

Epidural Spread Developed After Thoracic Paravertebral Block in Breast Cancer Surgery: A Case Report

Meme Kanseri Cerrahisinde Torakal Paravertebral Blok Sonrası Gelişen

Epidural Yayılımı: Olgu Sunumu

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ABSTRACT

The aim of this study was to determine that very rare anecdotal reports such as intra-neuronal and spinal cord injections, local anesthetic toxicity, and epidural spread of local anesthetic despite it is known that continuous catheter implementation is safer than paravertebral techniques, primary central neuraxial techniques. We presented a bilateral epidural block case developed due to epidural spread in a patient performed modified radical mastectomy with axillary dissection under thoracic epidural block.

Keywords: Thoracic paravertebral block; epidural spread; breast surgery.

ÖZET

Paravertebral teknikler primer santral nöroaksiyel tekniklere göre kateter uygulamaların daha güvenli olduğu bilinmesine rağmen intranöral ve spinal kord enjeksiyonları, lokal anestezi toksisitesi ve lokal anesteziğin epidural yayılımı gibi komplikasyonları içeren son derece nadir anektodal raporlar vardır. Biz de torakal epidural blok altında axiller diseksiyonlu modifiye radikal mastektomi uygulanan bir hastada epidural yayılım sonucu gelişen bilateral epidural blok olgusunu sunduk.

Anahtar Kelimeler: Torakal paravertebral blok; epidural yayılım; meme cerrahisi.

INTRODUCTION

Thoracic paravertebral block (TPVB) is a procedure that is performed to produce somatic and sympathetic block in ipsilateral spinal nerves located in the thoracic paravertebral space using local anesthetics (1, 2). Thoracic paravertebral space is a triangle-shaped area bordered by the superior costotransverse ligament posteriorly, parietal pleura antero-laterally, and adjacent costae superiorly and inferiorly. The base of the triangle is the vertebral body and intervertebral space (3). Paravertebral block technique is an option superior to epidural anesthesia, since it does not cause respiratory depression and is safe for the patients with coagulopathy. Paravertebral block (PVB) usually has low rates of adverse effects and complications. There

are very few anecdotal reports about the complications such as intra-neural and spinal cord injections, toxicity of local anesthetics and epidural spread of local anesthetics. TPVB that is preferred to epidural anesthesia for the patients with underlying diseases can be implemented safely for breast surgery (4). We aimed to present bilateral block developed due to epidural spread in a patient performed modified radical mastectomy with axillary dissection under thoracic epidural block.

A CASE REPORT

A 67-year-old woman with hypertension and diabetes mellitus was planned to perform the right modified radical mastectomy because of invasive ductal breast

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cancer. Her height was 162 cm and her weight was 65 kg. Routine laboratory tests were in normal ranges, ECG showed normal sinus rhythm. Physical risk score was accepted to be ASA II.

The patient was monitored in the local anesthesia room, a vascular access was established using 18-gauge cannulated she was sedated with 1.5 mg of intravenous midazolam and 25 µg fentanyl. Her pulse rate was 89 beats per minute, arterial blood pressure was 145/75 mmHg and peripheral oxygen saturation was 98%. While the patient in the sitting position, the position of Th2-Th5 levels was determined 2.5 cm lateral to the midline at the right side under aseptic conditions. Local skin and subcutaneous tissues were anesthetized with 2% lidocaine. A 16-gauge epidural needle with Tuohy tip was introduced into thoracic paravertebral space, after contact to the transverse process, it was entered 3.5 cm caudally with loss of resistance technique. A total amount of 15 mL of 0.5% levobupivacaine was injected at the Th2 and Th5 levels in equal amounts. The catheters were fixed at the 5 cm from the skin in the Th2 and Th5 (Figure 1). The right superficial cervical block was achieved with 10 cc of 0.25% levobupivacaine. The patient was positioned in the supine position and sensory block was evaluated with pick prick and cold tests. During sensory examination, it was determined that bilateral sensory block developed between Th1 and Th8. The patient was put on operating table 30 minutes later. The surgical procedure was started to propofol infusion (20-50 µg kg⁻¹ dk) following standard monitoring.

The surgical procedure continued throughout 85 minutes, hemodynamic parameters were stable during surgery and additional sedation was not needed. During follow up after block, catheters was not used for the patient did not need analgesic in postoperative period. She did not have the symptoms of nausea or vomiting. The patient was discharged from hospital approximately 48 hours after surgery.

