

Thoracic Paravertebral Block and Interscalene Brachial Plexus Block Superficial Cervical Plexus Block for Breast Surgery in A Patient with Ischemic Heart Disease

C. Pranab Nirmal¹, C. Gowrishankar²

Abstract

Introduction: We report a case of 53 years old female diagnosed with carcinoma of breast posted for modified radical mastectomy. Her comorbidities included ischemic heart disease, Anterior wall ischemia with severe Global systolic Dysfunction . The surgery was successfully completed under thoracic paravertebral block and interscalene Brachial plexus block and superficial cervical plexus block. Regional techniques like paravertebral block and interscalene brachial plexus block, superficial cervical plexus block are one of the preferred modalities in high risk cases and gives good intraoperative conditions with adequate postoperative analgesia and with least hemodynamic alterations

Keywords: Paravertebral block, Interscalene brachial plexus block, Superficial cervical plexus block, Carcinoma breast, Postoperative analgesia.

Introduction

Regional anesthesia using paravertebral block (PVB) and interscalene brachial plexus block is an ideal alternative to general anaesthesia for breast cancer surgery. Benefits include reduced postoperative nausea and vomiting and prolonged postoperative pain relief and increased potential for ambulatory discharge. Thoracic PVB involves injection of local anaesthetic solution (LA) 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 blockade. Interscalene nerve block refers to the technique of anaesthetizing the roots or trunks of the brachial plexus in the neck between the anterior and middle scalene muscles. The five roots of the cervical (C4-C8) and First thoracic spinal nerves and their anterior

rami give rise to three trunks (superior, middle, inferior) that emerge between the medial and anterior scalene muscle. The interscalene approach to brachial plexus blockade results in anaesthesia of the shoulder, arm, which helps for axillary clearance of node and for pectoralis muscle. PVB and interscalene brachial plexus block when compared to general anesthesia is an alternative technique for breast surgeries that may offer pain relief superior to general anesthesia alone.

Case Report

We report a case of 53 years old hypertensive, non diabetic, female with invasive ductal carcinoma of right breast scheduled for modified radical mastectomy. She was admitted with signs of ischemic heart disease with cardiac failuer, she was thrombolysed immediately and started on anti-failure measures. Patient was

maintained with T. ISDN, T. Aspirin, T. Metaprolol, T. Enalapril, T. Atorvastatin. After stabilisation she was sent for pre-operative assessment for her ductal carcinoma right breast. Her co-morbidity included Ischemic Heart Disease with dyspnea grade-III NYHA classification with anteriolateral wall ischemia on ECG. Her 2D echo revealed global ischemia with ejection fraction 32% and grade I diastolic dysfunction and minimal pericardial effusion.

On examination her vitals were:

1. BLOOD PRESSURE- 130/80
2. PULSE RATE- 96/minute
3. SP02- 97% in room air

Investigations:

1. Haemoglobin- 9.2g%
2. Random Blood Sugar- 82 Mg/dl
3. Renal Function Test- Normal
4. Coagulation Profile- Normal
5. Chest X-ray- Cardiomegaly

Her physical score was assessed to be ASA-III. She was advised to continue her cardiac drugs till the day of surgery. In view of her cardiac status elective post-operative ventilation was planned.

In view of her cardiac status, thoracic PVB and Interscalene brachial plexus block with

¹Institute Of Anaesthesia, Madurai Medical College, Madurai, Tamilnadu, India.

²Institute Of Transplant, Madras Medical College, Chennai, Tamilnadu, India.

Address of Correspondence

Dr. C. Pranab Nirmal
Assistant Professor, Institute Of Transplant,
Madras Medical College, Chennai, Tamil Nadu, India
Email: nirmal15mmc@gmail.com



