

CASE REPORT

Single Level Thoracic Paravertebral Block for Analgesia in Modified Radical Mastectomy in a Comorbid Female

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ABSTRACT

We report a case of 50 years old female diagnosed with carcinoma of breast posted for modified radical mastectomy (MRM). Her comorbidities included diabetes mellitus (DM), hypertension, ischemic heart disease (IHD) and chronic obstructive pulmonary disease (COPD). She was also anxious about postoperative analgesia. The surgery was successfully completed under general anesthesia (GA) with single level thoracic paravertebral block (PVB) using peripheral nerve stimulator (PNS). Regional techniques like PVB are preferred modalities for perioperative analgesia. It provides good intraoperative conditions with adequate postoperative analgesia with least hemodynamic alterations in high risk cases specially IHD.

Keywords: Carcinoma breast, Paravertebral block, Post-operative analgesia.

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INTRODUCTION

Optimum treatment for postoperative pain has been of fundamental importance in surgical patient care. Among the analgesic techniques aimed at patients undergoing breast surgeries, thoracic paravertebral block (PVB) combined with general anesthesia (GA) stands out for the good results and favorable risk-benefit ratio.¹ Benefits include reduced postoperative nausea/vomiting and prolonged postoperative pain relief and increased potential for ambulatory discharge.²

Thoracic PVB involves injection of local anesthetic (LA) solution at the site where spinal nerves emerges from intervertebral foramen. The PVB space contains dorsal and ventral rami and sympathetic chain, hence, infiltration of this space results in unilateral sensory, motor and sympathetic blockage.³

Paravertebral block with GA when compared to GA alone offer pain relief superior to general anesthesia alone and provide better hemodynamic status.⁴

CASE REPORT

We report a case of 50 years old diabetic, hypertensive female with invasive ductal carcinoma of right breast scheduled for modified radical mastectomy (MRM). Her comorbidity included chronic obstructive pulmonary disease (COPD), ischemic heart disease (IHD) with dyspnea grade-III New York Heart Association (NYHA) classification with inferolateral wall ischemia on electrocardiogram (ECG). Her two-dimensional echocardiogram revealed ejection fraction 45% and grade I diastolic dysfunction and minimal pericardial effusion. Her physical score was assessed to be ASA-III.

In view of her cardiac status, thoracic PVB with GA was planned for the proposed surgery. Anesthetic procedure was explained and written informed consent was taken. Nil per oral hours were confirmed and monitors were connected to the patient.

Intravenous access was established with 18 gauge intravenous (IV) cannula and in the sitting position, anatomical landmarks were marked. The spinous process of T3 vertebra identified and marked (Fig. 1). Local infiltration of 2% lignocaine given at 2.0 to 2.5 cm lateral to midpoint of T3 spinous process. Five centimeter



Fig. 1: Thoracic PVB

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needle of peripheral nerve stimulator (PNS) inserted perpendicular to the skin and the transverse process of the thoracic vertebra was contacted (4.5 and 4.0 cm distance). Initial setting of nerve stimulator was 2.5 mA current, 100 ms pulse width and 2 Hz frequency. The needle was withdrawn and redirected cephalic above the transverse process not more than 1 to 1.5 cm deeper than the initial insertion and motor stimulation of intercostal muscles was noticed. Muscle contraction also associated with sensory stimulation or paresthesia in the respective area. The needle repositioned till the best stimulation was achieved with minimum current strength, e.g. 0.5 to 0.8 mA.^{5,6} After careful aspiration, 0.3 ml/kg of 0.25 levobupivacaine with 25 mcg fentanyl and 1:400000 adrenaline injected in paravertebral space in small aliquots with repeated aspiration tests. After injecting the drug, the sensations tested by pinprick. After confirming sensory block following paravertebral injection, GA was induced with IV etomidate 0.3 mg/kg, IV succinylcholine 1.5 mg/kg was given to facilitate tracheal intubation. After intubation, patient was maintained with sevoflurane on 1% end tidal concentration with nitrous oxide and oxygen. Neuromuscular blockade achieved using vecuronium 0.04 mg/kg. Standard monitoring was done with her pulse 88 per minute regular and BP 130/90 mm Hg. Hemodynamic parameters were maintained throughout the surgery. There was no ST segment depression from base line in V4 and V5 leads during intraoperative and postoperative period. There was smooth emergence with stable hemodynamic status and good respiratory effort due to better analgesia.

