

Original Research Article

**A STUDY TO DETERMINE EFFECTIVENESS OF
DEXMEDITOMIDINE IN ERECTOR SPINAE PLANE BLOCK
FOR POSTOPERATIVE ANALGESIA IN PATIENTS
UNDERGOING MODIFIED RADICAL MASTECTOMY**

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Abstract:

Modified radical mastectomy (MRM) is associated with significant postoperative pain for which many blocks are given. Erector spinae plane (ESP) block is a recently described technique. We planned to use dexmedetomidine in erector spinae block to determine its efficacy and safety in ultrasound-guided ESP block for postoperative analgesia following MRM.

Methodology- 30 patients belonging to ASA physical status I and II, aged 25–60 years, undergoing MRM were included in the study. Ipsilateral block was given preoperatively at T3 or T4 level with 20 ml of 0.5% bupivacaine and 20 µg dexmedetomidine. Pain was assessed using visual analogue scale (VAS) till 24hours. Data collected from the patients and analysed.

Result: All 30 patients who were given the block did not complain of pain in 12 hrs post operatively. Only 2 patients (ie. 6.66% of total) complained of pain between the period of 12-18 hrs and 6 patients (ie. 20 of total) complained of pain between 18-24 hrs.

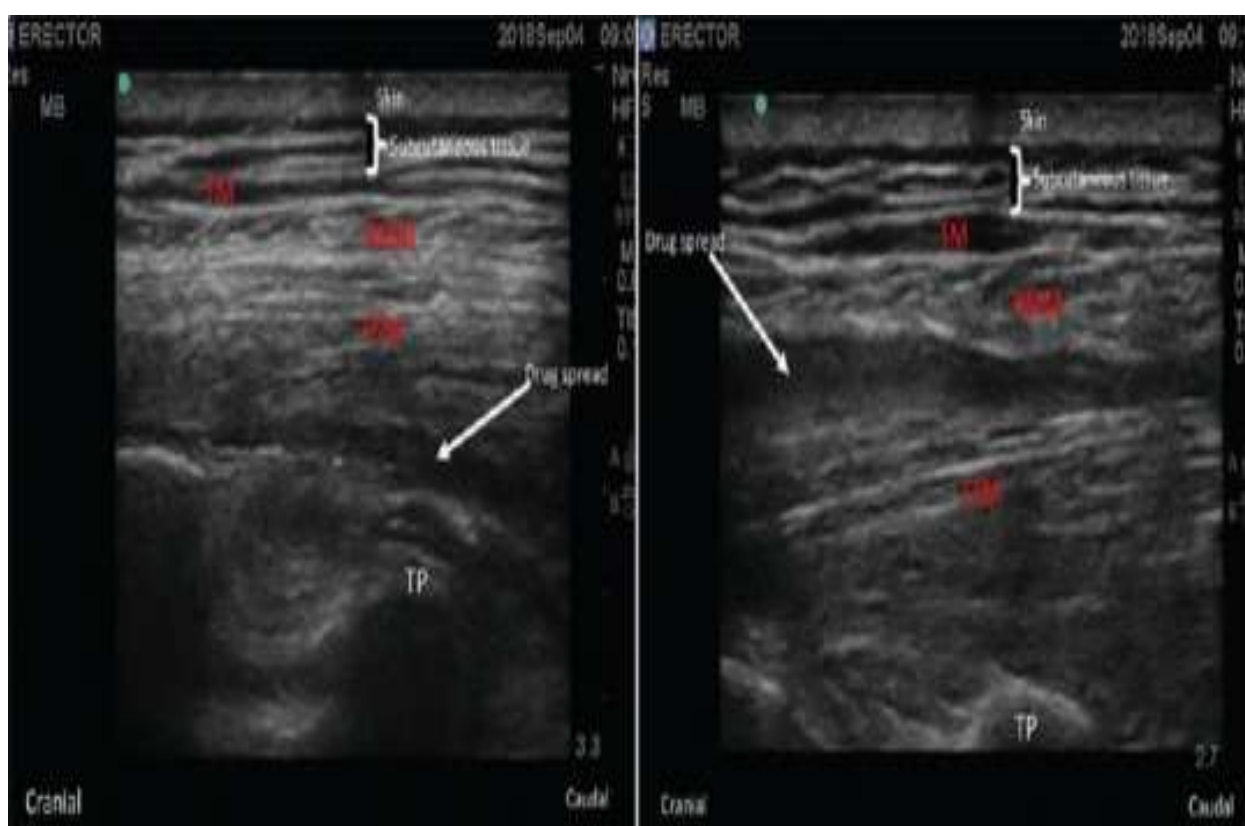
Conclusion: Erector spinae plane block is an effective measure to tackle post- operative pain in patients undergoing modified radical mastectomy (MRM). Addition of dexmedetomidine potentiates the block and prolongs post-operative analgesia.

