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Erector spinae plane block for pain relief in rib fractures

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Editor—We report a case of successful erector spinae plane (ESP) block using a continuous catheter technique for pain relief in a patient with multiple unilateral rib fractures.

A 50 year old male was thrown from a heavy vehicle sustaining multiple unilateral right sided rib fractures in the T6–T9 area. He had no other injuries. Thirty six hours post injury he was complaining of severe pain in the right hemithorax, was unable to move from his bed, and could not sleep as a result of pain. He was unable to take a deep breath or cough. On examination there was bruising and exquisite tenderness over the right lateral

chest wall, and very poor air entry bilaterally on auscultation over the mid and lower zones. He reported numerical rating scale (NRS) pain scores of 6/10 at rest, and 10/10 on the slightest movement, despite oral Paracetamol (Acetaminophen), Diclofenac, topical Lidocaine patches, and a patient controlled analgesia (PCA) Morphine infusion. The pain was particularly severe on the posterior aspect of the chest around the T6 level relatively close to the midline, and anteriorly along the right costal margin.

After informed consent and application of standard monitoring, a right sided ultrasound guided (Sonosite S-Nerve, Sonosite

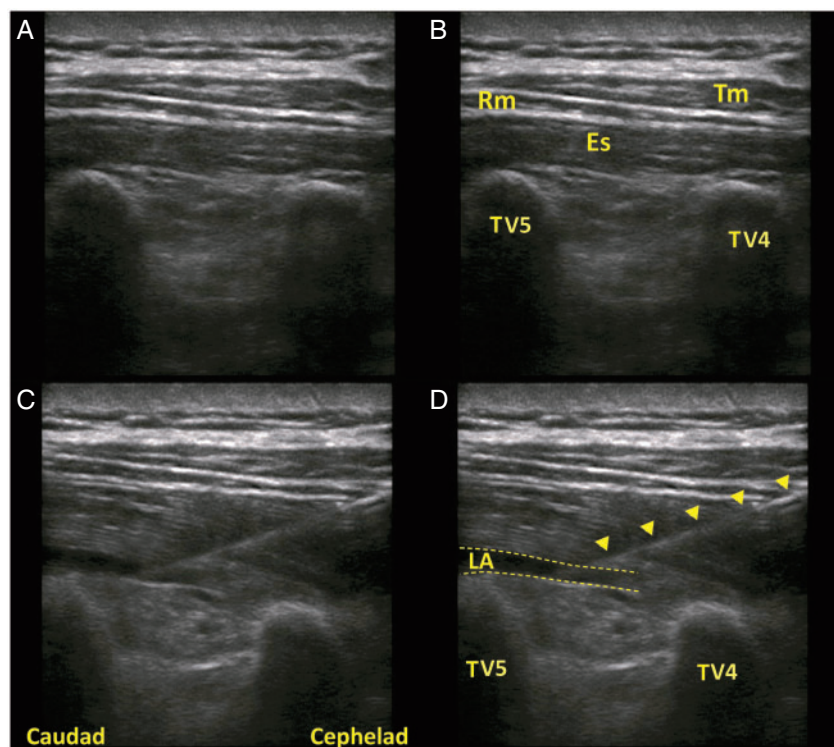


Fig 1 (A and B) Sonographic anatomy for Erector Spinae Plane (ESP) block: Trapezius muscle (Tm), Rhomboid Major muscle (Rm), Erector Spinae muscle (Es), TV4 & TV5: Transverse process of the fourth & fifth thoracic vertebrae respectively. (C and D) Ultrasound guided ESP block showing location of needle (arrows) and Local Anaesthetic (LA) deposited deep to the Erector Spinae muscle.

Inc, Bothell, Washington, USA) ESP block was carried out at the T5 level, using a 13-6 MHz 38mm linear probe, and an in-plane needling technique (Fig. 1). The patient was in a sitting position with the probe oriented in the parasagittal plane, approximately 3cm lateral to the midline. A bolus of 20ml of 0.25% Levobupivacaine produced almost immediate pain relief. An indwelling peripheral nerve block catheter (SonoLong Sono catheter, Pajunk, Germany) was then positioned, and a further 15ml of 0.25% Levobupivacaine was injected via the catheter under ultrasound guidance, confirming location of the catheter within the ESP. The catheter was tunneled and secured in place.

Within two min of performance of the regional block the static NPS was 0/10 at rest and 1/10 on coughing. The patient was returned to the ward and closely observed. Formal testing of the distribution of cutaneous sensory block showed loss of cold sensation over the right hemithorax extending from T1 to T9 with partial blockade of the C7 & C8 dermatomes.

A continuous infusion of 10 ml h⁻¹ 0.125% plain Bupivacaine was commenced, and this was continued for four days. The patient was able to mobilise around the hospital ward during this time. After discontinuation of the infusion the patient was discharged home.

Advances in regional anaesthesia in recent years have included the description of a number of important fascial plane blocks differentially blocking the dorsal, lateral and anterior cutaneous nerves of the thorax and abdomen. These include the transversus abdominis plane (TAP) block,¹ rectus sheath block,² quadratus lumborum (QL) block,³ PECS block,⁴ serratus plane block,⁵ retrolaminar block,⁶ and now the erector spinae plane (ESP) block.⁷ The key advantage common to all of these techniques is that they are technically easier to perform compared with neuraxial, nerve plexus, and targeted nerve blocks. Furthermore, while further studies are required, they offer the possibility of fewer serious side-effects (such as spinal cord damage, nerve trauma, pneumothorax etc.). As less technical expertise is required, it should be possible to make these methods more widely available to patients undergoing surgery, or suffering from acute or chronic pain syndromes.

Based on the experience of Forero and colleagues⁷ we deposited the local anaesthetic (LA) deep to the erector spinae muscle. Thus placing LA in close proximity to the costovertebral foramina, where both the dorsal and ventral rami of the thoracic spinal nerves originate. In this location we postulate that both cephalad and caudad LA spread is facilitated by the thoracolumbar fascia, which extends across the whole of the posterior thorax and abdomen, and is continuous with the nuchal fascia in the neck. This provides a logical explanation for

the extensive sensory changes and analgesia over the hemithorax after ESP block.

Chest wall injuries are associated with significant morbidity and mortality, especially in patients with coexisting respiratory disease.⁸ They are often underdiagnosed, and patients often have established respiratory failure when they present to critical care.⁹ Early intervention with adequate pain relief can be life saving, and regional anaesthetic techniques are often a crucial component in analgesia. The ESP block requires additional formal evaluation and may well be a major advance in the management of chest wall pain.

Declaration of interest

None declared.

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