

# Fluoroscopic-guided erector spinae plane block for spine surgery

## ABSTRACT

Erector spinae plane block (ESPB) is an ultrasound-guided block that can be also done under fluoroscopic guidance, which is usually used to manage postoperative pain of the thoracic and abdominal regions. We describe a successful Fluoroscopic-guided lumbar erector spinae plane block for lower back spinal surgery.

**Key words:** Local Anesthesia, lumbar vertebrae, nerve block, osteoarthritis, postoperative pain, regional anesthesia

## Introduction

The erector spinae plane block (ESPB) is gaining popularity as an interfacial regional technique for thoracic and abdominal surgeries. There are limited options for regional techniques for lumbar spine surgeries; however, recent literature<sup>[1-4]</sup> suggests consideration of the ESPB. The ESPB is traditionally performed by ultrasound guidance. We present a case of an anesthesiologist performing a successful intraoperative fluoroscopy-guided lumbar ESPB for postoperative analgesia.

## Case Summary

A 66-year-old male with multilevel lumbar neuroforaminal stenosis presented to our institution for scheduled two-stage extreme lateral Lumbar 3-4 and Lumbar 4-5 interbody fusion. Anesthetic induction, endotracheal intubation, and prone positioning were uneventful. For stage 1, fentanyl 100 µg was administered. The patient reported a pain severity of 9 out of 10 on recovery on the Numeric Pain Rating Scale,

where 0 is no pain and 10 is severe pain. For stage 2, fentanyl 100 µg was administered intraoperatively. In addition, the anesthesiologist performed an intraoperative bilateral Lumbar 4 ESPB under fluoroscopy guidance post-closure, where the needle was directed to the transverse process of the fourth lumbar vertebra. The location was confirmed by injecting a contrast [see Figures 1 and 2]. The patient tolerated the procedure with no complication. The patient denied somatic back pain postoperatively, and he reported a pain severity of 5 out of 10. The patient expressed satisfaction with the regional analgesic, and he was discharged home 2 days thereafter.

## Discussion


ESPB for lumbar fusion is associated with reduced postoperative pain and decreased hospitalization length of stay.<sup>[1]</sup> In ESPB, the local anesthetic spreads cephalocaudal to the dorsal rami of spinal nerves, which supply innervation to the paraspinal muscles and posterior skin. A cadaver

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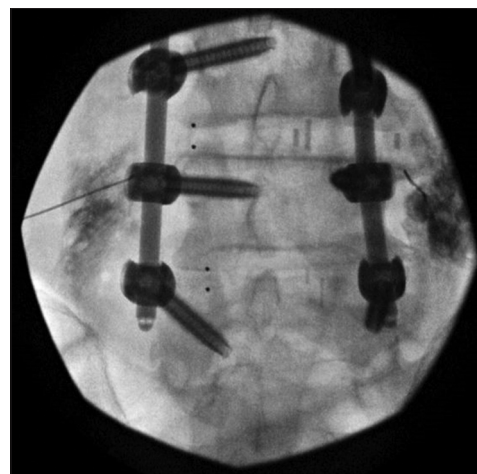
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**Figure 1: Lumbar 4 contract injection at the level of the left transverse process**



**Figure 2: Lumbar 4 contract injection at the level of the bilateral transverse process**

study by Ivanusic *et al.*<sup>[5]</sup> did not show consistent spread of injectate to the ventral rami or thoracic paravertebral space. A low thoracic ESPB performed at Thoracic 12 with 25-ml injectate will not provide sensory coverage to the lower lumbar levels in 14% of patients. Click here to enter text.<sup>[6]</sup> The injectate volume limited to 20 ml will not consistently lead to cutaneous sensory loss anterior to the axillary line.<sup>[7]</sup> Lumbar ESPB may lead to motor weakness, as local anesthetic can potentially spread anterior of the transverse process to the lumbar plexus and lumbar spinal nerves.<sup>[8]</sup> Interfascial blocks are volume dependent for spread, and the amount required differs on the region. Five milliliters at the vertebral level is indicated in the lumbar region versus 2.5 ml per thoracic level.<sup>[8]</sup> Given the above factors, our team elected to administer 15 ml of ropivacaine 0.2% at the Lumbar 4 transverse process bilaterally.

Fluoroscopy and ultrasound guidance have both been used for pain procedures. Fluoroscopy guidance is the mainstay in interventional pain and neuraxial procedures. Injection of contrast can be used to visualize spread of injectate and also monitor for intravascular uptake. Fluoroscopy is potentially several minutes faster than ultrasound.<sup>[9]</sup> Fluoroscopy does expose the practitioner and patient to ionizing radiation. In comparison, the lack of radiation does make ultrasound preferable in select populations like obstetrics or pediatrics. Ultrasound can be challenging to use with an obese habitus. It is challenging to accurately label vertebral levels in degenerated anatomy with ultrasound. Obesity and spinal degeneration are common in patients undergoing interbody fusions.

Another factor to consider is the timing of ESPB. A preoperative single-shot ESPB will benefit from an intact fascial plane,

which potentially yields more consistent cephalocaudal spread; however, surgical washout may lead to disruption of the local anesthetic pocket. A block in the recovery unit may be viable, but the patient will be cumbersome to position, given postoperative pain and site dressings. An intraoperative block post-closure can be performed efficiently as the fluoroscopy c-arm is immediately available.

## Conclusion

In summary, anesthesiologists can consider intraoperative single-shot ESPB with fluoroscopy expertise for lumbar spinal surgery.

## Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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