

Postoperative Analgesia in Modified Radical Mastectomy Patients After Instillation of Bupivacaine Through Surgical Drains

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Abstract

Background: Modified radical mastectomy (MRM) with axillary lymph node clearance causes acute postoperative pain (40%) and chronic postoperative pain (60%).

Aim and objective: post operative analgesia in MRM surgery through surgical drains.

Methods: This study was conducted on patients undergoing elective surgery of MRM under general anesthesia in Pacific Medical College & Hospital, Udaipur. Patients were divided into two groups, 30 in each.

Group B –Group B patients receive 40ml of 0.25% injection bupivacaine.

Group C –Group C patients receive no drug.

Duration of analgesia was recorded in hours when the patient was shifted after surgery in the post anesthesia care unit until the patient feel pain and discomfort of more than 4 scores according to the visual analog pain scale chart .

Results: All the demographic data were comparable (p value >0.05). The mean period of time during which analgesia was observed was significantly higher in Group B as compared to Group C (9.83±1.71 vs 4.03±1.25 hours, p=0.005).

Conclusion: We hereby concluded that postoperative pain analgesia is improved on instillation of bupivacaine through surgical drain on wound bed in MRM patients.

Key words: MRM, Breast cancer, surgical drain, Bupivacaine, Postoperative analgesia.

INTRODUCTION

Breast cancer is the most prevalent cancer among females. One in every four females dies due to breast cancer¹. MRM accounts for 31% of breast surgeries. Carcinoma of breast accounts 33% of all female cancer and 20% of cancer related death².

MRM with axillary lymph node clearance involves intense tissue dissection, with postoperative seroma formation & pain is the major complaint affecting patients³.

The patients complain of burning, pressure sensation & numbness confined to the anterior & lateral chest wall, upper limb & axilla.

Modified radical mastectomy (MRM) with axillary lymph node clearance causes postoperative pain 30-40% .⁴

Tissue damage causes pain due to inflammation, and neuropathic pain results from disruption of the second to sixth intercostal nerves.

Various pain management are used to decrease postoperative pain, that include^{4,5,6,7,8}

- 1) Intercostals blocks
- 2) Intrapleural blocks
- 3) Thoracic Epidural Block
- 4) Praverterbral Block
- 5) USGguided interfascial plane block
- 6) Instillation of local anesthetic through surgical drain

These minimally invasive procedures can result in immediate pain relief in patients undergoing mastectomy.

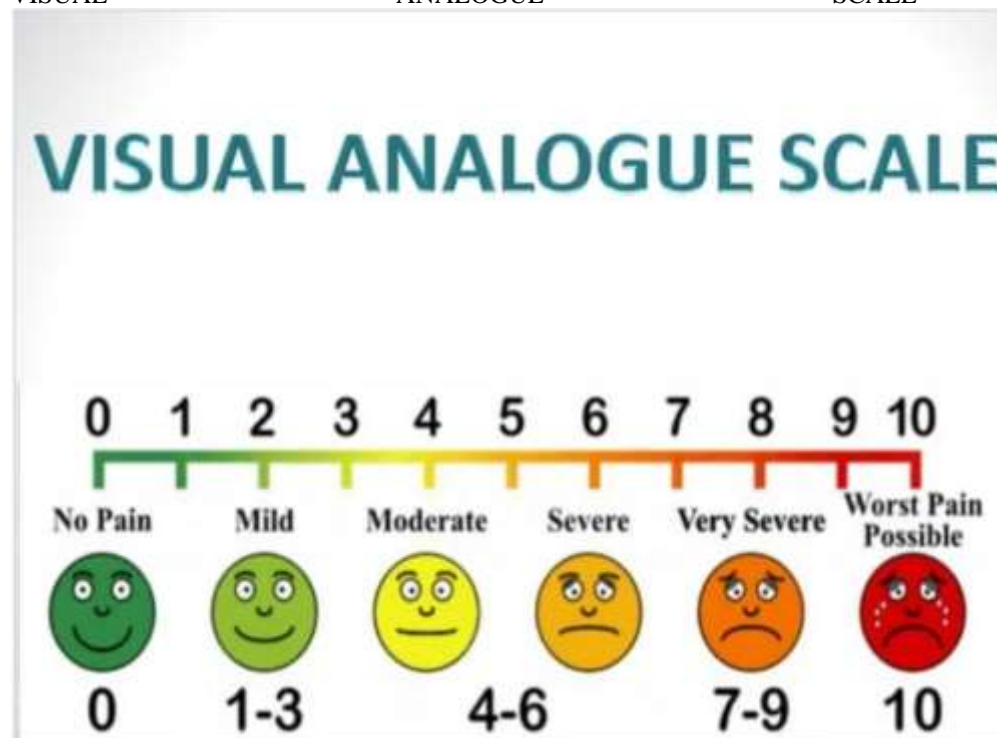
Local anesthetic drugs have become increasingly popular because of their analgesic properties and lack of opioid induced adverse effect for treating postoperative surgical pain. There are many methods for perioperative pain relief.

