

Walking in PACU after unilateral spinal anesthesia a criteria for hospital discharge : a 100 out patients survey

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Abstract : *Purpose :* This study measured time and ability to walk in PACU after unilateral spinal anaesthesia.

Methods : Orthopaedic adult patients ASA 1-2, in the lateral decubitus position and placed on the operative side, received via a 25-gauge Whitacre needle 5 mg of 0.5% bupivacaine plus 2.5 µg of sufentanil. Lateral decubitus was maintained for 15 minutes. Time from the spinal injection to eligibility for discharge was recorded. Discharge criteria were stable hemodynamic and ability to walk without crutches.

Results : One hundred consecutive patients (38 females), 48 ± 15 years-old were included. Unilateral sensory block was noted in 70% of patients. The maximum level of sensory block was at L1-T12 in 30 patients, at T11-T10 in 55 patients, at T9-T8 in 6 patients and at T7-T6 in 9. Criteria for PACU discharge were completed at 140 ± 14 min (extremes : 55-235). All patients were discharged home uneventfully.

Conclusion : Unilateral spinal anesthesia combining bupivacaine and sufentanil gives fast ability to walk for discharge.

Key words : Spinal anesthesia ; bupivacaine ; sufentanil ; ambulatory surgery ; orthopaedics.

INTRODUCTION

Regional anesthetic techniques are developing for outpatient mandatory. An ideal technique means rapidity and control of onset and offset of anesthesia, minimal side effects and complications and minimal expense (1). Low doses of hyperbaric or hypobaric local anaesthetic (LA) solutions, directional spinal needles, and lateral decubitus position are used to restrict the spread of spinal anaesthesia to the only operative side (2, 3). This trial aimed to study the patient ability to walk in the post anesthesia care unit (PACU) as criteria for home discharge.

METHODS

This prospective and observational study performed in two ambulatory units was approved by

the Local Ethic Committee and was conducted over 6 months.

Adult patients (ASA 1 or 2) with written pre-anaesthetic consent for spinal anesthesia and scheduled for an ambulatory orthopaedic procedure (knee arthroscopy or orthopaedic material removal) were included. Patients with contraindication for regional anesthesia or micturition disease were not included therein. After setting intravenous infusion with crystalloid, blood pressure, electrocardiogram and peripheral oxygen saturation were monitored with a measurement every five minutes throughout the procedure. Patients placed laterally on the operative side, received 5 mg of 0.5% bupivacaine plus 2.5 µg of sufentanil, through the midline approach at the L₃-L₄ interspace, using a 25-gauge Whitacre spinal needle with the aperture turned towards the dependent side. LA and opioid were injected slowly during 30 seconds. Lateral position was maintained systematically for 15 minutes. When systolic arterial pressure decreased more than 30% from the initial value or decreased below 90 mmHg, a bolus of ephedrine (3 mg) was administered intravenously. Eventual bradycardia (heart rate < 50 beats/min) was to be treated with intravenous atropine (0.5 mg).

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Implications statement : this case series survey supports the ability to walk in PACU for patients undergoing unilateral spinal anesthesia as an easy criterion of discharge in day case surgery.

Time from the end of spinal injection to the possibility of standing up and walk in the PACU was recorded every 5 min during the first half an hour then every 10 min during 2 hours. The patient's walk was assessed with a minimal distance of five steps without crutches.

As additional criteria for home discharge were the presence of stable vital signs and the absence of nausea pain or bladder distension or clinically relevant hypotension (decrease in systolic arterial blood pressure > 30% of baseline). The incidence of pruritus, urinary retention and postoperative nausea and vomiting (PONV) was recorded. Sensory and motor blocks were evaluated on both sides every 5 minutes following spinal injection up to the surgical procedure and every 10 minutes after surgery and in the PACU until spinal anesthesia was totally worn off. Sensory blockade and level was determined by pinprick discrimination (sharp versus dull). Duration of sensory block was defined as the time from intrathecal injection to two-segment regression of the block from the highest block level.

Motor blockade was determined using the modified Bromage scoring test (0 = no motor blockage, 1 = flexion of hip is not possible, 2 = flexion of hip and knee is not possible, 3 = flexion of hip, knee and ankle is not possible, 4 = hip, knee, ankle and toes do not move).

Concerning statistical analysis, results were expressed in mean and standard deviation for continuous data or as percentage for dichotomous data.

RESULTS

One hundred consecutive patients (38 females, 62 males), 48 ± 15 years-old were included in this prospective observational study. Surgery included 75 knee arthroscopies and 25 lower limb orthopaedic material removals. Surgery lasted 31 ± 19 min ; unilateral sensory block was noted in 70% of patients. The maximum level of sensory block was at L1-T12 in 30 patients, at T11-T10 in 55 patients, at T9-T8 in 6 patients and at T7-T6 in 9. Strictly unilateral spinal block was only observed in 82 patients with a modified Bromage scale always less or equal to 3 (knee blocked) in the operated limb (Fig. 1).

Due to exceeding surgical time, one patient needed general anaesthesia. Two patients complained of discomfort and received i.v. 5 mcg sufentanil.

Crystalloid infusion during surgery was 232 ± 140 ml. No colloid infusion was used. Ten patients had clinically relevant hypotension but only two received intravenous ephedrine, respectively 3 and 6 mg. None experienced significant bradycardia.

Time between spinal injection and the possibility of standing up and walking was of 141 ± 48 min.

