

Enhancing recovery in cervical spine surgery with erector spinae plane (ESP) block- A case series

Anterior cervical discectomy is often done for cervical disc diseases. Fusion may be required in cases of myelopathy, radiculopathy, and instability. It carries a significant risk of intraoperative spinal cord injury; thus, major perioperative goals include maintenance of mean arterial pressure for spinal cord perfusion. Postoperatively, early evaluation for complications and pain management is advisable to enhance recovery. Usually, intraoperative goals are achieved by employment of total intravenous anaesthesia, which often requires opioid infusion. Excess use of opioids leads to delayed tracheal extubation, postoperative nausea and vomiting, depressed mental status, etc. This delays postoperative goals and recovery. Non-steroidal anti-inflammatory drugs and cyclo-oxygenase-2 inhibitors used in the early post-surgical period may be associated with increased rates of pseudo-arthrosis, hardware failure, and revision surgery in patients undergoing posterior spinal instrumentation and

fusion.^[1] To date, there is sparse literature focusing on the erector spinae plane (ESP) block at the cervical level.^[2,3] We wish to share our experience of six patients who were given ESP block during single- or dual-level cervical spine surgery. We evaluated the influence of a single-shot bilateral T1 ESP block as an adjuvant to general anaesthesia on perioperative haemodynamic stability, opioid consumption and postoperative recovery in patients undergoing cervical surgery.

Consent was obtained from patients for publication of their findings. Patients belonging to the American Society of Anesthesiologists Physical Status I/II had chief complaints of chronic pain with radiculopathy not responding to conservative management. Patients did not have any pre-procedure neurological, sensory, or motor deficits. Using a high-frequency linear ultrasound probe (FUJIFILM SonoSite Edge II Total, Inc., Bothell, WA, United States) in parasagittal orientation, the T1 thoracic transverse process was identified, and a 22-G 80-mm echogenic needle (Stimuplex® Ultra 360® B BRAUN SE, Melsungen AG, Hessen, Germany) was inserted (in-plane approach) to contact the T1 thoracic transverse process. Bupivacaine 0.25%, 15 mL mixed with epinephrine 2.5 µg/mL and dexamethasone 2 mg was administered deep into erector spinae muscle

Table 1: Demographics and patient characteristics

	Age (years)	BMI (kg/m ²)	Gender	Level of surgery	MAP		POD-1 NRS (24 h)	POD-2 NRS (48 h)	m-PSI
					Min	Max			
Case 1	58	24.4	F	C6-C7	75	84	0	0	2
Case 2	62	22.5	F	C5-C6	72	85	0	0	1
Case 3	54	26.2	M	C6-C7	78	86	0	0	1
Case 4	66	38.4	F	C5-C6, C6-C7	80	94	0	3	1
Case 5	65	42.0	F	C5-C6, C6-C7	84	95	0	4	2
Case 6	70	33.8	M	C5-C6, C6-C7	78	92	0	3	1

BMI=Body Mass Index, MAP=Mean Arterial Pressure, POD=Postoperative Day, NRS=Numerical Rating Scale, m-PSI=modified Patient Satisfaction Index for Anaesthesia Technique, F=Female, M=Male

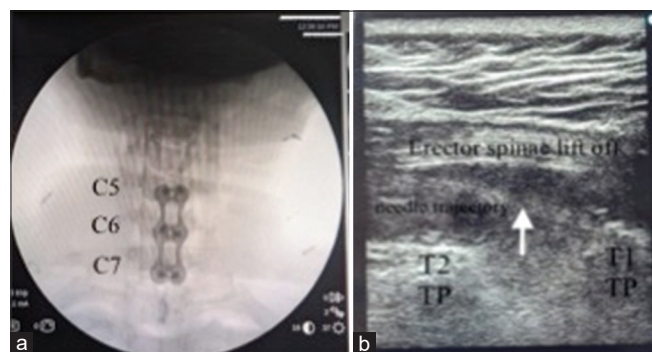


Figure 1: a: X-ray image of dual level (C5-C6, C6-C7) anterior cervical fusion; b: Ultrasound-guided T1 erector spinae plane block; TP = Transverse Process

fascia with visible local anaesthetic spread [Figure 1]. The process was done bilaterally. General anaesthesia was induced with intravenous propofol (2 mg/kg), fentanyl (2 µg/kg), and succinylcholine (1 mg/kg) and maintained with dexmedetomidine (0.5 µg/kg/h) and propofol (100 µg/kg/min) intravenous infusions. Postoperatively, additional analgesia was administered only as required, starting with intravenous paracetamol 1 g, followed by intravenous tramadol 50 mg if needed. None of the patients who underwent single-level surgery required rescue analgesics or opioids intraoperatively or postoperatively up to 48 h. However, the three patients who had dual-level surgery needed a single dose of intravenous paracetamol 1 g on 2nd day after 30–36 h, with Numerical Rating Scale 3–4/10. Four patients reported their modified patient satisfaction index (m-PSI) score as 1, while two reported it to be 2 [Table 1]. All patients were discharged as per institutional protocol after 48 h.

ESP block provides somatic and visceral analgesia by blocking the dorsal and ventral rami of the spinal nerve. It also blocks autonomic fibres to and from the sympathetic ganglia via rami-communicantes. Due to the extensive cranio-caudal spread of local anaesthetic, it is helpful in blocking larger dermatomes, thus beneficial for dual-level cervical surgeries. Technically, it is

simple to perform and safe due to the minimal epidural spread of the drug, allowing for better perioperative haemodynamic control during cervical surgeries. We found that single-shot ESP block leads to reduced opioid usage during anaesthesia and pain-free postoperative hospital stay, even in high BMI patients. This allowed the incorporation of a rehabilitative regimen early without fear, thus ensuring an enhanced recovery.

Adjuvant epinephrine slows the entry of local anaesthetic into the plasma and decreases its toxic effect, while dexamethasone prolongs the duration of the block.^[4,5] ESP block can be used as an adjuvant for cervical surgeries to ensure reduced use of opioids and analgesics, along with improved pain relief and better patient satisfaction. To validate the efficacy of ESP block for cervical surgeries, rigorous randomised controlled trials are warranted.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the forms, all the patients consented to their images and other clinical information being 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 identities, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. Lindsay SE, Philipp T, Ryu WH, Wright C, Yoo J. Nonsteroidal anti-inflammatory drugs in the acute postoperative period are associated with an increased incidence of pseudarthrosis, hardware failure, and revision surgery following single-level spinal fusion. *Spine* 2023;48:1057-63.
2. Diwan S. Bilateral ultrasound-guided cervical erector spinae plane catheters for posterior cervical spine fusion (Abstract). *Reg Anesth Pain Med* 2019;44:209. <https://doi.org/10.1136/rapm-2019-ESRAABS2019.359>.
3. Goyal A, Kamath S, Kalgudi P, Krishnakumar M. Perioperative analgesia with erector spinae plane block for cervical spine instrumentation surgery. *Saudi J Anaesth* 2020;14:263-4.
4. Shigeta H, Yasumura R, Kotake Y. Comparison of plasma

levobupivacaine concentrations with and without epinephrine following erector spinae plane block for breast cancer surgery: A randomized controlled trial. *BMC Anesthesiol* 2022;22:86. doi: 10.1186/s12871-022-01632-6.

5. Swain A, Nag DS, Sahu S, Samaddar DP. Adjuvants to local anesthetics: Current understanding and future trends. *World J Clin Cases* 2017;5:307-23.

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