



CASE REPORT

Unexpected motor block after ultrasound-guided lumbar erector Spinae plane block

Ultrasonografi rehberliğinde lomber erektör spina plan blok sonrası beklenmeyen motor blok

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Summary

The successful use of the erector spinae plane block (ESPB) has been reported for post-operative analgesia in numerous operations due to the widespread use of local anesthetic (LA) and the blocking of the dorsal and ventral rami. ESPB has also been effective for easing lumbar back pain caused by lumbar disc herniation through a high-volume LA application to the lumbar area. While high-volume LA administration increases the effectiveness of the block, it can also cause unexpected side effects due to its coverage area. In the literature, only one study has reported on the development of motor weakness following ESPB application, in a case in which the block was performed at the thoracic level. In the present study, a 67-year-old female patient with lower back and leg pain resulting from lumbar disc herniation developed a bilateral motor block following lumbar ESPB. This is the second report of this type of case in the literature.

Keywords: Analgesia; erector spinae plane block; high volume local anesthetic; lumbar back pain; lumbar disc herniation; motor block.

Özet

Lokal anesteziğin yaygın olarak kullanılması ve dorsal ve ventral ramilerin bloke edilmesi nedeniyle birçok operasyonda post-operatif analjezi için erektör spina plan blokunun (ESPB) başarılı bir şekilde kullanıldığı bildirildi. Ayrıca ESPB'nin, lomber bölgeye yüksek hacimli lokal anesteziğin uygulanması yoluyla lomber disk herniasyonunun neden olduğu bel ağrısının hafifletilmesi için de kullanıldığı gösterildi. Yüksek hacimli lokal anesteziğin uygulanması blokun etkinliğini artırırken, kapsama alanı nedeniyle beklenmedik yan etkilere de neden olabilir. Literatürde, torasik ESPB uygulamasının ardından gelişen motor güçsüzlükle ilgili sadece bir olgu bildirildi. Bu olgu sunumunda, lomber disk herniasyonu nedeniyle bel ve bacak ağrısı olan 67 yaşındaki kadın hastada, lomber ESPB uygulamasını takiben bilateral motor blok gelişti. Bu olgu, literatürde bu şekilde bildirilen ikinci vaka.

Anahtar sözcükler: Analjezi; erektör spina plan blok; lomber disk hernisi; lomber sırt ağrısı; motor blok; yüksek hacimli lokal anesteziğin.

Introduction

The erector spinae plane block (ESPB) was first described by Forero et al.^[1] as a novel approach to the treatment of thoracic pain, and it has been proven to be effective in post-operative analgesia in many surgical procedures as a result of the spread of the local anesthetic (LA) from the needle insertion point to the paravertebral area.^[1,2] In the literature, with the exception of one study,^[3] ESPB has been reported to be correlated with the injection site of the sensory and somatic blockage without a motor blockage, and radiological imaging has shown that the spread of the radiocontrast agent through the

paravertebral area was wide in both the cranial and caudal directions.^[4] In addition to post-operative analgesia, ESPB has been used for failed back surgery syndrome as well as cervical and interscapular myofascial pain.^[5] Lower back or radicular pain usually originates in the sinuvertebral nerves in the nerve root sheath, the dorsal ganglion, and the ventral epidural space.^[6] Due to the widespread dispersion of LA through the ESPB application, a lumbar ESPB with a high volume of LA has been reported as an alternative to a transforaminal epidural injection for lumbar disc herniation.^[5] This paper presents a case in which a bilateral motor block was encoun-

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tered as an unexpected side effect following lumbar ESPB that was used to treat lower back pain. It is the second report of this type of case in the literature.

