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CASE REPORT

THE DYNAMIC "TSUNAMI-SIGN" TO REPLACE THE "DOUBLE-V SIGN" FOR AN EFFECTIVE INTERFASCIAL BLOCK? A CASE OF INTERFASCIAL BLOCK IN BREAST LYMPHOMA

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ABSTRACT: In breast surgery, radical procedures such as mastectomies, previously performed only under general anesthesia, are now performed with a patient sedated by wall blocks. Wall blocks are also called fascial blocks and consist in the injection and propagation of local anesthetic through the fascial district where vascular structures and nerves run along; this allows the spread of anesthetic even far from the injection site.
The aim of the study was to point out the importance of the dynamic progression of local anesthesia in the interpectoral fascia. The fascial block was difficult to execute, because the neoformation also infiltrated the fascial plan. In this way, we overcame the obstacle with the needle and observed the progress of the local anesthetic so that we had good anesthetic coverage. This study is limited by the fact that it is only one patient, but the concept of dynamic progression of local anesthetic has already been written by other authors (1).

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Impact statement: This manuscript arises from the attention paid to the fascial block of increasing interest in anesthesiological practice. We understood, drawing on the clinic and also on the bibliography on the subject, that the dynamic execution of the block allows a better performance.

Abbreviations: IPP: InterPectoral Plane Block; NaCl: sodium Chloride; PM: Pectoralis Major; Pm: Pectoralis minor; N: Needle; "arrows" indicates the spread of anesthetic.

Key words: *fascial plane block; echoguided block; breast lymphoma.*

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INTRODUCTION

Over the past few years, the concept of fascia has been increasingly developed as an appropriate organ system with the function of connecting muscles, nerves, and blood vessels. Some surgical areas such as breast surgery, where radical procedures such as mastectomies, previously performed only under general anesthesia, are now performed with a patient sedated by wall blocks. Recent studies (2) have suggested that an injection might be considered successful when the "Double V" sign appears (a form of hypoechoic elliptical lens between muscles). It is now still used to confirm the correct execution of all inter-fascial plane blocks because, when the injection is correctly performed, and it is characterized by the spread of local anesthetic that widens until it disappears within the fascial plane.
Today, thanks also to the results on the corpse, it was observed that the appearance of adhesions, fibrous septae, often due to recent interventions, or chemo therapy or radiotherapy can compro-

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mise the spread of local anesthetic, as evidenced by some studies (3).

It is therefore as important to look for the sign of double V, as to dwell on the progress of the local anesthetic. As reported by Fusco (4), the block is effective when the propagation of local anesthesia in the fascia progresses like a wave, so we are sure to have performed an efficient fascia block not only when we have the sign Double V, but also when the target structure progressively opens and expands until disappearing on both sides of the screen.

The aim of the study was to point out the importance of the dynamic progression of local anesthesia in the interpectoral fascia; it is not enough in fact that the only detachment of the band occurs and that we observe a hypoechoic ellipsoid area, but it is also necessary to observe the progression within the band. This study is limited by the fact that it is only one patient, but the concept of dynamic progression of local anesthetic has already been written by P. Scimia *et al*. (1) about a TAP block that becomes a QL block. To execute this block "written" consent was obtained from patient for the publication of this case report.

Figure 1. *A 3 cm diameter view of lymphoma in the outer quadrants of the right breast.*

CASE DESCRIPTION

We report the case of the Inter Pectoral Plane (IPP) block in a 45-year-old woman who underwent broad excision of a voluminous (3 centimeters in diameter) intradermal lymphoma of the right external upper quadrant (**Figure 1**), which extended to the axillary cable (**Figure 2**). She was ASA III due to previous heart failure, high obesity (body mass index 30 kg/m^2) and chronic obstructive pulmonary disease. She had been suffering from about three months of fever, fatigue. Blood tests at the hospital showed lymphocytopenia. The patient reported that the lymphoma had increased in about a month. The block was made using a 50 mm 22 G needle for the IPP block and injecting the first 3 ml of NaCl (sodium chloride). Massive lymphoma infiltrated fascial plan between pectoralis major and minor (**Figure 3**). It was difficult to advance the needle and let the NaCl spread, so despite the Double-V sign evidence, it was confined to a circumscribed area of the fascia. Because it would have been difficult to move the needle forward on the obstacle, we injected 5 ml more of saline solution, that opened the way and let the needle overstep the neoformation. At this stage, a much more homogeneous and

