Ultrasound Guided Transverse Abdominis Plane Block for Postherpetic Neuralgia

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INTRODUCTION

One of the most common and debilitating sequelae of herpes zoster (HZ) infection is postherpetic neuralgia (PHN). However, treatment of PHN is difficult because the condition involves multiple mechanisms, including peripheral and central sensitization¹. Although several interventional treatment guidelines have been established for PHN, no information is available on how and when they should be applied². A transversus abdominis plane (TAP) block is used for the treatment of chronic pain syndromes and for surgical anesthesia involving the nerves supplying the abdominal wall. We present a case of satisfactory pain relief after repetitive TAP blocks in a patient with severe PHN that was refractory to multidrug medication and neuraxial blocks.

CASE REPORT

A 71-year-old man visited our clinic for severe pain in his right T11 dermatome caused by postherpetic neuralgia (PHN) that had persisted for 10 months. Several medications and interventions, including epidural or nerve root blocks, had been used in attempts to relieve his pain. Although the pain improved, the localized allodynia persisted in the anterior abdominal wall. A transversus abdominis plane block was performed between the internal oblique and transversus abdominis muscles, resulting in satisfactory and sustained analgesia. Such blocks might be a useful treatment option for pain management in cases of acute herpes zoster and PHN.

Key Words: Abdominal muscles, Herpes zoster, Nerve block, Postherpetic neuralgia, Ultrasonography

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was placed laterally between the 12th rib and the iliac crest. Once all 3 muscle layers (external, internal, and transversus abdominis) were visualized, a 21-G 100-mm Stimuplex needle (B. Braun, Bethlehem, PA, USA) was inserted from the lateral edge of the probe using an in-plane technique. Then, 15 mL of 0.25% levobupivacaine was administered between the internal oblique and transversus abdominis muscle layers (Fig. 2). We mobilized the probe vertically in the right periumbilical area (approximately 5 cm above and below the umbilicus) and confirmed by ultrasonography that the local anesthetic had spread between the T8 and L2 segments. Twenty minutes after the injection, the patient’s spontaneous pain and mechanical allodynia disappeared completely. Analgesia was confirmed by loss of cold sensation over the T9-T12 dermatomes on the ipsilateral side of the block. No side effects were observed during the TAP block.

On the seventh day of follow-up, the patient presented with complete pain relief for approximately three days. Repeated TAP blocks were conducted at 2-week intervals. Two months after the repeated TAP, the patient’s pain score had decreased to 10-20 mm on the VAS. His allodynia in the right lower abdomen had reduced. The patient’s medications were gradually tapered off. Pregabalin at 75 mg/day, without any opioid, was prescribed for 3 months. Three months after the last TAP block, his pain and mechanical allodynia had disappeared completely without the need for any medications. During the follow-up period, the patient showed a dramatic improvement in his performance of daily activities.

**DISCUSSION**

In this case, we found that a TAP block could be a treatment option to ameliorate intractable localized pain in patients with PHN despite having tried various other treatments. The patient had received several medications, including opioids as well as interlaminar epidural and nerve root blocks. Even though these treatments improved some of his symptoms, the localized pain in his right abdomen was not decreased. However, the persistent localized abdominal pain improved markedly after the TAP block.

The major risk factor for PHN is old age. The increased relative risk of PHN for each 10-year increment in age ranges from 1.22 to 3.11. Therefore, elderly people have an increased risk of PHN after HZ infection. PHN remains an unresolved problem, with a prevalence of >50% in affected patients over 69 years of age. In some cases, PHN has been considered as an intractable disorder because it does not respond to many methods of treatment and causes substantial morbidities such as motion limitation, increased risk of adverse drug events, and worsened quality of life. In order to prevent PHN, clinicians must try to treat HZ infections using antiviral therapy within 72 hours or as soon as possible. Nerve blocks with local anesthetics and steroids within 2 months of HZ infection are also effective for preventing PHN. Vaccination against the HZ virus can prevent the occurrence of PHN by decreasing the incidence of active infections. In patients with PHN, the first-line medications include tricyclic antidepressant (TCA) drugs, anticonvulsants such as pregabalin and gabapentin, and lidocaine patches. Nerve blocks and intrathecal steroid injections are also effective for the treatment of PHN.

PHN is believed to be caused by infection with the varicella-zoster virus, which damages sensory ganglia and sensory neurons of the spinal tract. However, the treatment of PHN has focused on relieving pain rather than on healing the damaged neural elements. For example, TCAs, gabapentin,
pregabalin, and opioids usually show analgesic effects in excited neurons by blocking receptors or ion channels\(^{1}\). Interventions such as epidural, sympathetic nervous system, and nerve root blocks relieve pain by blocking neuronal conduction from ganglions to the central nervous system\(^{2}\). However, topical lidocaine and capsaicin and peripheral nerve blocks provide pain relief by producing peripheral desensitization\(^{10,11}\). Therefore, TAP blocks might have the same mechanism for relieving pain in patients with PHN as topical analgesics or peripheral nerve blocks. In this case, the TAP block mechanism might have helped to improve intractable pain not amenable to multi-drug medications and spinal blocks.

Topical PHN analgesics provide clinically meaningful localized pain relief\(^{11}\), while providing fewer side effects and end-organ safety profiles in elderly patients with PHN and multiple diseases. This approach avoids the need for laborious titration of oral analgesic agents and helps prevent the adverse events of intervention, including coagulation disorders and infections. A TAP block may show stronger pain relief than topical analgesics in cases of persistent localized pain because it provides a powerful neuronal block due to the direct spread of local anesthetics to the peripheral nerves. In addition, a TAP block might be a potential treatment option for elderly patients with localized pain and fragile skin, thereby avoiding the need to change analgesic patches several times daily. We have previously used TAP blocks to relieve pain in patients with persistent localized pain, and the method was clearly effective against localized pain in the present case. Thus, TAP blocks may be a good option for controlling intractable localized pain. Further studies on its use in patients with PHN are necessary to determine its efficacy, the optimal frequency of applying the block, and the dosages of local anesthetics used.

In conclusion, a TAP block is a potential treatment option for patients with intractable abdominal pain that persists despite the use of combined regimens of medications as well as epidural and nerve root blocks for the treatment of PHN.

**Conflict of Interest Disclosures:** The researchers claim no conflicts of interest.

**REFERENCES**