


Original Research Article

Peripheral Nerve Blocks in the Management of Postherpetic Neuralgia: An Effective Interventional Technique for Improving Patients' Quality of Life

Traore M.M.¹, Leye P.A.¹, Gaye I², Ba E.H.B.¹, Fall C², Faye A², Thiome C.O.L², Toure M.S², Faye A.B², Camara L², Niass E.T², Ndiaye M¹, Diouf E¹

¹Cheikh Anta DIOP University, Dakar, Senegal

²Dalal Jamm Hospital, Dakar, Senegal

Article History

Received: 24.11.2024

Accepted: 31.12.2024

Published: 05.02.2025

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code

Abstract: Introduction: Complications such as postherpetic neuralgia (PHN) are the most common in herpes zoster infection. The pain is often severe and can lead to impact the quality of life whereas the treatment of this kind of pain is challenging. We performed ultrasound guided nerve block for pain relief. **Patients and methods:** During the period from March 2023 to May 2024, we conducted a single-center, prospective and descriptive study covering all patients who had post-herpetic neuralgia (PHN) with a DN 4 score $\geq 5/10$. The nerve blocks were performed under ultrasound regarding the metamere involved. The analgesic solution was ropivacaine 0,2% and dexamethasone 4mg. **Results:** The average age of our patients was 64.38 years and the sex ratio was 1.16. The majority had a score of more than 7/10, or 46% of the workforce. In 38% of cases the EVA was 7/10. The pain was accompanied by sensory disturbances such as cutaneous hyperesthesia in 62% of cases. Regarding the impact, a deterioration in general condition WHO stage 2 was noted in 61.6% of cases. In 23% of cases, pregabalin 75 mg was added to the paracetamol and tramadol combination. Haloperidol 5mg and amitriptyline 125mg were associated with these treatments in 1 case each, 7% of the total. Ultrasound guided paravertebral nerve block was mostly performed in 54% of cases. After 3 months of monitoring, 12 patients noticed their VAS score drop to 1/10. Only one needed a perineural catheter placement for pain relief. **Conclusion:** Peripheral nerve blocks is a good option in severe PHN where systemic analgesic failed.

Keywords: Postherpetic neuralgia, ultrasound nerve block, ropivacaine, dexamethasone.

Copyright © 2025 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

In the general population, the annual frequency of herpes zoster is estimated at 1.5 to 4 new cases per thousand [1]. It affects 25% of the population and the incidence increases with age [2]. Complications such as postherpetic neuralgia (PHN) are the most common. At 3 months, 18.8% of patients continue to have pain and at 12 months, this percentage drops to 7.6% [3]. It represents a challenge for the medical practitioners because of their impact on quality of life. The management of PHN is complex and involves different drug treatments that remain ineffective in 30% of cases [4]. As reported in many publications, the treatment of this pain remains a challenge. In Senegal, no interventional treatment was proposed; patients were followed by non-pain specialist physicians. In this

preliminary study, we propose an ultrasound-guided peripheral nerve block of the metamere affected by the disease with the main objective of evaluating its effectiveness.

PATIENTS AND METHODS

We conducted a prospective observational and interventional study carried out over a period of 14 months, from March 2023 to May 2024 at the Sassoum Leye DIOP private medical clinic. All consent were obtained.

Inclusion Criteria

We included in our study all patients who had postherpetic neuralgia with a DN4 scale score $\geq 5/10$ and been affected in their daily activity.

Non-Inclusion Criteria

All patients who had postherpetic neuralgia refusing treatment or who had a contraindication of nerve block were not included. Patients in whom communication could not be established or telephone follow-up could not be ensured. Concerning continuous block by perineural catheter, patients who lived more than 10 km from the center were also not included.

Interventional Procedure

Patient preparation: After a medical consultation assessing the patient and the possible contraindications to the nerve block, the painful symptoms were traced in their chronology, clinical manifestations and consequences. The clinical survey used the DN4 questionnaire before a local physical examination and a general examination. The patient, depending on the location of the lesions, was informed of the procedure, the monitoring methods at 30 min at H24 and H48. Possible complications were explained. After monitoring the pulsed oxygen saturation and the electrocardiographic trace, the patient was installed according to the type of infiltration procedure indicated.