Figure 2. *Lymphoma also extended into the axillary region.*

widespread Double-V sign was achieved, and we were able to inject 60 mg of Ropivacaine 0.75% + Dexamethasone 2 mg. The spread of the local anesthetic was homogeneous and dynamic because we had overcome the obstacle represented by lymphoma: like a "tsunami" wave, it has been spread evenly along the fascia. This makes us understand how the fascial compartment is dynamic and allows the spread of anesthetic even very far from the injection site, and that the only sign of the Dou-

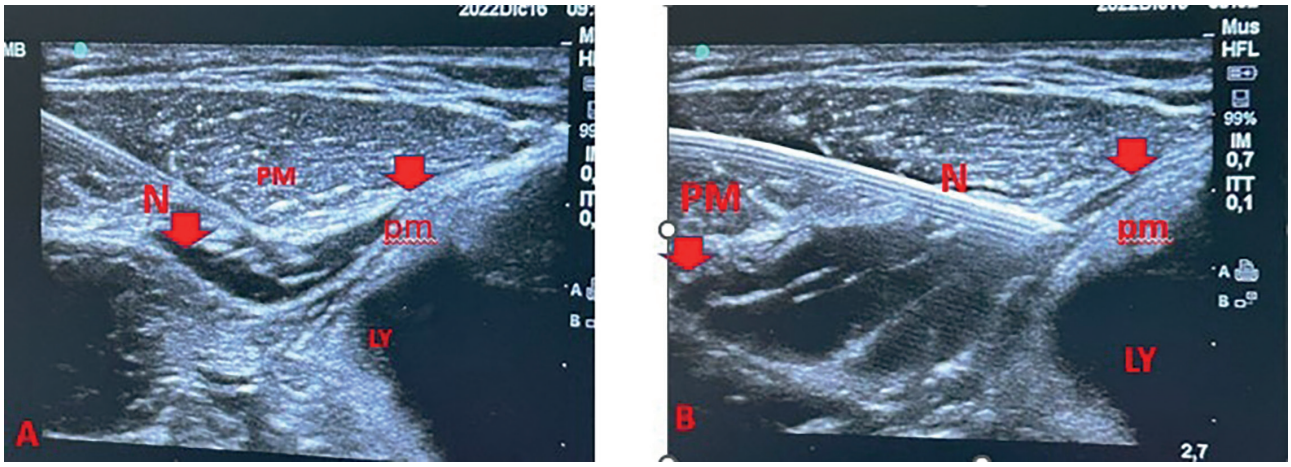

Figure 3. *Execution of the block. (**A**) static double V sign; (**B**) tsunami effect.*

ble V is not enough, because we could be in the fascial compartment, be sure to inject, but that for any obstacle the blockade then fails. It is therefore important as evidenced by other authors to follow in a dynamic way the execution of the block. The patient was lightly sedated with di-isopropilfenol in a targeted controlled infusion of 1 mcg/ml and spontaneously breathed with nasal cannula. In this case it would have been appropriate to also perform a serratus plane block, but given the extension of the neoplasia, it would have been difficult to execute.

No hemodynamic changes were reported (**Table 1**), no signs or symptoms associated with brain lesions were detected. The patient was prematurely discharged from hospital within the next eight hours; only intravenously administered 1 g paracetamol was prescribed as a Numeric Rating Scale <2.

