Continuous Erector Spinae Plane Block for Refractory Chest Wall Pain in a Patient With Metastatic Breast Cancer: A Case Report

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In this case report, we described the use of the continuous erector spinae plane (ESP) block in a patient presenting with severe chest wall pain due to terminal metastatic breast cancer. Her pain was refractory to most treatment modalities despite being on huge doses of parenteral opioids for 6 months. A single shot ESP block was initially trialed, which provided her complete pain relief. This was followed by an ESP catheter insertion and continuous infusion of local anesthetic, which helped her wean off the parenteral opioids over the next 4 days. She was discharged home with the catheter in situ, attached to a delivery pump. (A&A Practice. 2021;15:e01408.)

GLOSSARY

C = catheter; **CT** = computed tomography; **ESM** = erector spinae muscle; **ESP** = erector spinae plane; **N** = needle; **NRS** = numeric rating score; **TP** = transverse process

Breast cancer is the most common cancer (~25%) as well as the second leading cause of cancer-related death in Canadian women.[1] Oncological pain is generally due to the destructive process of the disease, generating a combination of somatic, visceral, or neuropathic pain.

Pain relief strategies in patients with cancer can be divided into pharmacological, oncological, surgical, interventional, physical therapy, psychotherapy, and complementary therapies. Opioids, being one of the mainstays, have been used extensively and can be administered through oral, parenteral, and neuraxial routes. However, high doses of opioids are limited by the development of tolerance, adverse effects, and opioid-induced hyperalgesia. Therefore, various interventional procedures including neuroablative procedures providing better analgesia and opioid-sparing effects have been described.

The erector spinae plane (ESP) block is a relatively new interfascial plane block whose mechanism of action resembles that of a paravertebral block. The ESP block provides both somatic as well as visceral analgesia.[2] In this case report, we describe the substantial pain relief with the use of continuous ESP block to treat a patient with severe chest wall pain due to metastatic breast cancer.

CASE REPORT

A 59-year-old female patient weighing 54 kg and 1.6 m tall was diagnosed with a large malignant phyllodes tumor of the breast and underwent a left-sided mastectomy 10 years ago. She was disease free until 6 months ago when she was reassessed by the thoracic team and was found to have a recurrence. A computed tomography (CT) scan confirmed pulmonary metastases with underlying pleural invasion and a progression of the destructive left chest wall mass. After receiving 10 cycles of radiation therapy and 2 cycles of chemotherapy, she decided to opt for palliation.

Since the recurrence, she frequented the emergency department on a regular basis owing to severe pain crises. The pain was mainly present on the left chest wall and armpit which she described as crushing, burning, sharp, and stabbing, as well as shearing pain felt inside her lung. The intensity on the numeric rating score (NRS) was always 10/10. Her pain medication was managed by the palliative care team and at the time of her presentation to us, she received morphine by subcutaneous route via a continuous ambulatory delivery device pump at the setting 19–40 mg/h with boluses of 10–20 mg every 20 minutes up to a maximum of 3 boluses per hour. In addition, she received gabapentin 900 mg twice daily and 300 mg at noon, methadone 10 mg twice daily and 5 mg at bedtime, diazepam 5 mg, and dexamethasone 4 mg 3 times a day. Despite these high doses, she was in agony most of the time.

She was referred to our pain service and by that time, she was switched to intravenous morphine infusion, 18 mg/h, and a bolus 2 mg hourly as required. After a thorough assessment and mapping of the painful areas, an ESP block was offered. Following informed consent, the procedure was performed with the patient in a sitting position and a high-frequency linear ultrasound transducer (GE LOGIQe, Wauwatosa, WI) was placed 3 cm lateral to the T4 level in the paramedian sagittal plane. A 10-cm 18-gauge needle (Contiplex Ultra 360° echogenic needle, B Braun Medical Inc, Bethlehem, PA) was inserted in-plane in cephalad to caudad direction and a total of 20 mL of 0.5% ropivacaine in small aliquots was administered following hydrodissection of the planes (Figure 1).

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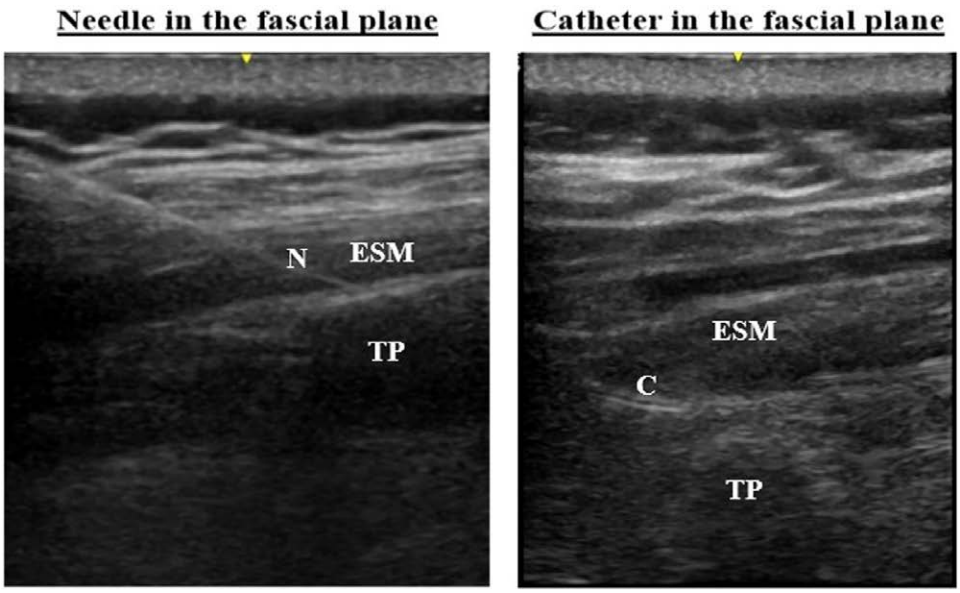

Figure 1. Ultrasound visualization of the continuous ESP block. The image shows the N (left) and the C (right) in the fascial plane between the ESM and TP. C indicates catheter; ESM, erector spinae muscle; ESP, erector spinae plane; N, needle; TP, transverse process.

