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Title:	<i>THE EFFICIENCY OF THE PARAVERTEBRAL BLOCK IN BREAST SURGERY COMPARED TO GENERAL ANAESTHESIA</i>
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THE EFFICIENCY OF THE PARAVERTEBRAL BLOCK IN BREAST SURGERY COMPARED TO GENERAL ANAESTHESIA

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ABSTRACT:

INTRODUCTION: THE PARAVERTEBRAL BLOCK REPRESENTS AN ANAESTHETIC TECHNIQUE DONE MAINLY IN BREAST SURGERY AND IN THORACIC SURGERY, EITHER AS A SOLE ANAESTHETIC TECHNIQUE, EITHER FOR POSTOPERATIVE ANALGESIA.

OBJECTIVES: WE STUDIED THE EFFICIENCY OF THE PARAVERTEBRAL BLOCK IN BREAST ONCOLOGY SURGERY AS AN ANAESTHETIC TECHNIQUE COMPARED TO GENERAL ANAESTHESIA, AND WE FOLLOWED THE SURGICAL ACT, THE PACIENT'S COMFORT, POSTANAESTHETIC ADVERSE EFFECTS AND POSTOPERATIVE ANALGESIA.

MATERIALS: IN THE STUDY GROUP WE HAD 14 PATIENTS, 7 HAD UNILATERAL PARAVERTEBRAL BLOCK WITH OR WITHOUT LIGHT SEDATION AND 7 HAD GENERAL ANAESTHESIA WITH OROTRACHEAL INTUBATION. THE PATIENTS GAVE THEIR CONSENT FOR THE BLOCK AFTER RECEIVING INFORMATION REGARDING THE BENEFITS AND THE RISKS FOLLOWING THE TECHNIQUE. THE BLOCKS HAD BEEN MADE UNDER ULTRASOUND GUIDANCE, IN ASEPTIC CONDITIONS.

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RESULTS: BASED ON THE RESULTS, WE SHOWED THAT THE PATIENTS WITH PARAVERTEBRAL BLOCK FOR BREAST SURGERY WITH OR WITHOUT LIGHT SEDATION HAD SURGICAL COMFORT, HAD PROPER ANALGESIA DURING AND AFTER SURGERY FOR 12-15 HOURS, NO NAUSEA AND VOMITING WERE RECORDED COMPARED TO THE GENERAL ANAESTHESIA GROUP, DID NOT NEED IV OR ORAL ANALGESIA DURING THE DAY OF SURGERY, HAD EARLY MOBILISATION.

CONCLUSION: UNILATERAL PARAVERTEBRAL BLOCK FOR BREAST SURGERY IS AN EFFICIENT ANAESTHETIC TECHNIQUE FOR BREAST RESECTION AS LONG AS AXILARY LYMPH NODE RESECTION IS NOT NEEDED. PARAVERTEBRAL BLOCK OFFERS SURGICAL AND ANALGETIC BENEFITS.

KEY WORDS: BREAST CANCER, GENERAL ANAESTHESIA, PARAVERTEBRAL BLOCK, ANALGESIA.

INTRODUCTION

About 1 in 8 women are diagnosed with breast cancer during their lifetime as per NHS UK. Breast cancer has a good chance of recovery if it's detected at an early stage¹. Breast cancer surgery is a traumatic surgery for the patient, so the anesthetic technique should bring all the physical and psychical comfort.

The classic anesthetic technique that everybody is familiar with is general anesthesia that provides sedation, analgesia, amnesia, muscle relaxation, that is comfort for the patient, surgeon and anesthesiologist.^{12, 13}

