

CASE REPORT

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# Ultrasound-guided lumbar ESP block for post-operative analgesia as an alternative mode of analgesia in hip arthroplasty with multiple systemic issues: a case report

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## Abstract

**Background:** Patients with multiple systemic diseases present an anaesthetic challenge in terms of perioperative pain management. We propose that ultrasound-guided erector spinae plane block be used as an alternative mode of analgesia in patients undergoing hip arthroplasty.

**Case presentation:** We report a case of a 54-year-old female, a known case of autosomal dominant polycystic kidney disease on continuous ambulatory peritoneal dialysis, hypertension, and deranged coagulation profile with fractured neck of femur planned for hemiarthroplasty. She was administered ultrasound-guided single-shot erector spinae plane block at L3 level with 20 mL of 0.25% ropivacaine and 4 mg dexamethasone. This block provided excellent post-operative analgesia for up to 24 h with early mobilisation.

**Conclusion:** Single-shot ultrasound-guided erector spinae plane block can be used as an alternative mode of analgesia in patients undergoing hip arthroplasty, with multiple systemic diseases in whom neuraxial blockade cannot be performed. This technique needs to be further explored in the form of randomised controlled trials.

**Keywords:** Analgesia, Arthroplasty, Nerve block, Erector spinae plane block

## Background

Erector spinae plane block (ESPB) has its utility in multitudinous scenarios due to its ease of administration, safety profile and excellent coverage. Here we report its use as a mode of post-operative analgesia after hemiarthroplasty in a 54-year-old hypertensive female patient with deranged coagulation profile with chronic kidney disease, on continuous dialysis, in which neuraxial blockade could not be performed. ESPB was performed at the third lumbar vertebral level post-operatively. Ample analgesia was achieved post-operatively; a mean NRS of 2.8/10 at 24 h was noted with quicker mobilisation and early discharge of the patient. Here we report the use of

ultrasound-guided single-shot ESPB for post-operative analgesia in a patient with multiple systemic issues.

## Case presentation

A 54-year-old female diagnosed to have a neck of femur fracture—on the right side, a known case of autosomal dominant polycystic kidney disease—end-stage renal disease (for 20 years) on continuous ambulatory peritoneal dialysis (CAPD), hypertension (for 15 years) with deranged coagulation profile (INR of 1.8), and ECG showing old anterior and lateral wall infarcts, and echocardiography was suggestive of concentric left ventricular hypertrophy (LVH), ejection fraction of 46.5%, and grade III diastolic dysfunction. She was posted for hemiarthroplasty of the hip joint under ASA physical status III.

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After shifting the patient to the operating room, standard ASA monitors were connected. The case was planned under general anaesthesia keeping in mind the systemic diseases and deranged coagulation parameters. The anaesthesia was induced with fentanyl 2mcg/kg i.v., propofol 1.5 mg/kg i.v. and atracurium 0.5 mg/kg i.v., and tracheal intubation was done. The patient's lung was then mechanically ventilated with a mixture of oxygen, nitrous and isoflurane titrated to a MAC of 0.9–1.0. At the end of the surgery, we performed an ultrasound-guided erector spinae plane block on the right side at L3 level using the SonoSite Edge II 6–13 MHz linear probe. Under all aseptic precautions, with the patient in the lateral position, the spinous process of L3 vertebrae was identified. The transverse process was then visualised by tracing the probe laterally, and a 10-cm Stimuplex® A needle (B Braun) was inserted in the craniocaudal direction with the needle path being visualised as it reached the transverse process. Twenty milliliters of 0.25% ropivacaine with 4 mg dexamethasone was injected after verifying the plane (Fig. 1). The patient was then extubated and shifted to post-anaesthesia care unit (PACU) for monitoring and observation. Post-operative analgesia plan included paracetamol 1g i.v. Q8H. Tramadol i.v. was advised as rescue analgesia. Pain was assessed using the Numerical Rating Scale (NRS) at 6, 12, 18 and 24 h. Mean NRS recorded 2.8/10 over 24 h.