Case Report

A 67-year-old female patient (weight: 89 kg; height: 163 cm) with Type 2 diabetes mellitus and hypertension, who was classified as ASA II and who had L3-L4 and L4-L5 intervertebral disc herniation on magnetic resonance imaging, was evaluated for complaints of right lower back pain and right leg pain. A physical examination revealed slight paresthesia, lumbar spine flexion, and paravertebral muscle spasm in the right L4-L5 dermatomes. A right straight leg lift test was positive, with increased right-sided pain in the 60° supine position. The bilateral deep tendon reflexes and lower extremity motor tests results were normal. Although the patient had these complaints for around 1 year, she had not received any type of treatment, such as a transforaminal or epidural steroid injection, other than medicinal treatment (25 mg of dexketoprofen and 75 mg of pregabalin). The patient was informed about ESPB (verbally and via written materials), which is less invasive than other methods such as transforaminal or epidural injection. After written consent was obtained and the laboratory test results were found to be normal, the patient was taken to the operating room. After electrocardiography, saturation oxygen and non-invasive blood pressure measurements were obtained and monitorization and intravenous access with 500 cc 0.9% NaCl were established, the patient was placed in the prone position. The lumbar region was sterilized, and a sterile sheath-covered ultrasound (US) probe was placed on the spinous process of the L4 vertebra. The probe was advanced 3–4 cm in the parasagittal plane toward the right side. After observing the transverse process of the L4 vertebra and the erector spinae muscle (ESM), a 21-gauge 10-cm needle (Braun Stimuplex A®, Germany) was advanced in the plane from the cranial to the caudal direction directly toward the transverse process of the L4 vertebra (Fig. 1). After observing hydrodissection in the anterior fascia of the ESM with 1–2 mL 0.9% NaCl, a total of 40 mL LA+steroid mixture (20 mL of 0.5% bupivacaine, 10 mL of 2% lidocaine, 9 mL of saline, 1 mL of methylprednisolone) was injected. The patient was then placed in the supine position. No left hip flexion was noted 10 min after the injection, and no left knee flexion was noted 15 min after

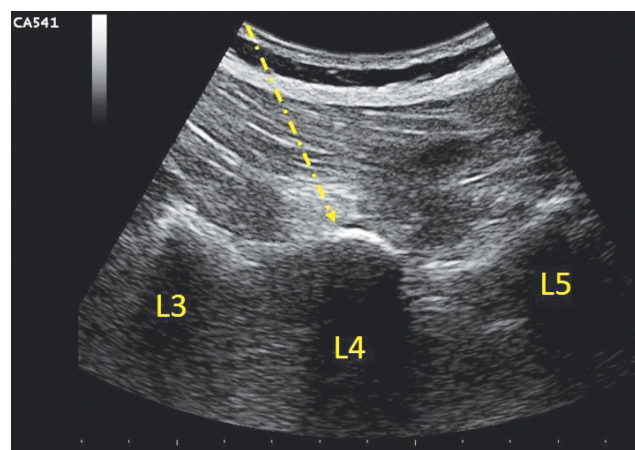


Figure 1. Ultrasound imaging of lumbar erector spinae plane block at L4.

the injection. The patient was hospitalized to monitor her vital signs. The dermatome examination revealed involvement from T10 to S4. Left knee flexion was observed after about 10 h, and right knee and left hip flexion were observed after 14 h. Since the patient had no neurological symptoms, she was discharged with recommendations for medical treatment of low-dose tramadol (37.5 mg) and paracetamol (375 mg), and a follow-up visit about 8 weeks later. The numeric rating scale (NRS) pain score, which was 9/10 before the block, decreased to 2–3/10.

Discussion

In ESPB, LA spreads widely reaching into the cranio-caudal and paravertebral planes, and even into the neural foramina in a lumbar application. Thus, it has been reported that high-volume unilateral LA application in lumbar ESPB has an effect that is similar to a transforaminal injection, which is associated with serious complications, such as paraplegia, vascular injury, vasospasm, dural puncture, and spinal epidural abscess, and that it is likely to be more reliable.

In ESPB, the spread of LA to the lumbar plexus contributes to the emergence of accompanying undesired side effects, such as motor blockage. Selvi and Tulgar applied ESPB as an effective postoperative analgesia in a cesarean section to treat somatic and visceral pain at the level of T11, and the patient experienced motor weakness after the procedure. They reported that epidural spread, in addition to paravertebral spread, may have been the cause of the motor weakness.^[3] In the case report presented in this paper, we believe that the bilateral motor blockage was caused by the spread of the LA to the lumbar plexus.