The surgery lasted for 2 hours and VAS score was recorded every 4 hours after operation and it was less than 3 up to 36 hours. Rescue analgesia IV diclofenac 75 mg was given postoperatively when VAS score reached > 3 in at 36 hours so total duration of analgesia was 36 hours with no incidence of postoperative nausea and vomiting (PONV) with good recovery in postoperative period without any complication specially concerning coronary artery disease due to better pain control and less sympathetic stimulation. Patient was discharged on third postoperative day.

DISCUSSION

Thoracic PVB is a useful adjunct to GA analgesic for breast surgery.⁷ The administration of levobupivacaine in PVB space has been successful in providing adequate analgesia for breast surgery.^{1,4} Pusch et al described single injection of high volume of bupivacaine in thoracic PVB and reported effective anesthesia for breast lump

excision as well as mastectomies with axillary clearance.⁸ Thoracic PVB also provides better hemodynamic stability, reduces blood loss and has got superior postoperative pain control than any other technique.⁴ Although it is an invasive procedure, recent reviews have showed it is safe technique.⁷

Our patient being a case of IHD and COPD needed a technique with minimal hemodynamic alterations and avoidance of poly pharmacy, therefore, thoracic PVB was chosen as adjunct to GA owing to its superior safety profile.

We have used nerve stimulator guided single level technique which provide more patient comfort and lowers the need for sedation during the procedure, thereby improves the patient satisfaction than multilevel injection technique. Nerve stimulation has increased the safety and reliability of the block, and hence, may contribute to its ever increasing applications in operative as well as nonoperative pain interventions.

Thoracic PVB also preferred over epidural anesthesia for patients with underlying disease, offers reliable anesthesia and stable hemodynamic response and provides rapid recovery without nausea vomiting and preserves respiratory functions.⁸ Generally, PVB has low rate of side-effect and complications, moreover, it was reported that time for tumor recurrence decreased with thoracic PVB.^{9,10}

According to recent meta-analysis, PVB is highly safe and efficacious technique and provides anesthesia and postoperative analgesia during breast surgery. It is easy to learn and has got high success rate and incidence of chronic postoperative pain after chemotherapy and surgery is decreased.⁹

Richardson's assertion states that PVB is a 'gold standard' block and afferent block of choice for unilateral surgery⁹ and we opted for loss of resistance technique described by Eason and Wyatt.¹¹ Thus considering the nature of cardiac and respiratory involvement of our patient, our choice of thoracic PVB was a good option for intraoperative and postoperative analgesia. In recent days, ultrasound-guided technique has been employed for further safe administration of this block.

Thus, thoracic PVB may be safe and efficacious technique which provides good hemodynamic stability intraoperative and superior postoperative analgesia.

REFERENCES

1. Leight GS, Steele SM, et al. Use of paravertebral analgesia in surgical management of breast cancer: experience in 156 cases. *Ann Surg* 1998 Apr;227(4):496-501.
2. Richardson J, Sabanathan S. Thoracic PVB analgesia. *Acta Anaesthesiol Scand* 1995 Nov;39(8):1005-1015.



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3. Bonica J. Local anesthesia and regional blocks. 2nd ed. New York: Churchill Livingstone; 1989. p. 14-20.
4. Klein SM, Bergh A, Steele SM, Georgiade GS, Greengrass RA. Thoracic paravertebral block for breast surgery. *Anesth Analg* 2000 Jun;90(6):1402-1405.
5. Pusch F, Wildling E, Klimscha W, Weinstabl C. Sonographic measurement of needle insertion depth in paravertebral blocks in women. *Br J Anaesth* 2000 Dec;85(6):841-843.
6. Wheeler LJ. Peripheral nerve stimulation end-point for thoracic paravertebral block. *Br J Anaesth* 2001 Apr;86(4):598-599.
7. Khai DKL. The use of single-injection thoracic paravertebral block in breast cancer surgeries in our Asian population: the Singapore general hospital experience. *Proceedings of Singapore Healthcare* 2013. p. 22.
8. Pusch F, Freitag H, Weinstabl C, Obwegeser R, Huber E, Wildling E. Single-injection paravertebral block compared to general anaesthesia in breast surgery. *Acta Anaesthesiol Scand* 1999 Aug;43(7):770-774.
9. Jadon A. Nerve stimulator-guided thoracic paravertebral block for gynecomastia surgery. *Ind J Anaesth* 2012 May;56(3): 298-300.
10. Davies RG, Myles PS, Graham JM. A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy: a systematic review and meta-analysis of randomized trials. *Br J Anaesth* 2006 Apr;96(4): 418-426.
11. Eason MJ, Wyatt R. Paravertebral thoracic block—a reappraisal. *Anaesthesia* 1979 Jul-Aug;34(7):638-642.