Practical implementation of nerve blocks:

The block was performed under ultrasound guidance (Sonosite®ICU, USA) with a multifrequency linear probe (L38) 8 to 13 Mhz,

- The patient being comfortably seated on the Table. A 2-stage dabbing with betadine and an alcoholic solution in the event of healed lesions. The ultrasound probe was protected by a sterile sheath and the operator proceeds wearing sterile gloves and a sterile gel; failing that, yellow betadine serves as an interface gel between the probe and the puncture site.

- The injected solution was ropivacaine 2mg/ml combined with dexamethasone 4mg in a single dose of 15ml or continuously via a perineural catheter with reinjections of 10 ml/24h
- Paravertebral, trigeminal, erector spinae and femoral blocks

They were carried out by introducing the solution into the passage space of the nerves for wild spread blocks or around the affected nerve in the case of a truncal block.

After the puncture procedure, the patient was laid on the bed for close monitoring for 45 min. Verbal contact was maintained throughout the procedure.

The verbal analog scale (VAS) score was assessed at 5 min, 10 min–20 min and 30 min before the patient was discharged from the clinic. Sleep quality and resumption of activities were also assessed upon returning home. A 3-month follow-up was established.

The results of our study were presented as means and standard deviations for quantitative variables and as percentages for qualitative variables. The data were analyzed using SPSS (Statistical Package for Social Sciences) Statistics version 25 software.

RESULTS

A total of 15 eligible patients, 13 of whom were included and 2 lost to follow-up. The mean age of the patients was 64.38 with extremes of 45 and 83 years. The age groups of 51-60 years and 61-70 years were the most represented. Figure 1 illustrates this distribution.

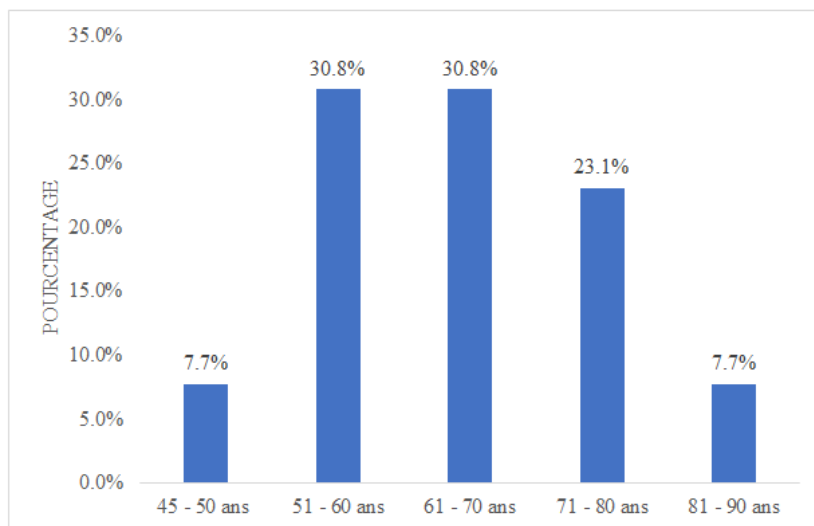


Figure 1: Distribution of patients by age group

Postherpetic neuralgia was predominantly in men, 54% of the population (7 men). The sex ratio was 1.16. The following diagram shows this distribution.

The patients had comorbidities and conditions, the distribution of which is illustrated in Table I.

Table I: Distribution of comorbidities and conditions

Medical history	Effective	Percentage
HTA	4	46%
Malnutrition	2	15%
Type 2 diabetes	2	15%
Asthma	1	6%
AVCI	1	6%
Hyperthyroidism	1	6%
Rheumatoid arthritis	1	6%

Clinical characteristics of patients

The patients received for postherpetic neuralgia came mostly at 3 months, i.e. 7 patients, the rest between 4 months and 2 years. Intercostal zoster was the main

location, i.e. 7 patients (54%). Table II gives the distribution of the different topographies of zoster in our patients.

Table II: Distribution of lesions according to topography

Topography	Effective	Percentage
Intercostal	7	54%
Ophthalmic	2	15%
Inguino-crural	2	15%
Lumbosacral	1	8%
Cervico-brachial	1	8%

Associated signs and therapeutic data

Cutaneous hyperesthesia was the main expression of these sensitivity disorders found in 8

patients or 62%. Before infiltration, these oral drug treatments were found at a frequency illustrated by Table III.

