Agri 2023;35(4):273–277
doi: 10.14744/agri.2021.43926

CASE REPORT

The effectiveness of the erector spinae plane block using methylprednisolone and bupivacaine in post-herpetic neuralgia: Case series

Post herpetik nevraljide metilprednizolon ve bupivakain kullanılarak yapılan erektör spina plan blokunun etkinliği: Olgu serisi

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Summary

Post-herpetic neuralgia (PHN) is the most common chronic complication of herpes zoster and the most common pain syndrome associated with infections. There are medical and interventional treatment options in PHN, and some patients may be resistant to the preferred medical treatments. This situation negatively affects the quality of life of the patient. Interventional treatments come to the fore, especially in patients in whom medical treatments are not sufficient, and systemic side effects such as hepatotoxicity and nephrotoxicity occur. Erector spinal plane block (ESPB) is a recently described ultrasound-guided regional anesthesia technique. It is especially used to prevent post-operative pain due to trunk surgeries. In this study, ESPB was administered with methylprednisolone and bupivacaine in five patients who developed PHN after thoracic herpes zoster and did not have an expected response to three-month medical treatments. Pain severity was assessed using the Numerical Pain Rating Scale. We want to emphasize that ESPB, which is applied with steroids and anesthetics, is a speedy and longacting treatment option that increases the quality of life of the patient, has low side effects, and is a cost-effective treatment option.

Keywords: Chronic pain; interventional ultrasound; local anesthetic; methylprednisolone acetate; pain management.

Özet

Post herpetik nevralji, herpes zosterin en sık görülen kronik komplikasyonudur ve enfeksiyonlarla ilişkili en sık görülen ağrı sendromudur. Post herpetik nevraljide medikal ve girişimsel tedavi seçenekleri bulunmaktadır ve bazı hastalar öncelikle tercih edilen medikal tedavilere dirençli olabilmektedir. Bu durum hastanın yaşam kalitesini oldukça olumsuz etkilemektedir. Özellikle medikal tedavilerin etkin olmadığı, hepatotoksisite ve nefrotoksisite gibi sistemik yan etkilerin ortaya çıktığı hastalarda girişimsel tedaviler ön plana çıkmaktadır. Erektör spina plan bloku son zamanlarda tanımlanan ultrasonografi eşliğinde uygulanan bir rejyonel anestezi tekniğidir. Bu çalışmada, torakal herpes zoster sonrası post herpetik nevralji gelişen ve üç aylık sürede uygulanan medikal tedavilere beklenen yanıt alınamayan beş hastada metilprednizolon ve bupivakain ile erektör spina plan bloku uygulandı ve ağrı şiddeti sayısal ağrı derecelendirme ölçeği ile değerlendirildi. Steroid ve anestezikler ile yapılan erektör spina plan blokunun, post herpetik nevralji tedavisinde oldukça hızlı ve uzun etkili, hastanın yaşam kalitesini yükselten, yan etkisi düşük ve ucuz bir tedavi seçeneği olduğunu vurgulamak istiyoruz.

Anahtar sözcükler: Kronik ağrı; girişimsel ultrasonografi; lokal anestezik; metilprednizolon asetat; ağrı tedavisi.

Introduction

Varicella-zoster virus is a neurotrophic herpes virus. It may cause a herpes zoster infection by re-emerging from the dorsal root ganglia, where it remained hidden after the first infection. The most common area of involvement is thoracic dermatomes. The dermatomal rash resolves within weeks, but neuropathic pain persists for a long time in most patients. It is suggested to evaluate the pain that persists for at least three months after the post-herpetic neuralgia (PHN) rash.[1]

Erector spine plane block (ESPB), defined in 2016, is an interfacial area block, mainly for acute pain treat-

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Submitted *(Başvuru)* 17.02.2021 Revised *(Revizyon)* 15.04.2021 Accepted *(Kabul)* 14.06.2021 Available online *(Online yayımlanma)* 19.10.2023

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Table 1. The data of the patients regarding demographic, clinical, and pain scores