The previous studies in the literature have reported knee extension and thigh flexion weakness following an L1-L2 paravertebral block, and unexpected motor blockage causing weak hip flexion following a quadratus lumborum block.^[7] Since it is likely that Selvi and Tulgar administered ESPB at the thoracic level, full motor blockage was not observed due to the slight spread of LA to the lumbar plexus.^[3] However, in our case, the application of ESPB in a high-volume LA administration at the level of the L4 vertebra facilitated the spread of LA to the lumbar plexus and/or epidural spread, resulting in s motor blockage lasting for a minimum of 14 h on the right side and 10 h on the left side.

Although the findings of our case were similar to those associated with spinal anesthesia, we did not consider this to be one of the complications because the block was US-guided and performed away from the spinal cord. Furthermore, the neurological deficits that emerge post- ESPB, such as motor weakness and incontinence, may be related to pre-existing or new-onset lumbar disc pathologies. In our case, these deficits did not occur, as evidenced by the recovery of all motor function within 14 h, the lack of incontinence, and the discontinuance of pain. In ESPB, LA injection into the anterior surface of ESM may affect the lateral cutaneous branches, in addition to its interaction with the ventral and dorsal roots.^[1] Furthermore, the spread of LA into the paravertebral space may also affect the rami communicates that connect to the sympathetic ganglion through the spinal nerves through visceral and somatic conduction.^[8] In cadaver, studies were shown that contrast agent spread as high as C5 and as low as L3 after a single injection at the T7 level.^[9] That said, there are specific differences between thoracic and lumbar ESPB.^[10] When administered in a high volume at the L4 vertebra, the injectant exhibits an effect that is similar to the lumbar plexus; it also advances through the neural foramina and spreads through the psoas muscle.^[11] Çelik et al.^[5] applied a high-volume LA injection at the level of the left L4 on a patient with lumbar disc herniation, and showed that spread using contrast to a broad area covering the paravertebral space from L1-S4, lumbar plexus, epidural space, lumbar intervertebral foramina and facet joint at the same side neural foramina, and they observed a more than 70% decrease in the symptoms. In our case, a motor blockage was encountered because the high-vol-

ume LA application affected a wide area that included the lumbar plexus and neural foramina, and the pain symptoms were observed to decrease by 80% after 8 weeks. In addition, similar to Alici et al.,^[12] we observed a dermatomal spread from T10 to S2 as a result of the application of 40 mL of LA at L4. Besides, we believed that both lumbar and sacral plexus were blocked, since bilateral bromage scale was 3. Therefore, a differential block could also be mentioned.

From a literature review, it was ascertained that 30 mL 0.2% of ropivacaine, which was used in a bilateral lumbar ESPB for lower back pain due to lumbar disc herniation, provided a patient with 80% pain relief.^[13] It was also reported that the NRS pain score decreased from 8 to 1–2 after a total 40 mL bilateral 0.25% bupivacaine application for lower back pain.^[14] In both cases, ESPB was performed bilaterally with an LA volume of 30–40 mL. However, in our case, while the high-volume (40 mL) unilateral LA application relieved the patient's pain, it resulted in an unexpected motor blockage as a result of paravertebral and/or epidural spread.

In conclusion, the impact area was extended because the high-volume LA application that was used in the lumbar ESPB procedure spread widely. While this would seem to be clinically beneficial, can result in some complications, such as motor blockage. This is the second reported case of post-ESPB motor blockage in the literature. The motor blockage encountered in this blockage method, which was used instead of a transforaminal injection, which is a more invasive approach that is associated with more side effects, may be frustrating for the patient if, prior to the procedure, he/she is not told that this side effect is a possible outcome. Thus, this unforeseen side effect may even lead to malpractice lawsuits. Unexpected motor blockage following lumbar ESPB, which occurred in the present case report, requires a reconsideration of the volume of LA and the application level of the block. We believe that future randomized clinical trials of using ESPB with high-volume LA on patients with back pain would be beneficial.

Informed Consent: *Written informed consent was obtained from the patient for the publication of the case report and the accompanying image.*

Conflict-of-interest issues regarding the authorship or article: *None declared.*

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