Table III: Distribution of the different analgesics used

Painkillers administered	Effective	Percentage
Paracetamol 1000 mg	2	15%
Paracetamol 1000 mg + tramadol 75 mg	2	15%
Tramadol 75 mg	3	23%
Tramadol 75 mg, paracetamol 1000 mg, haloperidol 5 mg	1	7%
Tramadol 75 mg, paracetamol 1000 mg, pregabalin 75 mg	3	23%
Tramadol 75 mg, pregabalin 75 mg	1	7%
Tramadol 75 mg, pregabalin 75 mg, amitriptyline 125 mg	1	7%

Pain assessment according to DN4 score

The DN4 questionnaire used during the medical consultation showed this distribution in Figure 3. The majority had a score of 7/10.

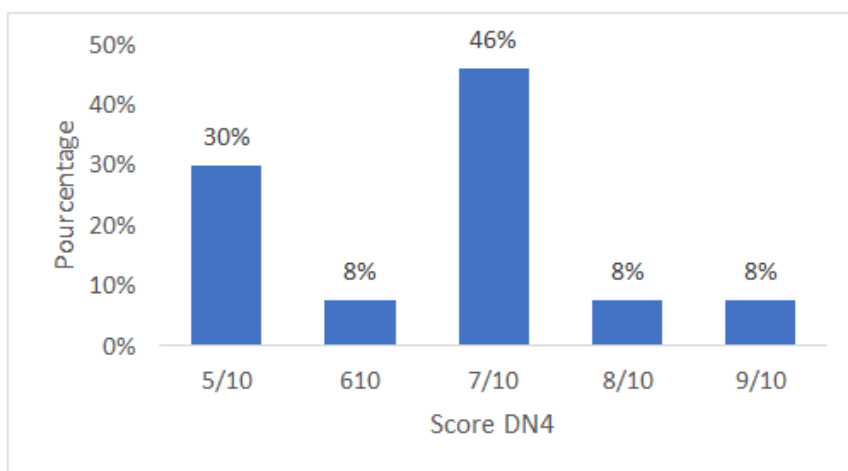


Figure 2: Distribution of the DN4 score in the cohort

VAS score

Most patients had a score of 70/100mm. Only one patient had a maximum pain of 100/100. The different VAS values are recorded in Table IV.

Table IV: Distribution of VAS score

VAS	Effective	Percentage
5/10	1	8%
6/10	2	15%
7/10	5	38%
8/10	3	23%
9/10	1	8%
10/10	1	8%

Impact of pain on daily activity:

In 61.6% of our patients, there was a reduction in daily activities according to the WHO score.

Table V: Impact of pain on the general condition of patients

WHO Stadium	Effective	Percentages
0	0	0
1	2	15.4%
2	8	61.6%
3	3	23%
4	0	0

Insomnia was almost permanent in 11 patients and 2 of the cohort presented psychological disorders such as irritability and mood disorders.

Therapeutic data by peripheral nerve block

These different nerve blocks were performed dictated by the location of the post-herpetic pain. The paravertebral block was the most frequent, i.e. 8 out of 13 (Table VI).

Table VI: The different types of nerve block

Nerve block	Effective	Percentage
Paravertebral block	8	61.5%
Ophthalmic nerve block	2	15.38%
Erector spinae block	2	15.38%
Obturator nerve block	1	7.7%

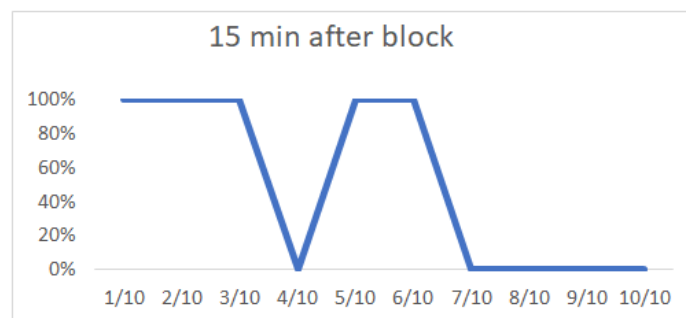
The duration of the act was 10 min in 54% of cases. However, a duration of approximately 15 min was noted in 23% of cases.

