scores between PPL and placebo [11]. PPL does not address the discomfort arising from ultrasound probe insertion into the rectum because the anal sphincter is not paralyzed. Another randomized study has suggested that needle punctures for lidocaine infiltration are more painful than probe insertion and the actual biopsy [14]. Two randomised studies have also shown that periprostatic lignocaine is insufficient for sampling 12 cores or greater [7,11]. Attention has also been drawn to potential risk of accidental intravascular injection and the danger of introducing infection into the prostate. A prospective randomized study by Öbek et al. [20] assessing infective complications noted that high fever was more frequent in the local anesthetic group than in the non injected group but the difference was not statistically significant. Finally the admin of PPL may cause fibrosis and interfere with nerve sparing radical prostatectomy [21].

In an effort to address these concerns we experimented with low dose SSBA. In our previous randomized study [15] we established its superiority over periprostatic lignocaine. SSBA is not a new anesthetic technique. SSBA with bupivacaine is commonly used by general surgeons for perianal surgeries, but its usefulness in prostate biopsy has not been fully explored. Traditional SSBA at doses of 0.8 ml or higher causes lower limb paralysis and blood pressure changes [22,23]. In this study patients were administered 0.3 mls (1.5 mg) bupivacaine. This dose caused complete paralysis of the anal sphincter and anesthesia of the perianal area and prostate without lower limb paralysis or appreciable change in mean systolic blood pressure from baseline. The mean systolic blood pressure change was 8.6 mmHg ( $\pm$  5.4). 20% of patients had transient tingling sensation in their lower limbs. All patients had a Bromage score of 0 and were all able to position themselves in the left lateral decubitus position for biopsy. The mean pain score in our study was 0.0 ( $\pm$  0.02). This is not surprising because there was definite anesthesia of the anal sphincter and prostate, which are the two areas responsible for the pain of prostate biopsy. This is much lower than the mean pain scores from published studies using periprostatic lignocaine which generally range between 2.4 to 4.6 [5-7,10,15]. All patients were very cooperative during the biopsy making it possible to take as many biopsies as required and 100% of them were willing to have a repeat biopsy should the need arise (Table 1). There were no anesthetic complications or complications related to entry into the spinal subarachnoid space. Complications related to prostate biopsy were seen in 65% of patients. The commonest of these was fever and exacerbation of lower urinary tract symptoms.

The drawbacks to the use of low dose SSBA would appear to be the need for an anesthetist, the need for patient monitoring and the additional costs involved. The attempts at lumbar puncture between the physician anesthetist and the nurse anesthetist were 1.6 ( $\pm$  0.81), range 1-3 versus 1.9 ( $\pm$  0.85), range 1-3 respectively. This difference was not statistically significant  $P=0.106$ . Thus it may not be mandatory to have a physician anesthetist. The mean systolic blood pressure change was 8.6 mmHg ( $\pm$  5.4). None of the patients experienced dizziness. All were able to ambulate at the end of biopsy and go home within one hour of biopsy. Duration of biopsy was 35.6 minutes ( $\pm$  5.8) including the time for induction of anesthesia. The calculated cost of the procedure was USD 4.0 excluding theatre and anesthetist fees. Based on the foregoing; the absence of lower limb motor paralysis, the minimal change in blood pressure and the ease of administration, it

should be possible to adapt this procedure to the outpatient or office setting.

## Conclusion

Low dose spinal saddle block anesthesia offers definite anesthesia for prostate biopsy with paralysis of the anal sphincter and absence of lower limb paralysis or appreciable drop in systolic blood pressure from baseline. It has high levels of patient cooperativeness and willingness to have a repeat biopsy. It can be administered easily by a physician or nurse anesthetist. It could be easily adapted to the outpatient or office setting and could be an alternative anesthetic technique for prostate biopsy.

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