

# Thoracolumbar interfascial plane block and erector spinae plane block for postoperative analgesia in patients undergoing spine surgery

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Dear Editor,

Regional anaesthesia prior to surgical intervention plays an important role in reducing post-operative pain and limiting opioid consumption. Ultrasound-guided interfascial plane blocks have gained popularity because they allow analgesia to be targeted to a specific anatomical region and provide effective pain control. In the United States, lumbar spine surgery is one of the most commonly performed procedures for pain relief in patients with low back and leg pain [1]. In recent years, the advent of the thoracolumbar interfascial plane block (TLIP) and the erector spinae plane block (ESPB) have been shown as effective interventions for pain control in patients undergoing lumbar spine surgery such as an hemilaminectomy. Additionally, the ESPB has even been utilized as the main anaesthetic in some cases [2].

We describe a case of a patient who obtained profound postoperative analgesia with the use of these regional techniques. Additionally, there is growing evidence of prolonged post-operative analgesia with the addition of adjuncts such as dexamethasone and dexmedetomidine to fascial plane blocks [3, 4]. We report one of the first successful uses of this technique for TLIP and ESPB. Patient consent was obtained for publishing this case report.

Our patient is a 39-year-old female who presented with right-sided leg pain and lumbar radiculopathy. She reported pain as 6/10 on a numerical rating scale. A lumbar computed tomography scan for the patient was unremarkable. Lumbar magnetic resonance imaging showed L5 disc herniation on the right paracentral position resulting in compression of the S1 nerve root and possible pseudoarthrosis of the L4 and L5 spinous process with bony ossifications posteriorly. Prior to imaging, the patient received physical therapy, epidural steroid injections, and medication management, all of which provided minimal relief. Hemilaminectomy, which involves removing laminae on a vertebra to relieve pressure on the spinal nerves, was conducted on the L5 and S1 segments. Prior to surgical intervention, the patient received a thoracolumbar interfascial plane regional nerve block and a lumbar erector spinae plane block by a regional anaesthesiologist. For the procedure, 20 mL of 0.2% ropivacaine with 5 mg of preservative-free dexamethasone and 25 µg of dexmedetomidine was used in total for the blocks. This medication was divided equally for both blocks. The TLIP procedure was performed under ultrasound guidance and using the classical technique describe by Hand *et al.* [5] with the de-

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position of medication between the multifidus and longissimus muscles. The ESPB was also performed under ultrasound guidance at the same level with the needle tip contacting the transverse process. The patient reported minimal pain postoperatively and noted that her pain never increased past 1/10 on the numerical rating scale through postoperative day 3. The patient only utilized acetaminophen for postoperative pain management and required no opioids through her hospitalization.

The use of the TLIP was a regional anaesthesia technique first described by Hand *et al.* in 2015 [5]. In the technique, 20 mL of 0.2% ropivacaine was administered between the multifidus and longissimus muscles to target the dorsal rami of the thoracolumbar nerves. In the study, all participants had predictable spread of the anaesthetic without any reported adverse effects. After the advent of the technique, Chen *et al.* conducted a randomized prospective clinical trial in 2018, which showed that opioid and anaesthetic consumption during the perioperative period decreased significantly in the group of patients receiving TLIP compared to the control group [6]. In addition, the study showed that the length of postoperative hospital stay in the TLIP group was significantly lower compared to the control group. The utility of the ESPB was described by Forero *et al.* in 2016 [7], who used the technique to manage thoracic neuropathic pain in a patient with metastatic disease to the ribs and another patient with malunion of multiple rib fractures. With the use of the ultrasound, the injection is administered to the deep fascia of the erector spinae to target the ventral and dorsal roots of the spinal nerves. Since its initial use, further reports of ESPB for postoperative pain relief following posterior spinal fusion surgery have emerged and demonstrate that the block may be effective in patients undergoing spinal surgery [8]. This block has also gained popularity with anaesthesiologists trained in chronic pain for its ease of use for postopera-

tive analgesia as well as chronic neuropathic pain conditions [9, 10]. Ciftci *et al.* [11] compared the utility of both the TLIP and ESPB during lumbar discectomy surgery and demonstrated that both blocks had similar benefits and utility in providing postoperative analgesia. However, we have demonstrated that combined usage of these blocks with the addition of adjunctive medications may provide prolonged postoperative analgesia.