In more than half of the patients we did not need a 2nd infiltration. However, 6 of our patients had benefited from repeated blockade due to persistent pain and two of our patients from a 3rd infiltration.

In one case (ophthalmic zoster) we performed more than 3 infiltrations before placing a catheter along the path of the superficial branches of the ophthalmic nerve.

Pain intensity according to EVA before and after infiltration

The evolution of the pain was followed for 3 months. The different variations of the VAS are represented by the curves which follow in Figure 3.



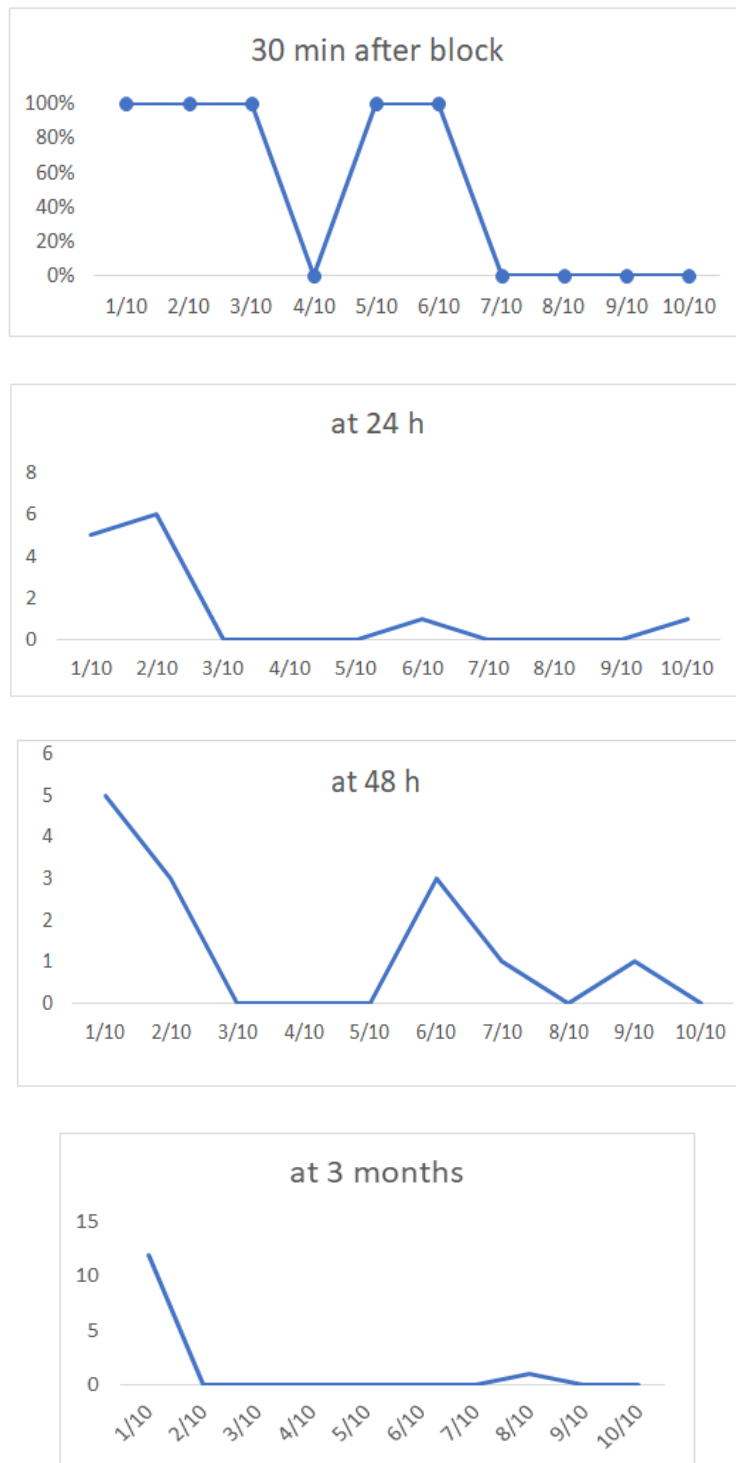


Figure 3: Pain scale assessment following 15 min, 30 min, 24 h, 48 h and 3 months

Assessment according to WHO score after the block

About 85% of patients had their general condition improved with a WHO stage of 1/5. The assessment period was done according to the following rhythm: 1 week then 2 weeks up to 3 months.

