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Thoracic paravertebral block performance for modified radical mastectomy with axillary dissection in a patient with severe chronic obstructive pulmonary disease

Şiddetli kronik obstrüktif akciğer hastalığı olan bir hastada aksiller diseksiyonla birlikte modifiye radikal mastektomi için torakal paravertebral blok uygulaması

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Summary

We present the case of an 86-year-old patient with severe chronic obstructive pulmonary disease undergoing modified radical mastectomy with axillary dissection by thoracic paravertebral block (PVB). Use of thoracic PVB provided hemodynamic and respiratory stability, excellent unilateral anesthesia and high patient satisfaction.

Key words: Chronic obstructive pulmonary disease; modified radical mastectomy; paravertebral block.

Özet

Bu olguda, torakal paravertebral blok (PVB) ile aksillar lenf nodu diseksiyonu ve modifiye radikal mastektomi yapılan, kronik obstrüktif akciğer hastalığı olan 86 yaşındaki hasta olgu olarak sunuluyor. Torakal PVB, hemodinamik ve solunumsal stabilite, mükemmel tek taraflı anestezi ve yüksek hasta memnuniyeti sağlamıştır.

Anahtar sözcükler: Kronik obstrüktif akciğer hastalığı; modifiye radikal mastektomi; paravertebral blok.

Introduction

Modified radical mastectomy (MRM) with axillary dissection is a surgical procedure that usually performed under general anesthesia and necessitates endotracheal intubation. Patients with significant chronic obstructive pulmonary disease (COPD) have higher risk for general anesthesia. We report here the use of paravertebral block (PVB) as a primary anesthetic technique in a patient with severe COPD and dilated cardiomyopathy undergoing MRM with axillary lymph node dissection for infiltrating ductal carcinoma.

Case Report

A 86-year-old 66 kg, 150 cm woman, with American Society of Anaesthesiology (ASA) physical status III was scheduled for right MRM with axillary lymph node dissection for infiltrating ductal carcinoma. She was suffering from severe COPDS and mild dilated cardiomyopathy. On physical examination, auscultation revealed prolonged expirium and rhonchus. Arterial blood gases revealed: pH:7.4, SO_2: 86%, PCO_2:43 mmHg, PO_2:52.3 mmHg. Her left ventricular ejection fraction (LVEF) was 35%. Spirometer was applied to evaluate her base-

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line pulmonary function, but could not be completed because of patient's cooperation problem. Performing the procedure under thoracic PVB was discussed with the family, as the patient presented a higher risk of complications for tracheal intubation. A decision was made to proceed with thoracic PVB and sedation.

Patient was monitorized and sedated with 2 mg intravenous (IV) midazolam. The initial blood pressure, heart rate and peripheral oxygen saturation were 135/88 mmHg, 75 beats.min^{-1} and 90% respectively. Paravertebral injections were performed with the patient in the sitting position by using the technique described by Moore[1] and Katz.[2] The superior aspects of spinous processes of C_7-T_6 were marked. The skin and subcutaneous tissue were anesthetized with 5 mL lidocaine (10 mg.mL^{-1}). The skin entry points were 2.5 cm lateral to the marks. A 22 gauge Quincke spinal needle attached via extension tubing to syringe containing local anesthetic was utilized. The needle was inserted perpendicular to the skin until the transverse process was contacted. The needle was then withdrawn and reangled inferiorly and advanced further 1.5 cm. After careful aspiration, 5 mL per segment 0.5% levobupivacaine with 1:400,000 epinepfrine was administered. Following the PVB the patient was placed in the supine position with a right lateral tilt and a superficial cervical nerve block was performed using 5 mL of the same local anesthetic. This was done to block the supraclavicular nerves that provide sensation to superior aspect of the breast.[3] Onset of sensory loss occurred 10 minutes after injection with surgical anesthesia ensuing 30 minutes after injection.

After 30 minutes, patient was transferred to the operating room for surgery. Prior to incision, blood pressure decreased to 115/75 mmHg. Intraoperative sedation was provided with IV 2 mg midazolam and 50 µg fentanyl. There was no evidence of epidural spread or pneumothorax. Surgery lasted 125 minutes and the patient remained comfortable during the procedure.

