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Research Article

Ecoguided Paravertebral Block for Breast Surgery in Rural Areas

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Abstract

Introduction: Paravertebral thoracic block (BPVT) is a locoregional anesthesia technique indicated for the treatment of pain in thoracic and senological surgery, post-traumatic pain and even chronic pain. It is consist in inject a local anesthetic product into the thoracic paravertebral space (EPVT).

Method and Results: This is a prospective cross-sectional and descriptive study involving patients undergoing breast surgery chest ultrasound guided paravertebral nerve block associated with sedation, performed at the Surgical Department of the Sainte Croix Isoanala South surgical unit over a period of 04 years, from January 2014 to December 2017. Our goal is to demonstrate the efficacy of BPVT during the mastectomy. We have operated 29 patients of with an average age of 51.30 ± 10.66 years. Patients are classified ASA II in 82.80% of cases and ASAIII in 17.20% of cases. We used lidocaine adrenaline 1% including 15 ml at T3-T4 and 15 ml at T6-T7. The average time of installation of the sensory block is 12.27 ± 3.70 minutes. The average duration of intervention is 115.48 ± 44.98 minutes. The average duration of the sensory block is 312.62 ± 80.69 minutes. The success of BPVT is observed in 62.10% of cases with a very comfortable state. Partial sensory block was observed in 07 patients, or 24.10% of cases, with the need for further sedation. Four cases of paravertebral block (13.80%) are converted to general anesthesia. During the first 24 hours, the majority of our patients do not need analgesics. Postoperative pain is managed with Paracetamol for the 48 hour. Complications observed were vascular puncture in two patients and postoperative paresthesia in three patients.

Conclusion: The thoracic paravertebral block is home to many interests in breast surgery including an alternative to general anesthesia, postoperative pain management. However, it requires a good mastery of the technical gesture to be effective and to avoid complications.

Keywords: *Locoregional Anesthesia; Thoracic Paravertebral Block; Breast Surgery*

Introduction

Paravertebral chest block is indicated for analgesia after unilateral thoracic surgery or trauma, for chest and abdominal wall anesthesia, and for the treatment of chronic pain [1-3]. According to SFAR (French Society of Anesthetic and Resuscitation) [4], BPVT is also indicated to target anesthetic in breast and chest wall surgery. BPVT consists of the injection of a local anesthetic into the EPVT, located

laterally on each side of the thoracic spine. At the surgical center at Isoanala South, the breast tumor was frequently observed. In Mozambique, the cancer rate is estimated at 2.30% while mortality is not well specified [5]. The only treatment that could be considered was the mastectomy with axillary empting. We chose locoregional anesthesia for safety reasons. The objective of this study is to demonstrate the efficacy and safety of BPVT during the mastectomy in the Isoanala Holy Cross Surgical Antenna.

Materials and Methods

This was a prospective cross-sectional and descriptive study of patients undergoing breast surgery under echoguided thoracic paravertebral block. This study was carried out at the surgery department of the Holy Cross surgical center Isoanala South over a period of 04 years, from January 2014 to December 2017. The pre-anesthetic consultation was systematic before the realization of the block. All (29 patients) patients scheduled for mastectomy were included. Non-inclusion criteria were refusal, abnormal haemostasis, puncture site infection, back malformation, pleuropulmonary pathology, and tumor invading the posterior axillary line. Midazolam 2 mg intravenous was used in patients with anxiety. Continuous monitoring of vital parameters (blood pressure, heart rate, electrocardiogram, SP02, breath rate and temperature) was provided by an electrocardioscope to ensure intraoperative safety. All patients were placed in the left or right lateral decubitus at the time of the puncture according to the location of the tumor. A single resuscitating anesthesiologist performed all the paravertebral blocks in this study. We adopted the ultrasound technique with a transversal plane approach (in-plane) using a 7 MHz linear probe (Figure 1 and 2), followed by sedation for the patient's intraoperative comfort. The probe was protected by a condom. After cutaneous preparation, the 90 mm stimuplex needle is inserted from the medial side into the plane. After aspiration test, infiltration was performed at two levels (T3-T4 and T6-T7) using lidocaine adrenaline 1% including 15 ml at T3-T4 and 15 ml at T6-T7. The good position of the needle was confirmed by the recoil of the plunger moment of infiltration. The cold test was used to evaluate the installation of the sensory block in the territory to be operated. Sedation was carried out using propofol at a dose of 3 mg/kg/h after complete installation of the sensory block and before the incision. The parameters studied were socio-demographic characters, the time of installation of the sensory block (delay between end of the injection of the anesthetic product and the installation of the sensory block), the average duration of intervention, the success rate, the intraoperative comfort of the patient, the complications related to the technique, the duration of the sensory block (delay between the installation of the sensory block and the appearance of the pain), the postoperative pain (evaluated according to the ENS every 4 hours and during 48 hours) and the duration of stay. The criterion of success of the block is defined by a complete sensory block of the territory to be operated with hemodynamic stability and absence of reaction during the intervention. Partial block is defined by the persistence of a thermo-algic sensitivity in certain territories, accompanied by an intraoperative neuro-vegetative disturbance and requiring the deepening of sedation. Failure is defined by the complete absence of a sensory block at the area to be operated, 20 minutes after infiltration and requiring the use of general anesthesia. The data was processed using Microsoft Excel 2010.