DISCUSSION

In this interventional and observational study, peripheral nerve blocks demonstrated a certain efficacy

in postherpetic pain. Pain scores according to VAS up to 48 hours to 3 months decreased significantly; improving comfort, quality of sleep and daily activity of patients for at least a week. This finding in our observational study justifies the place of peripheral nerve blocks as a therapeutic option against this pain which can be considered as a disease due to its harmful consequences. Currently its management is a challenge and poses a lot of difficulty for dermatologists and internists most often confronted with this type of patient. In several studies,

this challenging chronic pain is highlighted in several proposed treatment regimens [5]. Therapies include different types of associative analgesics such as systemic analgesics, psychotherapy and interventional treatment. Systemic analgesics include nonsteroidal anti-inflammatory drugs, opioids, antidepressants and antiepileptics. These therapeutic classes are the most common in first-line care accessible to colleagues in dermatology and internism medicine. In our low-resource context, other therapeutic options remain mostly inaccessible. Therefore, peripheral nerve blocks constitute a real effective therapeutic option against this type of pain. They have proven their effectiveness in cases of atrocious PHN that are resistant to conventional analgesics. Roelands *et al.*, recently in a letter to the editor demonstrated the interest of the superficial cervical block under ultrasound guidance in front of a PHN of the face with a single injection of ropivacaine at high concentration 0.75% associated with methylprednisolone. A complete remission of pain was obtained at 2 weeks and a 70% improvement of the symptoms at 6 weeks. Other cases have been described in the literature underlining an efficacy in acute herpes zoster pain [6]. Of the 3 other cases found in the literature, only one of the patients progressed to chronicity of his pain [7].

In this study, several types of peripheral nerve blocks were proposed if the metamere was accessible to ultrasound based on the pathophysiology of PHN. The paravertebral block was the most frequent compared to other types of block, certainly due to the frequency of intercostal zoster. The ultrasound-guided paravertebral block was preferred to the epidural for its easier performance, its unilateral nature and its fewer complications. On the technical level, ultrasound has put this block back in the saddle by ensuring a higher level of safety compared to landmark techniques [8]. The ultrasound-guided approach guarantees a more precise action on the target because the nerve structures and diffusion spaces are visualized. In terms of safety, the needle and the pleura, which are fundamental landmarks, are also visualized during the procedure. These safety principles during the procedure largely explain the low complication rate [9, 10].

In our study we used ropivacaine 0.2% associated with dexamethasone 4 mg for a low concentration analgesic block of local anesthetic and a corticosteroid as an adjuvant. The dexamethasone used here has the advantage of prolonging the sensory block and acting on the inflammatory component of the pain [11, 12]. Other therapeutic options can be conducted in PHN even if their superior efficacy has not been demonstrated. Topical capsaicin and lidocaine have given satisfactory results but the unavailability in our country of these therapeutic forms does not allow them to be offered to patients. Thus, peripheral nerve blocks technically accessible to most of anesthesiologists are a relevant option for these patients whose pain constitutes

a major handicap by the alteration of their quality of life. Moreover, there is no consensus in the management of this type of pain, pain teams go according to their accessible choice [4].

The real question is the need for a continuous block for some patients who have a recurrence of pain after a first injection without significant improvement in clinical symptoms. In our context, the choice of the continuous block must be carefully considered, taking into account the complications inherent to a perineural catheter but especially its management at home. Most of our patients live in an unfavorable environment quite far from the medical site. The lack of education and paramedical staff available for the administration of boli and the management of adverse effects argue for abstention from any placement of a perineural catheter if the necessary conditions are not met.

The limitations of this study are the small sample size to assess the complications inherent to each technique. However, the complications are commons on the complications of peripheral nerve blocks, which are quite well known in peripheral locoregional anesthesia [13]. The observational nature also constitutes a certain limitation of this series. On the other hand, the expectacular regression of pain scores after the block at 15 min and 30 min allows us to clearly conclude on the effectiveness of peripheral blocks in PHN. The question of continued effectiveness is nowadays debatable for certain patients for whom several reinjections or even the placement of a catheter for up to 3 weeks is an absolute necessity to guarantee significant and lasting relief.

