

Erector Spine Block (ESB) for Pain Relief in a Patient With Multiple Ribs Fracture

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Abstract. Erector Spine Block is a simple and effective block in controlling chest wall and upper abdominal pain. It is also possible to increase painless period for a few days by placing a catheter. We used this block in a high-risk traumatic patient to reduce the pain of rib fractures.

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Introduction

Erector spine muscles (ESM) is a group of three muscles, *spinalis*, *longissimus*, and *ilcostalis*, which extended from the sacrum and lumbar spine to the thoracic and cervical spine (1). ESB is a novel technique in the chest wall and upper abdomen pain management. ESB has better safety than paravertebral and intercostals nerve block because the risk of pleural puncture and epidural spread is low (2). We performed this block in a patient with multi-level right side ribs fracture after a motor vehicle accident.

Case Report

A 54-year-old man weighing 68 kg was admitted to the intensive care unit after a traumatic injury. In paraclinic evaluation, lung contusion and ribs fracture (T6-T9) was found. In past medical history, diabetic mellitus type 2 and ischemic heart disease (IHD) was noted by his wife. The patient suffered from severe pain and couldn't sleep, lie on his right side, breath, and cough effectively. He reported a numerical rating scale (NRS) 10/10. ICU service had started intravenous analgesic, but because of poor response, pain service was consulted after 2 days. We decided to perform ESB for him because we found anticoagulant drugs in his medical order, and this block was safer than other techniques such as paravertebral, intercostals, and thoracic epidural block. After informed consent and application of standard monitoring, the patient positioned supine, and we palpated the C7 spinous

process and marked it and then count caudally to T5. The T5 spinous process was identified and marked. After prep and drape and local infiltration of 0.5% lidocaine with a high-frequency linear transducer (6-13 MHz) 3 cm to the right of the midline in the parasagittal plane we identified transverse process (TP) of T5 and then an 8 cm 18 tuohy needle advanced in-plane from caudal to cephalad to intake osseous contact with T5 TP then we used hydro dissection technique with a small volume of saline to assess the satisfactory spread of fluid underneath the ESM, above the T5 TP. Then the volume of 30 ml bupivacaine hydrochloride 0.25% (75 mg) with 40 mg methylprednisolone was injected under direct ultrasound visualization. Craniocaudal spread was seen below ESM during injection. 10 minutes following the procedure pain score markedly decrease to NRS 0-1/10. Then a peripheral nerve block catheter was inserted and secured in place.

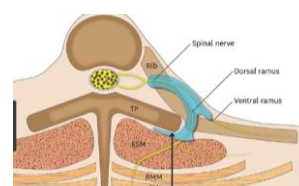


Figure. Schematic diagram. Local anesthetic was injected between the erector spinae muscle and transverse process, and spread to the thoracic vertebral and intercostal space via bony gaps, such as the costotransverse foramen. Additionally, local anesthetic will pass through fenestrations in the costotransverse ligament, reaching the nerve root in the paravertebral space. TP=transverse process, ESM=erector spinae muscle, RMM=rhomboid major muscle, TM=trapezius muscle (7).

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Erector spine block (ESB) for pain relief

A continuous infusion rate of 10 ml/h 0.125 % bupivacaine was started. The patient was able to move and transferred to the surgery ward. After 3 days, we discontinued the infusion and removed the catheter and continued oral analgesic for pain management, and the patient was in good condition with oral medications.

Discussion

Chest wall injuries are associated with significant morbidity and mortality (3). Rib fractures are common in multi-trauma patients and require effective analgesia to prevent respiratory complications. Early intervention with adequate pain relief can be life-saving, and regional anesthetic techniques are often a crucial component in analgesia (4). ESB first describes as a paraspinous regional anesthesia technique. Local anesthetic (LA) deposit below the ESM and above the T5 TP. Diffusion of LA into the paravertebral space at multiple levels block the ventral and dorsal rami of the spinal nerves (5).

In this case presentation, we performed ESB in a patient with ribs fracture that was under anticoagulant therapy because of IHD and did not good response to IV analgesics. Pain relief and patient satisfaction were excellent. This technique is safe because pleural puncture hazards and dural spread of LA are very minimum (6).

References

1. Tsui BCH, Fonseca A, Munshey F, McFadyen G, Caruso TJ. The erector spinae plane (ESP) block: a pooled review of 242 cases. *J Clin Anesth* 2019, 53:29-34.
2. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block. a novel analgesic technique in thoracic neuropathic pain. *Reg Anesth Pain Med* 2016;41:621-7.
3. Hamilton DL, Manickam B. Erector spinae plane block for pain relief in rib fractures. *Br J Anaesth* 2017;118:474-5
4. Luftig J, Mantuani D, Herring AA, Dixon B, Clattenburg E, Nagdev A. Successful emergency pain control for posterior rib fractures with ultrasound-guided erector spinae plane block. *Am J Emerg Med* 36:1391-6.
5. H. Ueshima, H. Otake. Clinical experiences of ultrasound-guided erector spinae plane block for thoracic vertebra surgery. *J Clin Anesth* 2017;38:137.
6. Bonvicini D, Giacomazzi A, Pizzirani E. Use of the ultrasound-guided erector spinae plane block in breast surgery. *Minerva Anestesiol* 2017;83:1111-2.
7. Kwon WJ, Bang SU, Sun WY. Erector Spinae Plane Block for Effective Analgesia after Total Mastectomy with Sentinel or Axillary Lymph Node Dissection: a Report of Three Cases. *J Korean Med Sci* 2018;33:e291