Dr. C. Pranab Nirmal



Dr. C. Gowrishankar

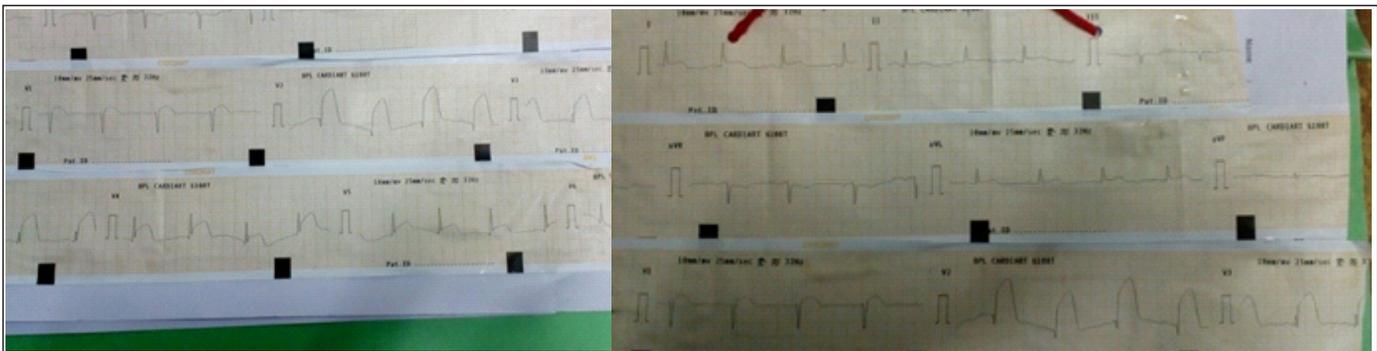


Figure 1: Ischemic Heart Disease with dyspnea grade-III NYHA classification with anterolateral wall ischemia on ECG..

superficial cervical plexus block was planned for the proposed surgery. Anaesthetic procedure was explained and written informed consent was taken. Starvation was confirmed and standard monitors were connected to the patient. Total volume of local anaesthetic solution prepared was 40 ml containing 0.5% 15ml Bupivacaine and 1.5% 15ml Lignocaine with adrenaline. Intravenous access was established with 18 G cannula.

Procedure:

Thoracic Paravertebral Block:

Thoracic PVB was given at T2, T4 and T6 levels on right side in lateral position under aseptic precaution. Skin was infiltrated with inj. Lignocaine around the point of insertion 2.5cm lateral to the spine on right side. Contact was made with the transverse process and needle was walked off caudad 1-1.5 cm of the initial depth till loss of resistance could be elicited and local anaesthetic solution was injected. 5ml was given at each level after repeated aspiration to avoid accidental intravascular injection.

Interscalene Brachial Plexus Block:

The patient was positioned in supine position and cricothyroid cartilage is located

and marked. The patient is asked to lower his shoulders and to slightly rotate the head to the opposite side. The index and middle fingers of the palpating hand are placed behind the Sternocleidomastoid muscle at this level pushing it slightly forward (medially). This maneuver brings the palpating fingers under the Sternocleidomastoid muscle and on top (anterior) to the anterior scalene muscle. The fingers are then rolled back until they fall into the interscalene groove, which at this proximal point in the neck is a real structure and easy to identify. This is the point of needle insertion, at the level of cricoid cartilage. Needle is inserted not more than 2cm, paraesthesia is elicited, 15ml of local anaesthesia given.

Superficial Cervical Plexus Block:

Under strict aseptic precautions, mid point of posterior border of sternocleidomastoid muscle is identified, needle is inserted 10ml of local anaesthetic solution prepared is injected subcutaneously.

Adequacy of the block was checked by sensory loss in the surgical field to pin prick before incision and response to cold. Surgical incision was made about 20 min. after

completion of the block and standard monitoring was done with her pulse 88-98 per min. regular and BP 130/80-140/90 mm Hg. Hemodynamic parameters were maintained throughout the surgery. The surgery lasted for 2 hours and VAS score was 0 and 2 at the end and after 3hrs after the surgery respectively. Postoperative analgesia was supplemented with Paracetamol infusion.

Discussion

Thoracic PVB and Interscalene brachial plexus block are useful alternative analgesic technique for breast surgery. Interscalene block is essential for pectoralis muscle resection. The middle supraclavicular nerve crosses middle of clavicle anteriorly and supplies the skin of chest wall of pectoralis major. The administration of local anaesthesia in PVB space in the form of multiple injections at various consecutive cervical and thoracic levels and Interscalene brachial plexus block has been successful in providing adequate analgesia for breast surgery.



Figure 2: CHEST X-RAY- CARDIOMEGALY

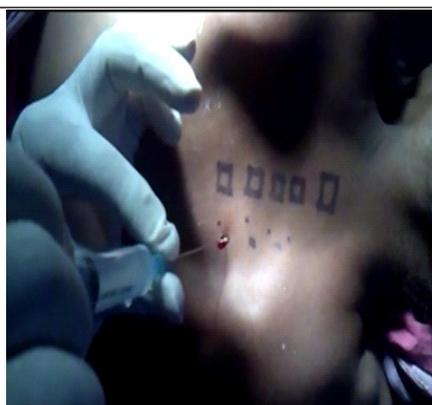
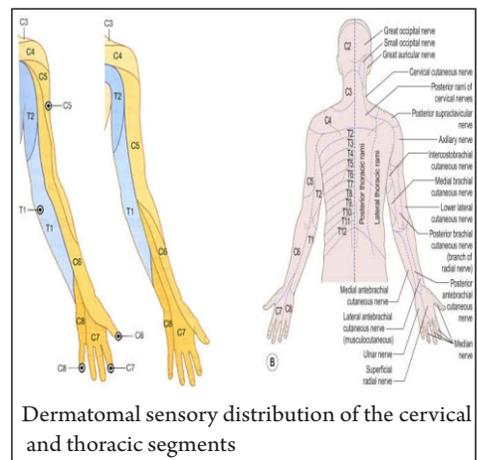


Figure 3: Postoperative analgesia was supplemented with paracetamol infusion.



