

DETAILED STUDY OF PARAVERTEBRAL BLOCK ANAESTHETIC MANAGEMENT IN PATIENTS WITH CARCINOMA BREAST FOR MODIFIED RADICAL MASTECTOMY

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Abstract

To assess safety and efficacy of the regional anesthetic technique paravertebral block for operative treatment of breast cancer, and to compare postoperative pain, nausea, vomiting, and length of hospital stay in patients undergoing breast surgery using paravertebral block and general anesthesia. General anesthesia is currently the standard technique used for surgical treatment of breast cancer. Increasing hospital costs have focused attention on reducing the length of hospital stay for these patients. However, the side effects and complications of general anesthesia preclude ambulatory surgery for most patients undergoing breast surgery. Paravertebral block can be used to perform major operations for breast cancer with minimal complications and a low rate of conversion to general anesthesia. Paravertebral block markedly improves the quality of recovery after breast cancer surgery and provides the patient with the option of ambulatory discharge

Key words -paravertebral block, breast cancer, radical mastectomy

INTRODUCTION

Postoperative nausea, vomiting, and pain after major breast cancer surgery can result in longer recovery room stays and require hospitalization for treatment for some patients [1]. In spite of newer drugs, general anesthesia still accounts for 59% of the intensity of breast surgery's emetogenic effects. Modern breast cancer surgery might be better performed under regional anaesthesia with intraoperative sedation rather than general anaesthesia. Regional anaesthesia is known to reduce nausea and vomiting and to provide prolonged postoperative pain relief when coupled with appropriate local anaesthetics [2].

Postoperative pain may also be reduced as a result of a preemptive analgesic effect. The benefit of this procedure is a reduction in postoperative nausea and vomiting, a prolongation of postoperative pain relief, and the possibility of discharge by ambulation. An injection of local anesthetic is performed at the site where the spinal nerves exit the intervertebral foramen in a thoracic paravertebral block [3]. A sympathetic chain runs through the paravertebral space and consists of dorsal and ventral rami. This space is therefore blocked unilaterally on sensory, motor, and sympathetic levels by the infiltration of bacteria. As an anesthetic technique for chest and shoulder surgery, paravertebral block has been used for pain relief after rib fractures, herpes zoster, and pleurisy, 13 for chronic postthoracotomy pain, and for acute and chronic pain associated with rib fractures, herpes zoster, and pleurisy. Paravertebral block was recently used at Duke University Medical Center to manage breast cancer patients surgically. There were significant pain, nausea, vomiting, and hospital stay reductions. Our institution has routinely used paravertebral blocks since April 1994. In this study, we compare the anesthetic efficacy and complications associated with this procedure with those associated with general

anesthesia over a period of two years, evaluating postoperative analgesia, nausea and vomiting, and length of hospital stay [4].

Details of cases

A paravertebral block with intravenous sedation was performed under informed consent for 25 patients after approval by the Institutional Review Board. As an alternative to modification radical mastectomy with axillary dissection, three surgeons performed axillary dissections. A total of 24 patients aged 24 to 77 years were included in this study. Their ASA status ranged from I to IV (Table II). Preoperative holding areas were monitored by attending anaesthetists during all blocks. Blocks were placed on seated patients. Midazolam 1-3 mgs and fentanyl 50-150 µg were administered after monitors and oxygen were applied. Afterward, Moore [6] and Katz [7] described performing thoracic paravertebral blocks. A noticeable superior aspect can be seen on the spinous processes of C7-T6. A 3 cm lateral distance separated the entry points from the marks on the skin. The local anaesthetic was administered through a 22-gauge Quincke spinal needle attached to an extension tube. Perpendicular to the skin, a needle was inserted 2-4 cm into the transverse process (dependent on the body habitus). A further 1.5 to 2 cm of advancement was made after the needle was withdrawn and walked caudally off the transverse process. We administered 3-4 ml of bupivacaine 0.5% per segment with 1:400,000 freshly added epinephrine after careful aspiration. 105-140 mg of bupivacaine were administered. There was a range of 10-15 minutes for the performance of blocks. Ten minutes after injection, sensory loss began, followed by 20-30 minutes of surgical anesthesia. Surgery was performed in the main operating room. Propofol was administered intraoperatively, titrating to moderate sedation with patients rousable on command. As needed, intermittent doses of 25 µg fentanyl

were administered. Incomplete blocks requiring more sedation or general anesthesia were transferred to the post-anaesthesia care unit. Each patient was given 500 mg of naproxen po twice daily for four days. Patients were also given a prescription for TABLE I Surgical procedures

Surgery #	Patients
Lumpectomy and axillary dissection	5
Simple mastectomy	3
Wide excision and axillary dissection	4
Modified radical mastectomy and axillary dissection	13