Moderate pruritus and urinary retention occurred in one patient for each side-effect. No PONV was observed and all patients were

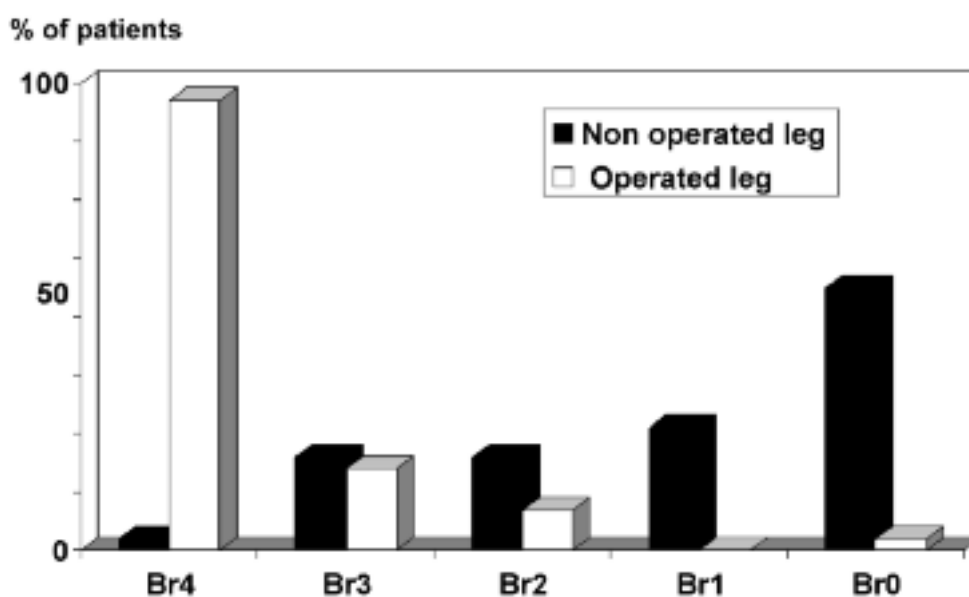


Fig. 1. — Bromage scale repartition in the operated leg and non operated leg. Br : Bromage

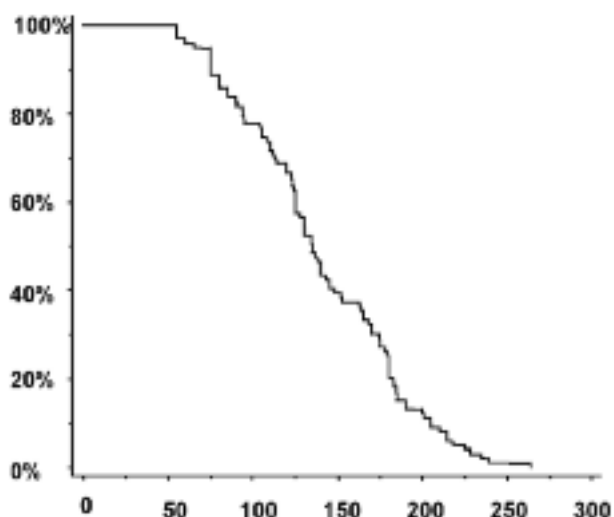


Fig. 2. — Kaplan Meier curve for time ready to discharge from PACU. The diagram represents the percentage of patients that did not fulfill criteria to discharge.

discharged home uneventfully though one patient complained headache on the postoperative day.

DISCUSSION

This study supports that unilateral spinal block using small doses of bupivacaine and sufentanil is an attractive technique for ambulatory anesthesia with a fast ability to home discharge and with a low risk of side-effects. In general, spinal anesthesia is a relatively inefficient anesthetic for ambulatory surgery due to unpredictable recovery time. Different hyperbaric bupivacaine regimen (from 6 to 8 mg) without adjuvant agents have been tested in previous studies (3, 4): these trials demonstrated the efficacy of small doses of hyperbaric bupivacaine with at least 10-15 min in lateral decubitus position (3). However, time to home discharge was near than 4 hours from the spinal tape (4, 5). Our data confirm the effectiveness of these previous studies but also show that decreasing bupivacaine doses improves readiness to home discharge. This study supports the needle design improves the quality of the lateral distribution (6-7). Positioning time to achieve unilateral spinal anaesthesia has to be discussed. For example, the positioning time was 15 minutes, whereas surgery was 30 minutes. Most ambulatory surgery centers would consider an anesthesia time equal to 50% of operating time as an expensive OR time which could have been spent performing more surgical cases. Nevertheless, Figure 2 illustrates that more than 50% of patients

did fulfill criteria to PACU discharge around two hours after spinal tape.

In ambulatory surgery, fast block recovery becomes a disadvantage when surgery lengthens. Adjuvant agents are administered with LA to lengthen the duration of anesthesia and to prolong analgesia. Fentanyl (8, 9) and clonidine (10) were studied as adjuvant agents in unilateral spinal anesthesia and have demonstrated to improve the effectiveness of this technique. Moreover, spinal opioid allows decreasing the LA dose with the same efficacy and consequently reduces the risk of arterial hypotension (8). Our results confirm this beneficence since only 2 patients needed ephedrine.

Crystalloid infusion during anesthesia, around 230 ml, was reduced. Large amount of intraoperative fluid volume increase the risk of urinary retention in spinal anesthesia (11, 12). Thus, unilateral spinal anesthesia with low doses of LA limits administration of intravenous fluid. However, intrathecal opioids alter bladder function by causing dose-dependent suppression of detrusor contractility and decreased sensation of void (13). Nevertheless, only two episodes of urinary retention were observed in the 100 patients probably due to sufentanil 2.5 mcg.

In summary, this study is the first one to evaluate after unilateral spinal block the ability to walk in PACU as criteria for home discharge.

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