## Discussion

The hip joint is innervated by spinal roots of the lumbar plexus (L2–L4) and the sacral plexus (L4–S1). The lateral femoral cutaneous nerve from the lumbar plexus (L2–L3) innervates the proximal lateral thigh which is involved in skin incision of anterolateral approach to surgery (Birnbaum et al., 1997). Various modes of analgesia can be used for patients undergoing hip surgeries that include epidural analgesia, but the pressing concern

of deranged coagulation profile was a contraindication for epidural catheter placement. Lumbar plexus block has also been advocated for analgesia after hip surgeries but not used due to the motor blockade and subsequent delay in mobilisation of patients (Chudinov et al., 1999). Erector spinae plane block (ESPB) has been described for the treatment of thoracic neuropathic pain and also been used extensively for thoracic and abdominal surgeries as part of perioperative analgesia (Chin et al., 2017). There have been case reports of ESPB in use for proximal femur and hip surgeries (Mistry et al., 2020). The deposition of local anaesthetic in the erector spinae fascial plane leads to the extensive spread of the LA cranio-caudally in the fascial plane and anterior to paravertebral and epidural spaces (De Cassai & Tonetti, 2018; Vidal et al., 2018) and blockage of the dorsal, ventral and rami communicantes of spinal nerves. USG-guided lumbar ESP block has been used as an analgesic technique in a patient undergoing total hip arthroplasty (Tulgar & Senturk, 2018; Tulgar et al., 2018). We administered the block at the L3 level to cover the lower lumbar nerves. Post-operatively, the patient was comfortable, with a mean NRS of 2.8/10 until 24 h post-operatively, and could be mobilised early.

## Conclusion

Analgesia dictates outcome and early mobilisation in patients undergoing hip arthroplasty. For patients with deranged coagulation profile and multiple systemic issues in whom neuraxial blockade cannot be performed, ESP block offers an alternative mode of effective analgesia in patients with excellent pain scores and patient satisfaction as evidenced by our case report.

## Abbreviations

ESP: Erector spinae plane; NRS: Numerical Rating Scale; LA: Local anaesthetic; INR: International normalised ratio

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None

## Authors' contributions

1. OMM: conduct of the case, literature search, and manuscript preparation. 2. SD: conduct of the case, literature search, manuscript preparation, and manuscript review. 3. SN: conduct of the case and patient follow-up. 4. PA: conduct of case manuscript preparation and manuscript review. 5. CKD: manuscript preparation and critical review. All authors have read and approved the final manuscript.

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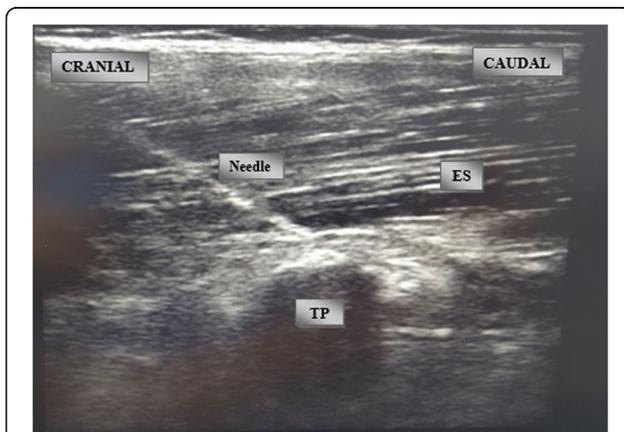
## Availability of data and materials

Not applicable

## Declarations

## Ethics approval and consent to participate

Not applicable



**Fig. 1** The transverse process, the erector spinae plane after deposition of drug. ES erector spinae muscle, TP transverse process

**Consent for publication**

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of this is available with the author.

**Competing interests**

The authors declare that they have no competing interests.

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