

Erector Spinae Block for thoracic Trauma

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Abstract

Introduction: Anesthesiologists face a difficult task in managing pain in trauma patients with acute rib and spine fractures, and attaining appropriate analgesia is critical in minimizing pulmonary consequences. Erector spinae plane (ESP) blocks are a type of localized anaesthetic that can be used to treat pain.

Case Report: After falling off his bike, a 42-year-old man suffered several rib and spine fractures. His injuries included fractures of the D4, D5, D8, D11, and D12 vertebral bodies, as well as fractures of the pedicle and spinous process of the D7 and D9 vertebrae, as well as comminuted fractures of the D7 and D10 vertebral bodies.

The decision to proceed with bilateral ESP block was made. A right-sided ESP block was conducted.

On presentation, the patient was in excruciating pain due to multiple rib and spine fractures, and was experiencing pain-related decreased respiratory effort. After receiving an ESP block, the patient's pain gradually subsided, and his respiratory effort improved, and he was managed conservatively in the hospital until he was taken for surgical intervention.

Conclusion: A novel myofascial plane block for thoracic analgesia is the ultrasound-guided erector spinae plane block (ESP). It allows patients to cough and breathe deeply while also reducing the length of time they are on mechanical ventilation.

Keywords: Erector Spinae block; Thoracic trauma.

Key Messages: Provide appropriate messages of about 35-50 words to be printed in centre box.

A 42 year old male patient sustained multiple rib and spine fractures. Pain management in such patients is a challenge for the anesthesiologist. ESP block is a novel myofascial plane block for thoracic analgesia and provides an alternative regional anesthetic technique for pain management. Ultrasound guided bilateral ESP block was given after which patient was pain free and successful management of the case is reported.

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Introduction

Anesthesiologists face a difficult task in managing pain in trauma patients with acute rib and spine fractures, and attaining appropriate analgesia is critical in minimizing pulmonary consequences. Erector spinae plane (ESP) blocks are a type of localized anaesthetic that can be used to treat pain. In regional anaesthesia, the ESP block is a basic fascial plane block with a growing application. Although early investigations of the ESP block showed that local anaesthetic diffused over the thoracolumbar fascia and into the paravertebral region, providing analgesia to both the dorsal and ventral rami of the spinal roots, more research is needed. The ESP block is expected to provide excellent analgesia for individuals with acute traumatic spine fractures or patients undergoing surgical spinal instrumentation by blocking the dorsal rami. A case of effective analgesia with bilateral ESP block for a patient with acute traumatic rib fracture and T4 vertebral body rupture fracture is described in this study.

Case Report

After falling off his bike, a 42 year old man suffered several rib and spine fractures. His injuries included fractures of the D4, D5, D8, D11, and D12 vertebral bodies, as well as fractures of the pedicle and spinous process of the D7 and D9 vertebrae, as well as comminuted fractures of the D7 and D10 vertebral bodies (Fig. 1), which resulted in spinal canal narrowing, cord compression, and spinal cord oedema. The patient described extreme pain in his thorax and back due to the severity of his injuries.



Fig. 1: It shows fractures in multiple levels.

Noninvasive blood pressure, heart rate, pulse oximetry (SpO₂), and electrocardiogram (ECG)

monitoring become routine. In light of respiratory distress, the patient was placed on HFNC (high flow nasal cannula) with a fio₂ of 60% and a flow rate of 40 litres. His SpO₂ was 80 percent on face mask 5 L/min, and ECG readings revealed normal sinus tachycardia. The chest pads were connected after two big intravenous accesses were inserted.

The patient was originally treated with a multimodal analgesic regimen that included planned acetaminophen (1000 mg four times a day), Diclofenac (75 mg twice a day), Tramadol (50 mg twice a day), and a Buprenorphine transdermal patch. An epidural was not recommended due to his severe spine fractures. Pain, on the other hand, remained uncontrollably high. Due to splinting from pain, the patient required a high flow nasal cannula (HFNC) and intermittent continuous positive airway pressure (CPAP) to improve breathing function.

On post injury day 2, the surgical team contemplated placing an epidural, but it was deemed hazardous due to the significant risk of surgical site bleeding and the potential for epidural hematoma formation. As a result, the decision to proceed with bilateral ESP block was made. A right sided ESP block was conducted under ultrasound guidance with a high frequency linear ultrasound probe after informed permission. With the transducer positioned in a parasagittal orientation roughly 3 cm off midline, the right T4 transverse process was found. Using an in-plane needling method, a 17 gauge Tuohy needle was advanced in a cephalad to caudad direction to a point exactly posterior to the T4 transverse process and anterior to the erector spinae muscle. The ESP was discovered.

On presentation, the patient was in excruciating pain due to multiple rib and spine fractures, and was experiencing pain related decreased respiratory effort. After receiving an ESP block, the patient's pain gradually subsided, and his respiratory effort improved, and he was managed conservatively in the hospital until he was taken for surgical intervention (spinal fusion and implant fixation).

Discussion

The block's use has expanded to cover the treatment of a variety of acute and chronic pain conditions in the thorax and abdomen.¹⁻⁴ The ESP block has previously been documented in the acute trauma patient with spine fractures as an alternative to neuraxial procedures.^{2,7} However, the ESP block has not been described in the acute trauma patient with spine fractures as an alternative to neuraxial

techniques.

The analgesic advantage for patients having spine surgery or with acute traumatic spine fractures can be explained by the projected cephalad and caudad spread along the thoracolumbar fascia, which encompasses the dorsal rami of the spinal nerves. The injectate distribution into the intercostal gaps, where local anaesthetic can act on the ventral rami, appears to provide an additional mechanism of action for analgesia of the anterolateral thoracic and abdominal wall.⁶ There is one case series that illustrates the successful use of ESP blocks in patients undergoing spine surgery, however this was in the absence of further trauma-related injuries, and the ESP blocks were placed at low thoracic levels near the surgical site.⁵

The ESP block, like other fascial plane blocks, is technically simple to perform and is thought to have a lower risk of consequences such as nerve damage, pneumothorax, and hematoma formation.^{2,3} The ESP block also allows for ongoing neurologic testing in trauma patients with intracranial disease or possible spinal cord injury, which can be muddled when neuraxial procedures are performed.

Furthermore, when compared to neuraxial procedures, there are less contraindications to installation, making ESP blocks a viable alternative to neuraxial or even paravertebral approaches. Expanding the use of the ESP block for patients having spine surgery or with acute traumatic spine fractures could provide an analgesic option for people who were previously unsuitable for the procedure. This opens up the possibility of a new line of investigation and research.

Conclusion

Rib and spine fractures are typical injuries in acute chest trauma, causing intense thoracic pain and limiting patients' capacity to cough and breathe

deeply, leading to atelectasis and pneumonia. Analgesics and localised anaesthesia have been described as therapies for pain control in rib and spine fractures. A novel myofascial plane block for thoracic analgesia is the ultrasound guided erector spinae plane block (ESP). It allows patients to cough and breathe deeply while also reducing the length of time they are on mechanical ventilation.

Conflict of Interest: Nil

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