TABLE II Demographic data

Mean	Range	Age	ASA status	Height - cm	Weight kg
55	24-77	11	I-IV	161	65

TABLE III Results of block

Surgery	Successful	Unsuccessful
Lumpectomy with axillary dissection	3/5	2/5
Simple mastectomy	3/3	0/3
Wide excision and axillary dissection	4/4	0/4
Modified radical mastectomy and axillary dissection	10/13	3/13
Total	20/25	5/25

acetaminophen with 30 mg codeine to take if necessary. During the 72-hour evaluation, patients were asked to document: (i) the return of sensation, (ii) the frequency and occurrence of nausea or vomiting, and (iii) the degree of discomfort. Moreover, there was a request for patients to rate the technique as unsatisfactory, satisfactory, or very satisfactory

Results

There were 20 patients who did not need supplementation for their blocks. A total of five patients had incomplete blocks: two were given general anaesthesia by face mask (early in the series), and three received local supplementation (missed or partial anaesthesia of a single dermatomal segment). Neither spinal nor epidural blocks caused complications (e.g. pneumothorax, spinal injury, or anaesthetic toxicity). A total of 17 patients were available for follow-up among the 20 patients who had successful blocks (Table IV) for nausea and vomiting. Thirteen patients did not experience nausea or vomiting during the entire postoperative period, while the others did. A naproxen tablet on an empty stomach caused emesis in two of these

patients, and oral opioid consumption caused emesis in two more. After intravenous or oral narcotics, three of the four patients in the incomplete block group reported nausea or vomiting. The duration of successful blocks was 18 hr on average (range 12 to 30 hr). There were 17 patients with successful blocks who were available for follow-up, and six of them did not require analgesics during the postoperative period, two patients inadvertently received acetaminophen tablets containing 30 mg codeine (not requested by the patient), and two patients received only plain acetaminophen. The majority of patients took one to two tablets of acetaminophen with 30 mg codeine for mild pain or stiffness, and three patients made more than two tablets of acetaminophen with 30 mg codeine. Intravenous PCA followed by oral opioids was administered to all patients with incomplete blocks. The procedure was found to be satisfactory by all patients. There was a high level of satisfaction among patients who had successful blocks.

Discussion

The majority of patients can successfully undergo paravertebral blocks for breast cancer surgery with very few side effects. [5] reported the efficacy and safety of paravertebral blocks for various procedures in 367 paediatric and adult patients under general anaesthesia, confirming the technique's effectiveness and safety. The failure rate in adults was 10.7% (inadequate postoperative analgesia with visual analogue pain score >5). The pleural puncture of three adults (0.9%) resulted in a pneumothorax in one of them. It was found to have epidural spread. The percentage is 1%. Seizures were experienced by one patient. [6] There were no reported lumbar punctures. Lonquist's series serves as a good guide as to the possible risks of pneumothorax, epidural, and spinal complications, since our series is small. Any of the 25

patients showed no signs of local anaesthetic toxicity. Paravertebral blocks showed similar absorption kinetics to brachial plexus or epidural blocks, thereby increasing the margin of safety over intercostal and interpleural blocks, according to Wulf et al. Among our patients, there is a 30 percent incidence of nausea and vomiting (30%) that is half that of previous studies^{3,4} and in a retrospective study of breast cancer surgery under general anesthesia at Duke University Medical Center. Despite successful blocks, virtually all patients undergoing general anaesthesia without narcotics required parenteral opioids postoperatively. Regional anaesthesia has been used for breast surgery in various ways [8]. For minor procedures, simple infiltrative methods can provide adequate anaesthesia, but their frequent need for supplementation and distortion of anatomy may prevent them from being used for major procedures. Axillary dissection involves blocking the upper thoracic roots, which is essential to the blockade of the intercostal nerves, which were traditionally used for minor breast surgery. When used for postoperative analgesia, thoracic epidurals cause substantial cardiorespiratory physiological changes, which are satisfactory for intraoperative procedures but require higher monitoring. The ambulatory unit was bypassed for all patients whose blocks succeeded. Most patients chose not to stay in the hospital for 23 hours, which was routine at Duke University Hospital at the time[10]. It has the potential to save major amounts of money for cancer patients if breast cancer surgery under regional anaesthesia can be performed safely as an ambulatory procedure. Overall, patients were enthusiastic about the paravertebral block technique, possibly as a result of returning home early and with a minimum of disability. Breast cancer surgery is to be conducted under general anaesthesia versus regional anaesthesia as part of a larger study. The

results of this study will likely provide a better understanding of the effect of regional anesthesia on reducing complications and reducing costs associated with this procedure [11].

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