Utilization of TLIP and ESPB in combination for patients undergoing lumbar spine surgery may be a safe and effective technique to reduce postoperative pain. Further studies in large, controlled groups should be considered to assess the use of a combination of these blocks in reducing perioperative anaesthesia use, postoperative pain relief, length of postoperative hospital stays, and postoperative opioid consumption in patients undergoing spinal surgery. We believe that additional studies should look at the addition of adjuncts to these blocks separately along with combined TLIP and ESPB to compare the efficacy of combined regional techniques.

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## REFERENCES

1. Weinstein JN, Lurie JD, Olson PR, Bronner KK, Fisher ES. United States' trends and regional variations in lumbar spine surgery: 1992-2003. *Spine (Phila Pa 1976)* 2006; 31: 2707-2714. doi: 10.1097/01.brs.0000248132.15231.fe.
2. Ahiskalioglu A, Tulgar S, Celik M, Ozer Z, Alici HA, Aydin ME. Lumbar erector spinae plane block as a main anesthetic method for hip surgery in high risk elderly patients: Initial experience with a magnetic resonance imaging. *Eur J Med* 2020; 52: 16-20. doi: 10.5152/eurasianjmed.2020.19224.
3. Herman J, Urits I, Hasoon J, et al. Synergistic effect of local dexamethasone and dexmedetomidine (Dex-Dex) in extending the analgesic effect of a transversus abdominis plane block prior to inguinal hernia repair. *J Clin Anesth* 2020; 62: 109703. doi: 10.1016/j.jclinane.2020.109703.
4. Sharma UD, Prateek, Tak H. Effect of addition of dexamethasone to ropivacaine on post-operative analgesia in ultrasonography-guided transversus abdominis plane block for inguinal hernia repair: a prospective, double-blind, randomised controlled trial. *Indian J Anaesth* 2018; 62: 371-375. doi: 10.4103/ija.IJA\_605\_17.
5. Hand WR, Taylor JM, Harvey NR, et al. Thoracolumbar interfascial plane (TLIP) block: a pilot study in volunteers. *Can J Anaesth* 2015; 62: 1196-1200. doi: 10.1007/s12630-015-0431-y.
6. Chen K, Wang L, Ning M, Dou L, Li W, Li Y. Evaluation of ultrasound-guided lateral thoracolumbar interfascial plane block for postoperative analgesia in lumbar spine fusion surgery: a prospective, randomized, and controlled clinical trial. *PeerJ* 2019; 7: e7967. doi: 10.7717/peerj.7967.
7. 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: 621-627. doi: 10.1097/AAP.0000000000000451.
8. Chin KJ, Lewis S. Opioid-free analgesia for posterior spinal fusion surgery using erector spinae plane (ESP) blocks in a multimodal anesthetic regimen. *Spine (Phila Pa 1976)* 2019; 44: E379-E383. doi: 10.1097/BRS.000000000000285.
9. Hasoon J, Urits I, Viswanath O, Aner M. Utilization of erector spinae plane block in the chronic pain clinic for two patients with post-thoracotomy pain. *Cureus* 2020; 12: e8988. doi: 10.7759/cureus.8988.
10. Hasoon J, Urits I, Viswanath O, Dar B, Kaye AD. Erector spinae plane block for the treatment of post mastectomy pain syndrome. *Cureus* 2021; 13: e12656. doi: 10.7759/cureus.12656.
11. Ciftci B, Ekinci M, Celik EC, Yayik AM, Aydin ME, Ahiskalioglu A. Ultrasound-guided erector spinae plane block versus modified-thoracolumbar interfascial plane block for lumbar discectomy surgery: a randomized, controlled study. *World Neurosurg* 2020; 144: e849-e855. doi: 10.1016/j.wneu.2020.09.077.