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Case Report
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Total Spinal Anaesthesia: A Rare Complication of Psoas Compartment Block

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Abstract

Psoas compartment block is an acceptable regional anaesthesia technique as a substitute to central neuraxial blockade for lower limb surgeries. Being a peripheral nerve block, it is considered relatively safe compared with the central neuraxial block. However, it can lead to some serious complications. Herein, we report a rare complication of total spinal anaesthesia following peripheral nerve stimulator-guided psoas compartment block.

Keywords: Lower limb surgery, psoas compartment block, total spinal anaesthesia

Introduction

Lumbar plexus block (LPB) is used for pain management of the thigh and knee and with sacral plexus block or sciatic nerve block can provide surgical anaesthesia to the whole lower limb (1, 2). LPB can be given by either anterior (Winnie's 3-in-1 block) or posterior (psoas compartment block [PCB]) approach (1, 2). PCB is a deep peripheral nerve block that can be given safely when patients may not tolerate the untoward haemodynamic effects of general anaesthesia or central neuraxial block (3).

Despite being peripheral nerve block, it has many severe complications, such as injury to the abdominal viscera, retroperitoneal hematomas, psoas abscess, and epidural and subarachnoid spread (4-6). Although total spinal anaesthesia is a rare complication, drastic consequences can occur. It has been reported in one case report till date (7). We encountered total spinal anaesthesia in a patient posted for above-knee amputation by PCB. Written consent to publish this article was obtained from the patient.

Case Presentation

A 54-year-old woman, weighing 60 kg, had soft tissue sarcoma, and was posted for left above-knee amputation. She was anaemic, having haemoglobin of 7.5 mg dL^{-1}, and other parameters were within the normal limits.

Surgery was planned under peripheral nerve stimulator (PNS)-guided PCB with sciatic nerve block. We explained the procedure to the patient during preanaesthesia check-up, and written informed consent was obtained. On the day of surgery, routine standard monitors were applied in the operation theatre. An 18-gauge intravenous cannula was secured, and 50 µg fentanyl injection was given. The patient was positioned in lateral decubitus, and the fourth lumber spine (L4) and the iliac crest were identified. After ensuring all aseptic precaution, we introduced an insulated 100 mm needle (Stimuplex® A, B. Braun Medical, Melsungen, Germany) perpendicular to the skin and 4 cm lateral from the midline on the line drawn from L4 to the iliac crest. The needle was directed towards the transverse process of L4 using a PNS (Stimuplex® HNS12, B. Braun Medical, Melsungen, Germany). At 7 cm depth, the L4 transverse process was reached, and the needle was angled caudally. Patellar move-

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ment was seen, and the current was reduced. At a depth of 8 cm, when the patellar movement could be appreciated at 0.5 mA, we injected 25 mL of 0.5% ropivacaine after confirming for negative aspiration for blood and cerebrospinal fluid (CSF), with continuous verbal communication with the patient. After LPB, preparation for the sciatic plexus block was started. The patient suddenly became unresponsive and the heart rate decreased to 30 beats min^{-1} with hypotension of 60/40 mm Hg. The patient was immediately made supine, and ventilation was started with bag and mask using 100% oxygen. Although 0.6 mg atropine was administered intravenously, the heart rate did not improve; therefore, a second dose of inj. atropine 0.6 mg along with two doses of inj. mephentermine 6 mg were given. One litre Ringer lactate was administered quickly, and after approximately 10 min, the blood pressure improved. Meanwhile, the patient was intubated with 7.5 cuffed endotracheal, and respiration was given with 100% oxygen. The surgery was postponed, and we decided to shift the patient to the intensive care unit (ICU) for further management.

In ICU, the patient was haemodynamically stable, and 2 h later, she regained consciousness but had shallow breathing. After 3 h, the patient was fully awake with adequate respiratory effort and tidal volume, and was therefore extubated.

After extubation, the motor and the sensory levels were checked, and it was found to be a dense bilateral sensory block up to the second thoracic (T2) level, which disappeared completely after 6 h of the event, and the patient was fully recovered. The patient was observed in ICU for the next 24 h and shifted to the ward the next day.

Discussion

LPB consists of the ventral rami of T12 and L1-L4 and forms the ilioinguinal, iliohypogastric and obturator nerves, the lateral cutaneous nerve of the thigh and the femoral nerve (2, 8). It is positioned between the quadratus lumborum and psoas major muscle and supplies the anterior thigh and medial lower leg along with the quadriceps muscle (1, 2, 8).

Main Points:

- PCB is considered a safe substitute to central neuraxial blockade for lower limb surgeries.
- A rare complication of total spinal anaesthesia following PNS-guided PCB is reported.
- Administering the drug in 5 mL aliquots, with continuous verbal communication with the patient during the procedure, is recommended.

PCB is the posterior approach of lumber plexus block and can be performed by various approaches such as Winnie's, Chayen's, Dekrey's and Capdevila's approaches. Winnie's approach is the most commonly practiced but has high risks of epidural and subarachnoid spread (2, 9, 10).

The identification of PCB can be performed with the loss of resistance technique, PNS-guided or ultrasonography-guided (4, 9). Ultrasonography-guided machine was not available; therefore, we decided to perform a PNS-guided block. The endpoint of PNS-guided PCB is the contraction of the quadriceps muscle because of the stimulation of the femoral nerve (2).

Complication of the block, although rare, can be due to direct needle trauma to nerves, intraneural injection, intravascular spread, damage to the abdominal viscera, retroperitoneal hematomas, psoas abscess, local anaesthetic allergy, and epidural and subarachnoid spread (5, 6).

Till date only one case of total spinal anaesthesia has been reported with LPB with Chayen's approach (7). In our case, the patient became unconscious and haemodynamically unstable after PCB and required inotropic support and ventilation. Differential diagnosis of vasovagal attack, local anaesthetic toxicity (LAST) and central neuraxial block was made.

Vasovagal was unlikely as the patient had persistent haemodynamic instability and unconsciousness despite resuscitation and change of position. We were in continuous verbal communication with the patient, and there were no signs of LAST such as perioral numbness or tinnitus. Because of the sudden onset of unconsciousness, severe hypotension, bradycardia, and dense bilateral motor blockade, diagnosis of total spinal anaesthesia was made.

In our case, total spinal anaesthesia occurred 2 min after the injection, even after we had ensured absence of blood or CSF during aspiration before injection. It is possible that the needle tip was in the paravertebral or epidural space, from which a large volume of the drug spread into the subarachnoid space.

Conclusion

Total spinal anaesthesia, a rare complication of PCB, can be noticed, even if CSF aspiration is negative. To avoid complications, always administer the drug in 5-ml aliquots and maintain continuous verbal communication with the patient during the procedure so that any untoward side effects can be diagnosed early and managed accordingly.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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