Figure 1

Figure 2

Results

During the 4-year study period, 29 patients underwent BPVT mastectomy. The characteristics of the patients are summarized in table 1. The mean age was 51.30 ± 10.66 years. The patients were classified ASA II in 82.8% of the cases and ASAIII in 17.20% of the cases. The average installation time of the sensory block was 12.27 ± 3.70 minutes. The average duration of intervention was 115.48 ± 44.98 minutes. Success was observed in 62.10% of cases with a very comfortable condition, i.e. 18 patients; 24.10% partial block were observed or 07 patients with need for deepening sedation; 04BPVT were converted to general anesthesia because of failure, i.e. 13.80% of cases. Complications observed were vascular puncture in two patients and postoperative paresthesia in three patients. The mean duration of sensory block was 312.62 ± 80.69 minutes. Regarding postoperative pain, during the first 24 hours, only 04 patients require opioid analgesics (ENS ≥ 4), or 14% of cases. The pain was managed with paracetamol for the 48th hour following all patients. The average length of stay was 03 days.

Settings	Peculiarities	Number (n)	Percentage (%)
Patients recruited		29	100
So	ASA II	24	82.80
	ASAIII	5	17.20
Immediate incidents and complications	Paresthesia	03	10.3
	Vascular puncture	02	6.9
Installation delay of sensitive block (minute)	Less than 15 minutes	18	62.1
	More than 15 minutes	11	37.9
Sensitivity block duration (minute)	Less than 300 minutes	12	41.40
	More than 300 minutes	17	58.60
Block performance	Complete block with Comfortable condition	18	62.10
	Partial block + sedation	07	24.10
	Echec + AG	4	13.80

Table 1: *Summary features of patients.*

Discussion

The breast tumor was common in our area. The only treatment that could be considered was the mastectomy. The reference of the patients was almost impossible. The family income of the patients did not allow her to pay for medical expenses in the referral center. Our center is not equipped with a resuscitation service or a recovery room. Management during the perioperative period was often difficult for these patients. For safety reasons, we decided to perform the intervention under locoregional anesthesia, including the paravertebral thoracic block. Concerning the approach, the paravertebral space can be approached in three different ways: blind according to the Eason and Wyatt's classic technique, this technique is practically abandoned since the advent of the ultrasonographic apparatus; intraoperative open surgical technique performed by the surgeon and the ultrasound technique in the plane or out of the plane which is currently recommended using a 5 - 7 MHz probe [6]. A catheter can be introduced into the paravertebral space in order to ensure continuous analgesia [7]. In our study, the ultrasound-guided technique in the plan was adopted in all cases because in this approach, the path of the needle is fully observed. The average installation time of the sensory block and mean sensory block duration in our study were 12.27 ± 3.70 minutes and 312.62 ± 80.69 minutes, respectively. This duration is longer than that of a study conducted in Dakar in 2017 which reported an average delay of installation and an average duration of sensory block of 11.06 ± 4.3 minutes and 265 ± 63 minutes [8].

In Tunisia, in 2017, a study [9] reported that the warming of the anesthetic product caused a shortening of the time of installation of the sensory and motor blocks and an extension of the duration of the sensory block. Our anesthetic products were stored in a warm place with a tropical climate, which could explain the lengthening of the duration of the sensory block in our study. The BPVT ultrasound for breast surgery is a topical anesthetic technique; its feasibility is described by several authors. The technique varies by author, country and availability of anesthetic products. For us, 62% success was observed for double-level infiltration with lidocaine adrenaline, which was the available anesthetic. In Reg in 2010, one study reported an infiltration of ropivacaine followed by propofol sedation for mammectomy [10]. In England in 2010, another study also showed its feasibility by performing dual-level infiltration using 0.75% ropivacaine in the T3-T4 and T6-T7 space, followed by propofol sedation [11]. Another study investigated dual-level infiltration (T2-T3 and T4-T5) using ropivacaine 0.375% followed by ultiva ivse 0.025 µg/kg/min associated with hypnosis; according to them, this association makes it possible to act at the same time on the anesthesia, the analgesia and the perioperative comfort of the patients [12]. For some authors, the quality of the sensory block for multiple injections is better compared to a simple injection [13].

In our study, BPVT was able to manage postoperative pain in the majority of cases during the first 24 hours; Only 04 patients need opioid analgesics like tramadol (ENS ≥ 4), or 14% of the cases. Authors have reported that BPVT can reduce pain in the first 48 hours postoperatively with a reduction in opioid consumption as well as a reduction in the occurrence of postoperative nausea and vomiting [14-16]. Other authors have found the efficacy of a BPVT for postoperative analgesia compared to analgesic systemic or infiltration of the scar [17] [14]. In our study, the complications observed were 02 vascular punctures and 03 paresthesia. One study reported 3.8% to 6.8% vascular puncture, 4.6% hypotension, 1% epidural and contralateral diffusion, 0.5% pneumothorax, spinal nerve trauma, epidural or subarachnoidal puncture, a pulmonary hematoma, a syndrome of Claude Bernard Horner [18]. Other studies have found some complications such as hypotension, bradycardia, pneumothorax, epidural crossing [19]. Block failure in our study was observed in 14% of cases. One study found 10 to 25% failure [18]. Another study found 10 to 13% failure [19].