In this study we chose local anesthetic infiltration through surgical drains which would avoid opioids related side effects like nausea, vomiting and respiratory depression.

VISUAL

ANALOGUE

SCALE



VAS is a measurement instrument that tries to measure the characteristics or attitude that cannot be easily measured.

It has been used as a measure of pain intensity.

VAS is a straight line of fixed length usually 100mm. Each describing as from no pain as starting point to worst imaginable pain as the end mark.

AIM AND OBJECTIVE:

The aim of this study is to determine the efficacy of bupivacaine instillation through surgical drains on a wound bed in controlling postoperative pain after MRM by comparing the mean duration of analgesia.

Materials and methods: After informed consent and taking institutional ethical clearance, 60 female patients aged between 20 to 60 years with ASA grade I & II undergoing unilateral MRM with axillary lymph node dissection were involved in this study.

Patient refusal, allergic to study drug and ASA grade more than II were excluded from this study.

Sample size:- on basis of Bruder's formula:

$$N = (Z_{\alpha} + Z_{(1-\beta)})^2 P(1-P) / E^2$$

This was a Randomized control study. Pre anesthetic evaluation was done one day prior to the surgery. Patients were taught before the operation about the visual analogue scale (VAS: 10 cm scale) to assess their postoperative pain. On the day of surgery patient was nil by mouth 8 hours before surgery, Intravenous line was secured with 18 G cannula.

All baseline parameters, Heart rate, Blood pressure, O₂ saturation were noted.

Patient was premedicated with injection glycopyrrolate 0.01mg/kg, injection Ondansetron 0.1mg/kg and injection Fentanyl 2mcg/kg. After preoxygenation for 3minute, induction of anesthesia was done with inj. Propofol 2mg / Kg body weight. After check ventilation inj. Suxamethonium 2mg/kg was given. Patient was intubated with endotracheal tube. Endotracheal tube position was confirmed and connected to volume controlled mode of mechanical ventilator. Anesthesia was maintained with oxygen and sevoflurane (1to2%) and inj . atracurium was given initial loading dose of 0.5mg/kg followed by 0.1mg/kg as a maintenance dose. Hemodynamic parameters heart rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and Spo₂ was monitored intra operatively. At the end of surgery two drains were placed before closing

the surgical incision by the surgeon .They were preoperatively randomized into two designated groups by lottery method.

Group B patients received 40 ml of injection bupivacaine 0.25%, 20 ml through each axillary and chest wall drain.

Group C had no instillation.

The drains were kept non functional by clamping them for a short 10 minutes and released afterward to allow the bupivacaine to run from positive pressure into the negative pressure drain.

Patient was reversed with neostigmine and glycolpyrrolate. After extubation patient was transferred to the recovery room for post operative vital monitoring and pain control management.

Duration of analgesia was calculated in hours starting when the patient was received in the recovery room till the patient felt the pain of score > 4 according to the Visual Analogue Pain Score chart (VAS). Pain score at 0 hours was noted after extubation and subsequently every hour by a trained resident for 12 hour.

Rescue analgesia was provided by injection paracetamol 1 gram intravenous if VAS scores more than four. All the data was noted and recorded in the attached proforma, along with the demographic data.