Patient		PHN dermatomes	Before block		1st h		1st month		3rd month	
			A	R	A	R	A	R	A	R
1	Age: 52 years, Weight: 65 kg, Height: 155 cm, Gender: F	T7-11 (left) *T9	10	7	3	2	2	1	1	1
2	Age: 64 years, Weight: 58 kg, Height: 160 cm, Gender: F	T8-11 (right) *T9	9	8	2	1	3	2	3	2
3	Age: 67 years, Weight: 63 kg, Height: 160 cm, Gender: F	T3-7 (left) *T5	9	7	2	1	2	1	2	1
4	Age: 65 years, Weight: 70 kg, Height: 176 cm, Gender: M	T3-7 (left) *T5	10	8	2	1	4	2	6	5
5	Age: 64 years, Weight: 70 kg, Height: 176 cm, Gender: M	T7-10 (right) *T8	8	8	2	1	0	0	0	0
Median			9	8	2	1	2	1	2	1

PHN: Post-herpetic neuralgia; T: Thoracic vertebra; A: Active movement; R: Rest; *: Block level.

ment. This procedure is applied by touching the transverse process of the thoracic vertebra with the block needle and injecting a local anesthetic agent under the deep fascia of the erector spine muscle. The ESPB acts by blocking the dorsal and ventral roots of the spinal nerves and sympathetic nerve fibers.[2,3]

Methylprednisolone is an analgesic and anti-inflammatory agent used to treat pain caused by inflammation. Steroids also prolong the action of local anesthetic agents.[4]

The study was planned to observe whether ESPB applied with methylprednisolone and bupivacaine is an effective method for the treatment of acute and chronic pain due to PHN.

Case Report

The verbal and written consent of the patients was obtained. The patients diagnosed with herpes zoster were treated with valaciclovir (3 g/d, for 7–10 d), dexketoprofen, and oral vitamin B12 during the acute period. The ESPB was applied to five patients with no systemic disease, whose complaints continued for at least three months despite tramadol and pregabalin treatment, and whose Numerical Pain Rating Scale (NRS) score was ≥7. The pain scores of the patients were evaluated in the first and third months in the algology outpatient clinic. The pain scores and sociodemographic and clinical data of the patients are shown in Table 1. While evaluating pain with the NRS, the patient is asked about the pain level, to give 0 points for the absence of pain and 10 points for the most severe pain.

Patients were placed in the prone position after establishing vascular access and monitored, and 2 mg of midazolam was administered intravenously (Fig. 1). The skin in the treatment area was sterilized with 2% chlorhexidine. The linear US probe (Esaote MyLab30®, CA631 high-frequency probe, London,

Figure 1. Physician and patient position during the ESPB procedure.
ESPB: Erector spinal plane block.

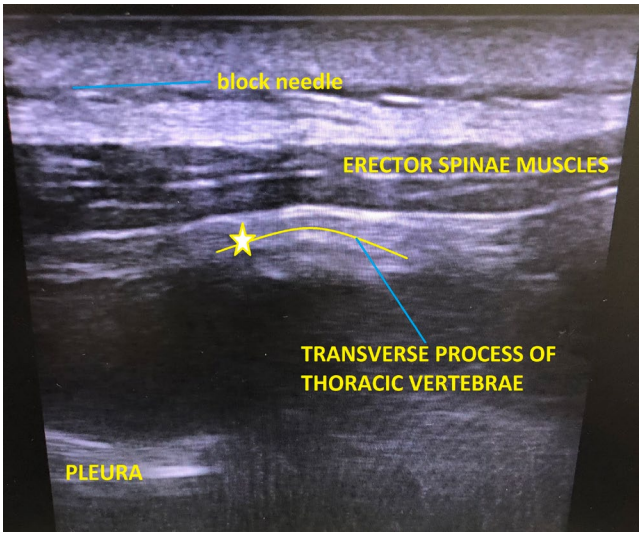

Figure 2. Anatomy under US and block needle, yellow star shows the block plane.

