# Spinal Perianal Block: A Prospective, Randomized, Double-Blind Comparison with Spinal Saddle Block

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**BACKGROUND:** In this prospective, randomized, double-blind study, we evaluated whether a very low dose of spinal bupivacaine could be sufficient for safe performance of short perianal surgery.

**METHODS:** Eighty patients were randomly assigned to receive hyperbaric bupivacaine doses of either 1.5 mg ($n = 40$) or 6.0 mg ($n = 40$).

**RESULTS:** The lower dose produced satisfactory anesthesia with a more limited block (median S4; $P < 0.01$), earlier time to ambulation (98 vs 147 min; $P < 0.01$), and hospital discharge (126 vs 249 min; $P < 0.01$), compared with the higher spinal dose.

**CONCLUSIONS:** The use of 1.5 mg spinal bupivacaine can be successful for short perianal surgery.

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Attempts have been made to tailor spinal anesthesia for specific surgical procedures (1). Several studies targeting local anesthetic at specific nerve roots supplying the surgical field have demonstrated successful results (2,3). However, little research has been published concerning spinal saddle block. This study was designed to examine the efficacy of very low dose (1.5 mg) bupivacaine for blockade of the nerve supply of the surgical field in short perianal procedures compared with the dose regularly used in spinal saddle block (6.0 mg).

## METHODS

After IRB approval and patients' written informed consent, 80 ASA physical status 1 and 2 adult patients scheduled for elective short perianal procedures under spinal anesthesia were enrolled in this prospective, randomized, double-blind study. Under standard monitoring using an automated data recording system and with the patient in the sitting position, dural puncture was performed at L4–5 or L5-S1 intervertebral space using a 24-gauge Sprotte needle with its orifice directed caudad. Patients were randomized to receive bupivacaine doses of either 0.2 mL (1.5 mg: perianal group) or 0.8 mL (6.0 mg: saddle group), prepared in a tuberculin syringe and injected at a rate of 0.1 mL/10 s. An investigator blinded to group allocation performed the sensory and motor evaluations. In both groups, while the patient was sitting, sensation was tested at 1 min intervals using a long surgical toothless clamp gently applied radially, starting from the anal orifice, in different diagonal directions until satisfactory block had reached S4 and repeated after 1 min. Motor function was tested using a modified Bromage scale. The ability of the patient to position him/herself unaided, prone or supine, for surgery was noted. If there was no detectable weakness, the patient was asked if he/she perceived any change in motor power (4). If not, the patient was allowed to position him/herself without aid. Sensory and motor functions were assessed immediately before and after surgery, until recovery was complete. Patient discomfort related to surgical manipulations was assessed by asking the patient to subjectively rate his/her degree as none, mild, moderate, or severe. A successful block was defined as one that did not require any supplementation. A partial success was defined as the need to supplement with lidocaine local infiltration or IV fentanyl. Failure was defined as the need for general anesthesia to complete the operation. Patient satisfaction was also assessed, and was defined as complete satisfaction, minor or major reservation, or dissatisfied. Times to ambulation, voiding, and readiness for discharge (5) were noted. All times were recorded starting from the time of bupivacaine injection. Each patient was contacted the next day to assess the presence of complications including headache and backache.

A power analysis with a power of 0.95 ($1 - \beta$) and $\alpha = 0.5$ indicated a sample size of at least 39 subjects for each group would be required to show a difference of 2 dermatomes in sensory block. Statistical analyses were performed using the GB-STAT V 8.0 software (2000 Dynamics Microsystems Inc.). Data are presented as median [range], mean (SD), or frequencies as appropriate. Parametric data were analyzed using

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**Table 1.** Patient Characteristics, Type of Surgical Procedure Performed, and Patient Positioning During Surgery

| | Perianal group $N = 40$ | Saddle group $N = 40$ |
|---|---|---|
| Age (yr) | 39 ± 6 [22–70] | 37 ± 6 [19–64] |
| Height (cm) | 163 ± 6 [150–177] | 167 ± 7 [149–182] |
| Weight (kg) | 66 ± 11 [54–95] | 73 ± 17 [45–115] |
| Gender (M/F) | 25/15 | 28/14 |
| Duration of surgery (min) | 49 ± 8 [36–58] | 51 ± 8 [32–62] |
| Surgical procedure | | |
| Hemorrhoidectomy (*n*) | 18 | 19 |
| Perianal fistulectomy (*n*) | 11 | 13 |
| Perianal lesion excision (*n*) | 5 | 3 |
| Chondylomata excision (*n*) | 4 | 4 |
| Anal mass biopsy (*n*) | 2 | 1 |
| Surgical posture | | |
| Jack-knife position, *n* (%) | 36 (90) | 36 (90) |
| Lithotomy position, *n* (%) | 4 (10) | 4 (10) |

Data for age, height, and weight are expressed as mean ± SD and for duration of surgery as median [range]. Data for surgical posture are expressed as frequencies.

