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Sacral erector spinae plane block for analgesia after hip surgery

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The authors stated that the written consent was obtained from the patient presented with images in the study.

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Abstract

Erector spinae plane block (ESPB) is an interfascial plane block used for providing analgesia in acute or chronic perioperative/postoperative pain for various indications. The case reports presented here describe the use of sacral ESPB for postoperative pain control in two patients who were operated on for a femur fracture. One underwent spinal anesthesia and the other underwent general anesthesia. The sacral ESPB technique has been described and the pain scores and the analgesia requirements of the patients during postoperative 48 hours have been reported. We observed that sacral ESPB is an effective method for postoperative analgesia in patients undergoing surgery for the treatment of a femoral fracture through a posterolateral approach.

Keywords: Erector spinae block, Hip surgery, Ultrasonography

Introduction

Erector spinae plane block (ESPB) was first described as an interfascial plane block performed at the upper thoracic levels to alleviate neuropathic pain [1]. Later, its use has been reported in many thoracic procedures including mastectomy, video-assisted thoracoscopy (VATS), and heart surgery, and at lumbar levels for abdominal surgery, prostatectomy, lumbar spine surgery, total hip arthroplasty, and proximal femur surgery [2].

Sacral ESPB has been recently described. Case reports are showing that it is useful in various types of surgery. In case presentations, it has been reported as effective in providing analgesia in the posterior branches of the sacral nerves in pilonidal sinus surgery, in the treatment of radicular pain at the L5 - S1 level, after a sex reassignment operation and hypospadias surgery, and its use in combination with lumbar ESPB for analgesia was reported after hip prosthesis surgery [3-8].

Severe pain occurs after general anesthesia following hip surgery either because the spinal anesthesia wears off or the patient is not given adequate doses of opioids to avoid potential respiratory problems and hospital morbidity. Severe pain acts on a variety of factors from patient mobilization to the length of hospital stay. We herein reported the effect of sacral ESPB in providing postoperative analgesia by presenting the VAS scores and the need for analgesics in the first 48 hours after surgery in two patients. One of these patients underwent intramedullary nail treatment of an intertrochanteric femoral fracture and the other one underwent prosthetic replacement of the femoral head.

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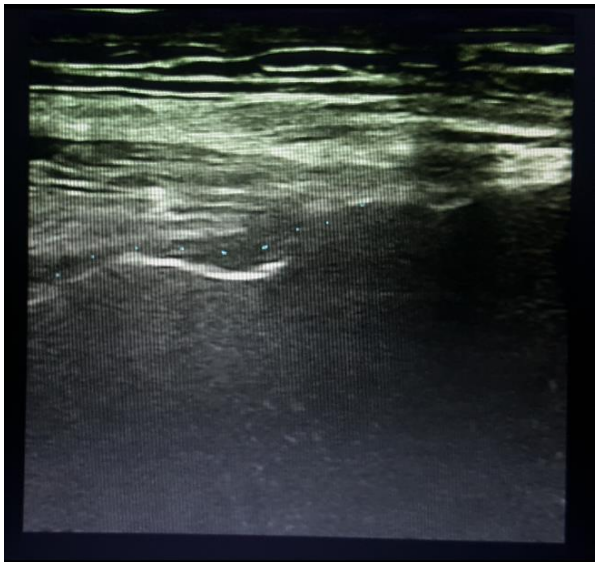
Case presentation

The first patient was a 71-year-old female with a history of rheumatoid arthritis who underwent intramedullary nail treatment due to a trochanteric fracture in her right femur. Written informed consent was obtained from the patient. The surgical procedure was performed without the use of opioids in approximately 2.5 hours under spinal anesthesia by administering 12 milligrams of bupivacaine through the intervertebral space between the L4 and L5 vertebrae.

When the patient was in the lateral decubitus position, the curvilinear (curved) transducer was placed parallel to the median sacral crest pointing towards the caudal direction. After visualizing the S1 median sacral crest, the transducer was shifted caudally. When the S3 level was reached, the transducer was moved 3-4 cm laterally. Then, the intermediate crest (IC) was detected in the parasagittal plane. At the S3-4 level, a 21-gauge, 80-mm-block needle (Pajunk, Geisingen, Germany) was advanced in the caudo-cranial direction under the erector spinae muscle until it contacted the bone. Then, a 30 ml solution containing 60 mg bupivacaine and 240 mg prilocaine was injected. The caudal-cranial spread of the solution and the elevation of the erector spinae muscle over the bone were observed (Figure 1). Motor block was not detected in the lower extremities of the patient, who was re-evaluated in the inpatient unit 2 hours after the block. There was no pain at the incision site, where the posterolateral approach was used. The pain severity with joint motion was scored as 2/10 using the numeric pain rating scale (NRS). Because the visual analog scale (VAS) score of the patient was 4/10 at the end of the 6th hour, paracetamol infusion was administered. The VAS score was still 2/10 at the end of 24 hours. No other analgesics were required within 48 hours. The patient was mobilized on the postoperative first day and discharged on day 4.

