

Erector Spinae Plane (ESP) block associated with Transversus Abdominis Plane (TAP) block as a multimodal analgesia for breast cancer early reconstruction surgery. Case report

Vanessa Henriques Carvalho¹ , Vinicius Marques¹, Angelica Braga¹

How to cite: Carvalho VH, Marques V, Braga A. Erector Spinae Plane (ESP) block associated with Transversus Abdominis Plane (TAP) block as a multimodal analgesia for breast cancer early reconstruction surgery. Case report. *Periop. Anes. Report.* 2023;1:e000323. <https://doi.org/10.61724/par.000323>

ABSTRACT

Breast cancer surgeries with early reconstruction have been changing in recent years, reinforcing the need for new anesthetic techniques. These techniques improve patients' well-being, involving less pain, faster and better postoperative recovery, and reduction in opioid consumption. Within this perspective, ultrasound-guided regional blocks promote adequate intra and postoperative analgesia.

Our aim was to demonstrate an anesthetic technique of interfascial plane blocks (ESP block associated with TAP block) to avoid acute pain in a patient submitted to radical mastectomy with early skin flap reconstruction. Analgesia assessment using a numerical rating pain scale, consumption of opioids and other analgesics, hemodynamic status, duration of analgesia, and adverse effects were monitored.

KEYWORDS

Nerve blocks; extended radical mastectomy; acute pain

INTRODUCTION

Interfascial plane blocks are one type of multimodal analgesia controlling acute postoperative pain, mainly for oncologic patients for whom higher doses of opioids are avoided. Opioids can affect cancer recurrences due to their impact on the inflammatory response system^(1,2,3).

Postoperative pain following breast surgery is complex since breast innervation has multiple origins. Acute pain after major breast surgeries arises from two major contributors: intercostal nerves (T2–T6) and brachial plexus (medial pectoral nerve, lateral pectoral nerve, long thoracic nerve, and thoracodorsal nerve). Nerves from the brachial plexus provide motor fibers to the breast area, which is responsible for acute pain involving

muscle contraction and chronic pain (chronic pain following long thoracic nerve resection)⁽³⁾. Moreover, injuries on the intercostobrachial nerve cause chronic postsurgical neuropathic pain⁽⁴⁾. The Ultrasound-guided Erector Spinae Plane Block (US-ESP Block) is a technique involving regional anesthesia where local anesthetics are injected into the fascial plane deep into the erector spinal muscle. Afterward, the technique blocks the spinal nerves' dorsal and ventral branches, extending from the back of the neck to the sacrum, providing analgesia similar to epidural block in high thoracic regions^(2,3).

ESP block provides analgesia, as Forero et al. showed⁽⁵⁾. Usually, ESP block performed at T2–T3 level with a

¹ University of Campinas, Anesthesiology Department, Campinas, São Paulo, Brazil



sufficient volume of local anesthetic can quickly spread upward to C3, covering brachial plexus origins and potentially the plexus itself. In addition, ESP block action on intercostal nerves is widely demonstrated both in anatomical and radiological studies⁽⁵⁾.

On the other hand, TAP (transversus abdominis plane) block is well-described for acute parietal pain in abdominal surgeries since the local anesthetic is injected in the fascial plane between the internal oblique and transversus abdominis muscles⁽⁶⁾.

This case report aims to demonstrate a good alternative for acute pain control, performing both blocks in the same patient associated with general anesthesia. The case report involved radical mastectomy, axillary clearance, and early reconstruction including a tissue expander and a big skin flap reaching the ipsilateral umbilicus.

The patient previously signed the informed consent, and the study was approved by the ethical committee from the University.

CASE REPORT

A 65 years old woman, 80kg (weight), 155cm (height), was scheduled for an elective radical mastectomy and axillary clearance with early reconstruction involving an expander and skin flap due to invasive right breast carcinoma. The tumor had a large, ulcerated region, and the surgeons decided not to preserve the original breast skin.

After standard monitoring, the induction of General anesthesia (GA) was performed as a total intravenous (IV) (Target Controlled Infusion with remifentanyl and propofol) as well as rocuronium bolus, and maintenance with IV remifentanyl and propofol. After GA, a US-guided ESP block with Ropivacaine 0.2% 30mL was performed at the T3 level. All anesthesia procedure was free of complications. Since surgeons performed a skin flap below the T10 dermatome intraoperatively, we added the US-guided TAP block with bupivacaine 0.25% 20mL and epinephrine at the end of the surgery to cover the analgesia for these low dermatomes (Figures 1, 2 and 3). The total procedure duration was 3 hrs. The patient was extubated in the OR without pain, and the numerical rating scale (NRS) was zero. The length of stay in PACU (post-anesthesia care unit) was 1 hour, and the patient was discharged home 24h after surgery with just oral analgesic (metamizole) and NSAID non-steroidal anti-inflammatory drug (ketoprofen). No adverse events were described.