RESULTS:

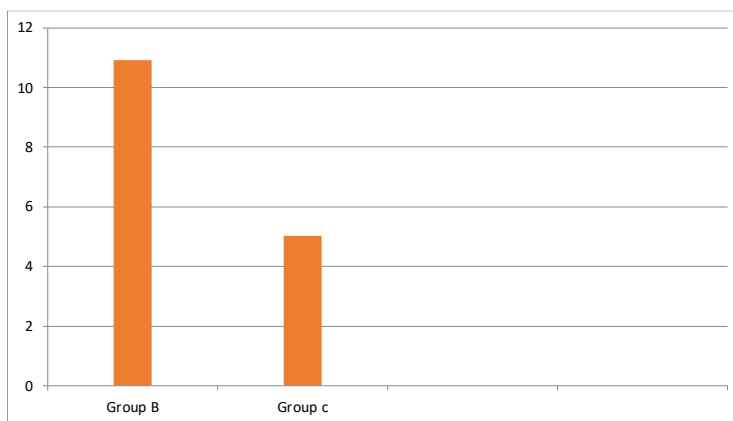
All demographic data (age, weight, duration of anesthesia & duration of surgery) were comparable in both groups (p value > 0.05)

Duration of analgesia was recorded in hours when the the patient was shifted after surgery in the post anesthesia care unit until the patient feel pain and discomfort of more than 4 scores according to the visual analog pain scale chart .

The pain was assessed by VAS score for 12 hours.

The mean period of time during which analgesia was observed was significantly higher in Group B as compared to Group C (9.83±1.71 vs 4.03±1.25) hours, p=0.005). That shows statistically significant.

Parameters	Group B	Group C	P Value
Age (years)	48.37±6.88	48.94±7.99	0.922
Weight(KG)	57.06±10.53	65.17±10.20	0.731
Duration of surgery(minutes)	123.33±9.54	126±10.84	0.658
Duration of anesthesia(minutes)	137.73±30.86	140.29±33.04	0.472
Duration of analgesia(Hours)	9.83±1.71	4.03±1.25	0.005



Duration of analgesia in (hours) in Group A and Group B

DISCUSSION:

Surgical stress and pain produce metabolic response involving release of neuroendocrine hormones and cytokines, which lead to myriad of detrimental effects.

In MRM surgery, there is an extensive dissection of chest wall, Breast tissue, skin, nipple, and axillary clearance that cause pain. This pain delays recovery and increase patient's stay in hospital.

There are many methods for perioperative pain relief. In this study we chose local anesthetic infiltration through surgical drains which would avoid opioids related side effects like nausea, vomiting and respiratory depression. Regional nerve & field block are good options for post-operative analgesia for MRM but there are risks of iatrogenic Pneumothorax.

In paravertebral block there are 70% chances of diffusion of local anesthetic infiltrate content from paravertebral space to epidural space.

Infiltration of local anesthetic along suture line is not recommended because needle tract seedlings and cutaneous spread of malignancy.⁹

Uzma Shamianseth¹⁰ et al, studied on postoperative analgesia in MRM patients after infiltration of Bupivacaine through surgical drain. In this study patients were randomly divided into two groups, 30 each. 30 female patients in group A received 40ml 0.25% Bupivacaine through surgical drains and 30 female patients in group B received no local anesthetic instillation through drains.

They found that post-operative period of analgesia was significantly longer and higher in group B as compared to group C (10.95±1.84 versus 5.03±1.35 hours) p value was (0.0005) that was statistically significant.

Nirmala Jonnavithula et al³ conducted role of wound instillation with bupivacaine through surgical drains for postoperative analgesia in MRM surgery. In their study group C was control with no local anesthetic instillation but received normal saline 40ml, 20ml through each drain. Group B 40ml 0.25% bupivacaine and the drains were clamped for 10 minutes. There was significant difference in the cumulative analgesia requirement and the number of analgesic demands between groups (P= 0.000). The mean duration of analgesia in the bupivacaine group was 14.6hr, 10.3 in the saline group and 4.3 in the control group. They concluded that local anesthetic is a simple and effective mean of providing good analgesia without any major side effect.

