

CASE REPORT

Bi-level erector spinae plane block for the control of severe back pain related to vertebral metastasis

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SUMMARY

Pain is the most common reason for emergency department visits. Traditionally, pain management has been provided by narcotics, non-steroidal anti-inflammatory drugs and non-narcotics. Erector spinae plane block is a new interfascial plane block that has been successfully used for acute pain control in different surgeries. Two female patients with severe back pain related to breast cancer metastasis applied to emergency department. The pain scores of the patients were between 8 and 10. We performed bilateral erector spinae plane block at the levels of T3 and T6. The pain scores decreased under 2 within 30 min and none of the patients required additional analgesic agent for 24 hours. Previously erector spinae plane block was used for rib and spine fractures in emergency department. Different from previous cases, we performed bi-level blocks to cover a larger area and the block abruptly and effectively reduced pain scores of the patients with breast cancer.

BACKGROUND

Pain is the most common reason for emergency department visits. Effective pain management is associated with improved satisfaction among patients with painful conditions.¹ Traditionally, pain management has been provided by narcotic analgesic agents, non-steroidal anti-inflammatory drugs and non-narcotic analgesic agents in surgical wards and emergency departments.² In the recent years, nerve blocks have been popular as a new approach for acute pain relief. Erector spinae plane (ESP) block is a new interfascial plane block which was first described by Forero *et al* for neuropathic pain management in thoracic area.³ After that, ESP block was successfully used for the pain control of several different conditions.⁴⁻⁶ We managed severe backache due to vertebral metastasis in two patients with bi-level erector spinae block in emergency department and we represented these two patients in this case report.

CASE PRESENTATION

Written informed consents for approval of ESP block intervention and publication of the case were obtained from the patients. The first patient was a 69-year-old woman with body mass index 27.3 kg/m². She had the diagnosis of breast cancer for 2 years. Although she had a known bony metastasis at the T4-5 vertebrae, she described a severe pain between T2 and T8 dermatomal levels. She was

receiving a 50 mcg fentanyl patch and paracetamol 1000 mg four times per day. Despite the pain treatment, she rated her back pain as 8/10 with Numerical Rating Scale. The second patient was a 45-year-old woman. Her body mass index was 22.8 kg/m². She was diagnosed with breast cancer 2 years ago. She had multiple bony metastasis between the T3 and T7 levels of the vertebrae. She was receiving 100 mcg fentanyl patch and dexketoprofen 50 mg four times per day. Her back pain was between T1 and T8 dermatomal levels and she rated her pain as 9/10 with Numerical Rating Scale. Following a high-dose opioid application, the patients would have to be followed in emergency department for possible side effects. In addition, the effect of injectable opioids would be shorter than a plane block. Therefore, we decided to perform bi-level ESP block for the control of acute pain. The block procedures were performed while the patients were in sitting position. We used a convex transducer in the parasagittal plane at the level of T3 spinous process. Then we moved the probe 2–3 cm laterally from the midline. After we anaesthetised the injection site with 3 mL of 2% lidocaine, 80 mm 21-gauge block needle was inserted using an in-plane technique until the needle tip contacted T3 transverse process. We applied 10 mL of 0.25% bupivacaine, 2 mg of dexamethasone and 5 mL of normal saline mixture. The spread of the mixture was observed in both cranial and caudal directions. The same procedure was repeated at the contralateral side. Then we placed the probe at the level of T6 spinous process and performed bilateral ESP block with the same volume of mixture. After 30 min, the pinprick test revealed a sensorial block between C8 and T10 dermatomal levels in the first patient and a sensorial block between T1 and T9 dermatomal levels in the second patient. The pain scores of patients were under 2 and no additional analgesic agent was required during the first 24 hours. The patients were referred to the algology clinic for the dose adjustment of fentanyl patch.

OUTCOME AND FOLLOW-UP

None of the patients had any complications related to ESP block procedure. The interventions were completed uneventfully. The patients didn't require rescue analgesic in the first 24 hours. In the next 6-month period, both patients admitted to the algology clinic again for the same procedure. They refused the placement of a nerve block catheter not to be hospitalised. Therefore, we repeated the



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block procedures with the same volume of drugs, but we did not place a nerve block catheter. The ESP block procedure provided a painless period to the patients until the effect of increased dose of fentanyl patch started.

DISCUSSION

The patients usually receive large doses of opioids for acute control of severe pain. However, opioids are known to be related to series adverse events such as hypotension, nausea and vomiting, urinary retention, respiratory depression and increase in the incidence of delirium.⁷ Therefore, physicians seek for a new pain management approach to spare the opioid consumption in surgical wards and emergency departments. Ultrasound-guided ESP block has gained great popularity since its first description by Forero *et al* in 2016.³ Although it was initially used for the analgesia of neuropathic pain and postoperative analgesia of different surgeries, nowadays ultrasound-guided ESP block finds its place for pain management in emergency departments. Luftig *et al* performed ultrasound-guided ESP block for acute pain control of multiple rib fractures in three patients.⁴ They reported that the block effectively reduced pain scores within 30 min. Recently, Ahiskalioglu *et al* described the acute pain management of a patient with bilateral lumbar transverse process fracture in emergency department.⁸ The authors performed bilateral ESP block at the level of T10. The pain score of the patient was reported to decrease from 9/10 to 0 in seconds after the procedure. Different from the previous reports, we performed a bi-level block in order to cover a larger area. In a previous cadaveric study, ESP block was performed with 20 mL of dye solution at the level of T5. The craniocaudal extent of dye staining was between 9 and 14 vertebral levels. However, visible spread to the epidural space was between T3 and T7, while visible spread to the neuronal foramina was only between T3 and T6.⁹ Therefore, Tulgar *et al* recently described bi-level ESP block to improve analgesic effect of the block by increasing the extent of local anaesthetic spreading. They reported that ESP block performed at the levels of T4 and T6 vertebral levels provided better analgesia than the single-shot block performed at the level of T5.¹⁰ According to these results, we decided to perform bi-level ESP block to provide sensorial block over a larger dermatomal area. Similar to previous cases, the pain scores of our patients abruptly and effectively decreased under '2' within 30 min.

Previously, ESP block was shown to produce a spread of local anaesthetic agents to dorsal ramus, ventral ramus and intercostal nerves. So, ESP block can provide analgesia for both posterior and large portion of lateral and anterior chest wall.¹¹ However, the ideal volume or concentration of local anaesthetic agents is still unclear. Luftig *et al* performed the block with 20 mL of 0.5% bupivacaine and 10 mL of normal saline, while Ahiskalioglu used totally 20 mL of 0.5 bupivacaine, 20 mL of 2% lidocaine and 20 mL of normal saline for a bilateral block.^{4 8} As we performed bi-level ESP block, we injected a smaller volume and concentration of bupivacaine (10 mL of 0.25% bupivacaine) in order to avoid systemic local anaesthetic toxicity and bi-level bilateral ESP block provided effective analgesia in patients with severe back pain due to bony metastasis.

In conclusion, ultrasound-guided ESP block seems to be a good alternative as a part of multimodal analgesia for emergency pain management of different painful conditions in surgical wards and emergency departments.

Learning points

- ▶ Erector spinae plane block is a new interfascial plane block first described for neuropathic pain management in thoracic area.
- ▶ Erector spinae plane block produces a spread of local anaesthetic agents to dorsal ramus, ventral ramus and intercostal nerves.
- ▶ Erector spinae plane block can provide analgesia for both posterior and large portion of lateral and anterior chest wall.

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