Conclusion

Breast cancer is common in the rural area south of Madagascar. The reference of patients in a specialized center is almost impossible due to lack of financial means. Mammectomy is the first-line treatment. Intervention is performed under locoregional anesthesia, including the ultrasound paravertebral thoracic block. The thoracic paravertebral block consists of multiple interests in breast surgery including an alternative to general anesthesia, postoperative pain management, decreased occurrence of postoperative nausea and vomiting, early rehabilitation. However, it requires a good mastery of the technical gesture to be effective and to avoid complications.

Bibliography

1. Matthews PJ and Govenden V. "Comparison of continuous paravertebral and extradural infusions of bupivacaine for pain relief after thoracotomy". *British Journal of Anaesthesia* 62.2 (1989): 204-205.

2. Richardson J., *et al*. "A prospective, randomized comparison of preoperative and continuous balanced epidural or paravertebral bupivacaine on post-thoracotomy pain, pulmonary function and stress responses". *British Journal of Anaesthesia* 83.3 (1999): 387-392.

3. Davie RG., *et al*. "A comparison of the analgesic efficacy and side effects of paravertebral block vs epidural blockade for thoracotomy- a systematic review and metaanalysis of randomized trials". *British Journal of Anaesthesia* 96.4 (2006): 418-426.

4. F Bonnet., *et al*. "Le bloc paravertebral: technique et indications". 51eme congrès national d'anesthésie et de réanimation. Médecins. Conférence d'actualisation. Elsevier Masson SAS (2009).

5. P Touré. "Bilan de la prise en charge des cancers du sein chez la femme". Expériences annales de Pathologie. Masson Paris (2003): 23492-23495.

6. Karmakar MK., *et al*. "Real-time ultrasound-guided paramedian epidural access: evaluation of a novel in plane technique". *British Journal of Anaesthesia* 102.6 (2009): 845-854.

7. Sabanathan S., *et al*. "Efficacy of continuous extrapleural intercostal nerve block on post- thoracotomy pain and pulmonary mechanics". *British Journal of Surgery* 77.2 (1990): 221-225.

8. Leye PA., *et al*. "Evaluation de la pratique du bloc axillaire échoguidé auCHU Aristide Le Dantec de Dakar". *Revista Africa Anesthésiologica Medicine Urgence* 22.1 (2017): 53-57.

9. Trabelsi W., *et al*. "Effect of warming bupivacaine 0.5% on ultrasound-guided axillary plexus block. Randomized prospective double-blind study". *Orthopedics and Traumatology: Surgery and Research* 103.1 (2017): 71-75.

10. Renes SH., *et al*. "In plane ultrasound-guided thoracic paravertebral block: a preliminary report of 36 cases with radiologic confirmation of catheter position". *Regional Anesthesia and Pain Medicine* 35.2 (2010): 212-216.

11. Marhofer P., *et al*. "Lateral ultrasound-guided paravertebral blockade: an anatomical-based description of a new technique". *British Journal of Anaesthesia* 105.4 (2010): 526-532.

12. Bouzinac A., *et al*. "Hypnose et bloc paravertébral échoguidé dans la chirurgie du cancer du sein". *Annales Françaises d'Anesthésie et de Réanimation* 31.7-8 (2012): 644-645.

13. Zoher M and Mariam El-Rajab. "Thoracic paravertebral Bloc: influence of the number of injections". *Regional Anesthesia and Pain Medicine* 31.3 (2006): 196-201.

14. Schnabel A., *et al*. "Efficacy and safety of paravertebral blocks in breast surgery: a meta-analysis of randomized controlled trials". *British Journal of Anaesthesia* 105.6 (2010): 842-852.

15. O'Rian SC., *et al*. "Thoracic paravertebral blocks using real-time ultrasound guidance". *Anesthesia and Analgesia* 110.1 (2010): 248-251.

16. Bouzinac A., *et al*. "Intérêt de l'échographie dans la réalisation du bloc paravertébral thoracique en chirurgie mammaire". *Annales Françaises d'Anesthésie et de Réanimation* 30.5 (2011): 453-455.

17. Marret E., *et al*. "Efficacité des techniques d'anesthésie locorégionale après chirurgie du sein: une méta-analyse". *Annales Françaises d'Anesthésie et de Réanimation* 25.9 (2006): 947-954.

18. Lonnqvist., *et al*. "Paravertebral blockade failure rate and complications". *Anesthesia* 50.9 (1995): 813-815.

19. Youssef Tahiri., *et al*. "General anesthesiaversus thoracic paravertebral block for breast surgery: a meta-analysis". *Journal of Plastic, Reconstructive and Aesthetic Surgery* 64.10 (2011): 1261-1269.

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