Letters to Editor

Possible use of low-molecular weight dextran as adjuvant for erector spinae plane block procedure

To the Editor,
We read with interest the recently published randomized controlled study regarding erector spinae plane (ESP) block for a mastectomy by Sharma et al.[1] As demonstrated, an ESP block is technically easy with fewer complications and can provide good analgesia, thus is becoming a popular option for truncal interfascial nerve block procedures, such as transversus abdominis plane block (TAPB), quadratus lumborum block (QLB), and paravertebral block (PVB). However, ESP block effects are sometimes insufficient or inconsistent, especially in major surgery cases. Large variations in analgesic effects is a common issue for all types of interfascial nerve block.[2] Recently, we found that the addition of low-molecular weight dextran (LMWD) to the local anesthetic (LA) as an adjuvant enhanced the analgesic potency and duration of TAPB and QLB and resolved performance instability.[2,3] Further, it reduced LA toxicity by lowering the LA plasma concentration via a mechanism in which LMWD optimally controls LA distribution and absorption.[3,4] Based on these findings, we considered that an LA-LMWD mixture for ESP block can provide good analgesia in the same way as for TAPB and QLB, and thus applied it to video-assisted thoracic surgery (VATS) cases.

Five patients [age 63 ± 7 years (mean ± standard deviation), 59 ± 7 kg, American Society of Anesthesiologists (ASA) physical status 1–2] scheduled for VATS for lung cancer received a unilateral ESP block just prior to starting surgery [Figure 1]. Targeting the transverse process at the level of the thoracotomy incision, 40 mL of 0.3% ropivacaine in a 7% LMWD mixture was injected under ultrasound guidance. General anesthesia was maintained with desflurane and remifentanil to maintain systolic blood pressure and heart rate at 70%–110% of their preanesthesia values with a bispectral index of 40–60. General anesthesia was maintained with desflurane and remifentanil to maintain systolic blood pressure and heart rate at 70%–110% of their preanesthesia values with a bispectral index of 40–60. Acetaminophen at 15 mg•kg⁻¹ was also administrated. For postoperative rescue analgesia, 50 mg of intravenous flurbiprofen was prepared. The average anesthetic concentration required during surgery was very low, with desflurane at 0.6 ± 0.1 minimum alveolar concentration (MAC) and remifentanil at 0.13 ± 0.04 μg•kg⁻¹•min⁻¹. The first night after surgery with no additional rescue analgesics given, the numerical rating scale (NRS; 0-no pain, 10-worst pain) score was uniformly very low at 2.2 ± 1.1. No adverse effects were observed, including infection, tissue necrosis, and prolonged abnormal sensory disorder, in any patient.

As a control, we enrolled patients (n = 5) who underwent our usual protocol for VATS, general anesthesia combined with epidural anesthesia (EA) and 15 mg•kg⁻¹ of acetaminophen, with postoperative continuous EA with 3 mL•hr⁻¹ of 0.25% ropivacaine. The first night, the NRS score was 2.1 ± 1.2, indicating that the analgesic effect of an ESP block with an LA-LMWD mixture may be comparable with EA, though the number of cases were few for comparison.

EA and PVB are gold-standard procedures for truncal surgery. However, EA is sometimes restricted by anticoagulant use while PVB induces LA contamination of the pleural fluid.[5] While an ESP block, as demonstrated by Sharma et al.,[1] may be another promising option, it needs several improvements, such as optimum LA formula, including dose, volume, and LMWD use.

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Conflicts of interest
There are no conflicts of interest.

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Figure 1: (a) Positions of ultrasound linear probe and nerve block needle (BN) for erector spinae plane (ESP) block targeting of the transverse process (TP) at the incision line (IL) level in a representative patient situated in a lateral decubitus position just prior to starting video-assisted thoracic surgery for lung cancer. (b) Corresponding ultrasound image during ESP block obtained with use of linear ultrasound probe (8–13 MHz). A mixture of local anesthetic and low-molecular weight dextran (LA-LMWD) was spread on the layer above the TP.
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