DISCUSSION

Ultrasound multiple interfascial plane blocks can be performed; however, we need to calculate and follow the



Figure 1. Mastectomy and skin flap procedure.



Figure 2. Skin flap.

total concentration of local anesthetic, avoiding the risk of local anesthetic systemic toxicity (LAST). In this case,



Figure 3. Skin flap stitches.

we could have performed a lower ESP block involving a higher volume instead of TAP. However, as the surgical plan was modified, we didn't know the extension of the skin flap in advance or the spread of ESP block, which could be irregular and could not reach low dermatomes. Therefore, we decided to provide breast analgesia using ESP block, in addition to abdominal parietal analgesia with TAP block⁽⁷⁾. Those associated blocks could be a good strategy in case of an abrupt change in the surgical plan during the operation.

Many strategies for pain relief have been proposed for radical mastectomy (such as paravertebral block, epidural as a single or continuous infusion, and Pectoral

Nerves block (PECS - block); however, the best method has yet to be determined⁽³⁾.

It is demonstrated here that ESP and TAP blocks avoid pain, limit opioid use and show a good-quality recovery, increasing patients' well-being and better outcomes without pain^(2,3,5-7).

REFERENCES

1. Andersen KG, Kehlet H. Persistent pain after breast cancer treatment: a critical review of risk factors and strategies for prevention. *J Pain*. 2011;12(7):725-46. <http://dx.doi.org/10.1016/j.jpain.2010.12.005>. PMID:21435953.
2. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane blocks a novel analgesic technique in thoracic neuropathic pain. *Reg Anesth Pain Med*. 2016;41(5):621-7. <http://dx.doi.org/10.1097/AAP.0000000000000451>. PMID:27501016.
3. Cassai A, Andreatta G. Will ESP block be the gold standard for breast surgery? We are not sure. *Saudi J Anaesth*. 2020;14(2):291-2. http://dx.doi.org/10.4103/sja.SJA_776_19. PMID:32317911.
4. Mustonen L, Aho T, Harno H, Sipilä R, Meretoja T, Kalso E. What makes surgical nerve injury painful? A 4-year to 9-year follow-up of patients with intercostobrachial nerve resection in women treated for breast cancer. *Pain*. 2019;160(1):246-56. <http://dx.doi.org/10.1097/j.pain.0000000000001398>. PMID:30234699.
5. Forero M, Rajarathinam M, Adhikary SD, Chin KJ. Erector spinae plane block for the management of chronic shoulder pain: a case report. *Can J Anaesth*. 2018;65(3):288-93. <http://dx.doi.org/10.1007/s12630-017-1010-1>. PMID:29134518.
6. Baeriswyl M, Kirkham KR, Kern C, Albrecht E. The analgesic efficacy of ultrasound-guided transversus abdominis plane block in adult patients: a meta-analysis. *Anesth Analg*. 2015;121(6):1640-54. <http://dx.doi.org/10.1213/ANE.0000000000000967>. PMID:26397443.
7. Aponte A, Sala-Blanch X, Prats-Galino A, Masdeu J, Moreno LA, Sermeus LA. Anatomical evaluation of the extent of spread in the erector spinae plane block: a cadaveric study. *Can J Anaesth*. 2019;66(8):886-93. <http://dx.doi.org/10.1007/s12630-019-01399-4>. PMID:31119551.

This study was carried out at the operation room from CAISM Woman's Hospital - UNICAMP.

Authors' contributions: Vanessa Henriques Carvalho: idea, wrote the paper, conducted the case. Vinicius Marques: conducted the case. Angelica Braga: revised the paper.

Ethics statement: PLATAFORMA BRASIL: 2042.8419.0.0000.5404.

Conflict of interest: None.

Financial support: None.

Submitted on: January 29th, 2023

Accepted on: March 17th, 2023

Correspondence

Vanessa Henriques Carvalho

University of Campinas, Anesthesiology Department

126 Tessália Vieira de Camargo Street, Campinas, SP, Brazil

Phone: +55 (19) 3521-9560

vanessahcarvalho74@gmail.com