Dermatomal sensory distribution of the cervical and thoracic segments

Pusch et al described single injection of high volume of Bupivacaine in thoracic PVB and reported effective anaesthesia for breast lump excision as well as mastectomies with axillary clearance. Thoracic PVB and Interscalene brachial plexus block also provides better hemodynamic stability, reduces blood loss and has got superior post operative pain control than any other technique. Although it is an invasive procedure, recent reviews have showed it is safe technique. Our patient being a case of Ischemic Heart Disease needed a technique with minimal hemodynamic alterations and avoidance of poly pharmacy, therefore thoracic PVB and Interscalene brachial plexus block was chosen over general anesthesia owing to its superior safety profile. Thoracic PVB also preferred over epidural anesthesia for patients with underlying

disease offers reliable anaesthesia and stable hemodynamic response and provides rapid recovery without nausea vomiting and preserves respiratory functions. Generally PVB has low rate of side effect and complication, moreover it was reported that time for tumor recurrence decreased with thoracic PVB. PVB is highly safe and efficacious technique and provides anaesthesia and post operative 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. Richardson's assertion states that PVB is a 'goldstandard' block and afferent block of choice for unilateral

surgery and we opted for loss of resistance technique described by Eason & Wyatt. Thus considering the nature of cardiac involvement of our patient, our choice of thoracic PVB was a good option. In recent days ultrasound guided technique have been employed for further safe administration of this block.

Conclusion

Thus thoracic PVB, interscalene brachial plexus, superficial plexus block are safe and efficacious technique which provides good hemodynamic stability intraoperatively and superior post operative analgesia.

References

1. E Coveney, C R Weltz, et al. Use of paravertebral analgesia in surgical management of breast cancer. Experience in 156 cases. *Ann surg* 1998
2. Richardson J, Sabanathan S. Thoracic PVB analgesia. *Acta Anaesthesiology scandal* 1995; 39: 1005-1015.
3. Bonica J. *Local Anesthesia and regional blocks*. 2nd ed. New York: Churchill Livingstone 1989
4. Klein SM, Bergh A, Steele SM, Georgiade GS, Greengrass RA.: Thoracic paravertebral block for breast surgery. *Anesth Analg*. 2000
5. Darren Koh Liang Khai: *The Use of Singleinjection Thoracic Paravertebral Block in Breast Cancer Surgeries in our Asian Population: The Singapore General Hospital Experience. Proceedings of Singapore Healthcare* 2013
6. Pusch F, Freitag H, Weinstabl C, Obwegeser R, Huber E, Wildling E. Single-injection paravertebral block compared to general anaesthesia in breast surgery. *Acta Anaesthesiology Scand* 1999
7. Ashok Jadon: Nerve stimulator-guided thoracic paravertebral block for gynecomastia surgery: *Indian J Anaesth* 2012;56,298-300. Schnabel AI, Reichl SU, Kranke P, Pogatzki-Zahn EM, Zahn PK. Efficacy and safety of paravertebral blocks in breast surgery: a metaanalysis of randomized controlled trials. *BJA* 2010;105;842-52.
8. Kairaluoma P et al. Preincisional paravertebral block reduces the prevalence of chronic pain after breast surgery. *Anesth Analg* 2006; 103: 703-8
9. Richardson J, Sabanathan S, Meams AJ, Sides C, Goulden CP. Post-thoracotomy neuralgia. *Pain Clin* 1994; 7: 87-97
10. Exadaktylos AK, Buggy DJ, Moriarty DC, Mascha E, Sessler DI. Can anesthetic technique for primary breast cancer surgery affect recurrence or metastasis? *Anesthesiology* 2006;105:660-4.
11. *Anaesthesia* 1979, 634-638-42: Paravertebral thoracic block-a reappraisal. *Anaesthesia* 1979, 634-638-42.
12. Nikam S, Marghade P, Paliwal N, Lawhale S. Thoracic paravertebral block for breast surgery in a patient with ischemic heart disease. *Anaesth Pain & Intensive Care* 2014;18(3):280-281

Conflict of Interest: Nil
Source of Support: None

How to Cite this Article

Pranab Nirmal C, Gowrishankar C | Thoracic Paravertebral Block and Interscalene Brachial Plexus Block Superficial Cervical Plexus Block for Breast Surgery in A Patient with Ischemic Heart Disease | *Journal of Anaesthesia and Critical Care Case Reports* | Sep - Dec 2019; 5(3): 31-33.