MRM was completed without any complication and the patient was transferred to the postanesthesia care unit (PACU). In PACU, her initial pain assessment which was assessed with by verbal analogue scale (VAS, 0=no pain, 10=worst pain imaginable) was zero. Nausea and vomiting were not seen neither in PACU nor in ward. She did not require any analgesic medication for 30 hours. After 30 hours her VAS score was 2, tramadol 100 mg PO was administered and also prescribed as 3 times a day. During her hospitalization, no opioid medication was needed and the patient was discharged on the third postoperative day. Two weeks later, the patient was phone called for interviewing the home recovery. She stated that, she did not require any further medication for pain and she was very satisfied with the anesthetic technique.

Discussion

In this case, we reported the use of PVB in a patient with severe COPD and heart failure undergoing MRM with axillary lymph node dissection. MRM can be performed under different anesthetic techniques including general anesthesia, thoracic epidural anesthesia or PVB. Regarding to our patient's anesthetic plan, we had two objectives: Primary objective was avoiding intubation and mechanical ventilation because of foreseen postoperative respiratory failure. Secondary objective was avoiding severe hypotension, not to hasten the heart failure. As a result, we decided to perform thoracic PVB.

PVB can offer several advantages for patients with COPD and heart failure. By administering local anesthetic near the somatic roots, unilateral anesthesia was provided without bilateral sympathectomy. So this technique could facilitate maintenance of the normal haemodynamic status.[4]

PVB can provide profound, long-lasting sensory deafferentation. The resulting greater attenuation of the surgical stress response may translate into reduced inotropic stimulation of the heart. Additionally, unlike general anesthesia, PVB can provide superior postoperative analgesia and less nausea and vomiting, shorter recovery time, require fewer analgesic, earlier mobilization, and earlier home readiness for discharge. The use of PVB in patients undergoing ambulatory breast cancer surgery has cost-saving potential.[5]

Thoracic epidural anesthesia (TEA) provides effi-

cious surgical anesthesia and sensory deafferentation but is associated with profound hypotension because of bilateral sympathectomy. Also muscle weakness, epidural abscess, hematoma and paraplegia are rare but serious complication of thoracic epidural anesthesia.[6] Important adverse effects such as hypotension, urinary retention, nausea and vomiting are less frequent with PVB than with TEA. PVB can provide better pulmonary function and fewer pulmonary complications than TEA.[7]

Paravertebral block is a technique of regional anesthesia in which a needle is inserted just lateral to the vertebral spinal process into a space where local anesthetic is administered. Here, the local anesthetic is adjacent to where spinal nerves emerge from the intervertebral lamina. The result is an ipsilateral somatic and sympathetic nerve blockage of the respective dermatome. In respect to the technique itself, there are several approaches to achieve the block. Both single[8] and multilevel[9] paravertebral injections have been reported to provide good analgesia. We used a multilevel injection PVB which has been shown to produce a more reliable sensory block than a single-injection technique.

PVB generally has a low incidence of adverse effects. Overall incidence of adverse effects or complications has been reported less than 5%. In a multicentred prospective study of 367 pediatric and adult patients, the reported overall failure rate was 10.1% and the other complication rates were 4.6% for hypotension, 3.8% for vascular puncture, 1.1% for pleural puncture, and 0.5% for pneumothorax.[10]

During PVB, potential inadvertent injection or spread into epidural space may be seen. These potential complications of PVB could be minimized by using low doses of local anesthetic at several levels. Another potential complication of PVB is a pneumothorax. With careful attenuation to technique and performing the block by an anesthesiologist who is experienced in this procedure, the chance of pneumothorax will be extremely low. However, the potential of a pneumothorax must still be considered carefully in COPD disease patients.

PVB has been shown to provide improved acute postoperative pain management following breast surgery. Recent studies suggest additional benefits to this procedure, including decreased development of chronic pain[11] and decreased cancer recurrence.[12]

In this patient use of thoracic PVB provided hemodynamic and respiratory stability, excellent unilateral anesthesia and high patient satisfaction. In a patient with COPD and heart failure, thoracic PVB can be performed as an efficient and good anesthetic technique for MRM surgery.

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