Case Report

Prolonged duration of spinal anesthesia with normal dose of hyperbaric bupivacaine: case report

Abstract

Background: Spinal anesthesia has been used for over 120 years as a relatively safe and effective method technique. A well-known anesthetic, bupivacaine is the most widely used local anesthetic in the subarachnoid space. We report a case of prolonged sensory and motor blockade in a patient undergoing spinal anesthesia with 15 mg of 0.5% hyperbaric bupivacaine without any adjuvant, which lasted 32 hours to regress.

Case Report: The patient was a 36-year-old female, obese, with no known comorbidities, who was undergoing surgical treatment of varicose veins of the lower limbs. Normal pre-operative exams. After sedation with midazolam 2.5 mg, the patient was in a sitting position and 3 attempts at subarachnoid puncture with a 27G cutting needle were unsuccessful. Another attempt with a 25G cutting tip needle was successful and injected 15 mg of 0.5% hyperbaric bupivacaine without adjuvants. The surgical procedure lasted 3 hours without cardio circulatory changes, and the patient was referred to PACU. Ten hours after the persistence of sensory and motor blocks. MRI of the thoracolumbar spine was performed without evidence of alteration. After 17 hours, both sensory and motor blocks remained, requiring bladder catheterization. After 23 hours, the neurological examination was normal, showing the permanence of both blocks. The complete return of sensory and motor blocks occurred after 32 hours, with hospital discharge in 4 hours, after complete regression of the subarachnoid block.

Conclusions: In conclusion, an unexpectedly prolonged spinal block can be seen with regular doses of 0.5% hyperbaric bupivacaine. We cannot determine the exact etiology in our present case, with a normal MRI thoracolumbar.

Keywords: hyperbaric bupivacaine, prolonged spinal anesthesia, complications

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Points

What is already known?

a. The dose of 15 mg of 0.5% bupivacaine single shot is practically used worldwide.

b. There are three puncture positions; lateral decubitus, sitting, and jack-knife position.

c. CSF volume influences the dispersion of local anesthetics.

d. There are few cases of prolonged block published in the anesthetic literature.

What this case report adds

A. A normal dose in single shot technique of 0.5% hyperbaric bupivacaine can provide prolonged sensory and motor blocks.

B. The cases cited occurred more with 0.75% hyperbaric bupivacaine.

C. MRI performed did not show any changes in the thoracolumbar spine.

D. None of the published cases report the lot of anesthetic used.

E. We were unable to explain the real reason for the prolonged blockade for 32 hours.

Introduction

Although the incidence of complications is low, spinal anesthesia-induced neurological complications may determine serious sequelae.[1] However, during spinal anesthesia, when any complication occurs, it generates concern for physicians and suffering for patients. The presence of a motor block lasting more than five hours caused great concern in a patient after using 15 mg of 0.5% isobaric bupivacaine plus fentanyl for a herniorrhaphy lasting 50 minutes.[2] We report a case of surgical cure of varicose veins in the lower limbs with the return of sensory and motor blocks 32 hours after single-dose spinal anesthesia with 15 mg of 0.5% hyperbaric bupivacaine, and hospital discharge after 36 hours without neurological deficit.

Case report

Female patient, 36 years old, body mass index (BMI) of 35.1 kg/m2, ASA II, with a history of rigid ureter lithotripsy under sedation without complications. History of oral contraceptive use, hemoglobin 12.8 g/dL, hematocrit 39.8%, platelets 350,000/µL, and normal coagulogram. Preoperative blood pressure 110/70 mmHg and heart rate of 74 bpm. The patient is given orally 200 mL carbohydrate (CHO)-rich beverage between 2 hours before surgery to fasting abbreviation, for surgical treatment for varicose veins in the lower limbs under spinal anesthesia with sedation indicated. After entering the surgery room, she was monitored with a cardio scope (CM5), non-invasive blood pressure, pulse oximetry, and venoclysis in the upper limb with a 20G extracath. Sedation was performed with intravenous midazolam 2.5 mg, with the patient positioned in a sitting position for the subarachnoid block. After asepsis and antisepsis with 0.5% alcoholic chlorhexidine and 1 minute after its use, three subarachnoid puncture attempts were made with a 27G Quincke needle, without success. During the 3 attempts, the patient remained conscious, with no reports of pain, paresthesia, or evidence of bleeding. A new attempt was made with 25G Quincke obtaining cerebrospinal fluid (CSF) and

3 ml of 0.5% hyperbaric bupivacaine with 8% glucose was injected, followed by the patient returning to the supine position. Fifteen minutes after the injection, the sensory level of blockade (T10) and the degree of complete motor blockade of the lower limbs (Bromage score 3) were assessed. Sedation during the procedure was performed with midazolam 5 mg, and fentanyl 50 µg. Dexamethasone 10 mg, pantoprazole 40 mg, ketoprofen 100 mg, dipyrone 2 g, and ondansetron 4 mg were administered in the first 500 mL of lactated Ringer's. The surgical procedure lasted 3 hours, without hemodynamic instability or hypoxemia, and the patient was sent to the PACU awake and without complaints.

