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## Subarachnoid Block in Prone Position for lower limb surgery

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### ABSTRACT

Subarachnoid block is a safe and effective regional anesthesia technique. It is usually carried out in sitting or lateral position but it can also be performed in prone position. Here we report two cases of flame burn over bilateral gluteal region extending to the posterior and lateral aspect of both thighs, who were planned for debridement and split skin grafting. Both patients had difficulty in sitting and lying on either side of lateral position. We had administered subarachnoid block in prone position taking into consideration of patient's comfort and the nature of the procedure. Both patients remained hemodynamically stable throughout the procedure and their post-operative periods were uneventful.

**Keywords:** Burn; prone position; subarachnoid block

### INTRODUCTION

Subarachnoid block (SAB) is commonly performed regional anesthesia technique which is safe and effective when the surgical site is located on the lower half of the body. It is usually performed in lateral decubitus or sitting position. The choice of position depends on the nature of surgery, patient factors, and preference of the anesthesiologist. The SAB can also be performed in the prone position though it is technically difficult. This position is useful whenever patients have difficulty in positioning in a conventional way.<sup>1,2</sup> Here we present two cases of flame burn over bilateral gluteal region and thighs, who had undergone debridement and split skin grafting under SAB in the prone position.

### CASE REPORT

#### CASE 1

A 72 years female, with the diagnosis of 17 % second degree flame burn over gluteal region, lateral and posterior aspect of thigh on both sides (Figure 1) for debridement and Split-thickness skin graft (STSG). Her preoperative investigations were normal. She had difficulty in sitting and lying lateral on either side. Considering the patient's comfort, SAB in prone position was planned and written informed consent was taken. In Operation Theatre, she was kept in prone position and

standard ASA monitoring was done. For administration of SAB, positioning was done by putting pillows below the hip and chest. Furthermore, the leg end of the operating table was lowered down to keep the hip in flexion. Under aseptic conditions, SAB was performed via mid-line approach at L3-L4 space by using 23 G Quincke's spinal needle. After visualization of free flow of cerebrospinal fluid (CSF) (Figure 2), 10 mg of 0.5% heavy Bupivacaine was injected and the sensory level of block was achieved at T8 after 15 minutes.



Figure 1. Patient in prone position.

The total duration of the surgery was one hour. Intra-operative period was uneventful with stable hemodynamics. At the end of the surgery the level of block was regressed up to T10. Post-operative period she

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remained in the same position and she didn't complain of headache.



Figure 2. Free flow of CSF with 23G Quincke's needle.

## CASE 2

A 60 years female, with the diagnosis of 25% second degree bilateral flame burn over gluteal region and posterior aspect of thigh, planned for debridement and STSG. Her preoperative investigations were normal. She also had difficulty in positioning in conventional way for SAB. She was similarly prepared and positioned in prone on the operating table as described in case no 1. Under strict aseptic conditions, SAB was performed via mid-line approach at L3-L4 space using 25 G Quincke's spinal needle. Once in space, the stylet was removed but free flow of CSF was not found. After that the correct position of needle was confirmed by aspiration of CSF with 3 ml of syringe (Figure 3). After aspiration of the CSF, 12 mg of 0.5% heavy Bupivacaine was injected and the level of block achieved was T8 sensory after 15 minutes. The total duration of the surgery was 2 hours. Intra operative period was uneventful with stable hemodynamics. At the end of the surgery level of block was regressed up to T10. In post-operative period, she was also kept in same position and didn't have headache during that period.



Figure 3. Aspiration of the Cerebrospinal fluid in 25G Quincke's needle by 3ml syringe.

## DISCUSSION

SAB is usually carried out in sitting or lateral position. Besides that, it can also be performed in prone position. Traditionally the prone position is used for rectal, perineal and lumbar surgeries.<sup>3</sup>

We planned SAB in prone position for our patients, taking into the consideration of their inability to sit or lie down in lateral position for SAB, the avoidance of repositioning after induction of spinal anaesthesia and its consequences and more importantly the requirement of same position for both intra-operative and post-operative periods. Management of our patients in that position was heralded by multiple challenges like proper positioning for needle insertion, effect of baricity of local anesthetic drug, effects of gravity on flow of CSF and spread of drug, haemodynamic changes, post-dural puncture headache and maintenance of the patient comfort peri-operatively.

Spinal anesthesia in prone position is technically more challenging for the Anesthesiologists. Commonly encountered problems are identification of intervertebral space, Needle insertion and confirmation of needle placement in subarachnoid space. The induction of spinal anaesthesia in the prone position requires appropriate positioning for getting access to intervertebral spaces. In our both cases, optimal positioning was achieved by putting pillows below the hip and chest. Furthermore, the leg end of the operating table was lowered down to keep the hip in flexion by 15 degrees to reduce physiological lumbar lordosis, open the interspinous space and allow easy access to the subarachnoid space. We observed that, confirming subarachnoid space was easier with larger bore spinal needle (23G needle in our first case) as the CSF slowly overflowed against the gravity (Fig.2). However, the flow of CSF through smaller needle (25G in second case) was not observed and aspiration of CSF using 3 ml syringe (Figure 3) was needed to confirm it. This confirmation by aspiration of CSF technique was also used by Richard et al. (22G quincke's needle) and Laakso et al. (27G quincke's needle) in their similar cases. Hence, the free flow of CSF may not be a good indicator for the confirmation of subarachnoid space in prone position because of gravitational force leading to low CSF pressure.<sup>1,3-5</sup>

Baricity and gravity both affect the spread of local anesthetic within the intrathecal space.<sup>6</sup> Hypobaric solutions in prone jack knife position is commonly used for the surgeries around perianal region. But due to the unavailability of hypobaric solution, we had used 0.5% hyperbaric bupivacaine. In prone position, where the

natural curvature of vertebral column is reversed, use of hyperbaric solution might be leading to uncontrolled cephalad spread and level of block would be unpredictable and might cause hemodynamic instabilities. However, in our both cases the sensory level of block was achieved at T8 after 15 minutes of SAB and the hemodynamics remained stable perioperatively.<sup>2,3,5,7,8</sup>

Post-Dural puncture headache (PDPH) was another concern for us because, we had used larger bore (23G and 25G) Quincke's spinal needle which certainly predispose to the risk of PDPH. It has been described that the leaking of CSF through the puncture site of dural membrane leads to the PDPH. However, in the prone position, the puncture on the dura matter would be facing upward; thus, the loss of CSF could not be affected by gravity or intra-abdominal pressure, contributing to less incidence of PDPH. Our both patients remained in prone position during the intraoperative and post-operative period so they didn't experience the headache. Similarly, Laasko et al. did not found the PDPH in their cases.<sup>3,9,10</sup>

## CONCLUSIONS

SAB in prone position is technically challenging because of difficulty in getting the intervertebral space, confirmation of subarachnoid space, unpredictable spread of local anesthetics and hemodynamic changes. However, it can be a better alternative position when patients have trouble in positioning in a conventional way.

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