Pectoralis Nerve (Pecs 2) Block for Breast ancer Surgeries: A Pilot Study for an Ongoing Practice of Perioperative Surgical Home

Department of Anesthesiology, Kaiser Permanente Baldwin Park Medical Center, Baldwin Park, USA

Recent studies suggest that the choice of anesthesia and analgesia can affect clinical outcomes and survival for breast cancer patv ø /l ⊣ Ȯ ū patient's pain scores in the post anesthesia care unit (PACU) a required supplemental local anesthetic in fltration by the surgeon. The total amount of fentanyl given intraoperatively ranged from 25 mcg to 150 mcg. Three patients did not require any additional opiates in the PACU. Three patients received a total of 100 mcg of fentanyl, one received a total of 0.8 mg of hydromorphone, another received 50 mcg fentanyl and 0.6 mg hydromorphone and one patient received 200 mcg fentanyl and 1.8 mg hydromorphone during recovery.

Perioperative Surgical Home (PSH) protocols encompass many different aspects of perioperative care including anesthetic technique. In our effort to continuously improve PSH for our breast cancer patients, we created a pathway in our hospital to incorporate regional anesthesia for breast cancer patients. Here, we demonstrated the possibility of using a regional anesthetic technique for both surgical anesthesia and postoperative analgesia.

Keywords: Perioperative surgical home (PSH); Anesthesia; Post anesthesia care unit (PACU); Analgesia

Introduction

Breast cancer is the most commonly diagnosed cancer in women in the United States regardless of race and ethnicity and the incidence is expected to follow an upward trend in the foreseeable future, along with the cancer associated mortality [1]. While ranked the second deadliest cancer in all women breast cancer has already become the number one killer in Hispanic woman despite advancement of treatments such as surgery, radiation, chemotherapy, immunotherapy, hormonal therapy [1,2]. As of today, surgical excision of the tumor remains one of the primary methods of treating breast cancer. Surgical techniques have changed dramatically over the years in response to new scienti c evidence, ranging from radical mastectomy and lumpectomy to local excision with needle localization. However, improvement in anesthetic techniques for the various breast cancer surgeries has been slow. General anesthesia with an inhalational agent remains the primary technique; in fact, o en the only option o ered to patients for a wide variety of breast cancer surgeries.

Recent studies suggest that the choice of anesthesia and analgesia can a ect immediate and long term clinical outcomes for breast cancer patients. In an extensive review published in May 2017, Hollmann et al., noted the volatile anesthetics have been implicated with carcinogenic potential while evidence points to the anti-tumor e ects of Propofol. Although de nitive recommendations for anesthetic technique would be premature, current experimental evidence favors Propofol infusion-based anesthetics over inhalation anesthetics for patients undergoing cancer surgery [3]. In addition, regional anesthesia, speci cally thoracic epidurals and paravertebral blocks, has been regarded as an e ective means of pain control and method of decreasing postoperative opioid consumption for patients undergoing mastectomies [4,5]. Peripheral nerve blocks may also potentially decrease the incidence of developing postoperative chronic pain [6,7] as well as prevent future cancer recurrence [8]. ese new discoveries call for innovations in anesthesia practice and encourage more individualized perioperative management for breast cancer patients, which include selective plans for both anesthesia and analgesia.

Perioperative Surgical Home (PSH) was recently introduced and implemented into the eld of perioperative medicine which encompasses a multimodal approach to improve a long-term healthcare outcome that matters to the patient the most: Disability free survival. For cancer patients, techniques that decrease cancer recurrence which o en originates in the perioperative period, is more relevant as it will directly impact their disability free survival. In our hospital, we have implemented a PSH practice for several di erent surgical services [9,10] and in this case series, we delineated our e ort to incorporate regional nerve blocks with monitored anesthesia care for our breast

Chunyuan Qiu, Department of Anesthesiology, Kaiser Permanente Baldwin Park Medical Center, 1011 Baldwin Park Blvd, Baldwin Park, CA 92649, USA, Tel: +6268517253; Email: Chunyuan.X.Qiu@kp.org

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cancer surgeries. e regional block, called the pectoralis nerve block (Pecs 1 and Pecs 2), was developed by Blanco et al. [11] and provides an e ective way to control postoperative pain a er breast surgery. Here, we describe our experience with the Pecs 2 block for breast cancer surgeries and postoperative analgesia as a continuum. e goal was to minimize the immunosuppressive e ect of inhalation agents and long lasting opioid medication while providing e ective anesthesia and analgesia for surgery and postoperative pain.

Case Series

Nine breast cancer patients undergoing lumpectomies and simple mastectomies were included in this series. eir ages ranged from 42 to 83 with an average BMI of 29.78 (19.55-48.10). In Table 1, patients received a preoperative single-injection Pecs 2 block followed by moderate to deep sedation with Propofol infusions intraoperatively.

In the operating room, monitored anesthesia care was provided with Propofol infusions and additional fentanyl boluses as indicated.

the attenuation of the systemic stress response to surgical trauma thereby providing protective anti-in ammatory e ects, decreasing the amount of volatile anesthetics needed for surgery, and minimizing consumption of perioperative opioids [16]. Volatile anesthetics and opioids have been associated with suppression of the immune system which would allow residual neoplastic cells to proliferate a er tumor resection thus leading to cancer recurrence [17,18]. While current evidence is somewhat sparse and ongoing prospective randomized controlled trials are investigating this phenomenon, a retrospective analysis by Exadaktylos et al., has shown that the use of paravertebral nerve blocks for breast cancer surgery reduced the risk of cancer recurrence by four-fold in long-term follow-up [19]. is would need further exploration through future research on the pectoralis blocks and this e ect on morbidity and mortality a er breast cancer surgery.

Another less appreciated bene t of regional nerve block for breast surgery is its e ectiveness in reducing phantom breast pain, intercostobrachial neuralgia and other chronic pain syndromes, which are not uncommon a er breast cancer surgery. In fact, following surgery, a signi cant number up to 60% of patients can develop chronic pain [20]. Although the cause of long-term pain is multifactorial, patients

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