Figure 1: Linear distribution of local anesthesia after application of sacral erector spinae plane block



Total hip replacement surgery was planned for an 83-year-old female patient with congestive heart failure. Her ejection fraction (EF) was 40%; she had atrial fibrillation and was considered ASA III according to the American Society of Anesthesiologists Classification. The operation lasted 3 hours following the standard anesthesia induction. The patient was awakened and extubated without any problems and transferred to the inpatient unit. The VAS of the patient was 9/10 at the end of the first postoperative hour; therefore, the patient was scheduled to undergo sacral ESPB. Informed written consent for all procedures and permission to publish data was obtained from the patient. The patient was placed in the lateral decubitus position and the block was performed with the same method as described above. Fifteen minutes after the injection, the patient's VAS score decreased to 1/10. The patient did not complain of pain or need any analgesics for 24 hours. In the 25th hour, the VAS score of the patient was 5/10. Therefore, tramadol 50 mg was administered. In the 32nd hour, the VAS score of the patient was 4/10, necessitating the administration of 1 g paracetamol. The patient was discharged from the hospital on day 5.

Discussion

Hip fracture is a widespread problem, especially in the geriatric population. Because the cutaneous innervation of the hip area is complex, the success rate of effective anesthesia in completely covering the incision depends not only on the type of the surgical incision but the nerve block techniques as well. Surgical incisions for hip surgery are usually made near the greater trochanter of the femur. The posterolateral approach is usually the preferred method. The nerves that innervate the hip joint originate from the ventral branch of the spinal nerve roots of the lower part of the lumbar plexus (L2-4) and the upper part of the sacral plexus (L4-S1) [8].

The reduction in the need for opioid use by postoperative pain relief may allow to avoid respiratory complications and the early ambulation of the patient, help engage the patient in physical therapy programs that are less uncomfortable, improve patient satisfaction and shorten the time to hospital discharge. Peripheral nerve blockage is one of the preferred methods for postoperative multimodal analgesia in patients operated for hip fractures. Accordingly, we found that the postoperatively performed ESPB provided effective analgesia for 24 hours in two of our patients who underwent surgery for a hip fracture.

ESPB is a regional plane block that blocks the dorsal and ventral roots of the spinal nerve, providing somatic and visceral analgesia. It allows the widespread distribution of local anesthetics in the craniocaudal direction and the blockade of multiple dermatomes [9].

Because the sacral anatomical structures involved in ESPB have not been clarified yet, it has been argued that ESPB can alternatively be called sacral retrolaminar block or sacral multifidus plane block [10, 11]. ESPB can potentially block the pudendal nerve (S2-S4) at sacral levels. Also, the cephalad spread of anesthesia may result in the blockade of a part of the lumbar plexus. Previous studies suggested the potential of the epidural spread as it has been observed that extra analgesics were not needed after the block [4, 7]. Indeed, alleviation of pain both at the incision site and decreased severity of motion-induced pain after high-volume sacral ESPB in both of our patients yielded clinical data showing that the dorsal and ventral branches of the spinal nerves were blocked. Sacral ESPB is easy to perform under ultrasound guidance because it is applied relatively more superficially, and the intervention site is not close to major

vascular and neural structures. Also, we found that it can widely spread under the muscle depending on the volume applied and allow long-term analgesia without causing a motor block.

Because our study was limited to only 2 cases, further studies are needed to confirm the benefits of sacral ESPB for postoperative analgesia in hip fracture operations.

References

1. 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(5):621–7.
2. Cassai A, Bonvicini D, Correale C, Sandei L, Tulgar S, Tonetti T. Erector spinae plane block: a systematic qualitative review. Minerva Anestesiol. 2019;85(3):308–19.
3. Tulgar S, Senturk O, Thomas DT, Deveci U, Ozer Z. A new technique for sensory blockage of posterior branches of sacral nerves: ultrasound guided sacral erector spinae plane block. J Clin Anesth. 2019;57:129–30.
4. Piraccini E, Antioco M, Maitan S. Ultrasound guided sacral erector spinae plane block: a useful tool for radicular pain treatment. J Clin Anesth. 2019;59:11–2.
5. Kukreja P, Deichmann P, Selph JP, Hebbard J, Kalagara H. Sacral Erector Spinae Plane Block for Gender Reassignment Surgery. Cureus. 2020;12(4):e7665.
6. Kilicaslan, A, Uyel Y. Novel lumbosacral approach for erector spinae plane block (LS-ESPB) in hip surgery. Journal of Clinical Anesthesia. 2020;60:83–84.
7. Aksu C, Gürkan Y. Sacral erector spinae plane block with longitudinal midline approach: Could it be the new era for pediatric postoperative analgesia? J Clin Anesth. 2020:59:38-9.
8. Birnbaum K, Prescher A, Hessler S, Heller KD. The sensory innervation of the hip joint an anatomical study. Surg Radiol Anat. 1997; 19(6):371-5.
9. Kalagara HK, Deichmann P, Brooks B, Nagi P, Kukreja P. T1 erector spinae plane block catheter as a novel treatment modality for pancoast tumor pain. Cureus. 2019;11(11):e6092.
10. Hamilton DL. The erector spinae plane block: Time for clarity over anatomical nomenclature. J Clin Anesth. 2020;62:109699.
11. Piraccini E, Taddei S. Sacral multifidus plane block: The correct name for sacral erector spinae plane block. J Clin Anesth. 2020;63:109754.

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