CONCLUSION

Post zoster neuralgia is still a challenging pain where several treatments are given worldwide. Any of them showed a real superiority. Pain physicians regarding their context offer an analgesic available, then in ours low setting situation nerve block can be a reliable option. It demonstrates in our study an efficacy and a safety by ultrasound guided. Patients improved their quality of life and daily activity. We suggest to perform peripheral nerve block as a therapeutic option against PHN in patient whom pain remains severe.

REFERENCES

1. Gnann, J. W., & Whitley, R. J. (2002). Herpes Zoster. *N Engl J Med*, 347, 340-346.
2. Johnson, R. W. (2010). Herpes zoster and postherpetic neuralgia. *Expert review of vaccines*, 9(sup3), 21-26.
3. van Wijck, A. J., & Aerssens, Y. R. (2017). Pain, itch, quality of life, and costs after herpes zoster. *Pain Practice*, 17(6), 738-746.
4. Adriaansen, E. J., Jacobs, J. G., Vernooij, L. M., van Wijck, A. J., Cohen, S. P., Huygen, F. J., & Rijdsdijk, M. (2024). 8. Herpes zoster and post herpetic neuralgia. *Pain Practice*, 1-16.

5. Hempenstall, K., Nurmikko, T. J., Johnson, R. W., A'Hern, R. P., & Rice, A. S. (2005). Analgesic therapy in postherpetic neuralgia: a quantitative systematic review. *PLOS medicine*, 2(7), e164.
6. Roelands, S., Lebrun, C., & Soetens, F. (2022). Ultrasound-guided superficial cervical plexus block in the treatment of post-herpetic neuralgia. *Pain Practice*, 22(3), 414-415.
7. Park, K. B. (2015). Superficial Cervical Plexus Block for Acute Herpes Zoster at C3-4 Dermatome. *Keimyung Medical Journal*, 34(2), 152-156.
8. Ardon, A. E., Lee, J., Franco, C. D., Riutort, K. T., & Greengrass, R. A. (2020). Paravertebral block: anatomy and relevant safety issues. *Korean J Anesthesiol*, 73(5), 394-400.
9. Saran, J. S., Hoefnagel, A. L., Skinner, K. A., Feng, C., & Smith, D. I. (2017). Comparison of single-injection ultrasound-guided approach versus multilevel landmark-based approach for thoracic paravertebral blockade for breast tumor resection: a retrospective analysis at a tertiary care teaching institution. *Journal of Pain Research*, 1487-1492.
10. Patnaik, R., Chhabra, A., Subramaniam, R., Arora, M. K., Goswami, D., Srivastava, A., ... & Dhar, A. (2018). Comparison of paravertebral block by anatomic landmark technique to ultrasound-guided paravertebral block for breast surgery anesthesia: a randomized controlled trial. *Regional Anesthesia & Pain Medicine*, 43(4), 385-390.
11. Traore, M. M., Leye, P. A., Doussoumou, E., Bah, M. D., BA, E. B., Gaye, I., Ndoeye, M. D., Beye, M. D., & Diouf, E. (2019). Dexamethasone as an adjuvant in the axillary echoguided block: prospective single-blind, non randomized study. *J Anesth Int Care Med*, 9(2), 555759.
12. Desmet, M., Braems, H., Reynvoet, M., Plasschaert, S., Van Cauwelaert, J., Pottel, H., ... & Van de Velde, M. (2013). IV and perineural dexamethasone are equivalent in increasing the analgesic duration of a single-shot interscalene block with ropivacaine for shoulder surgery: a prospective, randomized, placebo-controlled study. *British journal of anaesthesia*, 111(3), 445-452.
13. Moharam, S. A., Elshikh, A., Abdelbadie, M., Ibrahim, A. M., Shaheen, M. M. K., & ElSharkawy, M. S. (2024). Efficacy of adding ketamine to levobupivacaine in paravertebral block on acute and chronic pain in thoracotomy: a randomized controlled double-blinded trial. *Pain reports*, 9(6), e1206.

Cite this article: Traore M.M, Leye P.A, Gaye I, Ba E.H.B, Fall C, Faye A, Thiome C.O.L, Toure M.S, Faye A.B, Camara L, Niass E.T, Ndiaye M, Diouf E (2025). Peripheral Nerve Blocks in the Management of Postherpetic Neuralgia: An Effective Interventional Technique for Improving Patients' Quality of Life. *EAS J Anesthesiol Crit Care*, 7(1), 19-25.
