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Case Report

Total Spinal after Posterior Lumber Plexus Block, Case Report

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Abstract

Patients can undergo lower extremity surgery by using the lumbar plexus block (LPB) technique. However, compared with central block, LPB problems were complex. For lower limb procedures, psoas compartment block is a suitable regional anaesthesia approach in place of central neuraxial blockade. As a peripheral nerve block, it is considered less dangerous than a central neuraxial block. However, it might result in some severe issues. Here, we describe a rare side effect of total spinal anaesthesia following psoas compartment block guided by a peripheral nerve stimulator.

Keywords: Total spine, Lumber Plexus Block, central neuraxial block, anaesthesia.

INTRODUCTION

Lumbar plexus block (LPB) is a method of intraoperative anaesthesia and post-operative analgesia (Chen *et al.*, 2016) 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 (gynecology & 2000, n.d.). Total spinal anaesthesia is a rare complication characterised by paralysis, cranial neuropathies, coma, hypotension, bradycardia and apnoea. This adverse event has been attributed to the spread of the local aesthetic in subarachnoid space from epidural, subdural or subarachnoid, usually occurring after epidural anaesthesia. We report a case of inadvertent total spinal anaesthesia after a posterior LPB performed in an awake patient for knee arthroscopy.

CASE PRESENTATION

A 35 years old male with bronchial asthma is scheduled for arthroscopy of knee to perform anterior crucial ligament repair. The patient is placed in a lateral decubitus position with a forward hip tilt. The full lower extremity was exposed to observe muscle contraction with the use of nerve stimulator. Blood pressure, pulse oximetry and ECG with 2 L of supplemental oxygen were monitored. After positioning the ultrasound probe and identifying the accurate location for injection, a peripheral nerve stimulator was used with a 100 mm insulated needle after obtaining twitches at 0.5 milliampere. Subsequently, negative aspiration was conducted for blood or cerebrospinal fluid (CSF) with 5 ml of Lidocaine1.5%. Adrenaline (5 mcg/ml) was injected after 30 seconds, and another 5 ml was injected; a total of 20 ml was injected within 2 minutes.

After 4 minutes, the patient starts complaining of difficulty of breathing, paralysis of all extremities, drop of blood pressure, bradycardia and drowsiness, thereby calling for help. Mechanical ventilation started via I-gel tube size 4, ephedrine 10 mg IV bolus and dopamine infusion 10 mcg/kg/ min. The operation started when the patient was stabilised. After 120 min, the patient was awake and can open his eyes upon command; anaesthesia of the upper limb was administered. The patient recovered spontaneous respirations after 180 min. The operation was completed after 180 min. After 260 min, he can move all extremities with head lift, at which time he was extubated uneventfully and transferred to an intermediate monitoring unit for postoperative care. The patient recovered without further sequelae. No motor or sensory deficits were observed prior to discharge.

DISCUSSION

The LPB, using ultrasound, is a safe procedure for postoperative pain management in patients undergoing surgery above the knee. The lumbar plexus

originates from the ventral rami of the first four lumbar nerves and lies within the psoas muscle and anterior to the transverse processes of the corresponding lumbar vertebrae. Care must be taken to maintain perpendicular needle insertion, and the direction should be in a cranial-to-caudal fashion with regard to the transverse processes. A more medial direction may result in intrathecal puncture or dural sleeve contact similar to a paramedian approach to the epidural space (Boakye, 2017).

Hypotension after lumbar plexus block can occur due to epidural spread of the local anaesthesia, especially with volumes greater than 20 ml. However, apnoea and dilated bilateral pupils are more consistent with intrathecal injection and total spinal anaesthesia.

The lumbar paravertebral region is highly vascular and contains the ascending lumbar veins and lumbar arteries, which can be visualised using colour and power Doppler ultrasound. A rich network of blood vessels is found within the substance of the psoas major muscle including the psoas compartment. The dorsal branch of the lumbar artery is also closely related to the transverse processes and the posterior aspect of the psoas muscle, where the lumbar plexus is located. Therefore, this blood vessel may be at risk of needle-related injury during LPB because it is directly in the path of the advancing needle. Inadvertent intravascular injection of local anaesthesia is expected, and psoas hematoma is observed after LPB, considering the vascularity of the lumbar paravertebral region (Meshkat & Nejati, 2017). The block is performed when the patient is awake to allow him to communicate any unusual symptoms, such as complete motor block or dyspnoea.