* There is no significant difference between the two groups.

**Table 2.** Block Characteristics and Postanesthesia Care Unit Variables

| | Perianal group $N = 40$ | Saddle group $N = 40$ |
|---|---|---|
| Bupivacaine dosage (mg) | 1.5 | 6.0* |
| Lowest mean BP (% of baseline) | 100 [94–100] | 92 [88–100]* |
| Time to S4 blockade (min) | 5 [4–7] | 4 [2–5]* |
| Maximum block (dermatome) | | |
| Preoperative | S4 [S3–S4] | S2 [L5–S2]* |
| Postoperative | S4 [S3–S4] | S1 [L4–S2]* |
| Regression of S4 (min) | 76 [67–86] | 153 [114–163]* |
| Modified Bromage score | | |
| Preoperative | 0 | 1 [1–2]* |
| Postoperative | 0 | 2 [1–3]* |
| Aided patient positioning | | |
| Preoperative, *n* (%) | 0 (0) | 40 (100)* |
| Postoperative, *n* (%) | 2 (5) | 40 (100)* |
| Motor regression (min) | N/A | 113 [84–129]* |
| Time to ambulation (min) | 98 [76–124] | 147 [118–168]* |
| Time to voiding (min) | 121 [89–160] | 236 [184–324]* |
| Time to readiness for discharge (min) | 126 [91–166] | 249 [194–338]* |
| Patient satisfaction, *n* (%) | | |
| Complete | 37 (92) | 36 (90) |
| Minor reservation | 3 (8) | 4 (10) |

Data are expressed as median [range]. Times are recorded starting from the intrathecal injection.

Preoperative = before surgery; Postoperative = on termination of surgery; BP = mean arterial blood pressure.

* $P < 0.01$.

two-tailed unpaired Student's *t*-test and expressed as mean (SD). $\chi^2$ Analysis was used for qualitative data analysis. Nonparametric data were analyzed using Mann–Whitney *U*-test and expressed as median [range]. Level of statistical significance was taken at $P < 0.05$.

## RESULTS

There were no significant differences inpatient demographics (Table 1). Low-dose bupivacaine in the perianal group produced a significantly restricted sensory block (median maximum = S4 and no motor block (Bromage = 0) ($P < 0.01$). Time to resolution of sensory block of S4 dermatome (equivalent to provision of adequate safe duration for surgical performance) in the perianal group was significantly shorter than in the saddle group ($P < 0.01$) (Table 2), and significantly exceeded the median duration of surgery ($P < 0.01$) (Table 1).

All patients in the perianal group were able to move. However, postoperatively, two patients expressed a subjective feeling of motor weakness (proprioception intact, Bromage = 0), which disappeared 10–15 min after S4 regression and required aided positioning. Time to ambulation, voiding, and readiness for discharge were significantly shorter in the perianal group ($P < 0.01$) (Table 2).

No patient in either group showed any significant discomfort related to surgical manipulations, and most expressed complete overall satisfaction (Table 2). Two patients in the perianal group expressed some discomfort unrelated to surgery that was alleviated by midazolam and fentanyl. No complications were reported postoperatively in either group.

## DISCUSSION

The present study demonstrates that low-dose intrathecal bupivacaine may be useful for short perianal procedures. Restriction of blockade to the most caudal spinal nerve roots (S4-coccygeal) supplying the perianal area, lack of motor and sensory blockade of the lower limbs and early ability to ambulate and void offered conditions favorable for early hospital discharge. All patients experienced no discomfort with respect to surgical manipulations, found the spinal perianal block completely acceptable and had no complications. However, patient complaints unrelated to surgery required additional medication.

Selectively targeting local anesthetic at nerve roots supplying the surgical field with preserving quality of anesthesia was shown to be successful, and the use of low dose bupivacaine (2,3,6–8) produced favorable results.

The spinal perianal technique aimed to confine a small bolus of bupivacaine to the lower end of the dural sac. Time taken in the sitting position is integral to this technique to effect a confirmed S4 dermatome blockade, in readiness for surgery. However, 5% of the

patients expressed a subjective feeling of very mild muscular weakness (Bromage scale = 0, proprioception intact) immediately at the end of operation which disappeared 10–15 min after regression of S4 sensory block. Ability to void may be delayed beyond sensory and motor recovery (9) and was the last discharge criterion to be achieved in both groups. However, this criterion may be phased out of many ambulatory surgery centers.

In conclusion, reducing the dose of bupivacaine to 1.5 mg in the spinal perianal block may be beneficial for short perianal surgery.

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