UK) was sterile coated for the procedure. A 20 G 100 mm block needle (Stumplex® Ultra 360®, Braun, Germany) was used with the "inplane" technique during the procedure. The US probe was placed on the vertebral column at the thoracic level over the midline. The vertebral transverse process and erector spine muscle matching the pain dermatome on the side to be operated on were visualized in the sagittal plane. Then, the transverse process was touched by inserting a needle under the deep fascia of the erector spine muscle. The injection site was confirmed with 2 mL of 0.9% NaCl, 20 mL of 0.25% bupivacaine, and 40 mg of methylprednisolone applied to this area (Fig. 2). The craniocaudal spread of the fluid was observed. For the block procedure, the vertebra matching the dermatome area closest to the center of the painful dermatomes was selected.

After the procedure, all patients were monitored, and vital signs were followed for four hours. An ice battery was applied to the dermatomes, where the block procedure was expected to be effective. All patients were discharged after a 4-h observation with stable hemodynamic findings. The patients used no medical treatment for PHN during the three months after ESPB.

Results

The pain levels of all patients were re-evaluated with NRS at the end of the first hour, and it was observed that the pain scores of all patients decreased dramatically. Pain levels remained lower or absent in the first and third months (Table 1).

Discussion

PHN is a chronic pain syndrome that is often resistant to treatments, can lead to physical, social, and psychological disorders, and can persist for years. In the medical treatment of this pain, antiviral agents, systemic steroids, non-steroid anti-inflammatory drugs, topical local anesthetics, antidepressants, anticonvulsants, and opioids are used, but their effectiveness is unfortunately limited. They also have many unwanted side effects.

Nerve stimulation, spinal cord stimulation, and dorsal root ganglion extension can be considered minimally invasive treatments for PHN.[5] These procedures require special equipment, advanced technological devices, and an experienced team.

The ESPB is one of the interfacial block techniques. Its analgesic effect is thought to be achieved by spreading the local anesthetic fluid to the paravertebral area, transforaminal area, and anterior epidural area.[2,3,6] It was hypothesized that when ESPB is applied to patients with PHN in the thoracic region, neurogenic inflammation and hyperalgesia can be reduced with widespread dissemination. Sensitization resulting from repetitive stimuli can be eliminated with ESPB

by blocking afferent neurons and sympathetic fibers in the pain pathways, and thus acute and chronic pain can be relieved.

The ESPB is successfully used to prevent post-operative pain after thoracic and abdominal surgeries in children and adults.[7–9] In a report, the authors presented the successful management of acute herpes zoster pain using ESPB and suggested that ESPB could be an effective and simple analgesic method for the treatment of acute herpes zoster pain.[10] Hacıbeyoğlu et al.[11] retrospectively compared the NRS, Leeds Assessment of Neuropathic Symptoms and Signs, and sleep interference scale scores of the 18 patients treated with an intercostal nerve block (Group 1) and 21 patients treated with ESPB (Group 2). The scores recorded at week 4 and week 12 were dramatically higher than the score of the 24th h in Group 1, and there was no difference between the results in Group 2. The scores at week four and week 12 were lower in Group 2 than in Group 1. Consequently, the authors stated that ESPB was a significantly effective method to reduce neuropathic pain symptoms and the need for additional therapy in the long-term treatment of PHN. In our study, after the application of ESPB, patients were evaluated in the 1st h, 1st month, and 3rd months, and their NRS scores were recorded (Table 1). Post-procedure pain scores for all patients were significantly lower than the pain scores before the procedure.

A study conducted in patients with PHN found that methylprednisolone and bupivacaine treatments applied to the epidural area were more effective than systemic drug treatments.[12] Compared to ESPB, the most significant disadvantage of the procedure is that epidural procedures are mostly performed with a blind technique, and the risk of complications such as dural damage is higher.