She was pain free for the next 6 hours which had not occurred since the recurrence. The following day, a catheter (Contiplex echo, B Braun Medical Inc) was inserted into the ESP at T5–6 level and the catheter was tunneled and sutured to the skin (Figures 1 and 2). The catheter was connected to a pump which was programmed to deliver 0.2% ropivacaine at 10 mL/h for the first 3 hours and then reduced to 5 mL/h for the remaining period with a lockout bolus of 10 mL every hour as required. Dermatomal testing to pinprick showed a sensory blockade from T2 to T10 (anteriorly and posteriorly) on the left side. The NRS with movement in the next 5 days was 1. During the course of the next 5 days, her morphine requirements were reduced drastically. The intravenous infusion rate of morphine was reduced to 5 mg/h without any need for rescue morphine. The fifth day after catheter placement, the intravenous morphine was discontinued. Methadone was increased to 15 mg 3 times a day to avoid withdrawal symptoms. The Edmonton Symptom Assessment System (revised version)[3] was used for evaluation and it showed an improvement (on a scale of 10) in the following components: pain from 10 to 1, tiredness from 7 to 5, nausea from 10 to 0, lack of appetite from 10 to 0, shortness of breath from 10 to 0, and sleep from 5 to 0. While her chest wall pain was successfully controlled, she then complained of pain in the epigastric region likely due to the widespread metastatic disease. An extra bolus of 30 mL of 0.2% ropivacaine helped to control the epigastric pain and she was offered another ESP catheter at a lower site for pain control. The patient opted to cope with the epigastric pain instead as it was not as intense as the previous uncontrolled chest wall pain. She was discharged with an indwelling ESP catheter at an infusion rate of 0.2% ropivacaine 10 mL/h. The patient required readmission to the hospital 7 days after due to disease progression and deterioration. Her chest wall pain was well controlled for the subsequent 6 weeks when she finally succumbed to her illness.

DISCUSSION

Cancer pain is a difficult and complex condition to manage and treat. The disability cancer brings to patients' lives is significant and variable and impacts various aspects of general health. Providing adequate pain relief improves the quality of life of these patients. The World Health Organization analgesic ladder can be successful in achieving adequate pain control in 80%–90% of patients with cancer pain.[4] The remaining 10%–20% need an effective and alternate plan. Up to 80% of patients taking opioids for cancer will experience unwanted side effects which include opioid-induced hyperalgesia. Although opioids remain a cornerstone of cancer pain management, they are not effective in all patients.[5,6] Radiotherapy, chemotherapy, and surgery as part of the treatment strategy can themselves lead to the development of chronic pain. Keeping all this in mind, it can be quite challenging for physicians to provide optimal care for cancer patients.

To our knowledge, this is the first case report demonstrating the successful use of a continuous ESP block with an indwelling catheter in the management of severe pain from metastatic breast cancer to the thoracic wall. The catheter allowed continuous infusion and excellent analgesia to the patient until she succumbed to the disease. It also resulted in 80% reduction of intravenous opioids, and substantial improvement in her quality of life as reflected by the Edmonton Symptoms Assessment System. In the literature, the common interventional procedure for this refractory chest wall pain is a neuraxial catheter delivery system. We are able to show that continuous ESP infusion can also provide profound analgesia.

The ESP block is a newly described technique that is capable of providing effective and extensive thoracic analgesia.[7] The use of ESP block in treating cancer pain (especially with neurolytics)[8,9] and chronic non cancer pain[10,11] has expanded its scope and potential. A recent magnetic resonance imaging study in living subjects showed that the local anesthetic injectate consistently spreads to the dorsal rami among the erector spinae muscle resulting in posterior thoracic and abdominal wall blockade. It also showed that the injectate consistently spreads to the neural foramina and into the intercostal space, contributing to a clinically meaningful

Figure 2. 19-gauge ESP catheter after subcutaneous tunneling and dressing. ESP indicates erector spinae plane.

sensory change and pain relief in the anterior (ventral) thoracic and abdominal walls. Nevertheless, the extent of spread to the neural foramina and intercostal spaces, and the sensory block itself, were highly variable.[12] The most significant advantages of the ESP block, in our opinion, is it is simple to perform—sonoanatomy is easily recognizable, less invasive, safe; there are no structures at risk of needle injury in the immediate vicinity, and can also be performed in patients who have certain contraindications to neuraxial procedures. The technique also lends itself well to insertion of an indwelling catheter, which can be used to extend the duration of analgesia as needed.

In conclusion, we have demonstrated that continuous erector spinae block is a realistic and feasible option for patients with metastatic breast cancer pain refractory to conventional analgesic strategies. The ESP continuous infusion not only significantly reduces the high doses of opioids consumed it also minimizes the unwanted side effects associated with opioids. More research needs to be done for the efficacy and safety of continuous ESP infusion in cancer pain management.

DISCLOSURES

Name: V. V. Subramanian, MD, FICPM.
Contribution: This author helped draft the report.
Name: Philip Peng, MBBS, FRCPC.
Contribution: This author helped draft the report.
Name: Mauricio Forero, MD, FIPP.
Contribution: This author helped extract the data from the case file and draft the report.
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