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Erector Spinae Plane Block for Intercostal Pain related to Cervical Spinal Cord Ependymoma: A Case Report

Karen Bach, BS[1], Olufunke Dada, MD[2], and Nitin Goyal, MD[2]

Background: The erector spinae plane (ESP) block is a relatively novel technique in the field of regional anesthesia and pain management. In the original 2016 case report by Forero et al, the ESP block demonstrated extensive neuropathic pain relief of thoracic origins. Although ESP blocks have proven to be a useful modality for managing perioperative, postoperative, and chronic refractory pain of the thoracoabdominal region, its use indication regarding pain therapy of the cervical region has not yet been clearly elucidated.

Case Report: A 50-year-old woman with a history of intercostal neuralgia and central pain related to ependymoma and syrinx of the cervical spinal cord presented with exacerbation of chronic postsurgical pain located in the right thoracic region at approximately T8-T11 levels. Given that her pain was refractory to other therapeutic modalities, the patient elected to have an ultrasound-guided right-sided ESP block at the T8 level. Immediately relief was felt after the procedure and was sustained at a follow-up visit. The patient reported 90% improvement of her pain as well as 90% improvement of functionality on her right side. She was extremely satisfied with the results and reported a decreased pain level, at 0 to 1 out of 10.

Conclusion: Although the ESP block was initially described for thoracic pain control, our findings demonstrate that it may also be a beneficial therapeutic option in the management of pain from cervical origin. Our experience with the block showed immediate analgesic efficacy in our patient and provided significant symptomatic relief without the need for opioid rescue therapy. Further investigation is needed to determine its long-term efficacy and safety profile.

Key words: Cervical pain, erector spinae plane block, nerve block, pain, pain management, regional anaesthesia

BACKGROUND

Originally described by Forero et al in 2016 (1), the erector spinae plane (ESP) block has gained increasing interest for its high therapeutic efficacy without the use of opioid rescue analgesia and for its favorable side-effect profile (2). The first description of its use was in shoulder surgery, and subsequent studies in the years after applied the technique to pain management focused on the thoracic, abdominal, and lumbar regions (3-5).

To the best of our knowledge, this is the first case where the ESP block successfully provided pain relief related to a central nervous system process. The patient in this report has provided verbal consent to have her case written up regarding her pain and relief from the ESP block.

CASE

A 50-year-old woman with a history of intercostal neuralgia and central pain related to ependymoma and syrinx of the cervical spinal cord presented with

From: [1]University of Toledo College of Medicine; 2 University of Toledo Medical Center, Department of Anesthesiology

Corresponding Author: Karen Bach, BS, E-mail: karen.bach@rockets.utoledo.edu
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exacerbation of chronic postsurgical pain located in the right thoracic region at approximately T8-T11 levels. The patient had undergone a surgical resection of an ependymoma in the cervical spine and subsequent radiation treatment 2 years prior to presentation at our pain clinic. Attempts at conservative pain management were made over the years with medications, therapy, and lifestyle modifications with no significant improvements. Despite clear evidence of no tumor recurrence or progression and only a syrinx located at the C4-C6 level on imaging, the patient continued to have persistent pain described as constant, shooting, tingling, and aching.

At her initial visit at our pain clinic, the patient reported a numerical pain score of 5 out of 10 at rest with worsening intensity upon movement. Given the severe pain and lack of relief from other therapeutic interventions, the patient elected to undertake a local analgesic approach for her pain, and an ultrasound-guided right-sided ESP block at the T8 level was scheduled.

Risks and benefits of the procedure were discussed with the patient and informed consent obtained. On the day of the procedure, the patient was placed in a seated position with her back exposed. Using ultrasound guidance, the spinous processes and transverse processes of the midthoracic spine were identified counting up from the 12th rib. The area was prepped with chlorhexidine in sterile fashion. A 22-gauge Stimuplex needle (B. Braun Medical Inc., Bethlehem, PA) was advanced under ultrasound guidance until reaching the target area between the erector spinae muscle and the transverse process. After negative aspiration, 20 mL of 0.125% bupivacaine with 40 mg methylprednisolone was injected at T8. Lifting of the erector spinae muscle was observed with injection, reflecting adequate medication spread. The patient tolerated the procedure well and reported more than 80% pain relief prior to discharge home.

Improvement of her pain was sustained, and at her clinic visit 4 weeks later she reported 90% improvement of her pain as well as 90% improvement of functionality on her right side. The patient was extremely satisfied with the results and reported a decreased pain level, at 0 to 1 out of 10.

DISCUSSION

Since it was first described, studies have been conducted to determine the spectrum of efficacy, mechanism of action, and safety/side-effect profile of the ultrasound-guided ESP block (1-5). In the literature, it has found encouraging use in pain management of thoracic, abdominal, and lumbar origins. Our patient had signs and symptoms of central pain and intercostal neuralgia related to cervical ependymoma and spinal cord syrinx that were refractory to other measures. The use of the ESP block transformed her pain control. To the best of our knowledge, this is the first successful use of the ultrasound-guided ESP block, a peripheral nerve block, in the management of pain due to a central nervous system process.

Given the relatively short history of the ESP block, a full understanding of its mechanism of action is yet to be elucidated and the block's potential utilization yet to be completely exploited. Some studies suggest that it works via anterior diffusion of the local anesthetic into the paravertebral space (6) while others suggest an interfascial spread toward the posterior rami of the spinal nerves (7) as the probable main mechanisms of action. Thus, anesthetic injected at the T8 level in our patient could have diffused cephalically to produce analgesia at a higher level (8). Further cadaveric studies are needed to fully determine the extent of analgesic spread.

In our patient, the decision to perform the ESP block over other regional anesthesia techniques was based on her history of spinal ependymoma. Our goal was to avoid central nervous system injection. The ESP block avoids neuraxial block risks such as dural punctures and spinal hematomas (9) and paravertebral block risks such as subarachnoid, subdural, or epidural injection (10).

We considered the possibility that our patient's intercostal neuralgia could have arisen secondary to any sort of trauma or manipulation during surgery. However, the initial surgery for resection of her ependymoma was a posterior cervical laminectomy at the C4, C5, and C6 levels and would not have affected any lower thoracic nerves to produce neuralgia.

The ESP block is a relatively novel regional anesthesia technique and thus, expectedly, limitations to its use exist. One major drawback in the literature is the low-grade evidence and lack of clinical trials to fully determine its efficacy and safety. While it is encouraging that no severe complications have been reported with use of ESP block, we must continue to be vigilant with the technique and continue monitoring for potential adverse effects in our patients.

This case report adds to the growing literature on the use of the ESP block. It is our hope that other providers will be able to provide pain relief for their appropriately selected patients who may be suffering from pain related to a central nervous system process and/or have contraindications to other regional blocks.

Fig. 1. Cervical spine MRI showing a large syrinx extending from the cervico- medullary junction into the thoracic spine. At C4-C5 and C6 levels, the syrinx is much larger in volume. Findings consistent with prior multi-level posterior cervical laminectomy also present.

Fig. 2. Ultrasound-guided right-sided Erector Spinae Block performed at the T8 level.

CONCLUSION

The results observed in this case report suggest that the ESP block may be a beneficial therapeutic option in the management of pain from cervical origin, despite its current use indications for thoracic pain. Its immediate analgesic efficacy provides patients with significant symptomatic relief without the need for opioid rescue therapy. Further investigation is needed to determine its long-term efficacy and safety profile.

Author Contributions

KB is the corresponding and submitting author and wrote parts of the manuscript. OD wrote parts of the manuscript and contributed to editing. NG contributed to compilation of patient information and editing of manuscript.

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