In the ward, the persistence of sensory and motor blocks was observed 10 hours after the spinal puncture, associated with urinary retention and post-puncture headache. On neurological examination, the level of sensory blockade remained at T12. Due to the performance of several punctures a magnetic resonance imaging (MRI) of the thoracic and lumbar spine was performed, which did not show compression or other changes, ruling out the spinal hematoma (Figure 1& 2). The MRI showed in the lower back adipose reticular blurring and liquid layers in the median deep subcutaneous tissue, without organized collections, and discrete edema of the extraforaminal fat below the right layer of L3, unrelated to the emerging root. There were no changes in the thoracic region. After 17 hours, the sensory and motor blocks remained, requiring bladder catheterization. A slow and progressive regression of subarachnoid anesthesia was observed. After 23 hours, she was evaluated by the clinical neurology team, and grade 4 strength was observed in both limbs, hypoactive reflexes, and sensory ataxia, with the diagnostic hypothesis of slow spinal anesthesia recovery, but with progressive improvement. Differential diagnoses were ruled out and the patient was kept under continuous observation, showing persistence of the block with slow regression. The complete return of sensory and motor blocks occurred after 32 hours, with hospital discharge in 4 hours, after complete regression of the subarachnoid block. The patient was monitored for 10 days via telephone, without any complaints.

Figure 1 Normal MRI of the thoracic region.

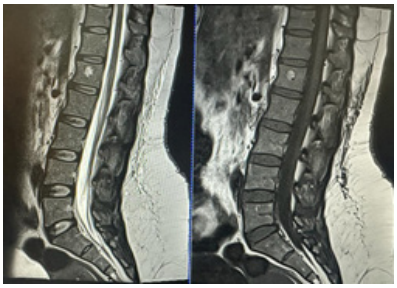

Figure 2 Normal MRI of the lumbar region.

Discussion

Spinal anesthesia has been used for over 120 years and has proven to be a safe and effective technique. This case report arouses interest because the patient received a recommended dose of 0.5% hyperbaric bupivacaine in a single injection and the patient developed complete sensory and motor blocks persisting for 32 hours in the postoperative period, being discharged from the hospital 4 hours after recovery without any neurological impairment. Studying the recovery of 100 mg of hyperbaric lidocaine (glucose 7.5%), 15 mg of 1% hyperbaric tetracaine (glucose 10%), and 15 mg of 0.75% hyperbaric bupivacaine (glucose 8.25%), showed that the resolution of sacral analgesia was respectively of 3.9±1.4 h, 9.1±3.5 h, and 7.3±1.7 h.[3] Exceptionally prolonged anesthesia after 7.5 mg of 0.75% hyperbaric bupivacaine with 25 µg fentanyl provides a blockade of approximately 36 hours, without neurological sequelae.[4] In a letter to the editor, prolonged blockade was shown after use in the CSF of 15 mg of 0.75% hyperbaric bupivacaine with 25 µg of fentanyl and 200 µg epinephrine.[5] After 17 hours of local anesthetic injection into the CSF, the patient had a return of normal sensation and motor strength throughout his lower limbs. A study with 10 volunteers who received 50 mg lidocaine in 7.5% dextrose demonstrated that low CSF fluid volume will cause increased sensory, and unfortunately, this correlation was not true for motor blockade.[6] The authors justified the low CSF due to the long duration of the block provided by spinal anesthesia, but in both reports, the CSF volume was not evaluated. The resolution of the sensory and motor blocks in both articles, occurred simultaneously.[4,5] Prolonged sensory and motor blockade after combined spinal-epidural anesthesia in a patient with ankylosing spondylitis[7] 15 mg of 0.5% hyperbaric bupivacaine was injected into the CSF and a 16G epidural catheter was introduced. The duration of the surgery was 5 hours, and the patient was maintained intraoperatively on infusion of 0.5% bupivacaine epidurally. After 24 hours the patient could not lift his leg and had quadriceps muscle weakness, associated with not being able to move both feet (Bromage score 3), and the epidural pump was removed. After removal of the catheter, for 4-5 hours the patient moved his legs normally with a normal neurological examination.

To examine the influence of CSF volume on the spread and duration of 15 mg of 0.5% hyperbaric bupivacaine in 7.3% glucose spinal anesthesia when the injection in the lateral position compared with a seated position, in 74 patients it showed that CSF volume influenced the duration of spinal sensory anesthesia when the injection was made with the patient in a seated position, but not in the lateral position.[8] Using MRI, the lumbosacral CSF volume was evaluated in 71 patients, the average found was 35.8±10.9 mL, was widely variable among patients, and was inversely proportional to body mass index.[9] The factors listed above to explain the prolongation of spinal anesthesia did not exist in our patient. MRI was normal and unfortunately we did not measure CSF volume to explain its possible influence on the late recovery of 32 hours after intrathecal injection of 15 mg of 0.5% hyperbaric bupivacaine without any adjuvant. Nevertheless, this case shows the remote possibility of prolongation of subarachnoid anesthesia without determining factors known until now.

Conclusion

Information about the time it takes a patient to void, ambulate, and completely resolve sacral anesthesia after spinal anesthesia is important.[10] Most neurological adverse events following regional anesthesia administration result in temporary sensory symptoms; long-term or permanent disabling motor and sensory problems are very rare.[11] The subarachnoid space is closed within the spine and

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increased pressure in this space can cause dangerous neurological impairment, such as prolongation of the return of sensory blocks, back pain, numbness, leg weakness, paraplegia, loss of bowel and bladder function, headache and neck stiffness and decreased deep tendon reflexes. Hemodynamic complications of spinal anesthesia are monitored more frequently, but our case report shows that infrequent complications such as a prolonged 32 hours spinal block should not be neglected and managed appropriately, especially with MRI to evaluate possible hematoma. In conclusion, an unexpectedly prolonged spinal block can be seen with regular doses of 0.5% hyperbaric bupivacaine. We cannot determine the exact etiology in our present case.

Acknowledgments

None.

Conflicts of interest

The author declares that there are no conflicts of interest.

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