Keywords: modified radical mastectomy, erector spinae plane block, dexmedetomidine

1. INTRODUCTION

Erector spinae plane (ESP) block is a myofascial plane block employed as a simple and safe alternative analgesic technique to provide sensory block at multi-dermatomal levels across the posterior, lateral, and anterior chest wall[1-3]. It can be used for acute post-surgical, post-traumatic, and chronic neuropathic thoracic pain. The extent of analgesia provided by ESP block depends upon the volume of drug, site of injection, approach of block, and pattern of

spread within the myofascial plane. In our study we gave ESP block in patients undergoing MRM ipsilateral to the side of surgery preoperatively using USG and single injection technique, this will not only help to decrease post-operative pain but will also decrease the requirement of anaesthesia drugs intraoperatively, resulting limited drug exposure in patients[4]. In our study we used 20 ml of 0.5% bupivacaine and 20ug of dexmedetomidine for giving the block, addition of dexmedetomidine potentiates the block, reduces onset time and increases post-operative analgesia time. Other blocks that are being used in MRM are SAP (serratus anterior plane) block , pectoralis nerve block etc. ESP is a newer block 1st used in 2016 in a patient with rib metastasis of a tumour[5-6].



ULTRASOUND IMAGE OF MUSCLES FORMING LANDMARK FOR ESP BLOCK

AIMS AND OBJECTIVES:

Primary: To evaluate analgesic efficacy of dexmedetomidine for post operative pain relief.

Secondary:

- To evaluate pain scores postoperatively.
- The time for first analgesic medication,
- Total rescue analgesic consumption.
- Hemodynamic stability.

Type of study: Prospective observational hospital based study

Location: Operating room of Gandhi Medical College, Bhopal

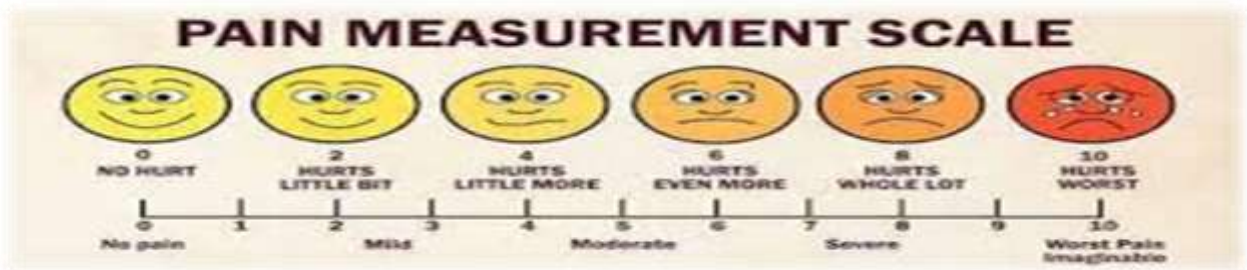
Sample size: 30 patients undergoing modified radical mastectomy.

Inclusion criteria	Exclusion criteria
ASA Grade I, II	Patients refusal
Age between 25 – 60 years	ASA grade III or more
Patients undergoing modified radical mastectomy	Patients having local anaesthesia allergy

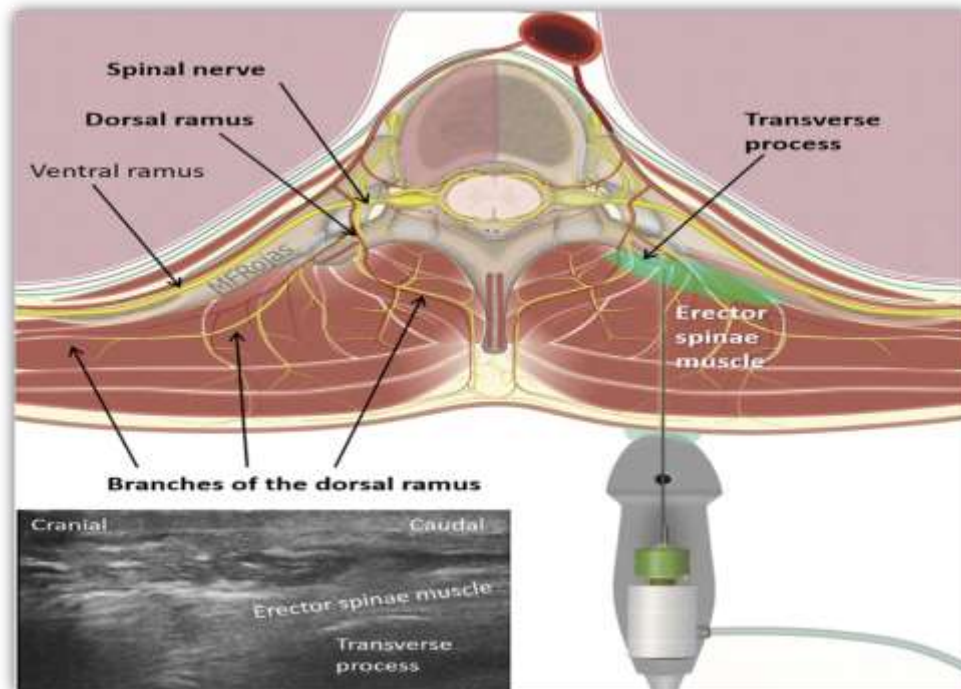
2. METHODOLOGY:

In the operating room standard monitoring was instituted. Patients were induced under GA, following standard protocol, and in lateral position, using aseptic precautions, USG – guided ESP block was performed ipsilateral to the MRM side preoperatively, needle was inserted in plane until its tip is located in between the tip of transverse process of T4 vertebrae and lower border of erector spinae muscle.