DISCUSSION

A case who developed epidural spread during TPVB performed for modified radical mastectomy was presented. Alternative techniques having advantages over general anesthesia should be considered because of their contributes to morbidity and mortality for the patients with underlying diseases. Epidural anesthesia provides surgical comfort sufficient for radical mastectomy. However, sympathetic block and accompanying hemodynamic instability, which are encountered during thoracic



Figure 1: The levels for the modified radical mastectomy with axillary dissection and the catheters inserted into the right paravertebral spaces at T2 and T5 levels were demonstrated.

epidural anesthesia procedure, are restricting factors for many patients. Other known complications of thoracic epidural anesthesia (epidural abscess, epidural hematoma, muscle weakness, hypotension, paraplegia) (5) are uncommon. The possibility of such complications makes anesthesiologist avoid epidural anesthesia procedures and therefore in many centers, general anesthesia is performed for mastectomy surgery.

TPVB is a safe technique alternative to epidural anesthesia, because it offers a reliable anesthesia with stable hemodynamic response, allows postoperative pain control through catheter, provides rapid recovery without nausea or vomiting, and because it preserves respiratory functions (6). Generally, PVB has low rates of side effects and complications. This rates vary from 2.5% to 5% in the studies (5). Mortality directly related to PVB has not been reported (7). The complications relating to PVB procedures involve hypotension (4.6%), vascular puncture (3.8%), pleural puncture (1.1%) and pneumothorax (0.5%) dir (5). Lack of urinary retention, rare occurrence of post-thoracotomy or post-mastectomy chronic pain are the advantages of PVB over neuraxial block procedures. Moreover, it

was reported that the recurrence of tumor decreased after breast surgery with PVB (8).

In a few centers, TPVB technique is routinely performed instead of general anesthesia for breast surgery (9). It is also reported that this regional technique can be performed with bolus injection from one level as well as with multiple injections. PVB performed with a large volume through one site cannot be sufficient for an effective surgical anesthesia. Furthermore, the distribution of local anesthetic cannot be predicted in single-injection PVB. We thought for the purposes of inserted a double-catheter technique to achieve a more balanced distribution of local anesthetic.

The spread of local anesthetic can occur in 3 different ways, spread within paravertebral area primarily in caudal-sacral direction, cloud-like spread within a few segments, and lateral spread throughout intercostal area (10). In contrast to epidural injection, the agent given with paravertebral injection primarily makes caudal spread. Whilst the agent given with epidural injection spreads 4-5 level towards cephalic direction and 1-2 levels towards caudal, this situation is reversed in paravertebral block (spread throughout 1-2 segment towards cephalic, 3-5 segments towards caudal direction) (11). The ideal spread is the paravertebral spread occurring in caudal-sacral plane. Although it is impossible to warrant an ideal spread, a homogenous spread can be ensured and maintained with catheterization at two different levels and administration of low volumes of local anesthetics through different levels (12). For this reason, single injection of large volume into paravertebral area cannot produce comfortable surgical anesthesia. In a study, it was denoted that 15 ml of 0.5% bupivacaine spreads over 1 to 9 dermatomes; in another study, it was reported that 1.5 mg/kg 0.5% bupivacaine spreads over 0-4 dermatomes towards cephalic direction and over 0-7 dermatomes caudally (6-12). In many articles, it was reported that TPVB was performed with multiple injections. We did not preferred multiple injections, considering that this option increases the risk of pneumothorax, and does not allow postoperative pain control; so that, we performed injections through 2 different levels and catheter insertion. We performed TPVB inserting two catheters at two different levels in this patient. On the sensory examination after the procedure, we recognized bilateral sensory block between Th1 and Th8 segments. We thought that bilateral block developed because of epidural spread.

Epidural spread is not an expectable situation during TPVB practices. Although it is generally denoted that epidural spread occurs in catheter insertion and with paravertebral injection through the needle placed in more medial position, no incidence rate has been reported. Although SQM Tighe et al. (13) denoted in a study that the incidence of bilateral spread reached up to 10%, they did not mention any reference. In our literature search, we have not found any other study about epidural spread among TPVB cases. The most important restriction of our study is the lack of demonstration of spread with radiopaque dyes.

In many centers, paravertebral block is an anesthesia technique to be preferred since it ensures hemodynamic stability, allows post-operative pain control and without catastrophic complication. In conclusion, we thought that could be prudent because of unpredictable spread of local anesthetic after injection to paravertebral space.

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