The ultrasound-guided shamrock technique uses a transfer-oriented probe placed in the posterior of the patient's flank. This approach provides fast, easy and sonographic visibility of the lumbar plexus, surrounding the anatomical structures, needle, needle tip and perineural local anaesthetic spread. The ultrasound transducer is positioned 3–4 cm lateral to the lumbar spine. The following settings are used to start the scanning: abdominal preset, depth of 11–12 cm and frequency of 4–8 MHz. The technique initially identifies the flat surface of the sacrum, and then scans proximally until the intervertebral space between L5 and S1 is recognised as an interruption of the sacral line continuity. Once the transverse process of L5 has been identified, that of the other lumbar vertebrae is easily determined by a dynamic cephalad scan in ascending order. The acoustic shadow of the transverse process has a characteristic appearance, often referred to as a 'trident sign'. Once the transverse processes are recognised, the psoas muscle is imaged through the acoustic window of the transverse processes. The psoas muscle appears as a combination of the longitudinal hyperechoic striations within a typical hypoechoic muscle deep to the transverse processes. Although some of the hyperechoic striations may appear particularly intense and mislead the operator to interpret them as roots of the lumbar plexus, the root identification in a longitudinal scan is unreliable without nerve stimulation. This unreliability is partly due to the fact that the intramuscular connective tissue (e.g. septa and tendons) within the psoas muscle is thick and may be indistinguishable from the nerve roots at such a deep location. As the transducer is moved progressively cephalad, the lower pole of the kidney often comes into view as low as L2–L4 in some patients.

To identify the psoas compartment, where the LPB is located, the intensity of the current must be between 0.5 and 1 mA. A motor response with low current indicates that the needle may be inside the sheath that surrounds the nervous root and extends to the epidural and subarachnoid spaces, to where the anaesthetic solution might spread. Despite the wide safety margin of the procedure, we were in continuous verbal communication with the patient, and no signs of LAST, such as perioral numbness or tinnitus, were found. Total spinal anaesthesia was diagnosed because of the sudden onset of unconsciousness, severe hypotension, bradycardia and dense bilateral motor blockade.

In our case, the total spinal anaesthesia occurred 4 min after the injection, even after we had ensured absence of blood or CSF during aspiration prior to injection. The needle tip was possibly 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 LPB, can be diagnosed, even if CSF aspiration is negative. The drug should always be administered in 5 ml aliquots to avoid complications, and continuous verbal communication with the patient should be maintained during the procedure so that any untoward side effects can be diagnosed early and managed accordingly.

Ethics Approval and Consent to Participate

This report was approved by the Institutional Review Board of Al-Balqa Applied University (Approval number: 9122/11/4/3/26).

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Contributions

M E and NB performed anesthetic management and wrote the manuscript. MR and RA helped design the case report and revise the manuscript. The authors read and approved the final manuscript.

Consent for Publication

Written informed consent was obtained from the patient for publication of this case.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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REFERENCES

- Boakye, M. (2017). *Investigating the association between emotional intelligence and socioeconomic status of Ashesi University College students*.
- Chen, Y., Peng, Y., & Fang, P. (2016). Emotional Intelligence Mediates the Relationship between Age and Subjective Well-Being. *International Journal of Aging & Human Development*, *83*(2), 91–107. https://doi.org/10.1177/0091415016648705
- gynecology, N. P.-A. journal of obstetrics and, & 2000, undefined. (n.d.). Report of the national high blood pressure education program working group on high blood pressure in pregnancy. *Elsevier*. https://doi.org/10.1067/mob.2000.107928
- Meshkat, M., & Nejati, R. (2017). Does emotional intelligence depend on gender? A study on undergraduate English majors of three Iranian universities. *SAGE Open*, *7*(3), 2158244017725796.