

Erector Spinae Block for Mini Thoracotomy

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Sir,

Erector Spinae Plane (ESP) block is one of the newer interfascial techniques with potential applications. The “erector spinae” comprises a group of muscles including the iliocostalis, longissimus, and spinalis muscles. They run bilaterally from the skull to the pelvis and sacral region, and from the spinous to the transverse processes, extending to the ribs. Sensory innervation of the upper posterior thorax arises from the dorsal rami of the first cervical (C1) to the fifth lumbar (L5) nerves; while the ventral rami of the thoracic spinal nerves from T1-T12 continue as intercostal nerves innervating the anterolateral chest and abdominal wall. In this block drug is deposited closer to costo-transverse foramina and origin of dorsal and ventral rami. It acts at the origin of spinal nerves based on cadaveric and contrast studies. Studies have showed that block at T5 level is sufficient to have unilateral multi-dermatomal sensory block ranging from T1 to L3¹. Though the block is successfully used as analgesic technique, literature review revealed very few evidence regarding its use as sole anaesthetic technique.

A 65 year old female, 156cm, 62kg, case of right sided chronic emphysema with broncho-pulmonary fistula, posted for elective intercostal drain insertion, gave history of cough with expectoration since 1month, and fever, chest pain while breathing since 1 week, and she was a known case of type 2 DM on regular treatment, with controlled blood sugar levels. On examination there was decreased air entry on right side of the chest. Complete preoperative assessment was done including complete blood counts, coagulation screening, blood sugars, chest x-ray which showed large right lung opacity with other patchy bilateral lung parenchymal opacities, USG chest showed loculated pleural collection, ABG, AFB, PFT,

ECG, and CT chest done for further evaluation showed right sided empyema with bronchopulmonary fistula (Figure 1).



Figure 1. CT chest showing right sided empyema with broncopulmonary fistula.

Since it was a case of broncho-pulmonary fistula in diabetic patient posted for minor procedure, we planned to proceed with regional block to avoid the use of multiple drugs including opioids. Hence we choose sole erector spinae block. Upon shifting to operation table standard monitoring Electro-Cardio-Gram (ECG), pulse oximetry (SpO₂), Non Invasive Blood Pressure (NIBP) were applied along with intravenous access and oxygen

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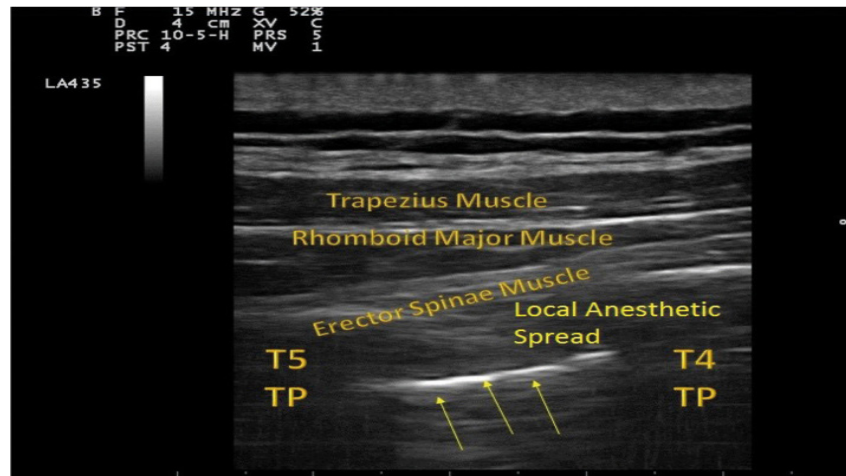


Figure 2. Figure showing deposition of local anaesthetic in the plane.

supplementation 5l/min via face mask. Basal readings noted, BP-128/70 mmHg, PR-92 bpm, SpO₂-98%. With patient in sitting position, under aseptic precaution, target transverse process T5 identified with the help of high frequency linear ultrasound transducer (7-12 Hz, Sonosite Turbo M[®] ultrasound machine) in paramedian sagittal plane, transverse process visualized. A 25 G spinal needle was inserted in-plane from cranial to caudal direction to reach transverse process under ultrasound guidance at T5 level. Block completed with injection bupivacaine 0.25%, 10cc and injection ligno-adrenaline 2% 10cc, after 10 mins of injection sensory blockade to cold swab noticed between T3 to T12 level vertebrae in anterior, lateral, posterior part of right hemithorax without any significant haemodynamic changes. Loculated empyema released, drainage done and ICD was inserted. Intraoperative period was uneventful. No sedation and opioids were used during procedure. Post-operatively patient complained of pain (vas score 4/10) after about 10hrs of block. Rescue analgesia, inj. Paracetamol 1gm IV once was required in 24 hrs of post operative period.

In our case maintenance of spontaneous ventilation was a paramount criteria as patient had a bronchopulmonary fistula and large right sided empyema. IPPV can cause hypoxia in this case. Hence anaesthetic technique with minimal effect on respiratory system and haemodynamics was preferred. ESB has less haemodynamic consequences

compared to the other neuroaxial block and GA. USG guided ESP block is a simple block and technically easy to perform with rare serious side effects². The analgesic effect is due to the diffusion of LA into the paravertebral space, acting at both the dorsal and ventral rami of the thoracic spinal nerves, in addition to its effect at the rami communicans that supply the sympathetic chain. The ESP plane is larger than the epidural space as the erector spinae muscle runs along the length of the thoracolumbar spine, thus providing extensive cranio-caudal spread³. Local infiltration and intercostal blocks were not chosen to avoid possibility of incomplete analgesia and need for multiple punctures.

We conclude that ultrasound-guided ESP block can be a suitable alternative anaesthetic technique for minor thoracic procedures. It has wide applications in pain relief postoperatively, with very less opioid use and other rescue analgesia.

Institutional review, written informed consent from patient and family for block and case report was taken.

References

1. Jain K, Jaiswal V, Puri A. Erector spinae plane block: Relatively new block on horizon with a wide spectrum of application - A case series. *Indian J. Anaesth.*, 2018; 62:809-813. https://doi.org/10.4103/ija.IJA_263_18. PMID:30443066 PMCID:PMC6190410.

2. Chin KJ, Adhikary S, Sarwani N, Forero M. The analgesic efficacy of pre-operative bilateral Erector Spinae Plane (ESP) blocks in patients having ventral hernia repair. *Anaesthesia*, 2017; 72:452-460. <https://doi.org/10.1111/anae.13814>. PMID:28188621.
3. Hamilton DL, Manickam B. Erector spinae plane block for pain relief in rib fractures. *Br. J. Anaesth.*, 2017; 118:474-475. <https://doi.org/10.1093/bja/aex013>. PMID:28203765.