After careful negative aspiration, the study drug was injected. The surgery was performed and patient was assessed for pain using VAS scale till 24 hrs postoperatively at 6 hours interval. Vitals were also recorded up to 8 hours in postoperative period. Tramadol 50 mg iv was used as rescue analgesia.



VISUAL ANALOG SCALE



3. RESULT:

After monitoring the Patients post-operatively and assessing pain according to vas scale the following results are seen:

All 30 patients who received the block did not complain of pain for first 12 hrs regardless of their age or ASA category.

2 Patients in age group 45-60 one each belonging to ASA I and ASA II category complained of pain between 12-18 hrs post-operatively and required rescue analgesia i.e. Tramadol 50 mg.

Another 4 patients 2 of age group 25-45 and 2 of age group 45-60 started complaining of pain between 18-24 hrs, 2 of them were of ASA I and 2 of ASA II category. So total 6 patients i.e. 20% of total patients required rescue analgesia between 18-24 hrs.

VARIABLE	TOTAL	MEAN	STD DEVIATION
AGE (25-60)	30	48.77	11.473
ASA I	10		
ASA II	20		

The 30 patients we took in our study had mean age of 48.77 years with SD OF 11.473. 10 patients belonged to ASA I and 20 to ASA II category.

VARIABLE	PAIN AT 6HRS	PAIN AT 12 HRS	PAIN AT 18 HRS	PAIN AT 24 HRS
AGE (25-45)	0 (12)	0 (12)	0 (12)	2 (12)
AGE (45-60)	0 (18)	0 (18)	2 (18)	2 (18)
ASA I	0 (10)	0 (10)	1 (10)	2 (10)
ASA II	0 (20)	0 (20)	1 (20)	2(20)
TOTAL	0 (0%)	0 (0%)	2 (6.66%)	4 (13.33%)

4. DISCUSSION:

Ahmed M. Elewa et.al used bupivacaine in ESP block following breast surgery and found 1st rescue analgesia requested around 8hrs,

In our study addition of Dexmedetomidine to bupivacaine potentiates the block and 1st rescue analgesia time increases upto 12 hrs[7].

Most of the patient does not feel any kind of pain for first 12hrs with vas score between 0-1.

Two patients complained of pain between 12-18 hrs with vas score ranging between 4-5, and 6 patient felt pain between 18-24hrs with vas score ranging 2-8, the pain was managed by giving 50mg tramadol[8].

Vitals of all the patients were monitored for 8hrs following the block, there were no significant changes seen from preoperative vitals.

5. CONCLUSION:

Addition of dexmedetomidine to bupivacaine in erector spinae plane block potentiates the block and prolongs the post-operative analgesia. It provides longer first analgesia request time and less total analgesia consumption. It has minimal effect on post-operative vitals as well.

Conflicts of interest: No conflict declared by the authors

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6. REFERENCES:

1. Forero M, Adhikari SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block: A novel analgesic technique in thoracic neuropathic pain. *Reg Anesth Pain Med.* 2016;41:621–7.
2. Chin KJ, Malhas L, Perlas A. The erector spinae plane block provides visceral abdominal analgesia in bariatric surgery: A Report of 3 cases. *Reg Anesth Pain Med.* 2017;42:372–6.
3. Ivanusic J, Konishi Y, Barrington MJ. A Cadaveric study investigating the mechanism of action of erector spinae blockade. *Reg Anesth Pain Med.* 2018;43:567–71.
4. Singh S, Chowdhary NK. Erector spinae plane block an effective block for post-operative analgesia in modified radical mastectomy *Indian J Anaesth.* 2018;62:142–50

5. Raft J, Chin KJ, Belanger ME, et al.. Continuous erector spinae plane block for thoracotomy analgesia after epidural failure. *J Clin Anesth.* 2018;54:132–133.
6. Finnerty DT, McMahon A, McNamara JR, Hartigan SD, Griffin M, Buggy DJ. Comparing erector spinae plane block with serratus anterior plane block for minimally invasive thoracic surgery: a randomised clinical trial. *Br J Anaesth.* 2020;125(5):802–10.
7. Deng W, Fu D, He L. Evaluation of pectoral nerve block in modified radical mastectomy: comparison of three concentrations of Ropivacaine. *Clin Interv Aging.* 2020;15:937–44.
8. Manzoor S, Taneja R, Sood N, Puri A, Kadayaprath G. Comparative study to assess the quality of analgesia of bupivacaine and bupivacaine with dexmedetomidine in ultrasound-guided pectoral nerve block type I and II in breast surgeries. *J Anaesthesiol Clin Pharmacol.* 2018;34(2):227–31.