The main advantages of thoracic ESPB are the rapid reduction of pain in PHN, the ability to maintain this effect for as long as possible, minimal invasiveness, applicability in outpatient clinic conditions, and the absence of systemic side effects. Thoracic ESPB procedures require experience due to the risk of developing complications such as pneumothorax, harlequin syndrome, and nerve damage.[13,14] Performing the procedure by improving US skills reduces the risk of complications.[15]

This case series showed thoracic ESPB applied with US-guided methylprednisolone and bupivacaine can be among the first-line treatments due to rapid treatment results, cost-effectiveness, long-term safety and low side effects.

Acknowledgements: Thanks to Dr. Fatih Öner for writing assistance.

Peer-rewiew: Externally peer-reviewed.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Conflict-of-interest issues regarding the authorship or article: None declared.

References

1. Akyol DT, Utaş S. Postherpetik nevralji ve tedavisi. Turkderm [Article in Turkish] 2002;36:298–302.
2. Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The erector spinae plane block: A novel analgesic technique in thoracic neuropathic pain. Reg Anesth Pain Med 2016;41:621–7.
3. Schwartzmann A, Schwartzmann A, Peng P, Antunez Maciel M, Forero M. Bilateral erector spinae plane block (ESPB) epidural spread. Reg Anesth Pain Med 2019;44:131. [CrossRef]
4. Kilinc L, Türk B, Türk HS, Cinar S, Turgut S, İslamoğlu S. Peritonsillar dexamethasone-bupivacaine vs. bupivacaine infiltration for post-tonsillectomy pain relief in children: A randomized, double-blind, controlled study. Eur Arch Otorhinolaryngol 2019;276:2081–9. [CrossRef]
5. Lin CS, Lin YC, Lao HC, Chen CC. Interventional treatments for postherpetic neuralgia: A systematic review. Pain Physician 2019;22:209–28. [CrossRef]
6. Celik M, Tulgar S, Ahiskalioglu A, Alper F. Is high volume lumbar erector spinae plane block an alternative to transforaminal epidural injection? Evaluation with MRI. Reg Anesth Pain Med 2019:rapm-2019-100514. [CrossRef]
7. Ueshima H, Otake H. RETRACTED: Clinical experiences of ultrasound-guided erector spinae plane block for thoracic vertebra surgery. J Clin Anesth 2017;38:137. [CrossRef]
8. Aksu C, Gürkan Y. Ultrasound guided erector spinae block for postoperative analgesia in pediatric nephrectomy surgeries. J Clin Anesth 2018;45:35–6. [CrossRef]
9. Chin KJ, Malhas L, Perlas A. The erector spinae plane block provides visceral abdominal analgesia in bariatric surgery: A report of 3 cases. Reg Anesth Pain Med 2017;42:372–6.
10. Ahiskalioglu A, Alici HA, Ari MA. Ultrasound guided low thoracic erector spinae plane block for management of acute herpes zoster. J Clin Anesth 2018;45:60–1. [CrossRef]
11. Hacıbeyoğlu G, Arıcan Ş, Ulukaya SO, Yılmaz R, Reisli R, Tuncer Uzun S. Evaluation of the efficacy of erector spinae plane block and intercostal nerve block in the postherpetic neuralgia. Agri 2020;32:208–18. [CrossRef]
12. Pasqualucci A, Pasqualucci V, Galla F, De Angelis V, Marzocchi V, Colussi R, et al. Prevention of post-herpetic neuralgia:

Acyclovir and prednisolone versus epidural local anesthetic and methylprednisolone. Acta Anaesthesiol Scand 2000;44:910–8. [CrossRef]

13. Ueshima H. RETRACTED: Pneumothorax after the erector spinae plane block. J Clin Anesth 2018;48:12. Retraction in: J Clin Anesth 2022;79:110763. [CrossRef]
14. Sullivan TR, Kanda P, Gagne S, Costache I. Harlequin Syndrome associated with erector spinae plane block. Anesthesiology 2019;131:665. [CrossRef]
15. Tulgar S, Aydin ME, Ahiskalioglu A, De Cassai A, Gurkan Y. Anesthetic Techniques: Focus on lumbar erector spinae plane block. Local Reg Anesth 2020;13:121–33. [CrossRef]