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Advantages of wound instillation of local anaesthetic drug mixture along with an additive through surgical drains (drain block) for postoperative analgesia after Modified Radical Mastectomy: A case series

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Abstract

The aim of this study is to report six cases of Drain Block for postoperative analgesia after Modified Radical Mastectomy (MRM). The procedure was carried out at Chittaranjan National Cancer Institute, Kolkata, among 6 female patients aged 32-75 years, who were diagnosed with unilateral breast carcinoma and were posted for MRM. Upon completion of MRM, all patients received a 40 ml solution of local anaesthetic drug mixture comprising of 0.5% isobaric bupivacaine (2 mg/kg) and 2% lignocaine (4 mg/kg) along with 2 ml of 50% Magnesium sulphate as an additive. The 40 ml solution was equally divided and instilled through both the surgical drains (pectoral and axillary drains). Thereafter, the drains were then clamped for 20 minutes and later declamped. The postoperative analgesic outcome was measured in terms of pain and mobility. Pain was quantified with VAS, while mobility was assessed using the evaluation of range of motion with the help of bio-physiological method. The documentation was carried out every 4 hours and continued for twenty-four hours postoperatively. No patient required rescue opioids for the first 18 postoperative hours, with 2 patients having no requirements (VAS < 4) for the first 22 postoperative hours. There were no limitations in ipsilateral arm abduction in immediate postoperative hours in any of the patients. Drain block, combining the beneficial effect of lignocaine on disease free survival in oncology patients and its potency to reduce dependence on postoperative opioids requirements, might prove to be a game changer by comprehensively covering all significant aspects of postoperative analgesia after MRM.

Keywords: Drain Block; MRM; Post-operative Analgesia; VAS; Range of motion

1. Introduction

Female breast cancer is the most commonly diagnosed cancer worldwide and it represents 1 in 4 cancers diagnosed among women globally[1]. Modified radical mastectomy (MRM) is the major surgical options for the treatment of breast cancer and is associated with significant postoperative pain. Axillary lymph node dissection (ALND), is an inherent component of surgery in most patients with N1 or N2 tumours[2]. ALND, when done, is also associated with significant restriction of the ipsilateral arm movement due to pain, that needs prompt and if possible pre-emptive interventions. Multimodal analgesia is now a recommendable approach that avoids dependence on opioids and thus their side effects.[3,4]

As per PROSPECT guidelines, paravertebral block is recommended as the first-choice regional analgesic technique for breast surgeries and opioid should only be reserved as rescue analgesia.[5] But, in high volume oncological centers, time

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plays a major deciding as well as a limiting factor in dealing with the ever-increasing case load. In this scenario, the incorporation of paravertebral block or other techniques like erector spinae plane block or serratus anterior plane block is often considered fancy and time consuming because of the involvement of gadgets like USG machine, requirement of manpower for positioning, etc. and thus are frequently avoided. The incorporation of lignocaine in wound instillation, has shown beneficial effect on disease free survival[6] and thus when used together, along with bupivacaine, through surgical drains (Drain Block) might prove to be a game changer by comprehensively covering all the aspects of postoperative analgesia.

Till date, no publication (as per Google search), has demonstrated the need and the benefits of the synergistic action of a short-acting and a long-acting action of the local anaesthetics when combined together along with an additive in the drain block. Thus, this case series, involving six patients, might help combat the time constraints and consolidate the truthful yet fruitful findings of drain block on postoperative analgesic outcome.

2. Case series

2.1. Case 1

A 40-year-old female patient, weighing 54 kg, with history of hypertension, was diagnosed with carcinoma of left breast and was posted for left MRM. After proper PAC and pre-emptive inj. Paracetamol of 800 mg (1 hour before surgery), the patient was shifted to the operation theatre. A conventional and standard general anaesthesia with second generation laryngeal mask airway was provided. The total surgical time constituted 70 minutes. Upon completion of surgery a solution of 40 ml comprising of 22 ml of 0.5% isobaric bupivacaine, 11 ml of 2% lignocaine, 2ml of 50% Magnesium sulphate and 5 ml of sterile water was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 180°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to post anaesthesia care unit (PACU) for observation. Subsequent measurements were conducted at 4 hours interval for the first 24 postoperative hours. VAS was observed to be >4, after 20 hours and the patient was then provided with inj. Tramadol 100 mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 160-180°, throughout the first 24 hours.

2.2. Case 2

A 32-year-old female patient, weighing 63 kg, with no history of comorbidities, was diagnosed with carcinoma left breast and was posted for left MRM. Preemptive paracetamol of 1 gm was given 1 hour preoperatively. A protocolized anaesthesia was provided. The surgical time constituted 90 mins. Upon completion of surgery a solution of 40 ml comprising of 25ml of 0.5% isobaric bupivacaine, 13 ml of 2% lignocaine and 2 ml of 50% Magnesium sulphate was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 170°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to PACU. VAS was observed to be >4, after 18 hours and the patient was then provided with inj. Tramadol 100mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 160-170°, throughout the first 24 hours.