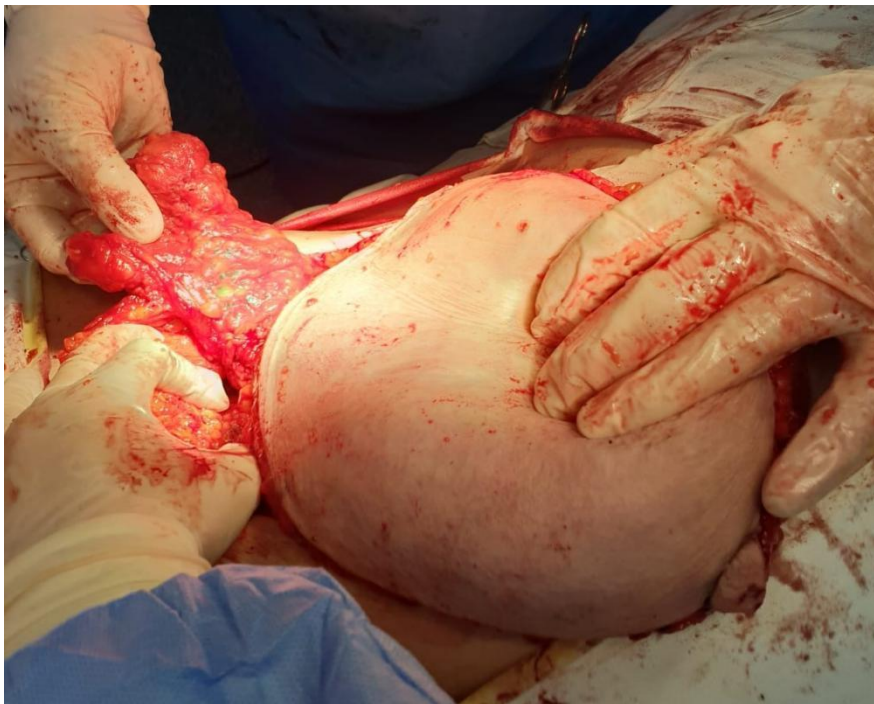


Fig. 1. Mastectomy

1. Shai Libson et. Al Int Rev Psychiatry. A review of clinical aspects of breast cancer. 2014
2. Wildsmith JA, Armitage EN. Principles and Practice of Regional Anesthesia, Churchill Livingstone, Edinburg, 1991.
3. Jiang Wu et al. Can J Anaesth. Thoracic paravertebral regional anesthesia improves analgesia after breast cancer surgery: a randomized controlled multicentre clinical trial, 2015 Mar.

Besides the benefits of general anesthesia, there comes postoperative risks and side effects, length of hospital stay, prolonged recovery of the patient.

A thoracic paravertebral block is a technique where a bolus of local anaesthetic is injected in the paravertebral space in the vicinity of the thoracic spinal nerves following their emergence from the intervertebral foramen.¹⁴ The resulting ipsilateral somatic and sympathetic nerve blockade produces anaesthesia and analgesia similar to a unilateral¹⁵ epidural block.¹⁶ This type of block is used most commonly in patients having mastectomy, cosmetic breast surgery, for analgesia after thoracic surgery or in patients with rib fractures.¹⁷

ANATOMY



Fig. 2: Human anatomy view

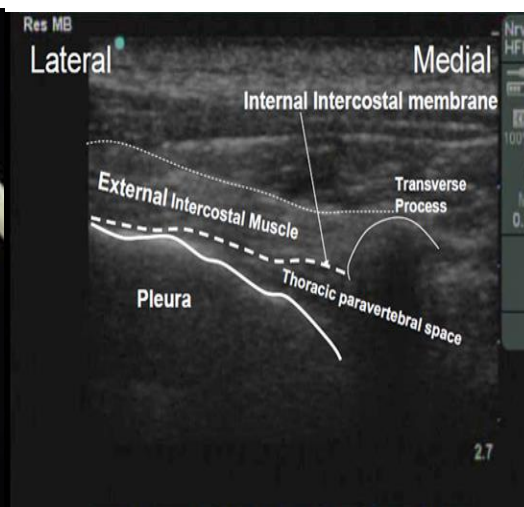


Fig. 3: Echographic view

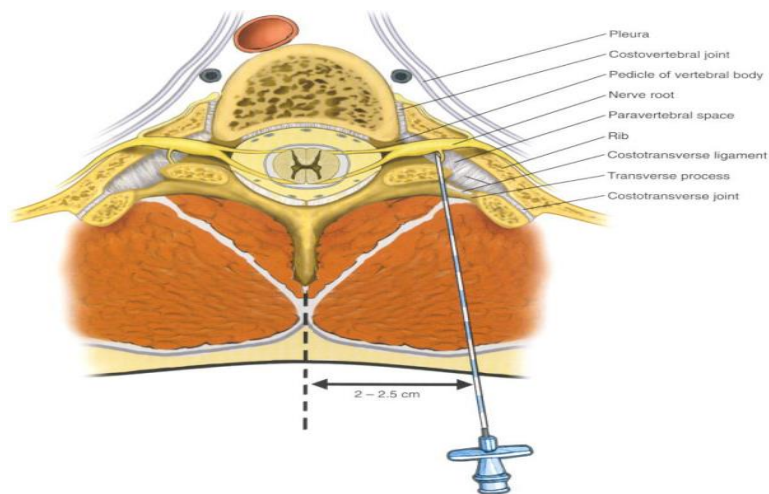


Fig. 4: Schematic view

⁴. Pei L, et al. PLoS One. Ultrasound-assisted thoracic paravertebral block reduces intraoperative opioid requirement and improves analgesia after breast cancer surgery: a randomized, controlled, single-center trial, 2015.

¹⁵ Flavius-Cristian Mărcău, Sorin Purec, George Niculescu, „Study on the refusal of vaccination against Covid-19 in Romania” în *Vaccines* 2022, 10, 261. <https://doi.org/10.3390/vaccines10020261>

⁵. McClure JH, Wildsmith JAW. *Conduction Blockade for Postoperative Analgesia*. Edward Arnold, London, 1991.

⁶. Gloria S Cheng et al. *Pain Manag*. A review of postoperative analgesia for breast cancer surgery, 2016 Nov.

TECHNIQUE

PATIENT POSITIONING

The patient is positioned in the sitting or lateral decubitus (with the side to be blocked uppermost) position and supported by an attendant.