Dr.Rajesh and Dr.Bindu¹¹ also compared post operative analgesia in MRM surgeries. In group A received 30 ml ropivacaine and group B receive 30 ml Bupivacaine in surgical drains. Mean duration of analgesia for ropivacaine was 10.323 hours and for bupivacaine , it was 9.6 hours .Duration of analgesia was comparable in between groups.

Wang et al¹²also studied ropivacaine infiltration for postoperative analgesia through exit site of drain in MRM surgery .The patient of ropivacaine showed a significant reduction in post operative pain in PACU (p<0.0005), at 6h(p<0.0005),12h(p<0.0005) and 24 h after surgery (p<0.05).

In our study all the demographic data were comparable p value more than 0.05 that shows statistically non significant and duration of analgesia was statistically significant p value is less than 0.05.

The studies of UzmaShamianseth et al, Nirmala Jonnavithula et al Dr.Rajesh et al, and Wang et al were in our favour.

Limitation

This study was done on ASA Grade I and II patients only. So results cannot be generalized to all MRM post operative patients.

CONCLUSION:

Instillation of the wound with injection bupivacaine via surgical drains after MRM with axillary lymph node dissection offers better postoperative pain relief.

REFERENCES

1. Effect of preoperative intravenous steroid on seroma formation after modified radical mastectomy. Khan MA <https://pubmed.ncbi.nlm.nih.gov/28718232/> J AYub Med Coll Abbottabad. 2017;29:207-210. {Pubmed} {google Scholar}
2. Westbrook AJ Buggy, anesthesia for breast surgery BJA CEPD Rev.200;315):151-4
3. Nirmala Jonnavithula, Harsh Khandelia, Padmaja Durga, Gopinath Ramachandra Role of wound instillation with bupivacaine through surgical drains for postoperative analgesia in modified radical mastectomy, Indian J. Anaesth,2015;59:15-20.
4. Das S, Bhattacharya P, MANDAL MC, Mukhopadhyay S, Basu SR, Mandol BK. Use of paravertebral Block as an alternative to general anaesthesia for elective breast surgeries: A Randomized controlled trial. Indian J Anaesth. 2012;56(1):27-33.
5. Singh AP, Tewari M, Singh DK, Shukla HS. Cervical Epidural Anesthesia: A safe Alternative to general Anesthesia for Patients Undergoing Cancer Breast Surgery. World J Surg. 2006;2006 ;30(11):2043-7
6. Lynch EP, Welch KJ, Carabuena JM, EBERLEIN TJ. Thoracic Epidural Anesthesia Improves Outcome After Breast Surgery. Ann Surg. 1995; 222(5):663-9.
7. Abdelhamid S, Elakany M. Segmental thoracic spine has advantages over general anesthesia for breast cancer surgery. Anesth Essays Res.2013; 7(3):390-5.
8. Kundra P, Varadharajan R, Yuvaraj K, Vinayagam S. Comparison of paravertebral and interpleural block in patients undergoing modified radical mastectomy. J Anaesthesiol Clin Pharmacol. 2013; 29(4):459-64.
9. M. risk of needle tract seeding of breast cancer. Cytological results derived from core wash malignant
10. Breast cancer res. Treat.2008; 15.03±1.35 hours 10:51-5 (pubmed)
11. Uzma Shamim Seth, SuGHRA Perveen, Tanweer Ahmed, MHAMMAD Taha Kamal, Jehangir Ali Soomro, Munira Murtaza Khomusi, and Maha Kamal 2022 Apr;14(4):e24125. Doi10.7759/cureus.24125.
12. Dr. Rajesh and Dr. Bindu. A Comparative Study of Post Operative Analgesia Of Bupivacaine Or Ropivacaine Instilled Through Surgical Drain In Modified Radical Mastectomy. wjpmr, 2018,4(10)113-116
13. Baona Wang, Tao Yan, Xiangyi, Li Sun, Hui Zheng, ND Guohua Zhang. BMC Anesthesiol.2020;20:257. published online 2020 Oct 6 doi:10.1186/s12871-020-01175-8