2.3. Case 3

A 75-year-old female patient, weighing 42 kg, with history of type 2 diabetes mellitus and hypothyroidism, was diagnosed with carcinoma right breast and was posted for right MRM. Preemptive paracetamol of 650 mg was given 1 hour preoperatively. A protocolized anaesthesia was provided. The surgical time constituted 55 mins. Upon completion of surgery a solution of 40 ml comprising of 17ml of 0.5% isobaric bupivacaine, 8 ml of 2% lignocaine, 2 ml of 50% Magnesium sulphate and 13 ml of sterile water was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 180°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to PACU. VAS was observed to be >4, after 22 hours and the patient was then provided with inj. Tramadol 75 mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 170-180°, throughout the first 24 hours.

2.4. Case 4

A 38-year-old female patient, weighing 55 kg, with history of asthma, was diagnosed with carcinoma left breast and was posted for left MRM. Preemptive paracetamol of 850 mg was given 1 hour preoperatively. A protocolized anaesthesia was provided. The surgical time constituted 60 mins. Upon completion of surgery a solution of 40 ml comprising of 22 ml of 0.5% isobaric bupivacaine, 11 ml of 2% lignocaine, 2 ml of 50% Magnesium sulphate and 5 ml of sterile water was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 170°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to PACU. VAS was observed to be >4, after 22 hours and the patient was then provided with inj. Tramadol 100 mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 160-170°, throughout the first 24 hours.

2.5. Case 5

A 46-year-old female patient, weighing 59 kg, with no history of any comorbidities, was diagnosed with carcinoma left breast and was posted for left MRM. Preemptive paracetamol of 900 mg was given 1 hour preoperatively. A protocolized anaesthesia was provided. The surgical time constituted 80 mins. Upon completion of surgery a solution of 40 ml comprising of 24 ml of 0.5% isobaric bupivacaine, 12 ml of 2% lignocaine, 2 ml of 50% Magnesium sulphate and 2 ml of sterile water was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 180°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to PACU. VAS was observed to be >4, after 20 hours and the patient was then provided with inj. Tramadol 100 mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 170-180°, throughout the first 24 hours.

2.6. Case 6

A 52-year-old female patient, weighing 60 kg, with history of CAD, was diagnosed with carcinoma right breast and was posted for right MRM. Preemptive paracetamol of 1 gm was given 1 hour preoperatively. A protocolized anaesthesia was provided. The surgical time constituted 75 mins. Upon completion of surgery a solution of 40 ml comprising of 24 ml of 0.5% isobaric bupivacaine, 12 ml of 2% lignocaine, 2 ml of 50% Magnesium sulphate and 2 ml of sterile water was prepared. The solution was then divided and instilled equally through surgical drains placed at pectoral and axillary regions. The drains were clamped for 20 minutes. The patients were thereafter provided reversal from neuromuscular blockade and extubated. The postexbutation VAS was 0 with voluntary abduction of the ipsilateral arm being 175°, as measured by a goniometer. The drains were declamped after 20 mins and the patient was shifted to PACU. VAS was observed to be >4, after 19 hours and the patient was then provided with inj. Tramadol 100 mg intravenously, as rescue analgesic. No further analgesics were required in the first 24 postoperative hours. There was no limitation in voluntary arm abduction and the maximum limit of abduction was found to be between 150-180°, throughout the first 24 hours.

3. Discussion

Oncology patients, because of the considerable disease load and already prevailing social stigma, frequently suffers from both physical and mental disturbances. A multifaceted postoperative care including delicate psychological support thus is the need of the hour, to alienate sufferings in these patients.

The advancement gadgets like USG machine and Peripheral Nerve Stimulator although have revolutionized the medical field but their setup before block placement requires significant time. Moreover, the need of the patient positioning for the postoperative nerve blocks necessitates the involvement of remarkable manpower. Both these two factors frequently hinder the adaptation of regional analgesic techniques in high volume centers, and thereby increasing the dependency on postoperative opioids.

Oakley, N et al,[7] and Talbot, H.[8] et al, in their respective studies have already demonstrated that in many situations, a superior postoperative analgesia yet avoiding the detrimental effects of opioids, can be extracted from a simple technique of wound instillation of local anaesthetics through surgical drains. The drug combination used in our study (2 mg/kg of 0.5% isobaric Bupivacaine, 4 mg/kg of 2% lignocaine and 2 ml of 50% magnesium sulphate, diluted to a

volume of 40 ml) provided a satisfactory long opioid free postoperative analgesic period (mean duration of 20.16 hours).

The overall postoperative satisfaction of the patients undergoing MRM, often depends upon the movement of the ipsilateral arm, because of the excruciating pain they suffer postoperatively due to the massive dissection of the extensively innervated axillary region. It was thus, very satisfying to report that none of our patients who received our drug combination complained of any restriction of ipsilateral arm movement in the first postoperative day.

4. Conclusion

The drain block, with our drug combination can thus become a superior alternative and might prove to be the "card up one's sleeve" for maintaining an opioid free postoperative analgesia in the upcoming years.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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