DISCUSSION

We can affirm that in addition to the static sign of the spread of local anesthetic, by checking the sign Double V, it should be important to find the dynamic spread of anesthesia in the fascial district. The so-called "tsunami sign" would help us better understand how important it is that the progression of the local anesthetic would be followed step by step during the execution of the block, and that it would spread homogeneously like a wave, because the opening of the fascial plane by the saline solution promotes the advancement of the needle inside this compartment and facilitates injection of the local anesthetic and its distribution, due to the rupture of the fibrous septa. If we do not get a homogenous stream of NaCl first, we could fail. Thus, in many cases with difficulties in spreading anesthesia in the fascial compartment, it is suggested to carefully overcome obstacles that could lead to block failure. The "tsunami effect" is first visualized before the progression of the needle, when we inject NaCl, then consists of a dynamic progression of local anesthesia, which confirms the success of the block. Besides "double V" sign, we suggest "tsunami" as a definition of the fascial block dynamic sign, because once the needle is properly positioned, the local anesthetic will propagate to the target location as a waveform. The so-called "tsunami sign" would help us better understand how important it is that the progression of the local anesthetic would be followed step by step during the

Table 1. *Hemodinamic and SpO_2 trends during intervetion.*

TIME OF SURGERY IN MINUTES	0	15	25	35	45	60	90
SYSTOLIC PRESSURE	120	110	115	110	102	105	120
DIASTOLIC PRESSURE	60	66	65	60	70	71	70
SPO_2	100	99	99	99	100	100	100
HEART RATE	75	70	69	67	71	69	71

execution of the block and allows us to understand how anatomical structures seemingly even distant from each other are connected to each other and accessible from the anesthetic even at a distance.

COMPLIANCE WITH ETHICAL STANDARDS

Fundings

There were no institutional or private fundings for this article.

Conflict of interests

The Authors have declared no conflict of interests.

Availability of data and materials

The availability of data and materials is personal and derives from the daily activity of the operating room.

Authors' contributions

CDE performed the block and ideated the Tsunami sign; PF provided the images; MT contributed to write the manuscript; GS drew up the tables and supervised the manuscript.

Ethical approval

Human studies and subjects

Approved by the Internal Committee.

Animal studies

N/A.

Publications ethics

Plagiarism

The contents of the article are original and any overlaps with other articles are by the Authors themselves and appropriately cited.

Data falsification and fabrication

All the data correspond to the real.

REFERENCES

1. Scimia P, Gentili L, Fusco P, Tedesco M, Tognu A, Sepolvere G. When a TAP becomes a QL block: a dynamic way to perform the fascial blocks. Minerva Anestesiol. 2022;88:976-8. doi: 10.23736/S0375-9393.22.16772-6.
2. Fusco P, Petrucci E, Marinangeli F, Scimia P. Block failure or lack of efficacy? The "Double V" sign: a novel sonographic sign for a successful interfascial plane block. Minerva Anestesiol. 2019;85(8):917-8. doi: 10.23736/S0375-9393.19.13457-8.
3. Behr AU, Chan VWS, Stecco C. Living versus cadaver fascial plane injection. Reg Anesth Pain Med. 2019:rapm-2019-100893. doi: 10.1136/rapm-2019-100893.
4. Fusco P, Petroni GM, Ciaschi W, Tonelli E, Marinangeli F, Stecco C. Dynamic double V sign: another step to the efficacy of fascial plane block. Minerva Anestesiol. 2022;88(12):1079-81. doi: 10.23736/S0375-9393.22.16773-8.
5. Sepolvere G, Tognù A, D'Errico C, Tedesco M, Cristiano L, Scialdone VR, Borghi B. Bilateral erector spinae block combined with awake sedation for cancer breast surgery in a seriously ill patient. Minerva Anestesiol. 2021;87(1):117-8. doi: 10.23736/S0375-9393.20.14918-6.
6. Bagaphou TC, Santonastaso DP, Cerotto V, Carli L, Cordellini M, Chiotti V, et al. Combined PECs II block with parasternal block for awake radical mastectomy. Minerva Anestesiol. 2022;88(12):1078-9. doi: 10.23736/S0375-9393.22.16785-4.