The back should assume knee-chest position, similar to the position required for neuraxial anesthesia.¹⁸ The patient's feet rest on a stool to allow greater patient comfort.



Fig. 5: Landmarks

LANDMARKS

1. Spinous processes (midline)
2. Spinous process C7 (the most prominent spinous process in the cervical region when the neck is flexed)
3. Lower tips of scapulae (corresponds to T7)

OBJECTIVES

We have studied the efficiency of the unilateral paravertebral block in breast oncology surgery as a sole anaesthetic technique at which we added small doses of opioids and benzodiazepines for the comfort of the patient, compared to general anaesthesia, and we followed the surgical act, the patient's comfort, postanaesthetic adverse effects and postoperative analgesia.^{19, 20}

MATERIALS

In this study group we introduced 14 patients of which 7 had unilateral paraspinal block performed with or without light sedation done under ultrasound guidance and 7

⁷. Brown DL. Atlas of Regional Anesthesia. Saunders, Philadelphia, 1992.

⁸. Iurie Acalovschi. Anestezie clinică, ediția a II-a, 2005;25, 556-569.

⁹. Bruce Scott D. Techniques of Regional Anesthesia. Mediglobe, Fribourg, 1995.

received general anaesthesia with orotraheal intubation.²¹ The patients gave their consent for both techniques after receiving all the information regarding the benefits and the risks following the techniques.²² The blocks had been made under ultrasound guidance, inside the operating room, in aseptic conditions.



Fig. 6: Ultrasound image

For the paravertebral block we used:

- ☑ 1% lidocaine for skin infiltration;
- ☑ 0.5-1% ropivacaine for paravertebral infiltration;
- ☑ 21Gx100 mm SonoPlex Stim cannula Needle (Pajunk);
- ☑ Toshiba mobile ultrasound;
- ☑ 100-250 mcgs fentanyl;
- ☑ 2.5-5 mgs midazolam.

For general anaesthesia we used:

- ☑ 2.5-5 mg midazolam for premedication;
- ☑ 100 mcgs fentanyl
- ☑ 100 mgs propofol;
- ☑ 100 mgs succinylcholyne;
- ☑ 20-30 mgs atracurium;
- ☑ 8 mgs dexamethasone;
- ☑ 4 mgs ondasetron based on Apfel score;
- ☑ 5-10 mgs morphine.

RESULTS

PARAVERTEBRAL BLOCK

- ✓ Good surgical comfort given by the block itself with the addition of Fentanyl 100-250 mcgs and Midazolam 2.5-5 mgs.
- ✓ Good analgesia during the surgery and after the surgery for 11-12 hrs when 0.5-0.75% ropivacaine was used and for 15-16 hrs when 1% ropivacaine was used.
- ✓ Better hemodynamic stability during the surgery.

10. Rao F, et al. J Pain Res. Ultrasound guided thoracic paravertebral block enhances the quality of recovery after modified radical mastectomy: A randomized controlled trial, 202

11. Daniel I Sessler et al. Lancet. Recurrence of breast cancer after regional or general anesthesia: a randomised controlled trial, 2019.

- ✓ No nausea and vomiting were recorded to all the 7 patients in the study group after the surgery.
- ✓ No extra analgesia needed during the day of the surgery and early mobilisation
- ✓ of the patients after the surgery.

GENERAL ANAESTHESIA

- ✓ Good comfort during surgery, but more medication used to provide sedation, analgesia and muscle relaxation when needed (we used midazolam, fentanyl, propofol, succinylcholine, atracurium, morphine).
- ✓ Hemodynamic instability immediately post anaesthetic induction.
- ✓ The presence of the risks associated with the maneuver of intubation and extubation of the patient.
- ✓ The use of opioids and NSAIDS after the surgery to provide analgesia and comfort for the patient on the ward-not all the patients had a very good response to oral/iv analgesia on the ward.

CONCLUSION

- The Paravertebral Block can be a very good anesthetic alternative to general anesthesia, but, it has to be done by an experienced anesthesiologist, otherwise the failure of the technique is large and the discomfort of the patient even larger.
- The Paravertebral Block can be a very good option for elderly patients with severe comorbidities where General Anesthesia can influence in a negative way the outcome of the patient.
- General Anesthesia is still a gold standard for breast cancer surgery as every anesthesiologist can manage and every surgeon and nurse is familiar with inside the operating room and after the surgery, on the surgical ward.
- Breast cancer is the most frequently diagnosed cancer in women and ranks second among causes for cancer related death in women. The ability to identify, diagnose and treat breast cancer has improved markedly

ACKNOWLEDGEMENT

All authors had the same contribution.

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4. **Pei L, et al. *PLoS One***. Ultrasound-assisted thoracic paravertebral block reduces intraoperative opioid requirement and improves analgesia after breast cancer surgery: a randomized, controlled, single-center trial, 2015.
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9. **Iurie Acalovschi**. Anestezie clinică, ediția a II-a, 2005;25, 556-569.
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12. **Daniel I Sessler et al. *Lancet***. Recurrence of breast cancer after regional or general anesthesia: a randomised controlled trial, 2019.